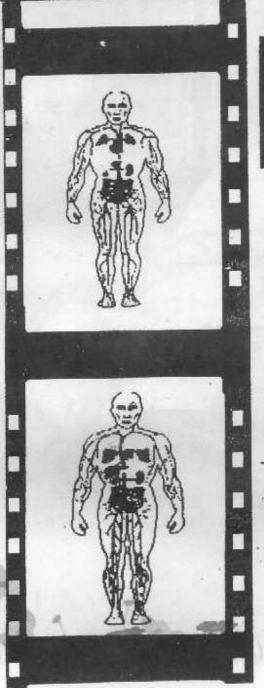
Dr Khaled Omar

PRINCIPLES OF





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CELEGES WEVEGLE SOVED



Vol. (1)

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Tel: 7237606 Mob: 012 2466443 Chapter []]

Wounds, Haemorrhage, Mock & Blood Transfusion

Chapter [1]



* Definition:

It is forcible loss of continuity of soft tissues.

* Aetiology:

Mainly due to Mechanical Trauma.

* Classification :

A) Opened Wounds: "In which the skin continuity is interrupted"

1 Incised Wounds:

- · Caused by Sharp cutting instrument.
- It has clean cut edges with little or no tissue damage.
- It is more liable for bleeding (cleanly cut vessels) & Less liable for infection.

D Lacerated Wounds

- · Caused by Blunt heavy instrument.
- It has crushed edges with severe tissue damage.
- It is less liable for bleeding & More liable for infection as Tetanus or Gas gangrene.

3 Stab or Punctured Wounds:

It is <u>caused by Pointed</u> objects as **Daggers**. It is the most dangerous type because internal organs or vessels may have been cut.

Gun shot wound:

It have an Intel & Exit.

(5) Abrasion:

Partial denuation of the superficial layer of the skin due to Fiction of skin with rough' surface. <u>Treated</u> by Antibiotics.

6 Bites: Animal or Human

B Closed Wounds: "In which the skin surface is intact"

- ① Contusion (Ecchymosis): It is extravasation of blood from injured small vessels with no formation of a swelling. Treated by fomentation
- ② Haematoma:
 - It is Localized Extravascular Collection of blood
 - Types: ① Subcutaneous. ② Subfascial.
- ② Subperiosteal.④ Intra-muscular.

- · Sequelae (fate):
 - Resoluted by absorption
- @ Localized by fibrosis.

(3) Infected

- Calcified.
- Talse Aneurysm if communicates partial injured artery
- Treatment : (A.B & Fornentation)

Then pressure bandage if small or Aspiration if large.

* Types of Wound Healing: There are 3 Types: &

1 Healing by Primary Intention: This occurs with clean surgical wounds, there is little amount of Granulation tissues & minimal fibrosis.

So The final result is a fine linear scar.

@ Healing by Secondary Intention : This occurs with septic surgical wounds, there is Marked amount of Granulation tissues & Marked fibrosis.

So The final result is a weak ugly scar.

3 Healing by Tertiary Intention: This occurs after [2ry suture or delayed 1ry suture]. The aims is to lessen the fibrosis & to obtain a fine linear scar similar to lry intention. 4++++++

* Types of surgical wounds:

(A) Clean: There is no gross contamination such as Herniorrhaphy and Thyroidectomy wounds. The Risk of infection is 1-2%

(B) Clean contaminated: Wounds involve regions of he body that may contain low numbers of resident organisms e.g urological procedures, or surgery on prepared colon.

The Risk of infection is 2-5 %.

(C) Contaminated: an unprepared region of the body with numbers of endogenous organism is entered e.g surgery on unprepared colon.

The Risk of infection is 5-30%.

* Factors affecting Wound Healing:

(A) General Factors:

① Age: Healing is slowly with elderly due to ↓ Protein turn over rate.

② Nutritional Status as :

Vit. A Deficiency → ↓ Epithelialization.

Vit. C Deficiency → ↓ Protocollagen maturity.

Protein Deficiency→
 ↓ Collagen synthesis.

Also Ca+, Zinc, Copper and Manganese plays a minor role in wound healing.

- O Cortisene Administration: as it inhibits Fibroblast proliferation.
- O Chronic Diseases: like Uraemia, Diabetes & Malignancy delay healing

Local Factors: Which Impair Wound Healing.

- ①. Poor vascularity → ↓ healing (e.g. below knee wounds).
- ② ↑ Tension: by tight sutures or haematoma → ischaemia of the edges.
- Toreign body & Necrotic tissues: impair healing.
- @ Infection: Bacteria competes with fibroblasts for oxygen, Also bacteria secretes enzmes which destroys collagen e.g. Hyallurindase Enz.
- Adhesion to bony surface → decrease wound contraction phase.

Components of wound Healing:

[1] Wound Contraction:

- This process of contraction helps to diminish the size of the wound.
- It starts immediately & continues for the next 2-3 weeks.

[2] Granulation tissue Formation:

Which is later on replaced by Fibrous tissue

[3] Epithelialization:

The Basal cell layer & the epidermis starts migration over the Fibrous tissue

* Stages of wound healing = (3 phases)

"Phase I

Contraction:

This is a mechanical reduction in the size of the defect, It start 2 days after the injury and complete within 2 weeks.

*Phase II

Granulation tissue formation:

A) Inflammation stage: Lasts for about 5 days.

During which there is † Vascularity & † Capillary permeability -> exudation of RBCs, WBCs, Plasma and Fibrinogen → fibrin networks. Also TMacrophages → Ingestion of cellular debris from the wound.

B) Granulation stage: Lasts about 2 weeks.

Proliferating Fibroblasts & New capillaries → collagen fibers i.e. ground substance (which will fill the depth of the wound) then mucopolysaccharides & glycoproteins are deposited.

C) Fibrous tissue stage:

Collagen fibers remodelling fibrous tissue (scar) which are arranged along the lines of tension of the wound.

Phase III

Epithelial surface formation:

- Incised wound: Basal cell layer of the epidermis starts migration over The fibrous tissue formed in the previous phase, to close the skin surface over the wound.
- Large open wound: Epidermis grows for few centimeters and then slow down → leaving a raw area → shallow pale ulcer (Which needs later cover by skin graft).

* Complications of wound Healing:

[1] Wound Failure (wound dehiscence):

m Definition:

Failure of abdominal wound to heal is called "Burst Abdomen".

- Pathology: (At 6-8th post-operative day)
 - Warning (RED sign)= Serosanginous discharge, Soaks the dressing.
 - If intestine prolapse through wound -> called Evisceration .
 - If intestine doesn't prolaps through wound —>called Dehiscence

■ Treatment:

[A] Preoperative care:

- · Cover the prolaps bowel by a sterile dressing.
- · Ryle's tube suction.
- · I.V Fluids & Antibiotics.

IBI Operative:

The <u>protruded intestinal</u> loops are washed saline and retuned to the abdomen, the <u>omentum</u> is spread over the intestine, the <u>abdominal wall</u> is closed as one layer by prolene (TENSION SUTURES) then retained at least 3 weeks.

[C] Post-operative care:

Abdominal Binder is used.

[2] Stretching of the scar.

[3] Contracture:

This is pathological shortening of scar tissue resulting in deformities.

[4] Post-operative wound infection:

(see chapter 6)

[5] Hypertrophic scar:

- Definition: It is an excessive amount of fibrous tissue Confined to scar
- Aetiology: It occurs Extra-stimulus to fibrous tissue formation during healing such as infection or Excessive tension.
- <u>Treatment</u>: Excision + Plastic repair

[6] Keloid Formation:

- <u>Definition</u>: It is a <u>localized overgrowth</u> of the fibrous tissues extends beyond the original wound into normal tissues
- Aetiology: It occurs after Wounds, Burns or Surgical operations. .
- <u>Treatment</u>: It is Difficult because of high rate of recurrence
 - Pre and post-operative irradiation to √ recurrence.
 - (2) Excision.
 - (3) Intra-lesional steroid injections.





Normal Scar



Hypertrophic Scar



Keloid Scar

* Treatment:

A First Aid Treatment "Pre-hospital Management"

- D Ensure of patent "airway" if patient is unconscious.
- @ Control of bleeding by compression.
- Sterile dressing to prevent Contamination.
 Then Transfer patient to Hospital

B Definitive Treatment "Hospital Management"

- Assessment of injury for associated Visceral, Arterial & Nerve injury.
- ② 4 Anti [Anti-shock, Anti-biotics, Anti-tetanic Serum & Anti-gas Gangrene].
- Transfer the patient to Operating Room.

Then According to the <u>onset</u> of wounds. [3 Possibilities]

IF "Wounds within 6-8 hours"

- * Incised wounds: There is No contamination & No Risk for infection so do to [1ry suture + suture of all structures including Nerves & Tendons].
- * Lacerated wounds: There is Contamination and Risk for infection so do & [Wound Excision] Then [1ry suture].

 Nerves & Tendons is repaired postponed 4-6 weeks.

"Wound Excision" It is excision of edges Then Incision of deep fascia Then Identification of Neuro-vascular bundles Then Removal of all foreign bodies Then Excision of all dead muscles.

IF "Wounds From 8-24 hours"

* The Wounds Incised or Lacerated are potentially contaminated so do So [Wound Excision] + Systemic A.B + Repeated dressing to allow the granulation Tissues to fill the wound.

Then IF becomes clean within 4-6 days we do [Delayed 1ry suture].

Or IF becomes clean after 10-14 days we do [2ry suture].

IE "Wounds After 24 hours"

★ The Wounds Incised or Lacerated are Infected so do ²
[Depridement] + Systemic A.B + Repeated dressing to allow the granulation tissues to fill the wound] Then [2ry suture].

"Depridement" It is Removal only of dead & devitalized Tissues with no excision of edges as this will break the body defense against infection & will open new plans for infection.

N.B: <u>Amputation</u> is indicated in Severely Crushed Limb, Severely Uncontrolled Infection or Vascular Gangrene

MAJOR TRAUMA & THE MULTIPLE-INJURY PATIENT

* Mechanism of injury:

There are 2 major types of injuries :

[1] Penetrating injuries:

1- Low velocity injuries:

- · Caused by knives & other sharp objects.
- · Also caused by bullets with low velocity .
- The injury is usually focused over a small area.

2- High velocity injuries:

Caused by a <u>missele</u> so the higher the velocity the more damage.

[2] Blunt injuries:

- I- Direct blows.
- 2- Fall from a heigh.
- 3- Road Traffic Accident (RTA).
 With blunt Trauma there is a tendency for certain patterns of associated injuries e.g.
 Head & cervical injuries or rupture liver or rupture spleen or fracture pelvis & urethral injuries.

* Causes of Trauma mortality:

Death following Trauma can be classified into 3 groups:

According to Time.

[1] Immediate deaths:

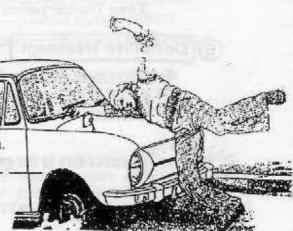
These follow fatal injuries and occur within <u>few minutes after the accident</u> so that little can be done for the victims. Examples of these injuries include major trauma to the brain or upper spinal cord, injuries of the heart or major blood vessels or rupture of the major airway.

[2] Early deaths:

These occur within <u>few hours after the accident</u> and so, with proper and rapid management, the patients have a chance of survival. These cases include intra-cranial haemorrthage, massive intra-abdominal or intra-thoracic haemorrhage, or major fractures.

[3] Late deaths:

These occur Some weeks after the accident generally due to sepsis or multiple organ failure.



MANAGEMENT OF SEVERE TRAUMA & MULTIPLE - INJURY PATIENTS

i.e Management of an Acutely injured patient

Organized Trauma care

The American College of Surgeons developed the Advanced Trauma Life Support (ATLS) which is an internationally accepted protocol for the management of major trauma victims. ATLS protocol has three elements.

- (1) Primary survey / resuscitation.
- (2) Secondary survey.
- (3) Definitive treatment of individual injuries.

[]] Pre - hospital Management:

- (1) Ensure of patent " Airway" if patient is unconscious.
- (2) Control of Bleeding by compression.
- (3) Sterile dressing to prevent Contamination.
- (4) Immobilize the fractured part associated.



[II] Hospital Care:

Primary survey / Resuscitation

- A= Air way maintenace.
- B= Breathing.
- C= Circulating i.e control bleeding.
- D= Disability i.e. support any fracture.
- $E = \underline{E}$ xposure of the patients.

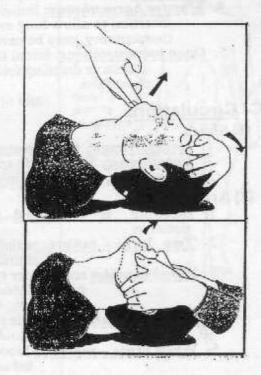
(A) Air way maintenance:

[1] Clear the airway

- 1- Vomit, blood or foreign material should be removed manually (finger sweep) or with a rigid sucker.
- 2- This is followed by chin lift or jaw thrust .

[2] Protect the airway:

- 1- An oropharyngeal or nasopharyngeal airway tube prevents the tongue from falling back and occluding the airway in an unconscious person.
- 2- Tracheal intubation is indicated with .
 - a. Apnoea.
 - b. Inhalation injuries.
 - c. Maxillofacial trauma
 - d. Closed head injuries



3

Orotracheal intubation allows the use of a large tube. Nasotracheal intubation is safer if the corpical coince appears frontiered

3- <u>Circothyroidotomy</u>. This is done either by making a cut and insrting a tube, or by the percutaneous insertion of wide – bore needle.

[3] Cervical spine control:

- The cervical spine should be considered unstable in the following situation:
 - Clinical examination reveals bony abnormalities or cervical tenderness.
 - 2- <u>Multi-system trauma</u>, a blunt injury above the clavicle.
 - 3- Maxillo-facial trauma
- Cervical spine immobilization is done using a backboard and a rigid collar.



Cricothyroidotomy



B. Breathing:

[1] Assessment:

- Inspection for Air movement Respiratory rate, Cyanosis, tracheal shift, jugular venous distention and open chest wound,
- Palpation for subcutaneous emphysema and flail segments.
 Percussion for hyperresonance or dullness over lung field
- 4. <u>Auscultation</u> for upper air way sounds as stridor. Wheezing or gurgling and for lower air way sounds over lung field.

[2] The immediately life - threatening thoracic conditions and their treatment are:

- Tension pneumothorax: Needle decompression
 followed later by intercostal chest tube.
- Cardiac tamponade: Needle pericardiocentesis followed later pericardiotomy and control for source of bleeding.
- 3. Flail chest intubation and positive pressure ventilation.
- Massive haemothorax: initial treatment is by chest tube insertion to allow lung expansion. Later thoracotomy, may be needed if bleeding continues.
- Open pneumothorax. Initial treatment is by an occlusive dressing followed by insertion of a chest tube.

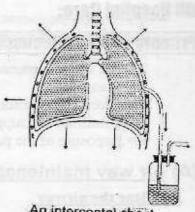
C- Circulation:

[1] Shock

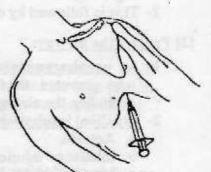
- 1. Haemorrhagic. Commonest
- Cardiogenic. Tamponade and myocardial trauma.
- 3. Neurogenic. Spinal cord injury.

[2] Action

- 1- <u>Bleeding is controlled</u> with direct pressure if possible.
- 2- Two large calibre: peripheral IV lines are inserted.
 A central line may also be added.
- 3- Blood samples are sent for typing, cross matching, haemoglobin, haematocrit and blood chemistry.
- 4- Ringers lactate solution is infused as a start.
 Volume of crystalloid needed
- 5- When cross matched blood is vailable it is to be infused immediately.



An intercostal chest tube is used to drain air of fluid



Pericardiocentesis

D. Disability:

Common causes of neurological deficits related to trauma are:

Head injury, Hypoxia, shock, Alcohol or drug Abuse

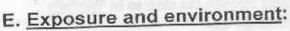
AVPU Evaluation

Based on patient's best response.

- A. Alert and interactive
- V. Vocal stimuli elicit a response
- P. Painful stimuli are necessary to evoke a response
- U. Unresponsive

A more detailed assessment using the Glasgow Coma Scale

(GCS) is performed



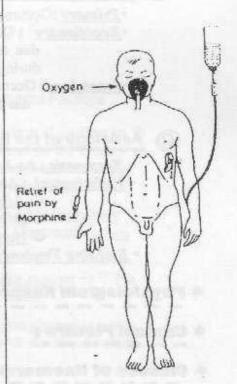
- (1) Clothes All clothes of the trauma victim are removed using sharp large scissors.
- (2) Warmth Keeping the emergency room warm and using blankets to prevent hypothermia.
- (3) Insert
 - 1- Urethral catheter (Foley's) to monitor output. This is contraindicated if there is blood at the urethral meatus as it usually unsuccessful and may even compound the injury.
 - 2- Nasogastric tube (Ryle's) decompresses the stomach and prevents vomiting and aspiration.

Secondary Survey

- The secondary survey is to be done once resuscitation efforts are under way and X-rays have been evaluated.
- . It includes examination of
 - 1. Head .
 - 2. Face .
 - 3. Spine.
 - 4. Neck .
 - 5. Chest.
 - 6. Abdomen.

Diagnostic peritoneal lavage (DPL) are indicated in blunt abdominal trauma, in an adult, that is associated with:

- a) Suspicion of organ injury.
- b) Unreliable abdominal examination because patient is unconscious, e.g., head trauma, or alcohol intoxication.
- c) Unexplained hypotension that may be caused by blood loss.
- 7. Perineum, including rectal examination in all patients and vaginal examination in females.
- 8. Limbs for fractures and for soft tissue injuries including vessels, nerves, and tendons,
- 9. Nervous system
 - Pupils for size, equality, and reaction to light.
 - Glasgow Coma Scale.
 - · Cranial nerves.
 - Sensation and motor activity in limbs.



Neck

Pelvis



* Classifications:

A Site of Bleeding

- <u>External</u>: Bleeding is visible as it occurs through the skin as in <u>Wounds</u> or from body orifice as in <u>Epistaxis</u>.
- · Internal: As in Haemothorax or Haemoperitoneum.
- · Interstitial: Bleeding occur into the tissues forming a Haematoma.

B Types of bleeding vessels

- <u>Arterial</u>: The Blood is <u>Bright red</u> in colour, Comes in <u>Pulsatile jets</u>.
 & The bleeding is <u>More from proximal</u> than distal end.
- Venous: The Blood is <u>Dark red</u> in colour, Comes in <u>Steady flow</u>
 & The bleeding is <u>More from distal</u> than proximal end.
- · Capillary: The Blood is Bright red in colour and comes as oozing.

C Time in Relation to Onset of Trauma

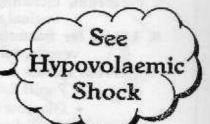
- Primary : Occurs at the time of trauma.
- <u>Reactionary</u>: Occurs <u>within 24 hours</u> after the time of trauma or operation
 due to slipping of ligatures as a result of restoration of <u>A.B.P.</u>
 during the recovery periods.
- Secondary: Occurs within 7-14 days after the time of trauma or operation due to Sepsis which dissolve the Clot & Erodes the arterial wall.

(D) Aetiology of the Bleeding

- · Traumatic : As Accidents "The Most Common".
- · Pathological : As 3
 - O Atherosclerotic e.g. (Ruptured Aneurysm).
 - Diffammatory e.g. (Bleeding Peptic ulcer).
 - ② <u>Neoplastic</u> e.g.(Haematuria in Renal Cancer).
- <u>Bleeding Tendency</u>: As Haemophillia & Purpura.

* Physiological Response:

- * Clinical Picture :
- * Classes of Haemorrhage :
- * Investigations & Monitoring If shocked :
- * Treatment:





SHOCK is a Pathological condition that is Characterized by Inadequate Tissue perfusion with impaired it's metabolism



Hypovolaemie Shock

(عوم جدا)

* Actiology:

Diminished Blood Volume due to %

- O Blood Loss : As in Haemorrhage.
- @ Plasma Loss: As in Burn.
- (1) Fluid Loss: As in Severe Vomiting & Diarrhaga.

* Physiological Response :

[Heemorrhage is the Classic Example of Hypevolagmic Shock] There are 2 Aims

- A Stopping the Bleeding "Local Factors"
 - By @ Immediate Vasocontriction.
 - @ Retraction of intima of bleeding vessels.
 - @ Subsequent Clot formation.

B) Maintaining effective Circulatory Volume "General Factors"

By @ Neural Factors: Stimulation of the Sympathetic System, Leading to 3

- Constrictions of Veins So displaces the blood to the Heart.
- · Constrictions of Arterioles So raise the poripheral resistance.
- · Increasing Rate & strength of cardiac contraction.
- @ Endocrinal Factors: Mediated through the following Mechanisms %
 - Catecholamines → 个 HR & Myocardial Contraction then constriction of arterioles of skin & viscera.
 - ↑ ADH, Aldosteron & Renin-Angiotensin system > ↑ Na
 & water retention So correct the blood volume.
 - ACTH, Cortisol, GH & Glucagon → Hyperglycaemia which increases Extracellular Fluid (E.C.F) So correct the blood volume.

* Clinical Picture:

[Haemorrhage is the Classic Example of Hypovolaemic Shack]

A Symptoms

- (a) Weakness & Fainting especially with standing.
- (b) The patient feels Cold.
- (c) There is Thirst Sensation.
- B Signs "Patients vary from Anxious to Restlessness to Drowsy" to unconciousness
 - (a) Pulse : (Rapid a Weak)

Due to ① ↑ Catecholamines → Direct stimulation of [S.A. Node].

- ② ↓O₂ (i.e. Hypoxia) → Direct stimulation of [C.A. Center].
- ③ Hypotension → Weak pulse.
- (b) Arterial Blood Pressure : (Hypotensien).

Because in Haemorrhage the venous Return decreases as a result of decreased Blood volume, and so the Cardiac output decreases $\rightarrow \downarrow$ A.B.P

(c) <u>Temperature</u>: (Subnormal).

Due to decreased metabolism.

(d) Respiratory Rate : (Tachypnea i.e .Air Hunger)

Due to → Hypoxia which stimulates Chemoreceptors in the [Carotid and Aortic bodies] → Stimulation of Respiratory Center (R.C).

(e) Skin : (Pala, Cold a Clampry).

Due to sympathetic overtone which

leads to ① Vasoconstriction of Skin Capillaries i.e. Pale Skin.

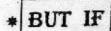
- D Vasoconstriction of Skin Arterioles i.e. Cold Skin.
- ② Excessive sweating secretions i.e. <u>Clammy</u> Skin.
- (f) Urine Output : (Cligaria)

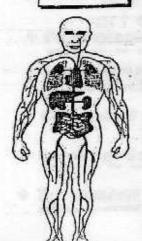
Due to O ADH.

- Renal Hypoperfusion.



The patient is rapidly treated by adequate volume replacement, these signs will rapidly return to normal





The patient is not rapidly treated by adequate volume replacement, the followings will occur

◇<u>Lung</u>: ARDS "<u>A</u>dult <u>R</u>espiratory <u>D</u>istress <u>S</u>yndrome".

◇<u>Heart</u>: ↓ Myocardial Contractility by "T.N.F" <u>Tumor</u> <u>Necrosis Factor released from Gut Hypoperfusion.</u>

◇Liver: Hepatic dysfunction & Jaundice from Liver Hypoperfusion.

♦ <u>Kidney</u>: ↓ GFR → Acute Tubular Necrosis → "A.R.F." <u>Acute</u>
<u>Renal Failure from Renal Hypoperfusion.</u>

♦ Small Intestine: Release of depressing substances as Endotoxins from Gut hypoperfusion.

* Classes of Haemorrhage:

Parameter	Class	Class II	Class III	Class IV
★ Blood loss	Up to 15% (750 ml)	15-30% (750-1500 mL)	30-40% (1500-2000 mL)	>40% (> 2000 mL)
* Mental status	Normal to Anxious	Anxious to Restless	Restless to Drowsy	Drowsy to Unconscious
* Capillary Relill	Normal	> 2 Sec.	> 2 Sec.	> 2 Sec.
* Pulse/min.	90-100/ min.	100-120/min.	120-140/min.	> 140/min.
★ A.B.P.	Normal	Normal in supine only	Low	Low
* Temperature	Normal	Cold	Colder	Very Cold
⋆ R.R	Normal	20-30/min.	30-35/min.	> 35/min.
* Skin	Normal	Pale	Pale	Pale
* Urine output	Normal >30mL/h.	30-20 mL/h.	20-10 mL/h.	10-0 mL/h.

* Investigations & Monitoring of Shocked pt.: "LC.U"

[The Aim is to Check the adequacy of Replacement]

- ① Pulse (Normally = 60 90/min), A. B. P. (Normally = 90-150/60-100), Respiratory Rate (Normally = 16-20/min.) and Temperature (Normally = 36.5 37.2).
- © Central Venous Pressure (C.V.P) (Normally = 5-10 Cm H₂O)
- Durinary output by Folly's Catheter.
- Pulmonary Artery Wedge Pressure (PAWP) by "Swan Gauz" Catheter to estimate pulmonary artery pressure.
- D Hb %, Haematocrite value, Electrolytes, Urea & Creatinine.
- © Blood gases as PO₂ (Normally = 80 100 mmHg).
 & PCO₂ (Normally = 35 45 mmHg).

N.B.: Irreversible Shock:

- It is a Complete Vascular Collapse with Hypotension unresponsive to volume replacement or drugs intervention.
- It is related to &
 - 1 The Duration & Volume of Fige.
 - The Age of patient.
 - The Fitness of patient.
- Before the conclusion that Irreversible shock has occurred,
 The cause of unresponsive to therapy, may be due to
 - (1) Continuous Internal Blood loss.
 - ② Inadequate Volume Replacement.
 - 3 Acute Myocardial Insufficiency.

* Treatment:

[Haemorrhage is the Classic Example of Hypovolaemic shock]

[A] Stop of Bleeding

· 1ry Haemorrhage :

① Proximal pressure is applied over the artery against bone.

O Cover the wound by clean dressing i.e. Packing then Positioning.

N.B.: Tourniquets are contraindicated because of it's complications unless the limb is going to be amputated.

Operative procedures, through control of bleeding points by ligation or diathermy coagulation.

· Reactionary Haemorrhage:

Re-exploration & control the bleeding as above.

· 2ry Haemorrhage:

1 The wound is packed with A.B & Sterile dressing.

② Antibiotics are given systematically.

① If the bleeding is not controlled by that ways. Do re-exploration of the wound & ligate the bleeding vessels in the wound itself.

[B] Restore the Blood Volume "Depending on the Classes"

Class II Haemorrhage (15 – 30% Bl. Loss)

The Replacement solution is [Ringer's Lactat].

The amount is 3 Times the estimated deficient blood i.e about 3 litters.

The Administration: [2 litters] are given as a bolus and the response is monitored. Then if there is definite improvement the remaining [1 litter] is given more slowly.

N.B. : If Haematocrite value < 30 → Bl. Transfusion is required

- Class III (30-40% Bl. Loss) & Class IV (> 40% Bl. Loss) :
 - Start with blood transfusion as replacement therapy.

The Amount is Equal the estimated deficient.

- The Administration The Transfusion is continued till recovery but if no improvement search for Internal bleeding to be Aspirated <u>Then</u> continue the transfusion till recovery.
- Either Class II, III & IV: The restoration is guided by clinical progress,
 CVP, urine output, Haematocrite value etc...

[C] Other Procedures

- <u>Positioning</u>: Elevate both legs while maintaining the trunk of the patient in supine position.
- Analgesia: As Morphla but it is contraindicated with Head injuries or respiratory distress (Morphia → ↓ RC → ↑ CO₂ → Cerebral VD).
- Pulmonary Support: Oxygen is administrated the through a Face Mask, Nasal Catheter or Endotracheal Tube.



* Incidence:

- The Most Serious type of shock & The Most Difficult to treat.
- The Mortality Rate > 30%.
- Gram -ve common than gram +ve, so it is called "Gram -ve Shock"

* Actiology:

Predisposing Factors :

- ① Extremes of Age.
- DM, Malnutrition, Malignancy or Uraemia.
- ② Patient under Corticosteroids or Immunosuppressive drugs.

Source of Gram-ve Organism: "E. Coli, Klebsiella & Pseudomonas"

- The Genito-urinary System.
- The Elementary Tract & Biliary System.
- The Respiratory System.

Common Causes :

- ① Sepsis following operation of Genito-urinary, Intestinal Tract & Hepatobiliary especially when surgery is urgent.
- O Septic Peritonitis.
- Major Trauma or Burn with Sepsis.

* Pathophysiology : (مهم جداً)

Gram -ve organism produce Endotoxins So Called "Endotoxic Shock" These Endotoxins will stimulate the Macrophages to release "Cytokines"]

Which cause the following Problems

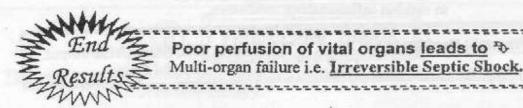
[A] Platelets & Leucocytes adherence to the Vascular Endothelium

Which leads to 3

- ① Impairment of microvascular perfusion i.e Microvascular thrombosis.
- ② More release of Cytokines & Oxygen free radicals leads to more damage to vascular endothelium.
- 3 Hypoxic Tissue damage.

[B] Damage of the Barrier Function of the Intestinal Mucosa: Allowing passage of Intestinal Pathogens into the circulation → Toxaemia.

[C] Excessive production of "Nitric Oxide" by Vascular Endothelium. Which is potent smooth muscles relaxant → peripheral vasodilatation → Aggravations of the shock.



* Clinical Picture :

- A Hyperdynamic (Warm) Septic Shock "The Early Stage"
 - Vitally : HR "Tachycardia", A.B.P "Hypotension, Temp. > 38°C "Fever"
 & R.R. "Hyperventilation".

Diskin : Dry & Warm.

- * Proper Treatment at this stage will survive.
- B Hypodynamic (Cold) Septic Shock "The Late Stage"

① It follows: The above stage if not treated properly.

The Clinical picture "Same as Hypovlaemic shock".
[↑ HR, Subnormal Temp., Hypotension & Hyperventilation + the skin is pale, Cold & Clammy + Oliguria]

The End result is Multi-organ Failure.

* Causes of Death :

- ARDS "Adult Respiratory Distress Syndrome"
- · Acute True Stress Ulcer.
- · ARF "Acute Renal Failure".

* Investigations & Monitoring of shocked pt.: "As Hypovlaemic Shock" +

Bacteriological Studies.

· Blood picture : Marked Leucocytosis.

Location of septic source: By X-ray (Abdomen - Chest), U/3 & CT scan.

* Treatment:

It is better to treat these patients in (I.C.U) Intensive Care Unite]

① Immediate recognition and early eradications of the source of sepsis e.g. Resect gangrenous parts & Drain intra-abdominal Abscess.

Antibiotics: The choice of drug depend on the possible suspected organism.

N.B.: A Combination of Caphalosperia, Amino glycosides a Metronidazele can cover all known organisms.

- (D) Correction of fluid imbalance by Ringer's Lactate, Plasma or Blood.
- Oxygen mask or Mechanical ventilation if PO₂ < 60 mmHge.
 i.e. Adult Respiratory Distress Syndrome.
- S Anti-oxygen free Radicals as Allopurinel.
- © Drugs as a. Vasopressors & Inotropics: if persistent Hypotension irrespective to the above mentioned measures.

Indomethacin & I.V. Carticosteroids:
 to combat inflammatory mediators.

Frequent Monitoring by Pulse, A.B.P, Temp., R.R, Skin, Urine output, CVP, ECG, PAWP & Arterial Gases



3 Cardiogenic Shock

* Actiology:

Due to deficient Cardiac output despite a normal venous Return due to

- Acute Myocardial Infarction.
- Massive Pulmonary Embolism.
- Arrhythmia or cardiac Tamponade.

* Characterized by:

- Manifestation of the cause.
- Congested Neck veins.
- · High C.V.P.

* Treatment:

- Treat the Cause.
- Drugs to improve Myocardial contractility e.g inotropics.
- Vasodilators to ↓ after-load & ↑ Cardiac output.



Neurogenic Shock

* Actiology:

Due to paralysis of vasomotor fibers → Peripheral vasodilatation → Inadequate venous Return → ↓ Cardiac output. This occurs with 3

- ★ Vaso vagal attack: due to hearing bad news leads to excessive vagal stimulation -> Bradycardia -> Hypotension.
- * High Transection of Spinal Cord: e.g. Spine fracture, or following spinal

* Characterized by :

- Hypotension.
- Normal pulse or slight bradycardia.
- " Warm skin.

* Treatment:

- The patient should be <u>Flat</u> with elevated legs.
- I.V Crystalloid solution as Ringer's Lactate.
- Vasopressors may be prescribed.



Anaphylactic Shock

* This is due to capillary paralysis from histamine release. Corticosteroid are beneficial + Antihistaminic drugs.



Fedoerinal Shock

This may occur in patients with Adison's disease or those receiving continuous Cortisone therapy.

Blood Transfusion



Precautions Before Blood Transfusion

1 Blood should be warmed before Transfusion

to decrease the incidence of Hypothermia & Arrhythmia.

- @ Medication should never be add to blood used in Transfusions.
- 3 Fluid intended to precede or follows Blood Transfusion should be isotonic without Calcium because (Ca++ will Clot Citrated blood).
- Blood Left out of refrigerator for > 30 min should not be used.
- Dlood Typing (ABO) must be done.
- © Cross Matching Test is done.



Indications of Blood Transfusion

Whole Blood : indicated to ₱

- · Correct blood volume as in Hge Class III & IV.
- · Correct any Internal Hge during the operations.
- · Replace infant's blood with RH -ve in Erythroblastosis foetalis.
- Provide Antibodies & Raise the general condition during severe infections.
- · Provide Deficient Factors as Factor VIII in Haemophilia A.
- Provide Deficient Factors as Factor IX in Haemophilia B.

@ Packed Red Cells:

- · Very useful in anaemic patient especially with Heart disease as it improve the oxygenation ability without over loading the circulation.
- Used in Haemolytic Diseases.
- Used in Certain Diseases as leukaemia.

1 White cells : used in 13

- · Leucopenia.
- Agranulocytosis.
- Aplastic Anaemia.

1 Plasma: used in 3

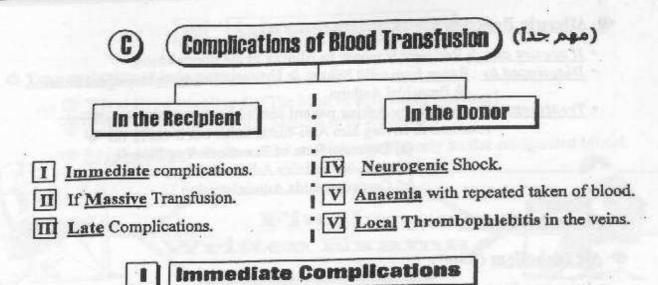
- · Burn.
- · Hypoproteinaemia.
- · Ascitis.

© Platelets:

Used with Thrombocytopenia.

© Coaquiation factors:

Used with Haemostatic Disorders.



1 Overloading the Circulation "Heart Strain":

 It occurs with Heart disease or Anaemia which blood is given faster than the Heart can accept it.

Diagnosed by [Lt. side HF + Acute Pulmonary Ocdema].

Treatment: It is recommended to Transfuse Packed red cells rather than the whole blood but if occur do [™]

(a) Oxygenation.

(b) Patient is placed in semi-sitting position.

(c) Drugs : As Digitalis & Lasix.

D Haemolytic Reaction : Rare but Serious.

 It occurs in presence of Antibodies in the recipient plasma which destroy the donor's RBCs i.e. Haemolysis.

N.B.: Human Frrer is frequently involved in such accident

Diagnosed by:

In the Conscious patient Chills, Fever, Flushing, Distended neck veins, Chest

& Flank pain, <u>Tachy</u>cardia, <u>Hypo</u>tension, <u>Tachy</u>pnea, <u>Oliguria</u> and Unexplained bleeding.

In the Anaesthetized patient Tachycardia, Hypotension and Unexplained bleeding.

In Major Haemolytic Reactions Jaundice, ARF & Haemoglobinuria.

<u>Treatment</u>: (a) Stop the infusion Immediately <u>Then</u> Repeat Typing.

(b) I.V Ringer's lactate + Manitol to wash kidney.

(c) Oxygenation.

3 Pyrogenic Reaction:

 It occurs due to minor bacterial contamination or some of pyrogens in the Transfusion apparatus.

Diagnosed by: Chills & [Fever, Headache, Malaise & Anorexia].

Prophylaxis is the main treatment.

@ Allergic Reaction :

It occurs due to Recipient response to Allergy in the donor blood.

Diagnosed by: Range from mild Itching & Urticaria to severe laryngeal oedema
 & Bronchial Asthma.

■ <u>Treatment</u>: <u>Prophylaxic</u> by Asking patient about histories of severe allergic reactions & Giving him Anti-histaminics but if occur do ®

(a) Decrease Rate of Transfusion or Stop it.

(b) Anti-histaminics Administration.

(c) Corticosteroids Administration

Thrombophlebitis (Rare)

6 Air Embolism (Rare):

• It occurs From blood Transfusion under pressure applied to it's surface.

· Diagnosed by : Mill-wheel Murmer & ICS changes.

 Treatment: Place the patient on the Lt. side with Head down to trap the air bubbles in Rt. ventricle & Keep them away from the pulmonary outflow.

II Complications Due to Massive Blood Transfusion

[Massive = Transfusion of 2500 mL of blood at one time]

1 Danger of Cold blood: Hypothermia & Cardiac arrhythmia

O Citrate Toxicity:

It occurs in patient with Liver disease or in shock. The liver cannot metabolise
 Citrate. Increased citrate will combine with Ca⁺⁺ → Hypocalcaemia.

· Diagnosed by : Tetanic manifestations.

Treatment: Administration of 10cc (10%) Ca Gluconate.

Metabolic Acidosis:

The PH of 14 days banked blood = 6.7-6.9

So because of hypoxic RBCs → Anaerobic Metabolism → ↑ Lactic Acid.

Coagulopathles:

Due to deficiency of Coagulation factors & Platelets in stored blood.

O Hyperkalaemia :

With prolonged storage of blood there is progressive loss of Potassium from R.B.Cs into plasma. So with blood transfusion several units of these potassium may produce Arrhythmia or even Cardiac arrest.

© Pulmonary Complications:

Due to accumulation of Unfilterable debris of clot present in (stored blood) > Pulmonary Micro-emboli.

III Late Complications

O Transmission of Infections:

- As ① Viral Hepatitis (B or C) [The Most Feared Complication]
 - AIDS Infection, Syphilis, Malaria & Brucelosis.

3 Septicaemia: Bacteria cannot multiply significantly in the refrigerated blood.



Chapter [2]

Diastic surgery Principles Principles The Burns

Chapter [2]



* Definition : Coagulative destruction of Tissues.

* Actiology:

O Physical Burns:

· Thermal: Exposure to Flame.

N.B.: A Scald caused by boiled liquids.

- · Electric : Burn due to Electricity.
- · Exposure to Irradiations.

O Chemical Burns:

- · Acids or Alkalis.
- · Corrosives as Potach.
- · Caustics.
- (3) Inhalation Burns : Due to Exposure to Hot gases.

* Classification: [PATHOLOGY]

1 According to the Percentage surface area involved

- * Role of (9) So Classified into
 - Major Burn : > 30% of Body Surface Area (B.S.A)
 - Intermediate Burn:

(15 - 30% in Adult & 10 - 30% in Children).

· Minor Burn :

(<15% in Adult & <10% in Children).

- * Head & Neck = 9%
- ★ Front of Trunk = 18%
- ★ Each upper limb = 9%
- ★ Back of Trunk = 18%
- ★ Each lower limb =18%
- ★ Perineum = 1%

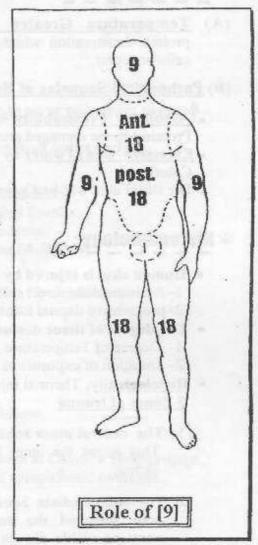
According to Depth

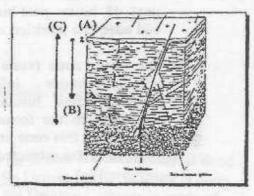
(A) First degree Burns:

Only the epidermis is damaged causing erythema of skin. So they heal rapidly e.g. sun burns

(B) Second degree Burns:

- The epidermis & portion of dermis are damaged Provided that No infection, the Healing occur by epithelialization from the epithelial remnants of Hair folicle & Sweat gland. But if infection occurs. These epithelial remnants will destroyed and so changed to be a full Thickness Burn.
- · This degree is subdivided into:
 - Superficial partial thickness burn:
 Which usually heal in 10-14 days.
 - (2) Deep partial thickness burn:
 Which usually heal in 25-35 days.





(C) Third degree (Full Thickness) burns:

This is a complete destruction of epidermis + dermis & the patient should be prepared for grafting.

3 According to Site of Burn :

e.g. Burn in perineum is difficult to nurse.

* Pathophysiology :

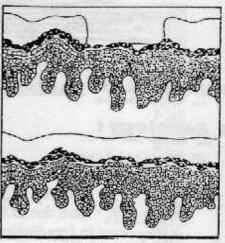
(A) <u>Temperature Greater than 45°C</u> Results in protein denaturation which exceeds the capacity of cellular repair.

(B) Pathoogical Sequelae of Burns

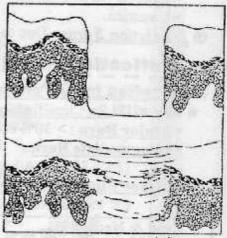
- Protein) in the damaged area.
- Excessive loss of water by Evaporation with loss of Calories.
- . The Burnt area will be Colonized by Bacteria.

st Histopathology :

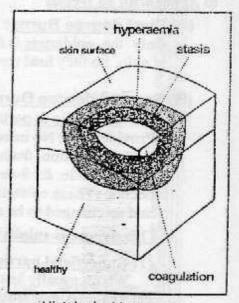
- · Human skin is injured by heat in two ways:
 - 1- An immediate direct cellular injury .
 - 2- progressive dermal ischaemia.
- · The degree of tissue desturction is related to:
 - 1- Degree of Temperature.
 - 2- Duration of exposure to the heat source.
- <u>Histologically</u>, Thermal injury to the skin results in 3 Zones of trauna
 - 1- The central inner zone (zone of coagulation). This forms the inner layer of the visible burn eschar.
 - 2- The intermediate zone (zone of stasis). This area surround the zone of coagulation. It contains viable tissues that may die over the next 48 hours post-burn, if tissue oxygenation and adequate nutrition are not maintained.
 - 3- The outer zone (zone of hyperaemia). This area contains inflammatory mediators (prostaglandins, histamine and kinis), which contribute to the formation of tissue oedema. Tissures in this zone nomally recover within 7-10 days unless subjected to infection.



Superficial burns heal by epithelialization.



Deep burns heal by fibrosis and scarring.



Histological burn zones

* Clinical Picture:

- ① Pain : sever with superficial burn & little with deep burn.
- ② Acute Anexity: The patient is often severly distressed.
- ② Dehydration : From fluid and plasma loss.
- (4) Local tissue oedema : May leads to airway obstruction.
- (5) Coma : Following major burn.
- * D.D.: Between partial & full thickness burn See later

* Complications:

(A) General Complications

- 1 Shock
 - <u>Neuregenie</u>: <u>Immediately</u> after burn due to sever pain from exposed nerve endings.
 - Hypovolaemic: 1st 48h due to plasma loss from burnt surface.
 - · Septic: After one week from infection.
- ② Respiratory System: Especially with Inhalated Burn.
 - Asphaxia & Laryngeal oedema from inhaled Smoke.
 - Pneumonia, Emphysema & Pulmonary oedema.
 - · Finally Adult Respiratory Distress Syndrome (A.R.D.S)

Cardio-yascular System

- · Anaemia.
- Cardiac output up to 50%.
- · Hypoproteinaemia.

@ Renal System

- · Oliguria from Renal Hypoperfusion.
- Fluid & Electrolytes Imbalance.
- · Finally Acute Renal Failure (ARF) may follow.

© G.I.T. System

- · Acute True Stress Ulcer of Stomach, Duodenum & Colon → Haemorrhage...
- · Acute gastric dilatation from Toxaemia and sympathetic overtone.
- Paralytic Ileus.

6 Endocrinal System

- ↑ Catecholamine from stress.
- † Cortisol secretions.
- · TADH

B Local Complications

- ① Infection: Due to Bacterial Colonization → Septicaemia or Septic Shock.
- ② Scar: Hypertrophic or keloid formation.
- (1) Contractures across joints.
- ⊕ Burns in Face & Neck → Oedema & Suffocation So Urgent Tracheostomy is done
- ⑤ Burns in Limb & Chest → Constricting Eschars So Urgent Escharectomy is done
- ⑥ Burns in <u>Perineum</u> → Reflex urine retention <u>So</u> Urinary Catheter is inserted.

* Management of Burns :

A 1st Aid Treatment "Pre-hospital Care"

- 1 Ensure of patent "Airway" if patient is unconscious.
- @ Burn is washed with saline or tap water to decrease pain
- 3 Sterile dressing to prevent concemination.
- Analgesic for pain.
- (5) Immobilize the fractured part if associated.
- 6 Transfer to Hospital.

B Definitive Treatment "Hospital Care"

- O Assessment of Burn "Minor, Intermediate or Major"
- ② 4 Anti [Antishock, Antibiotics, Antitetanic Scrum & Anti-gas Gangrene].
 Then it is very important to Differentiate between 3

Partial Thickness Burns	Full Thickness Burns	
	■ <u>Dry</u> .	
• Very painful.	Painless.	
• +vo "Pin Prike Test"	V6 "Pin Prike Test"	

- Appearance:
- · Pain:
- · Pin prike Test:

Then

According to the Assessment there are "2 Possibilities"

IF Minor Burns

No Hospitalization but 3

- 1 Wash of Burnt area with saline.
- ② <u>Puncture</u> of Vesicles.
- ③ <u>Remove</u> Necrotic Epithelium.
- Clean with Anti-septic solution (Savlon or Betadine).
- (3) Apply Silver sulphadiazine Ointment + Dressing with vaseline Gauze.
- © Leave it for 2 weeks until healing.

IF Intermediate or Major Burns

* General Treatment

- [] Resuscitation & Prevention of Shock.
- [II] Resuscitative fluid therapy.
- [III] Nutritional care.

[1] Resuscitation & Prevention of Shock

- Ensure patent "Airway" by Endotracheal Tube if Smoke is inhalated.
- Elevate the foot of patient to † Venous Return.
- 3 Tubes: Ryle Tube for suction, Foley's Catheter and A wide bore
 I.V Cannula is inserted rapidly for fluid therapy or
 Venous Cut Down.

مهم جدا Resuscitative Fluid Therapy

Evan's Formula)

* 1st Day : (1mL/Kg Normal Saline X % Burn).

+ (1 mL/Kg colloid "Plasma or Blood" X % Burn).

+ (2000 CC Glucose) for Caloric requirement.

* 2nd Day : (0.5 mL/Kg Normal Saline X % Burn)

+ (0.5 mL/Kg Colloid, "Plasma or Blood" X % Burn).

+ (2000 C.C Glucose) for Caloric requirement.

Parkland's Formula

4ml/kg Ringer's lactate × % Burn per day

Parkland Formula of Fluid Resuscitation

> 4 cc's of Lecatated Ringer's

per percent TBSA burn

per kg. of body weight

1/2 of total in first 8 hours 1/4 in second 8 hours 1/4 in third 8 hours

N.B. ① In all Formula, The Maximum percentage of burn calculated is 50%, otherwise serious over-perfusion occur.

- ② Half of the above calculated amount is given during 1st 8 hours then ¼ at next 8 hours then ¼ at next 8 hours.
- How to judge the adequacy for resuscitation?

A) Regular follow up of vital signs.

- b) The urine output should be 30-60 ml/hour.
- c) C.V.P in Critical cases.

IIIII Nutritional Care "At 3rd Day"

1st 48 hours (No) oral feeding to avoid vomiting. After that period (At 3rd Day) patient can tolerate oral intake of fluid, diet rich in vitamines & Iron should be Given.

★ Local Treatment

[I] - Early Excision.

[II] - The Exposure (Opened) Method.

[III] - The Occlusive (Closed) Method.

[I] Early Excision

In (Full Thickness) Burn: Excision of burnt tissues + Covering by suitable Skin Graft.

In Circumferential Burn: With constricting Eschar as chest & Limb
 So Linear Excision is indicated i.e. Escharectomy.

[II] The Exposure (Opened) Method:

 <u>Technique</u>: The Exposure requires isolation of the patient in completely Aseptic atmosphere.

■ Indicated with: ① Burns in the Face & Neck.

@ Burns involving one side of Trunk.

3 Burns in the perincum.

Advantages : ① More Comfortable to patient.

2 Avoid Repeated dressing.

③

Bacterial growth by Surrounding Dry Air.

[[]]] The Occlusive (Closed) Method:

• Technique: By ① Clean the burnt area with Aseptic solution.

② Apply Silver Sulphadiazine Ointement.

Dressing by Vaseline Gauze.

N.B.: In Occlusive Method a special Tube will be used "Hubbard Tank" for dressing changes or Anaesthesia especially in (children) since it is usually painful.

Indicated with: ① Circumferential Burns.

@ Burns in the Hand.

3 Burns in the Limbs.

Advantages: ① ↓ Fluid loss by Evaporation.

② ↓ Oedema of Tissues by compression.

③

 Pain by covering exposed nerves.

N.B. Management of special sites of burn

1 Head & Neck : I.V steroid to decrease laryngeal oedema ± treacheostomy.

@ Perincal burn : Insertion of urinary catheter to avoid reflex urine retention.



Full thickness burns will require closure by skin graft:

1. Autologous skin grafting:

Thiersch grafts are commonly used.

2. Biological dressings:

Indicated: If Autograft are not enough.

Examples: (1) Allograft (Cadaver's Skin).

(2) Xenograft (Pig's Skin).

(3) Amniotic membrane.

These grafts are Temporary.

3. Prevention of contractors:

Through immobilization in the best functioning position and physiotherapy.

Special Types of Burns

Electric burns (A form of thermal injury):

- . Tissue damage is due to the passage of the electric current through blood and bones.
- Severity of the burn: It is divided into high and low tension injuries according to the
 voltage responsible for the injury.
- The affected blood vessels usually show late thrombosis with delayed progressive ischaemic necrosis at different sites.

(2) Chemical burns

- Tissue damage is due to corrosive or potach.
- Severity of the burn: is determined by the strength of the agent, its amount, duration
 of skin contact and its mechanism of action.
- Management: (1) <u>Systemic</u> control by administering the proper antidote

 (2) <u>Locally</u>: the affected areas irrigated with massive amounts of water.

(3) Cold injury (A form of thermal injury):

- · Tissue damage is due to: Frost bite
- · Severity of the bun depends on the duration of exposure & degree of coldness.
- · This types usually affects hands, feet, ears and nose.

(4) Inhalation burn

- Tissue damage is due to: hot gases. & suspected in the followings:

 Facial burns, Burnt nasal hairs and closed space burns.
- The severity of the burn depends on site of affection
 - Upper respiratory tract ---> laryngeal oedema.
 - Lower respiratory tract ---> pneumonia.
- · Management = Early intubations with high flow oxygen.

II Principles of Plastic Surgery I Skin Grafting

* Definition:

A segment of skin, including (The Epidermis & Variable thickness of Dermis) separated from it's blood supply in donor area and then transplanted to raw recipient area.

* Actiology:

- · Burns.
- Trauma
- Follow Surgical resection of Tumors.

* Factors affecting the survival of skin graft:

The Vascularity of the recipient area.

• Graft Thickness: The Thinner is the Better.

· Graft Size: The Smaller is the Better.

* D.Q :	Split Thickness "Thiersch Graft"	Full Thickness "Wolfe Graft"	
* Include	Epidermis & part of Dermis	Epidermis & whole Dermis	
★ Advantages	• Good intake. • Donor sites heal spontaneously.	Cosmetically Better. Better sensation. Resist to Trauma strongly. Minimum contracture.	
★ Disadvantages	Cosmetically Poor. Poor sensation. Resist to Trauma weakly. Maximum Contracture.	Bad intake. Donor sites must be Closed Surgically.	



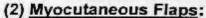
* Definition :

<u>Tissue Transferred from one side</u> of the body to another area <u>but</u> attached to it's origional site by a pedicle through which it receives blood supply.

* Types:

(1)Skin Flaps:

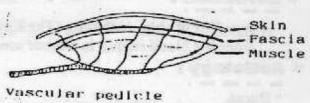
- Random Pattern Flaps: have no anatomically recognized blood supply, so it should has a length: width 2:1
- Axial Pattern Flaps: are supplied by a known artery & have no limitation as regard The length:width ratio, so they have a wider area for rotation e.g Forehead Flap based on superficial temporal artery



They are Flaps receive their blood supply from underlying muscle. e.g Pectoralis major myocutaneous flap in head & neck.







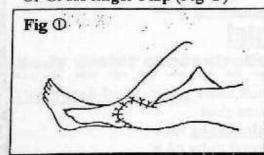
(3) Fascio- cutaneous Flaps:

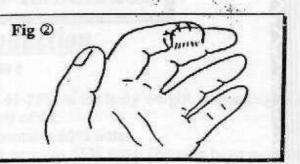
To avoid the functional deficit of muscle transfere & the bulky Flap.

(4) Distant pedicle Flaps:

These keep the recipient site attached to the donor site by a pedicle for 2-3 weeks in order to allow neovascularization, <u>before</u> separating the base from the doner site.

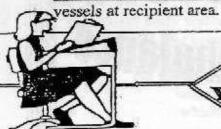
e.g Cross leg Flap (Fig ①) Or Cross finger Flap (Fig ②)





(5) Microvascular Free flaps:

Transfere a flap totally by microvascular anastomoses of it's artery & vein to a new



Final Written Exams



(1989)	Discuss Complications of Burn	
4200	The state of the s	

(25 Marks)

1002	- Discuss	Complications	of Dames
19931	• Discuss	Complications	oi Burn

(19 Marks)

1994) • Discuss Treatment of 30% surface Area Burn

(20 Marks)

• Discuss the Fluid therapy in 25% surface area "Acute superficial burn" in adult patient as regards (the amount of fluid, the types of fluid & The Timing of therapy).

(15 Marks)

1996 • Discuss Complications of Deep Major Burn.

(15 Marks)

1997 • Discuss Management of 35% Major Burn of head, neck & trunk.

بور ئاتى (10 Marks)

1999 • Discuss Complications of Burns

(10 Marks)

2000 Discuss Classifications of burns according to surface area & depth

2001 Discuss complications of Burn

درر تان (10 Marks) درر تان

2002 Discuss complications of Burn.

(10 Marks)

Discuss complications of Burn.
 Mention fluid therapy of 30% burn in adult

دور ثاني (10 Marks) آ12 Marks)

2003 . What are the complications of burns.

(20 Marks)

Chapter [3]

Water, Electrolyte Imbalance & Acid- base Regulation

Chapter [3]

Water, Electrolyte Imbalance
& Acid- Base Regulation



Water Imbalance

Introduction

* Body water concentration :

The Total body water varies from 45-75% of the body weight, depending on the body content of fat.

- An adult male contains 60% water.
- An adult female contains 55% water (Female have more fat).
- A newborn or infant has 75% water.

* Body water divisions:

The Total body water is divided into two compartments.

- (1) <u>The intracellular compartment</u> represents water inside the cells (40% of body weight.)
- (2) The extracellular compartment represents
 water outside the cells (20% of body weight)
 which is divided &
 - The interstitial compartment (15% of body weight).
 - The intravascular compartment which is the plasma (5% of body weight).

* Sources of Body Water:

- [A] Exogenous: e.g Water intake.
- [B] Endogenous e.g Metabolic water.

* Normal Water balance :

[A]Water Input = sources i.e Exogenous or Endogenous.

[B]Water Output = @ Lung: Controlled by respiratory rate.

@Skin: Controlled by climate condition.

Ø Feces: ↑↑ with diarrhae

@ Urine: Controlled by blood volume.

Input (ml)	Volume	Output (ml)	Volume
Drink	1500	Urine	1500
Food	800	Feces	100
Metabolic	200	Lungs	400
memora.		Skin	500
Total	2500	Total	2500

* Abnormal water balance: ① ↓↓ Water depletion (Pure Dehydration)
or ② Water Excess ↑↑(Water Intoxication)

10.00	(A) Water Deplection (Pure Dehydration)	(B) Water Excess (Water Intoxication)
*Causes:	① Intake: as difficulty of swallow or comatosed patient. ②↑Loss: as in Fever & uses of osmotic diuresis. ③ Unreplaced Losses: as ↑ los From lungs after tracheostomy.	patient. of ② Over-infusion of 5% glucose to post-operative patient. ③ ↑ Intake as neurosis.
* Pathology	If water ↓↓ → ↓ volume & 1 osmolarity → ↑ ADH & Finally 1 water resorption from kidney.	If water 11 -> 1 volume & 1
* <u>C/P</u> ;	① Thirst & Weaknes. ② ↓ Tissue Tugor. ③ Oliguria with ↓ specific gravity of urine.	[A] Moderate (Water Excess)
Treatment :		According to ① Moderate: only restriction of water intake. ② Marked: forced diuresis by Manitol But If ② Renal failure → Dialysis. ● Convulsion → 100-250 cc I.V 5% Nacl solution

II Electrolyte Imbalance

Introduction

*The Level of cations & Anions In ECF:

Cations	mmol/L	Anions	mmol/L
Na ⁺ K ⁺	140 5	CL' HCO ₃	105 25
Total	145	Total	130

*The chemical composition of body fluid compartments:

Intracellular fluid		Plasena Plasena	
Cations	Anions	Cations	Anions
K ⁺ 150	PO ₄ 150 SO ₄	Na ⁺ 142	CL- 103 HCO3 27
Mg ⁺ 40	HW 3-10	K ⁺ 4	SO4 PO4
Na [†] 10	Proteins 40	Ca ⁺ 5	Proteins 16
	II.	Mg ⁺ 3	Organic Acids 5
200	200	154	154

***The Most Important cations** →



- It is the main Extra cellular cations.
- Total body Na[†] ECF 44%.

ICF 9%.

Bone 47%



It is the main Extra cellular cations.

75% of Totalbody K+
Is found in skeletal
Muscle.



We will study 3

Na⁺ Imbalance = Hyponatremia i.e ↓ Na⁺

& Hypernatrenia i.e 1 Na+

K+ Imbalance = Hypokabenia i.e ↓ K+

& Hyperkalaemia i.e ↑ K+

	Hyponatremia (i.e ↓ Na ⁺)	Ilgpernatremia (i.e ↑ Na+)
* Causes !	as suction vomiting & diarrhaea. The loss in urine: occur with fenal failure, salt losing Nephropathyetc. E.C.F. loss: Externally with burns Internally (3 rd space loss) e.g peritionitis, ascites, tissue oedemaetc. Hypovolaemia. Adrenocortical insufficiency Restricted Na ⁺ in diet.	 ① Excessive saline transfusion in the early post-operative. Period. ②↑Na+ resorption with ↑ (Aldosteron or Cortison) ③ Inability to excrete Na+ with sever illness starvation. ④ Abnormal renal retention of Na+ with Heart or liver failure

* <u>C</u> /P_:	[Mainly due to ↓ ECF volume] ① Sunken eyes & depressed fontanelle in infants. ② Dry coated Tongue. ③ Dry winkled skin & Lax S.C tissue. ④ Collapsed skin veins. ⑤ Hypovolaemia → Tachy cardia, Hypotension & shock. ⑥ ↓↓ C.V.P ② Oliguria.	© The only reliable cardinal sign of ↑↑ total body Na ⁺ is oedema & ascites →
* <u>m:</u>	①Replacement by normal saline (Nacl 0.9%) or Ringer's lactate(Nacl + K ⁺ + lactate). ② If Associated blood loss, Blood transfusion is given.	ONa [†] restriction in diet. Carful use of diurestics. If oedema with Hyporoteinaemia protein must be corrected 1 st .

	Hypokalaemia i.e↓K+	Hyper Kalaemia i.e ↑ K+	
* <u>Cause</u> :	e.g pyloric obstruction. Severe Diarrhae e,g ulcerative colitis. External GIT fistula. K' Losing diuretics e.g Furosemide Alkalesis i.e Intra-cellular shift of K'	① Renal Failure. ② Acidosis. ② Diabetics with reduca insulin secretion.	
* <u>C</u> /P:	 ⊕ Early signs are vague as malaise & weakness ② Paralytic Ileus & distention ③ ± Cardiac arythmia. ⊕ ECG Changes: • Prolonged Q-T Interval. • depressed ST segment • inverted T wave 	① ↑ cell excitability for muscle & nerves. ② Hypotention. ③ ± Cardiac arythmia. ④ ECG changes: • wide QRS complex • Peaked Twave	
ent:	Estimation of K ⁺ deficit, can be obtaind from the total body K ⁺ capacity, Blood PH & Serum K ⁺ level. N.B: It should be consider that K ⁺ , is dangerous as Hyperkalaemia so it must be ginen slow I.V infusion.	① I.V Ca gluconates: as ca antagonized K+. ②I.V Na HCO ₃ → Alkalsis → Intracellular K+ shift. ③ 20 gm glucose + 10 unites regular insulin infusion. (Glucose is give to prevent polyglycaemia).	

III Acid - Base Regulation

Physiological Considerations

- An <u>Acid</u> = is a Hydrogen ion (H[†]) donor.
- A Base = is a Hydrogen ion (H⁺) accept.

Through out life,

The body produces (H⁺) & they must be either excreted or buffered to keep the PH of internal environment constant at a range of [7.3-7.5]

So

Mechansisms of PH Regulation are

[A] Body Buffer system:

Consists of weak Acide & Bases dividid into (Bicarbonate, Haemoglobin, Tissues & Bone)

[B] Renal mechanism:

- Resorbing filtered HCO3 preventing it's loss in urine.
- Excreting (50-100 mEq) H⁺/day.

[C] Respiratory mechanisms:

Through elimination of CO_2 generated by following equilibrium $HCO_3 + H^+ \rightarrow H_2O + CO_2$

(A)

Metabolic Acidosis

* <u>Definition:</u>

This is a condition where there is a base deficit or acid excess other than HCO3-

* Aetiology:

- [A] Over production of an organic acid: Which occurs in 3
 - Diabetic ketoacidosis.
 - ② Lactic acidosis of anerobic sepsis, shock or ischaemia.
 - Salicylate toxicity or Hyperalimination due to excess amino acids.

[B] Impaired renal execretory mechanism: as in %

- O Acute Renal Failure
- ② Chronic Renal Failure
- 3 Renal Tubular Acidosis.

[c] Abnormal loss of blcarbonat: as in 3

- Diarrhae, pancreatic or small intestinal fistula.
- ② Uretero-sigmoid anastomosis.
- 3 Diamox (Acetazolamide) therapy.

* Diagnosis:

- O Nausea, Vomiting & Drowsiness.
- @ Air Hunger "Kausmall's respiration"
- 3 Bone decalcification in chronic cases.

* Treatment:

- ① If mild to moderate acidosis → Treat the cause.
- ② If Severe acidosis → I.V HCO3 estimated as
 Body weight (Kg) X 0.3X base deficit



Metabolic Alkalosis

* Definition:

This is a condition where there is An acid difficit or Base excess.

* Actiology:

- ① GIT loss of H+: Excessive vomiting or suction of gastric secretion
- @ Renal loss of H+ with Aldosterone or Hypoparathyroidism
- (3) Hypokalaemia: stimulates intracellular H+ Shift
- Bicarbonate retention:
 either a or b
 - a- ^Na HCO3- administration
 - b- Milk Alkali syndrome.
- Delasma bicarbonate with severe ECF e.g severe vomiting.

⋆ Diagnosis:

- ① Cheyne-stokes respiration (slow & deep) with period of apnea
- Tetany i.e level of ionized Ca+
- ③ Hypokalaemia.

* Treatment:

- ① If mild with (no Hypokalaemia) → I.V saline in fusion (kidney will correct by retaining CL & excreting Na+ with excess bicarbonate) But if Hypokalamia → I.V KCL
- ② If Severe (Not responding to the above measures) give
 - a. Ammonium Chloride slowly I.V (140 mEq)
 - b. I.V Hydrogen chlorid through central line given as 0.05→0.15 NH₄ solution
- ③ If Tetany → (10%) Ca. Gluconate I.V slowly.



Respiratory Acidosis



Respiratory Alkalosis

Definition:

The condition is due to ↑ Co2 associated with ↓pH

Definition:

The condition is due to
Co2 below normal level & pH

Actiology:

- - Drug as opiate
 - CNS Lesion
 - Cardiac Arrest
- @ Respiratory muscles disorders:
 - My asthenia
 - Flail chest
 - obesity.
- 3 Imparid alveolar functions female: 3
 - COPD
 - Pulmonary oedema

Aetiology:

- 1 Hyperventilation: as in
 - Hysteria
 - Hyper-pyrexia
 - Brain stem lesion.
 - Bacterial sepsis
 - Ventilators
- P.t undergo neurosurgical procedures

may be Hyperventilated → cerebral blood flow.

Diagnosis:

- O Resless & cynosed patient.
- Post-operative Hypertension tachy cardia & Hypercapnia.
- The best for sure diagnosis is serum PH & PCO2.

Diagnosis

- 1 Tetany in severe Alkalosis
- @ Respiratory Arrest.
- N.B: Alkalosis impair condiac out put in cardiac patient
 - The Best for sure diagnosis is serum PH & PCO2.

Treatment:

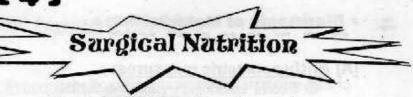
Improve ventilation + Aiding renal compression

Treatment:

- ⊕ If Hysteria → Instruct the patient to breath into a bage.
- ② Sometimes → CO2 addition to inspired gas mixture but the danger is in mistak of a compansatory metabolic acidosis.

Chapter (4)
Ulgical Nutrition

Chapter [4]



Physiological Considerations

* Maintaing a healthy nutritional status requires the following daily balanced supplementation.

	Kg	For (70 Kg)Person
• Water (m!) • Carbohydrate (g). • Fat (g). • Protein (g). • Nitrogen (g). • Na ⁺ (mmol). • K ⁺ (mmol)	35 2 3 0.7 0.7 1	2450 140 210 50 7 70 70

Malnutrition in Surgical patient

* Causes of Malnutrition surgical patient:

[A] Starvation:

- O Social causes.
- ② Dysphagia.

[B] Hypercatabolism:

- Major trauma and burns.
- @ Major surgical operations.
- ③ Severe acute pancreatitis.
- Major sepsis e.g. septicaemia.

* Effects of Malnutrition on the outcome of surgery :

- ① Impairment of wound healing may lead to burst abdomen
- ② Immunosupression with † susceptibility to infection.
- 3 Delay physical recovery & hospital stay.

* Diagnosis of Malnutrition :

[A] Anthropometric measures:

1 Recent nutritional weight loss ? 10%

Dody weight is less than 80% of the ideal for height).

Mid-arm muscle circumference <u>less than</u> 80% (of value in comparable population) = (muscle mass).

(4) Triceps skin fold thickness meaured by a calipentis an indication of fat loss

[b] Laboratory:

① Serum albumin < 35g /L = Server protein loss.</p>

② measurement of <u>daily nitrogen output</u> in urine to, then compared with nitrogen intake (grams of nitrogen = grams of protein: (6,25) provides a rough idea about nitrogen balance.

[C] Immune Function:

Total lymphocytic count < 1,2 X 10⁹/L.

② Impaired hypersenstivity reaction.

Nutritional Support

(A) Enteral nutrition

* Indications: patients in whom oral intake is inadequate, while having a functional accessible G.I.T as (comatosed patients, severe dysphagia, burns or Head & Neck surgery)

* Routes of administration :

O Nasogastric tube.

@ Gastrostomy



* Administration Formulae :

(A)Through Gastrostomy → liquid diets, Juice, milk.

(B)Through jejunostomy → isotonic sterile formula at a slow rate, otherwise the Patient develops (colics, distention & diarrhoea),

* Complications:

(A) Mechanical complications:

Pharyngeal or Oesophageal mucosal irritation, ulceration by feeding tube.

Obstruction of the feeding tube.

- Tube displacement
- (B) G.I.T Complications: Nausea, Vomiting, Aspiration pneumonia Distention, colics & diarrhaea.
- (C) Metabolic complications: glucose intolerance, electrolyte imbalance & malnutrition.

(B) Parenteral Nutrition

* Indications:

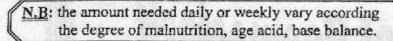
- ① In malnourished or hypercatabolic patient in whom the intestine fails to absorb nutrients e.g (inflammatory bowel disease)
- Preoperative administration to severely deplitated patients (for 2 weeks) to postoperative morbidity and mortality.

* Rout of administration:

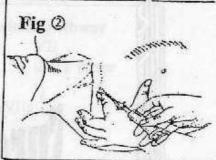
central venous line through internal jugular vein Fig ① or subclavian vein Fig ②

* Administration Formulae:

- · Carbohydrates: 25% glucose.
- Proten: L-amino acids (e.g Vamin novoplex)
- Fat emulsion: Intralipid 10% and 20% isotonic produced from soya oil (1L 20% intralipid → 2000 Kcal/day).
- . I.V vitamins: B12
- Iron preparation: I.M. injection.
- · Trace elements: Phoshate, magnesium, Ca+
- Electrolyte supplementation: Na⁺, K⁺







* Monitoring of effeciency and complications:

- Daily measuring body weight (a weight gain > 300g /day) is
 due to water retention.
- @ Balance of daily input and output.
- 3 Daily Lab: a. Full blood picture.
 - b. Blood Urea, K+, Na+, CL
 - c. Serum albumin, glucose.
 - d. Urine for nitrogen.
- Twice weekly Lab: a. liver functions tests
 - Blood coagulation studies.
 - c. Serum trace elements.

* Complications:

[A] Metabolic complications:

- 1 Over or underfeeding of the patient.
- ② Hyponatraemia, Hypokalaemia, Hyperglycaemia
- ③ Hyperosmolar dehydration.

[B] Catheter complications:

- ① <u>Displacement</u> of the catheter outside the vein.
- ② Puncture of pleura → Pneumothorax.
- (3) Injury to subclavian or carotid arteries + brachial plexus.
- (1) Air embolism if the infusion set accidently detacted from the catheter.
- S Venous Thrombosis.
- ⑥ Central venous catheter infection→ Thrombophlebitis → Septicaemia.

Chapter [5]

Surgical Haemostasis

Chapter [5]



*Definition:

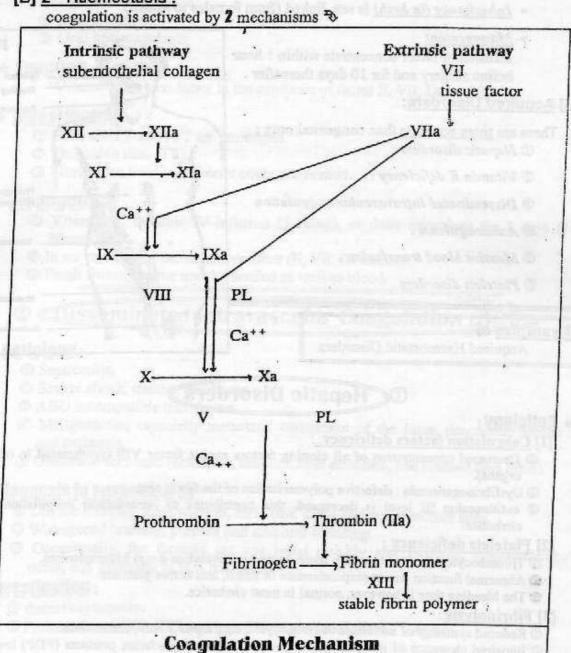
The mechanism by which the body attempts to stop bleeding after injury or cutting of a blood vessel.

* Physiology:

[A] 1" Haemostasis:

- O Vasoconstriction of disturbed vessels .
- 2 Platelet plug formation .
- 3 Tempanade of bleeding by surrounding tissue tension.

[B] 2^{ry} Haemostasis:



* Causes of bleeding during or after surgery :

[A] Inadequet Surgical Haemostasis .

[B] Defects of Haemostasis . &

Defects Haemostasis

[A]Congenital Disorders:

Hemophilia A and B

- <u>These are due to</u> deficiency of factors VIII and IX respectively.
- . Hamophilia A is the most common congenital coagulopathy.
- . Inheritance (in both) is sex linked (from females to males).
- Management
 Infusion of factor concentrate within 1 hour before surgery and for 10 days thereafter.

[B] Acquired Disorders:

These are more common than congenital ones:

- 1 Hepatic disorders .
- 2 Vitamin K deficiency .
- 3 Disseminated intravascular coagulation
- Anticoagulants .
- Massive blood transfusion .
- @ Platelets disorders .

Acquired Haemostatic Disorders The patic Disorders

* Actiology :

Examples of

- [1] Coagulation factors deficiency:
 - Decreased concentration of all clotting factors except factor VIII (synthesized in other organs).

Dysfibrinogenaemia: defective polymerization of the fibrin clot.

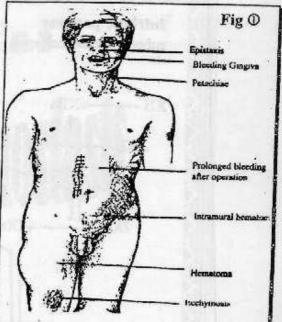
antithrombin III level is decreased, this contributes to intravascular coagulation in cirrhotics.

[2] Platelets deficiency:

- ① Thrombocytopenia due to splenic sequestraction or destruction due to hypersplenism.
- @ Abnormal function due to preponderance of small, less active platelets.
- 3 The bleeding time is however, normal in most cirrhotics.

[3] Fibrinolysis:

- O Reduced synthesis of inhibitors of fibrinolysis, e.g., alpha 2 anti-prothrombin.
- ② Impaired clearance of plasminogen activators. Fibrin degradation products (FDP) level may increase.



* Treatment :

① Vitamin K administration.

② Fresh frozen plasma (2-3 units) replaces the missing coagulation factors and coagulation and fibrinolysis inhibitors.

③ Desmopressin (0.3ug/k) can raise the levels of factor VIII and Von Willebrand,

and shorte the bleeding time before an invasive procedure.

Tranexamic acid or other fibrinolysis inhibitors may be useful in upper GIT haemorrhage.

② Vitamin K Deficiency

* Actiology:

① Inadequate diet (or TPN).

- ② In debilitated patients given prolonged broad spectrum antibiotics (reduce colonic bacteria).
- 3 Cholestatic jaundice.
- @ Malabsorption.
- Oral anticoagulants.

* Function:

Vitamin K is a co-factor in the synthesis of factor II, VII, IX, and X.

* Investigation:

- Both the PT and PTT are prolonged.
 - ② Thrombin time (TT).
 - ⑤ Fibrinogen level and platelet count are normal.

* Treatment:

- ① Vitamin K by slow IV infusion (5-10mg), or daily injections for 3 days (10-20mg/day).
- ② In an emergency, factor concentrates (II, VII, IX and X).
- ③ Fresh frozen plasma may be needed as well as blood.

3 Disseminated Intravascular Coagulation (DIC)

* <u>Actiology</u>:

- Septicemia.
- D Severe shock, trauma, and burns.
- ABO incompatible transfusion.
- Malignancies, especially metastatic carcinoma of the lung, pancrease, prostate, and leukemia.
- Obsteteric accidents (eclampsia, amniotic fluid embolism, and retained dead fetus).

* Diagnosis is suspected by:

- ① Diffuse bleeding from wounds, incisions, drain and venipuncture sites.
- ② Widespread bruising, purpura and mucosal bleeding.
- ② Occasionally, the thrombi are not lysed quickly and ischemic manifestations occur, e.g. gangrene of skin and digits.

* Investigation :

- 1 thrombocytopenia.
- \odot Prolongation of PT, PTT and low fibrinogen level (N = 2 4g/L).

* Treatment:

- Treatment of the underlying cause to stop the cycles of coagulation/fibrinolysis, e.g. draining an abscess and antibiotics for infection.
- ② Replacement of consumed coagulation factors and platelets with fresh frozen plasma and platelet transfusion.
- 3 Blood transfusion to restore circulating blood volume and oxygen carrying capacity since hypoxia exacerbates DIC.
- Heparin to stop the thrombotic component is not widely advocated.

(4) (Anti-Coagulants Therapy)

Can cause bleeding if the dose is not properly adjusted (look chapter D.V.T.)

(S) (Massive Blood Transfusion)

With stored blood (look chapter Blood Transfusion).

© Platelets Disorders

[A] Thrombocytopenia:

- Essential thrombocytopenic purpura.
- Secondary thrombocytopenic purpura may occur secondary to drugs as thiazides, methyl dopa and sulfa drugs, chemotherapy or radiotherapy.

[B] Disorders of platelets functions:

- ① Drugs as aspirin and NSAID inhibit cyclooxygenase and prostaglandin synthesis, thus they interfere with platelet adhesiveness.
- @ Cephalosporins and semisynthetic penicillins coat platelets.
- 3 Dipyridamole (Persantine) reduces platelet adhesiveness.
- Uremia and hypothermia can cause platelet dysfunction.

Pre-operative Evaluation of Haemostasis

[A] History:

O Personal History :

Age: e.g. childhood (Hereditary disorder).

@ Present History :

History of abnormal bleeding from multiple sites (see Fig 10)

· Characters of the bleeding :

- (a) Defects of 1^{ry} Haemostasis: The bleeding is superfial i.e. Skin, Mucous membrane ... etc.
- (b) Defects of 2^{ry} Haemostasis the bleeding is deep i.e. Haemostasis in muscle, Haearthrosis ... etc

@Past History :

History of liver disease, chronic renal failure, massive blood transfusion & drug intake.

@ Family History :

Suggests Haemophilia (A or B)

[B] Examination:

- ① Cutaneous signs of liver disease, e.g. jaundice, and spider naevi.
- ② Skin and mucous membranes are examined for bleeding,
- ③ <u>Musculoskeletal system</u>. Muscle Haematomas & Hemarthrosis.
- Abdomen. Hepatomegaly & Splenomegaly.
- ⑤ <u>Lymph node enlargement</u> may be caused by lymphoma, chronic lymphocytic leukaemia & IMN

[C] Tests of Haemostasis:

"Indications:

- ① Patients with Personal history or Family history of abnormal bleeding .
- ② Patients with <u>diseases</u> or who receive medications that can interfere with haemostasis.

*Tests for Primary Haemostasis:

- ① Platelet Count: Normal =150.000-400.000/ul.
 - Spontaneous bleeding occurs with counts 10.000-20.000/ul.
 - No hemastatic abnormality occurs in counts more than 100.000/ul.

Done Marrow Aspiration & Biopsy:

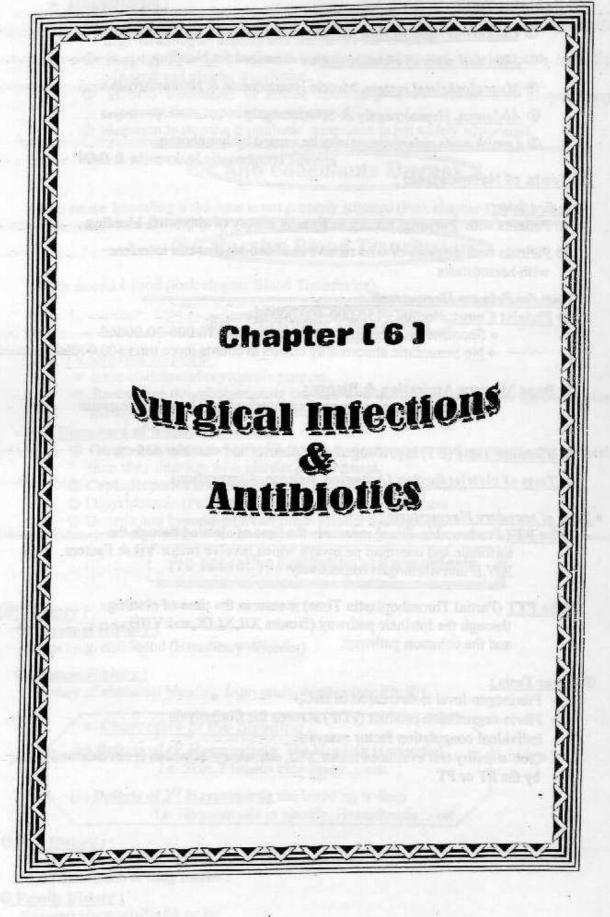
- Megakaryocytes are normal or increased in Thrombocytopenia
- ② Bleeding Time (BT) is prolonged with platelet and vascular defects.
- 1 Tests of platelet fuction (Adhesion, Release, Aggregation)

Tests of scondary Haemastasis:

- ©The PT (Prothrombin Time) measures the time of clotting though the
 Extrinsic and common pathways which involve factor VII & Factors
 X,V,II and fibrinogen respectively
- ② The PTT (Partial Thromboplastin Time) measures the time of clotting through the Intrinsic pathway (factors XII,XI,IX,and VIII) and the common pathway.

1 Other Tests:

- Fibrinogen level is decreased in DIC.
- · Fibrin degradation product (FDP) screens for fibrinolysis .
- Individual coagulation factor essays.
- Clot stability test evaluates factor XIII, deficiency of which is not detected by the PT or PT



I Surgical Infections



Acute Non Specific Infections

- * 1 Post-operative wound Infection.
- * @ Boil (Furncle).
- * 3 Carbuncle.
 - @ Cellulitis.
 - S Erysipelas.
 - 6 Bacteraemia & Septicaemia.

Post-operative wound Infection

This is a serious problem that may complicate operative wounds,

- Contaminating microbes may be derived from:
 - 1 The patient himself (Endogenous).
 - @ The patient's environment (Surgical team, Instruments, Dressing ...etc)

* Predisposing Factors:

[A] General Factors:

- ① Poor general condition.
- ② Systemic diseases that impair host defense as Diabetes or Uraemia.
- ③ <u>Drugs</u> that cause immunosuppression as corticosteroids.

[B] Local Factors:

- 1 Poor blood supply
- ② Poor surgical Techniques e.g Rough handling of tissues, or improper haemostasis leading to haematoma formation
- ③ Presence of foreign bodies as prosthetic implants.
- Nature of the operation e.g Operations for peritonitis, colonic resection especially for unprepared colon.
- (5) Defect in the sterilization technique in the operating theatre,

* Types of surgical wounds:

(A) <u>Clean</u>: There is <u>no</u> gross contamination from endogenous or exogenous sources such as Herniorrhaphy and Thyroidectomy wounds.

The Risk of infection is 1-2%

(B) <u>Clean contaminated</u>: Wounds involve regions of he body that may contain low numbers of resident organisms e.g urological procedures, or surgery on prepared colon.

The Risk of infection is 2-5 %.

(C) Contaminated: an unprepared region of the body with numbers of endogenous organism is entered e.g surgery on unprepared colon.

The Risk of infection is 5-30%.

* Pathology:

The process of wound infection passes into this stages:

1 Original contamination

Acute inflammatroy stage with local vasodilatation and infiltration by polymorphonuclear leucocytes.

③ Suppuration with purulent discharge.

Once the pus is properly drained and infection controlled the stage of healing starts

* Clinical Picture:

Usually appears between the fifth and tenth days post operatively:

- · Postoperative fever.
- · Pain in the wound

• The wound is swollen tender and red.

· Fluctuant areas or crepitus can occasionally be felt.

* Differential diagnosis :

[A] Other causes of postoperative fever,

e.g Chest infections, DVT ...etc.

[B] Other causes of wounds swelling

e.g Haematoma, and Incisional hernia...etc.

* Prophylaxis:

- The patient's defence mechanisms should be improved and any predisposing factor should be controlled e.g diabetes, malnutrition, and anaemia
- Description of the Prophylactic antibiotics are indicated in
 - [A] Clean contaminated or contaminated surgery.
 - [B] In wounds where foreign material is implanted
 - · Prophylactic antibiotics:

should be given pre-operatively, during the operation and in the early post-operative period.

3 Before any elective colorectal surgery,

Mechanical and Chemical preparation of the bowel are recommeneded

@ Proper surgical Technique:

e.g gentle handling of tissues, adequate haemostasis.

(5) Heavily contaminated wounds,

e.g operations in septic, should be left open (skin and subcutaneous tissue) for delayed primary closure.

* Treatment:

- The wound should be opened and stitches removed to allow pus drainage.
- Antibiotics guided by culture and sensitivity tests.
- Possible sources of hospital should be traced and corrected.



- This is a staphyloccal infection of a hair follicle or a sebaceous gland
- More common in diabetics and whenever there is lack of personal hygiene
- Necrosis of the central part occurs and is discharged togeher with pus

* Treatment:

- 1- Antibiotics effective against staph. organisms. (Incision may be needed).
- 2- Icthiol ointement.
- 3- Painting the surrounding skin with an antiseptic to prevent infection of the neighouring glands or hair follicles.
- N.B. : Always suspect diabetes melitus in patients who develop recurrent boils.



* Definition:

Carbuncle is Acute non specific infection of skin & S.C tissues ending by infective gangrene.

* Aetiology:

- · Organism : Staphylococcus Aureus.
- Predisposing Factors: Patient > 40 years with DM or Immuno-supressive.
- · Mode of Infection: Lack of cleanliness at Hairy areas of Face, Nape of neck, Back & Dorsum of hand.

* Pathogensis:

Infection start in Hair Foilicle then extends to S.C. tissues. Staph. Aureus is potent necrotoxin → Necrosis & Sloughing of Overlying Skin → gangrene.

* Clinical Picture:

General Examination

Severe Toxaemia

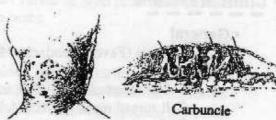
Local Examination

Painful indurated skin & S.C Tissues.

Localized Red area with central softening but No fluctuation.

• Multiple pustules 3

the surface, which bursting leaving a cribriform appearance. Some of them coallesces forming ulcer which allow separation of the slough, i.e. Infective gangrene.



* Complications:

- Spread of infection → Cellulitis, Lymphangitis & Lymphadenitis.
- Septicaemia & Pyaemia.
- <u>Cavernous Sinus Thrombosis</u> if the carbuncle in the <u>face</u>.
 or <u>Meningitis & Epidural abscess</u>, if the Carbuncle in the <u>Back</u>.

* Investigation:

Culture & sensitivity test for the discharge.

* Treatment:

A General ttt

- ① Improve General Health (Diet, Vitamines etc..).
- @ Control of D.M if present.
- Systemic A.B. According to Culture & Sensitivity test.

B Local ttt

- O Strong local A.B.
- @ Glycerine Magnesia local foment to help separation of sloughs.
- @ Excision of Sloughs.



* Definition:

This is an invasive non suppurative infection of the loose connective tissue

*Aetiology:

Organism:

Gram +ve bact, mostly streptococci or occasionally staphylococci into the superficial skin structure.

· Mode of infection:

Through Cratch or Prick

* Clinical Picture

General

Toxaemia (Fever, Headach, Malaise & Anorexia)

· Local:

- 1 The affected area is red, indurated, hot & painful
- ② It spread rapidly & the Advancing edge is ill defined.
- No suppuration except at portal of entery.

* Treatment

- O Rest & elevation.
- D Local heat.
- 3 Antibiotics (pencillin group)

N.B: Garful follow up is needed in order not to miss a hidden abscess.



* Definition:

This is a rapidly spreading <u>non</u>-suppurative infection of the <u>lymphatics</u> of the skin.

* Actiology

· Organism:

Specific strains of Haemolytic streptococci

· Mode of infection:

Through minute scratch or abrasion.

* Clinical Picture:

· General:

Toxaemia (Fever, Headach, Malaise & Anorexia)

· Local

Similar to cellulitis but &

1 The colour of the skin is rose-ink.

② The edge is <u>well</u> defined, slightly rasied & often shows minute vesicles just behind the spreading margin.

There may be islets of inflammation beyond the spreading margin separated from the main area by apparently normal skin.

* Treatment:

Similar to cellulitis but the patient must be isolated because the disease is very contagious



*Bacteraemia:

- Presence of bacteraemia which are not multiplying, in the blood.
- It usually follows dental work and instrumentation of the urinary tract.
- Hazardous in patients with damaged heart valves or with prosthetic valves.
 Antibiotic prophylaxis is essential in such cases.

*<u>Septicaemia</u>:

- Presence of multiplying organisms in the blood stream plus leucocytosis
- It usually denotes significant infection in which bacteria, bacterial toxins or inflammatory mediators escape the control of be immune system, enter the blood stream and produce a systemic response including ehills, Fever and sometimes pulmonary failure or shock.



Toxaemia:

Presence of toxins in the circulation

Pvaemia:

Presence of septic emboli in the circulation.



I- Chronic specific Infections:

- (1) Tuberculosis (T.B).
- (2) Syphilis.
- (3) Actinomycosis.
- (4) Nocardiosis

See Int. Medicine

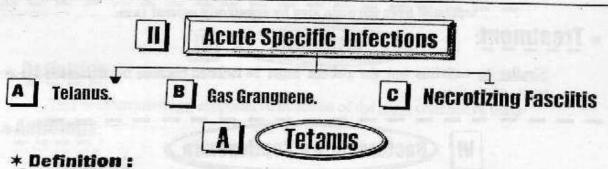
II- Parasitic Infections:

- (1) Schistosomiasis (Bilharziasis)
- (2) Filariasis.
- (3) Amoebiasis.
- (4) Echinococcosis (Hydotid disease)

See later

III- <u>Fungal Infections</u>:

e.g. Candidiasis.



Tetanus is Acute specific anaerobic infection caused by Neurotoxin of Clostridium Tetani which leads to nervous irritability & muscular contraction

* Aetiology:

Organism : Clostridium Tetani.

Which is • Gram +ve anaerobic bacilli, Spore forming with Drum stick shape

Naturally the organism living in small intestine of Horses.

· The spores present in Street dirts & Manured soil. This spores resist to Antiseptics, Heat or Boiling for 5 min.

Predisposing Factors :

The Anacrobic organisms flourish more in wounds with low oxygen tension as 10

- Deep Wounds especially if <u>Contused</u>.
- ② <u>Tissue Anoxia</u> from Hge & Shock.
- 3 Associated Pyogenic Infections (Which Consumes Local Oxygen).

• Mode of Infection :

- 1 Wounds: Hypoxic wounds contaminated with soil.
- Tetanus Neonatorum : From infected umbilical stump.
- Surgical Tetanus: Improper Sterilization on the Cat-gut Sutures.

* Pathogenesis:

The organism produce powerful Neurotxoins → Blood → B.B.B → CNS → Motor end plate & Motor cells → Hyper-excitability of Motor cells. So Any Minor Stimuli → Violent Generalized Spasm.

* Clinical Picture:

The Incubation Period in Non immunized patient = 24 h - 14 days but in immunized patient = 11 days → several weeks

[A] Stage of Toxaemia

- ① ↑ Temperature i.e Rigors.
- @ Irritability & Headache.
- 3 GIT Disturbance.

[B] Stage of Tonic Rigidity

- 1 Pain & Tingling of area affected.
- ② Spasm of facial muscles "Risus Sardonicus" = Bitter Smile & limitation of jaw movement "Trismus" = Lock Jaw.
- Neck Stiffness difficulty in swallowing due to affection of muscles of deglutition.

[C] Stage of Colonic Spasm "Convulsion"

- Severe muscle contraction with incomplete muscle relaxation due to minor stimuli as bright light, Noiseetc
- @ Back is arched backwards i.e. opisthotonos -
- ③ Spasm of diaphragm & Intercostal muscles → Respiratory insufficiency
- Marked Tachycardia is a grave sign.
- (5) Elevated Temp. with Profuse Sweating.
- The violent convulsions may leads to rupture of muscles e.g. "Rectus abdominis" or Fracture Bone.

* Special Types of Tetanus :

- Acute Tetanus: Affect the Unimmunized, Short I.P & Death in few days.
- Chronic Tetanus: Affect the Immunized, long I.P. & Mild symptoms.
- Local Tetanus: Occur in immunized patient where general Toxaemia is absent & Localized muscular affection only.
- Splanchnic Tetanus: Only affect muscles of Deglutition → Dysphagia or Only affect muscles of Respiration → Dysphagia
- <u>Cephalic Tetanus</u>: <u>Due to</u> wound of face or scalp.
- · Cryptogenic Tetanus: Mild & without an overt wound.

* Causes of Death:

- Toxaemia or Hyperpyrexia.
- Exhaution from Severe Convulsions.
- Heart failure, Respiratory failure & Asphyxia from laryngeal spasm.

* D.D :

Trismus: From Arthritis of Tempro-mandibular joint.

Meningitis: Turbid CSF containing organisms & Leucocytosis.

Others as %:

① Strychnine poisning: complete relaxation between attacks.

② <u>Tetany</u>: Carpo-pedal spasm + ↓ Serum Ca.

 Rabies: History of Dog bite + Spasm occurs mainly on seeing or drinking water.

* Management:



Every Child Should be Immunized by a Routine (D.P.T) vaccines at 2,4,6,
Months then a booster dose of Tetanus Toxoid is taken every
7-10 years.



According to this facts, there are 3 possibilites for prevention :

A IF Patient previously received 3 or more doses of Toxoid & The last one within 10 years:

A booster dose of <u>Tetanus Toxoid</u> is needed on exposure to Tetanus prone wounds (0.5 ml I.M.).

(B) IF patient previously received less than 3 doses:

 With <u>Clean minor</u> wounds → Only <u>Tetanus Toxoid</u> is needed on exposure to Tetanus prone wounds.

With wounds having <u>High risk</u> of Tetanus → <u>Both</u> Tetanus Toxoid & Tetanus Immunoglobulin (TIG) is given.

(C) IF Patient (Not) previously Immunized:

 With <u>Clean minor</u> wounds → <u>Only Tetanus Toxoid</u> is needed but 3 doses with 4-6 weeks interval.

With wounds having <u>High risk</u> of Tetanus → <u>Both</u> Tetanus Toxiod (3 doses)
 & Tetanus Immunoglobulin (T.I.G.) is given
 (250 U I.M.) + Strong A.B.



Neutralize Toxins with (TIG): 3000-6000 unites I.M.
 Repeated doses may be needed, since the half life of Antibodies 3 weeks & the Established tetanus often lasts longer.

DExcise & Debride the wound :

The wound must be left open & Washed by "Hydrogen Peroxide"

② Penicillin-G:

10-40 million Unit/day I.V.

The patient should be protected from Sudden minor stimuli, So
 he is isolated in a dark quiet room.

Proper Sedation is used: As Barbiturates but cautiously as they often cause Cardio-respiratory failure.

6 Tracheostomy: If Respiratory problems is Associated.

* Prognosis:

The Mortality Rate = 30-60%.



* Definition:

Gas gangrene is Acute specific anaerobic infection caused by Gas forming Clostridium group leads to gas formation & End by infective gangrene.

* Actiology:

· Organism : Clostridium Group :

Which is • Gram <u>+ve</u> anaerobic bacilli, All of them are Motile & Non capsulated except CL. Welchii.

- · Some of Clostridia Naturally living in intestine of Animal & Man
- They are 2 groups : Saccharolytic or Proteolytic group.

Predisposing Factor:

The Anaerobic organisms flourish more in wounds with low oxygen tension e.g. ① Lacerated wounds involving bulky muscles.

Schaemia of muscles or devitalized Tissues.

© Contaminated above knee stump by stool if patient suffer from faecal incontinence.

Mode of Infection:

The organism exist normally in bowels of Man & Animal. So Thigh & Buttocks particularly affected being near to faecal contamination.

* Pathogenesis

- A General Blood Haemolysis → Ting of Jaundice. ALSO Degenerative changes of liver & Kidney may occur.
- B Local : According to Type of organism:
 - [1] <u>Saccharolytic Organisms</u>: [CL. Welchii-CL. Spticum-CL. Oedematicns] They ferment <u>Glycogen</u> of Devitalized or (ischaemic) muscles → Liberation of (CO₂ + H₂) → Haemolysis of Blood → Liberation of blood pigments which stain the dead muscles by <u>Brick red colour</u>.
 - [II] <u>Proteolytic Organisms</u>: [CL. Histolyticum-CL Sporogens-CL. Tertium]

 They ferment <u>Proteins</u> of Devitalized or (ischaemic) muscles→
 liberation of [Ammonia & Hydrogen sulphide] → Haemolysis of blood

 ↑Iron from hemoglobin which combines with the Hydrogen sulphide

 → Iron sulphide which stain the dead muscles by <u>Greenish black colour</u>.

* Clinical picture:

The incubation period varies from few hours to few days

General Examination

- ① The patient shows Pallor, Fever & Marked Tachycardia.
- ② <u>Icteric Jaundice</u> & Oliguria.
- ③ In severe cases patient is shocked

Local Examination

- O Tense & Swollen limb.
- (2) Wound Stitches are seen under tension with crepitus sensation.
- 3 A Sanguinous discharge with Characteristic Foul odour exudate from wound.
- Skin over shows greenish to black Coloration.
- (5) The affected muscles don't contract or bleed if cut.
- The affected muscles show greenish black or brick red coloration

* Special Types of Gas Gangrene:

- (A) Massive Type: (The usual) If affect several muscles.
- Local Type: (Less common) If affect a muscle or a group of muscles.

* Causes of Death:

- Severe Toxemia.
- Haemolysis & Jaundice.
- Damage of Kidney & liver.

* D.D :

From Other Clostridial Infections

- Simple Contamination: Localized to site of infection & Non Invasive.
- Gas Abscess: As simple contamination but no muscle affection.
- · Others: As &
 - ① Clostridial Cellulitis: Superficial & Localized to S.C Tissue.
 - ② Myositis: Localized to one group of muscles.
 - ② Oedematous gangrene: Caused by CL. Oedematiens & Characterized by No gas production

* Management:

[1] Prevention

- ① Adequate debridment of wound with Excision of dead muscles.
- ② Strong Antibiotics especially Pencillin.
- 3 Adequate Circulatory support in severe injuries :

Is required to avoid tissue hypoxia.

N.B. Polyvalent Anti-gas gangrene serum Not used in Modern surgery

(III) Treatment

A General ttt

Fresh Blood Transfusion.

Strong A.B.: Penicillin 10-40 million Unit/ day I.V.

IF Available "Hyper-barric Oxygenation"

· It is oxygen drenching in a pressure chambre.

 It is given At 3 Atm for 1-2 hours and is repeated every 6-12 hours. [3 - 5 exposures are usually necessary].

· It inhibits bacterial invasion & production of Toxins.

B Local ttt

• The wound is opened & All dead tissues are excised.

· Tight fascial Compartment are decompressed.

· The Deep fascia is left open.

N.B: ① Daily debridement is necessary under anaesthesia.

② Amputation with Massive type.

@ Diverting Colostomy: In Extensive perincal infection

* Prognosis:

The Mortality Rate = 20%



* Aetiology:

* Organism: Mixed microbial Flora

* Predisposing Factors:

Immunocompromised patients e.g. diabetic patients.

* Mode of infection:

Through a puncture wound, leg ulcer or a surgical wound .

* Pathology:

- The infectious process spreads along the Fascial planes which leading to thrombosis of the vessels passing between the skin and deep circulation.
- · There is ischaemic changes lead to superficial skin neerosis

* Clinical picture:

[A] General:

- · The patient is alert .
- Toxaemion (Fever, Headach, Malaise & Anorexia)
- · Tachycardia.

[B] Local:

- · The skin shows haemorrhagic bullae & necrosis.
- The skin surrounded by odema & inflammation.
- · The skin may be anaesthetic.

* Investigations:

Gram stained smears & cultures show the mixed nature of infection.

* Prevention:

Adequate debridement of wounds & Antibiotics for contaminated wounds

*Treatment:

[1] Surgical: Debridement (under anaesthesia).

[2] Medical :Penicillin (20-40 million units/day / I.V) together with Gentamycin (5mg/kg/day) or Amikacin (15mg/kg/day)

* Prognosis:

In many cases the diagnosis is missed so the disease has a fatal outcome.



* Guide lines for Antibiotics prescription :

[A] The patient:

- ① Age, sex, pregnancy & lactation.
- ② The condition of Renal & Hepatic function i.e (sites of Antibiotics metabolism)
- 3 Known history of allery to Antibiotics.
- The uses of other <u>drugs which enhance or ↑ side effects</u> of Antibiotics e.g contraceptive.
- The most suitable route of administration (Oral, IM. IV)

[B] The pathology & causative orgnism:

- ① Establised diagnosis before starting antibiotics.
- ② Wide spectrum & less expensive antibiotics are more preferred the pathology & clinical assessment.

* Antibiotics In common use:

[1] For [staph = Gram + ve cocci]

- Penicillanase resistant penicilline
 - e.g Flucloxacillin or Cephalosporins
- O Clindamycin (Dalacin C)

- [2] For [Strept = Gram + ve cocci] e.g Penicilline or Erythromycin
- [3] For (Gram-ve bacilli) Except (E-coli, klebsella & Proteus) e.g Gentamycine
- [4] For (Gram-ve anaerobe) i.e Bacteroids. e.g Metronidazole (Flagyl) or Clindamycine
- [5] For Pseudomonas: e.g Carbenicilline or Amicaine.
- [6] For Entero-cocci: e.g Strept. Fecalis. e.g Ampicilline

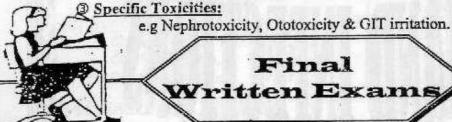
* Action of Antibiotics:

Depends mainly on lysis of cell membrane.

* Complications of Antibiotics:

- ① Hypersensitivity reaction commonly with pencillin including urticaria, fever & a sthma.
- O Vit B deficiency

due to alternation of bowel flora especially with prolonged used





 Discuss the treatment of <u>Tetanus</u> (1985)

1986

1992

1995

2004

· Complication & ttt of Carbuncle of upper lip.

 Measures to prevent Gas gangrene in a lacerated wound of thigh.

• Tetanus : Aetiology, Diagnosis & ttt (1988)

Discuss Actiology, C/P & ttt of Gas Gangrene

 Discuss treatment of <u>Tetanus</u> 1993 Discuss treatment of Gas Gangrene

Discuss Actiology, C/P, Prophyloxis & ttt of <u>Tetanus</u>

 Discuss prevention of Tetanus & Gas Gangrene 1996

 Discuss path., C/P & ttt of <u>Carbuncle</u> 2003 Give a short account on carbuncle

Discuss post-operative wound infections

(10 Marks)

نور ثاني (10 Marks)

دوز ثانی (10 Marks)

(25 Marks)

بور ثاني (25 Marks)

(15 Marks)

(25 Marks)

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ىور ئتى (15 Marks)

نور ثانی (12 Mark)

دور ثاني (20 Marks)

Chapter (7)

HO INTERIOR

Chapter [7]

Hand Infections

*Due to the use of the hand & it's exposure to contamination, the frequency of hand infection is high proper treatment & early interference is needed to preserve the function of hand.

* Classifications:

[A] Cutaneous & S.C Infections:

- 1 Paronychia (Acute & chronic)
- ② Pulp space Infection
- ③ Web space Infection

[B] Fascial spaces Infections:

- Mid palmar space infection.
- @ Hypotheanar space infection.
- 3 Theanar space infection

[C] Synovial sheath Infections:

- O Acute digital Tenosynovitis
- O Ulnar bursitis.
- 3 Redial bursitis.

[D] Bone & Joints Infections:

* General principles :

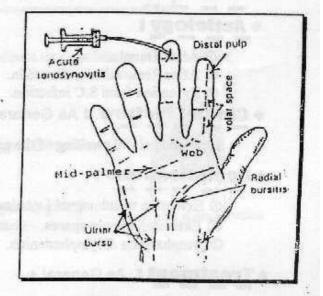
[A] <u>History</u>: usually manual warkers with history of prick or usually house wives.

[B] C/P:

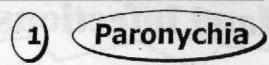
- General examination: Fever, Headch, Malaise & Anorexia or (Hectic fever & throbbing pain) if Abscess.
- Local examination ① Redness, Tenderness, Hotness & Dorsal oedema overlying skin
 - @ Firm Tender L.Ns.
 - The fingers can't be approximated because adduction →↑ pain

[C] Treatment:

- ① General & Local rest in elevated position.
- @ Early adminstration of strong A.B.
- (Don't wait for fluctation)
- 1 Incision (nerve crosses hand crease) & under general anasthesia.
- (3) Incision is done under tourniquet to have bloodless field
- © Early restoration of function by movement to avoid stiffness of joints.



A Cutaneous &S-C Infections



1- Acute Paronychia

* Definition: It is an acute Inflammation of the hidden Part of

the nail, affecting the nail fold

* Incidence : The commonest type of hand infections.

* Aetiology:

- O After Trauma.
- After Removal of excess skin.
- ② Extension from S.C infection.

* Cinical Picture : As General +

localized painful swelling of the nail fold

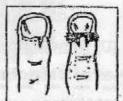
* Complications :

- O Extension to subungual i.e below the nail.
- @ Extension to pulp spaces.
- ③Lymphangitis & lymphadenitis.

* Treatment: As General +

 Unilateral: Triangular flap (Triangular incision in the skin fold to raise nail fold).

Bilateral: Quadrangular flap
(Incision of the skin at the both angles of nail fold, raising the nail fold).



2- Chronic Paronychia

- * Definition: It a Chronic inflammation.
- * Incidence : Common with washer women.
- * Actiology : It a Fungal Infection.
- * Clinical picture : As General +

Localized painless swelling in the <u>nail</u> fold with tropic changes.

* Treatment: As General +

- Anti-Fungal treatment
- 2) Avoid water.
- 3 Nail extraction.





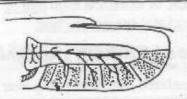
2

Pulp Space Infections

[FELON]

SURGICAL ANATOMY

- Pulp space is closed compact space
 Between skin & periosteum.
- It is shut from the middle pulp by a
 Transverse septum attached to bone.
- It is filled with fat & partitioned by incomplete fibrous septa



* Actiology:

Infection mainly be <u>Staph</u>, organism through direct inoculation by a pin prick or extension from <u>Paronychia</u>.

* Clinical Picture : As General+

Localized painful swelling over the distal pulp with induration

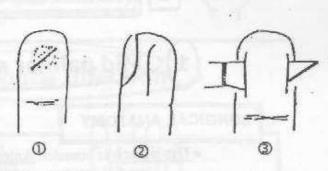
* Complications :

- ① Tenosynovitis (Tendemess over proximal fingers & palm)
- ② Arthritis (limited movement of <u>All</u> Joint of hand)
- Lymphangitis.
- Lymphadenitis.
- S Extension to mid or proximal pulp spaces

* Treatment : As General +

Drained either by 🖘

- ① Direct incision over the inflamed point .
- ② Hockey-stick incision if One side of pulp is inflamed
- Trans-fixation incision passing infront of the phalynx with division of all septa if the whole pulp is full of pus.





SURGICAL ANATOMY

- Web space is S.C. spaces between the 4 digital slips of palmar Apponeurosis.
- It is bounded by Proximal phalanges on each side
 - Palmar skin infornt
 - Dorsal skin behind





IIIII Fibroadenoma

* Incidence: Commonest breast mass of young female.

Fibroactenome

* Actiology:

[Benign Tumor of Epithelial cells + Fibrous tissue] It may be &

. From the start i.e. De Novo.

Or . On top of Excessive loclaization of Adenosis & Fibrosis

of Fibroadenosis.

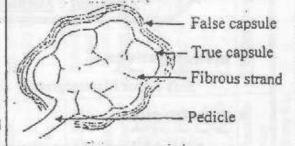
* Pathology :

The Tumor is (Well Capsulated)

 <u>True capsule</u>: Showing <u>fibrous</u> band dividing it into lobules

 False capsule: Formed of compressed breast tissues.

There are 2 Types . 3



	Hard Fibroadenom; (Perl-canalicular)	Soft Fibroadenoma (<u>Intra≃</u> canalicular)
• N/E Picture	Attached to it's capsule by one pedicle.	Attached to it's capsule by multiple pedicles
» Microscopic Picture	Ducts surrounded by Dense F.T. Rounded Glands Dense F.T.	Compressed Glands Slit like lumen

* Clinical Picture :

	Age	20 - 30 years	30 – 40 years
	<u>C/O</u>	 Hard & Painless mass. Slow Rate of growth i.e.malignancy is Rare. 	Soft and Painless mass. Rapid Rate of growth i.e.malignancy is Common
•	Exam.	Hard & not tender. Well defined edge. Mobile (Breast Mouse) No L.Ns Enlargement	• <u>Soft</u> & not tender.

* Complications:

THE WORLD WITH STREET STREET, STREET STREET, STREET STREET, ST	
Malignancy • Never	 Commonly → Sarcoma
Wangiancy	

* Aetiology:

Infection mainly by staph, organism through direct inoculation by a pin prick or extension from mid or proximal spaces infection.

Clinical Picture : As General +

Localized painful swelling over the web space with induration.

* Complications:

- ① Tenosynovitis (Tendemess over proximal fingers & palm)
- ② Arthritis (limited movement of All joints of hand)
- Lymphangitis.
- Lymphademitis
- Extension to mid palmar spaces, Hypotheanor or theanar spaces i.e Fascial spaces.



Drained by ®

Transverse incision on palmar surface of web, near its free border . Counter incision may be done posteriorly if the abscess communicates with a dorsal pocket.



Fascial spaces Infections

Mid palmar space Infection

SURGICAL ANATOMY

• The space is bounded Anteriorly by palmar apponeurosis, Medially by medial septum separating it from the hypothenar space & Laterally by the lateral septum separating it from the thenar space.

* Atiology:

Infection mainly by staph. organism through direct inoculation by a pin prick or extension from web space infection



* Clinical Picture : As General +

Localized painful swelling over the mid palmar cavity i.e. [Frog's Hand] with induration.

* Treatment : As General +

A Transverse incision is done like that of a web space in distal palmar crease (Hiltons Method) is done using forceps is introduced into the retrotendenous space to drain pus.

2 Hypothenar space Infection

* Aetiology:

Infection mainly by <u>staph</u>, organism through direct inocolation by a pin Prick or extension from web space Infection between <u>Little & Ring fingers</u>.

* Clinical picture : As General +

Localized painful swelling at <u>Hypothenar</u> space with induration

* Treatment : As General +

A vertical incision along the medial border of
The 5th metacarpal bone is done. The small muscles of
The little finger are reflected and the space is entered by a
Sinus forceps i.e. (Hilton's Method)

3 Thenar space Infection

* Aetiology:

Infection mainly by <u>staph</u>. Organism though direct inocluation by a pin prick or extension from web space infection between Index & Middle fingers.

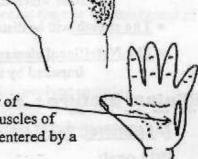
* Clinical picture : As General +

Localized painful swelling at Thenar space

Treatment:

1- Transverse incision at the distal end of the thenar eminence at the web then the space is open by a sinus forceps (Hilton's Method).

2- <u>Vertical incision</u> on the lateral aspect of the back of the 2nd metacarpal bone, this is the incision commonly used



C

Synovial sheath Infections

Teno-synovitis

SURGICAL ANATOMY

The middle 3 fingers are surrounded by three

Tendon sheath which extend from the distal phalanx to the head of the corresponding metacarpal bones

* Aetiology :

Extended Infection from cutaneous & S.C Tissue

* Pathology:

- Synovitis is associated with excessive <u>clear</u> synovial fluid which turned to be <u>turbid</u> by pus.
- · The sheath will be distended.
- The Nutritional element to tendons will be Impaired by inflammatory thrombosios of vesseles.

*Clinical picture : As General +

[A] General: Fever. Headach, Malaise & Anorexia

[B] Local:

- D Symmetrical swellings of fingers.
- @ Semiflexion of all joints (Hook sign)
- Extension of inter-phalangeal joints is very painful, while metacorpo-phalangeal joints is slightly painful contrast to mid palmor space infection

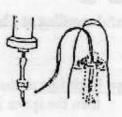
* Complications:

- O Stiffnes Fingers.
- O Septic Arthritis.
- 3 Speading Infections.

* Treatment : As General +

- ① Transverse incision over distal crease.
- Aspirate pus by a catheter
- (3) Inject Antibiotic









Diseases of Tendons & Fascia

Chronic Tendenitis

1 Tennis Elbow

 The patient complains of pain in the elbow at rest and in particular when he uses the hand (extensors). Pain develops at the site of attachment of the extensor muscles of forearm to the <u>lateral</u> epicondyle.

2 Golfer's Elbow

 Similar to Tennis Elbow, but it affects the attachment of flexor muscles of the forearm to the medial epicondyle.

3 Supra-spinatus Tendinitis

 Pain is felt in the shoulder especially on abduction and rotation. There is localized tenderness over the insertion of the supra-spinatus tendon.

4 Plantar fasciitis

 Pain and localized tenderness occur under the heel at the site of attachment of planter fascia to the calcis.

*Treatment: (1,2,3,4)

- a- Ask the patient to avoid powerful contraction of the involved muscles.
- b-Local injection of Hydrocortisone and local anesthetics.
- c- When sura-spinatus tendon is calcified surgical release may be needed

5 Stenosing Teno-Vaginitis

Spontaneous thickening of tendon sheath which gradually entrap the tendon.

I- Dequervain's disease:

 The common sheath of abductor pollicis longus and extensor pollicis brevis tendon at the wrist is affected by stenosing thickening. Patient develops pain with movements of the thumb.

II- Trigger finger:

Stenosing thickening affects the retinacula of the flexor tendons in the palm. The
affected finger can be flexed. But on extension the patient feels difficulty at a
certain angle after which the finger snaps extended like a trigger.

* Treatment : (5)

- a. Local injection of Hydrocortisone.
- b. Stenosing Retinaculum can be divided surgically.

Chapter (8)

Tumors & Transplantation



*Definition:

An autonomous, excessive, purposeless and pathological proliferation of cells. This growth continues indefinitely in the absence of physiological stimuli and without regard to its effects on the surrounding tissues.

* Histogenetic Classification Of Tumors:

	BENIGN	MALIGNANT
*Epithelial Tumors Surface Glandular	Papilloma Adenoma	Carcinoma Adenocarcinoma
*Connective Tissues Adipose Fibrous Cartilage Bone Smooth muscle Striated muscle	Lipoma Fibroma Chondroma Osteoma Leiomyoma Rhabdomyoma	Liposarcoma Fibrosarcoma Chondrosarcoma Osteosarcoma Leimyosarcoma Rhabdomyosarcoma
* Neuro-ectodermal Nerve cells Melanocytes Meninges Nerve sheaths	Ganglioneuroma Pigmented naevus Meningioma Neurofibroma	Neuroblastoma Malignant melanoma Neurofibrosacoma
*Hemopoletic & Lymphoreticular		Leukemias Lymphomas
*Blood vessels	Hemangioma	Hemangiosarcoma
Lymph vessels	Lymphangioma	Lymphangiosarcoma
Germinal & Embryonic cells	Benign Teratoma	Malignant Teratoma Seminoma
Placenta	Hydatiform mole	choriocacinoma

* Actiology of cancer:

[I] Onchogenesis:

Agents that damage genes that initiate the malignant Transformation.

- (1) Chemical Agents.
- (2) Physical.
- (3) Viruses
- (4) Diet
- (5) Idiopathic

[II] Another Category:

Agents not damage genes but enhance the growth of Tumour cells e.g. Hormones. (1) Oestrogen stimulate growth of cancer Breast

(2) Androgen stimulate growth of cancer Prostate



(1) Chemical Agents:

a. Tobacco smoke (mainly of cigarettes)

e.g cancer lung, esophagus, urinary bladder and pancreas.

b. Occupational Agents:

e.g Asbestos -> Mesothelioma of lung with insulation workers.

- Benzidine -> Transitional Cell Carcinoma of urinary bladder with petrochemical
- Diesel exhaust -> Bronchial Carcinoma with bus-garage worker.
- Soot -> Squamous Cell Carcinoma (skin) with sweepers.

(2) Physical Agents:

a. Mechanical irritation:

e.g. gall stanes ____ cancer gall Bladder .

b. Ionizing radiation:

e.g $\alpha \& \beta$ rays \longrightarrow cancer in man and Animal.

c. Ultraviolet rays:

e.g. cancer skin .

(3) Viruses:

a. Human papilloma viruses:

Sexually Transmitted ---- Cervix & Anus.

b. Hepatitis B & C ----> Hepatocellular Carcinoma.

(4) Diet:

a. Fat -> Cancer colon and rectum.

b. Alcohol ______Cancer upper digestive tract and hepatocellular Carcinoma.

(5) Idiopathic.

* Cancer development:

(1) Hyperplasia : The cells look normal but reproduce to too much cells.

(2) Metoplasia: Change of type of epithelium into another type.
(3) Dysplasia: The cells becomes a typical in size & shape.

(3) Dysplasia: The cells becomes a typical in size & shape.
(4) In situ: The cells not invade the basement membrane.

(5) Invasion: The cells begain to invade the neighboring tissue.

(6) Metastasis : The cells tend to reach blood and lymphatics

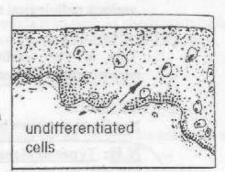
* Cancer grading:

Grading in a measure for turmor aggression.

(1) Well differentiated tumors: The least aggression.

(2) Moderatly differentiated tumors.

(3) Poorly differentiated tumors: The most aggression



* Cancer spreading : مهم

(A) Properties that allow Metastasis:

I- Defective cell adhesions : Cancer cells lack of adhesive proteins which bind the

cells to another.

2- Tumer Angiogenesis : Cancer cells access to circulation through newly

formed capillaries.

3- Production of proteolytic Enzymes which digest the basement membrane allowing invasion.

(B) Mode of Metastasis:

1- Local spnead: To neighboring Organs & Tissnes.

2- Lymphatic spnead: 2 types .

a- <u>Permeation</u>: Malignant cells invade the endothelium of lymphatics then grow inside the lymph vessels.

b- Embolization: Malignant cells carried as an emboli to draining L.Ns.

3- <u>Blood spread</u>: Malignant cells invade to cappillaries as an emboli to lung, bone, liver & Brain.

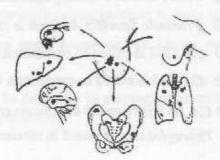
4- Transcoelomic spread: Travel along cavities

* Cancer staging: (T.N.M)

(T) = Extent of 1ry <u>Tumor</u> in size and depth.

(N) = Presence or absence of L.Ns.

(M) = Presence or absence of Metastasis.



*Diagnosis of malignant tumors:

[A] Screening:

Some people may have a higher risk of developing a certain malignant tumour

So certain screening programmes are done to detect the
neoplasm as early as possible.

A Common Example is to do Soft Tissue Mammography for females who have a higher chance of developing breast cancer.

[B] Radiological:

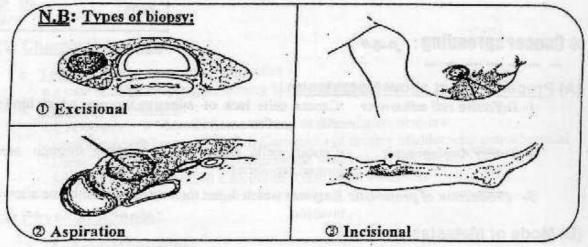
various radiological techniques including contrast studies, ultrasound & CT

[C] Endoscopy

This is very useful for diagnosis of most lesions of the respiratory, gastrointestinal and urinary.

[D] Histology

Needle or operative biopsies essential for tissue diagnosis .



[E] Cytological Examination:

Fine needle aspiration cytology is now a well established line of investigation which is commonly used to diagnose lesions of the Thyroid, Breast ...etc

[F] Tumours Markers:

Many malignant Tumours secrete certain oncofetal proteins which can be established. This may help in the diagnosis of certain tumours Examples include 3

- ① a-feto-protein is raised in hepatocellular carcinoma & testicular tumor.
- ② CEA (Carcino-Embryonic Antigen) is raised with cancer colon.
- ③ Prostatic Specific Antigen is raised in Prostatic carcinoma.
- @ CA 15-3 is raised in carcinoma of the Breast.
- (5) CA-125 is raised in carcinoma of the Ovaries .
- 6 CA 19-9 is raised in carcinoma of colon.
- Thyroglobulin is raised in carcinoma of thyroid.

* Treatment Of Cancers:

[Modalities for Treatment of Patient with Cancer]

(A) Early (equivalent terms = loco-regional, potentially curable, operable)cancer.

- · There is one evidence of distant spread .
- · Cure is possible if this local disease is eradicated .
- · Treatment is radical, i.e., aims at cure.
- Treatment is, essentially, by loco-regional modalities, i.e., surgery, radiotherapy, or by a combination of both.
- Adjuvant (complementary) treatment of systemic modalities such as chemotherapy is indicated if there is a high possibility of systemic microscopic spread in distant sites.

(B) Late (equivalent terms = systemic, incurable, inoperable) cancer.

- · There are distant metastases.
- · Cure is not possible.
- Treatment aims to palliate of the patient's symptoms so as to provide him with a reasonable life quality.
- · Treatment is also essentially by systemic modalities as chemotherapy and hormones.
- · Surgery or radiotherapy is sometimes needed to palliate local symptoms.

The individual modalities of treatment include:

1) Surgery:

- Primary tumour: Radical surgery aims at excision of the primary tumour with as wide a safety margin.
- Lymph nodes: The treatment of lymph nodes varies from one tumour to another
 - (1) G.I.T. malignancies: lymph nodes are routinely resected
 - (2) Breast cancers: they are either resected or irradiated
 - (3) Head and neck malignancies: the nodes are treated only if they prove to contain malignant deposits.
- Advantages : Surgical excision is both quick and effective.
 It accounts for the largest number of cures.
- <u>Disadvantages</u>: Surgery may produce functional and cosmetic disabilities.

2) Radiotherapy:

- Indications: (1)Cancer of the larynx so as to preserve the voice.
 - (2) Early Hodgkin's disease early cancer prostate & early cancer breast
- Method :Powerful X-rays, gamma rays, electrons, or heavy particles are directed to the tumour.

The radiation may be aimed at a tumor from outside the body (teletherapy), or it may be delivered by placing radioactive needles at the cancerous site (brachytherapy).

Advantages:

(1) Curing the cancer without sacrificing the patient's ability to function.

(2) Radiation can destroy microscopic extensions of cancerous tissue around that a tumour that a scalpel might miss.

(3) Radiation is a safer option for older.

Disadvantages:

(1) While some tumours as squamous cell carcinoma are sensitive to irradiation, adenocarinoma is much less sensitive.

(2) Radiation is commonly associated with burns of the skin or enteritis, which are difficult to treat.

(3) Compared to surgery, radiotherapy is slower as it usually takes 5 to 8 weeks.

3) Chemotherapy:

- (1) Main line of treatment of leukaemias.
- (2) Metastases.
- (3) Adjuvant to surgery in early cases where microscopic metastases.



Better results are obtained from combination chemotherapy rather than using agent.

- Advantages: The drugs travel the circulation and can reach malignant cells anywhere
 in the body. Many malignancies including leukaemias, lymphomas and
 testicular cancer are now successfully treated by new conbinantion of
 chemotherapy.
- <u>Disadvantages</u>: The available chemotherapeutic drugs often kill many healthy cells and thus bring on serious effects, so causes anemia, leucopenia and thrombocytopenia.

4) Hormone therapy:

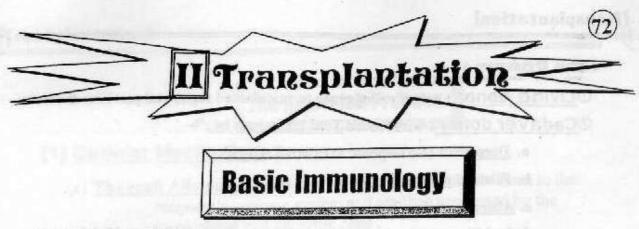
Horrmone-blocking and hormone-supplementing therapies affect the rate at which tumor cells grow, and multiply. Examples are :

- Anti-estrogen for women with cancer breast that is positive for oestrogen receptors.
- · Anti-androgen for men with cancer prostate.
- Thyroxin to suppress TSH for patient with papillary carcinoma of thyroid.

5) Immunotherapy:

- Non-specific. The tuberculosis vaccine BCG stimulates the immune system in general.
- · Specific. This method is still of limited use.

Administration of Monoclonal antibodies from a single clone of lymphocytes that have been stimulated by a specific protein of the cancer cells.



*Tissue Typing:

Glycoprotein molecules on the surface of all somatic cells act as "self- markers" which are responsible for triggering the immune reaction leading to allograft rejection. These molecules were originally detected on leukocytes and are therefore, named Human leucocyte antigens (HLA).

*Histocompatibility complex:

These <u>HLA Antigen</u> are genetically controlled by loci on the short arm of chromosome 6. This area on chromosome 6 is termed the *Major Histocompatibility Complex*.

Transplantation Immunology

*Pre-transplantation Assessement :(Histocompitability Test)

OSerological Cross Match

To Test the recepient serum for cytotoxic antibodies against the donor cells.

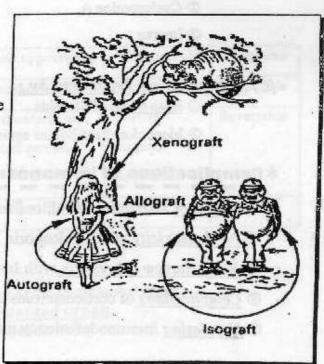
②HLA Matching Test:

for Donor & Recepient tissue to minimize genetic disparity & later graft rejection.

*Types of Graft

(For Transplantation):

- 1 Autograft: same individual .
- ② Allograft: same species .
- (1) Isograft: identical twins.
- Xenograft: different species.



*The Donors:

- ①Living donor: only if paired organ or vascularised segmental part like the liver.
- @Cadaver donor : with Proved Total brain death by :"&
 - a. Deep coma (No response to external stimuli).
 - b. Bilateral dilated fixed pupils.
 - c. Absence of all reflexes .
 - d. Inability to maintain the vital signs for 3 minutes without artificial means.
 - e. Flat EEG in all channels .

***Organ preservation:** By ₹

- ① Cooling (surface or perfusion) to↓ tissue metabolism.
- ② Perfusion of a special solution to maintain a normal metabolic activity.

*Immunosuppression: To prevent Rejection

- (A) Induction immunosuppression: 1st 2 weeks after Transplantation to prevent lymphocytes from attacking the transplant by:
 - ① Large doses of Corticosteroids.
 - ② Azathioprine.
 - 3 Anti-thymocyte globulin .

(B) Maintenance Immunosuppression by:

- O Small doses of steroids
- 2 Cyclosporine A.
- ③ Imuran

(C) Anti-rejection Treatment by:

- 1 High doses of Steroids.
- @ Monoclonal antibodies again T-lymphocytes carring CD3 receptors.

*Complications of Immunosuppression:

- ① Infection: Bacterial, Viral, or Fungal in U.T., Surgical wounds or Catheters.
- ② Nephrotoxicity with Cyclosporin A.
- 3 Bone marrow depression with Imuran .
- Complications of corticosteroids .
- (5) Neoplasia: immunodefeciency may predispose to cancer development.

The Rejection Process

[1] Cellular Mechanism:

- (a) The graft Allo-antigens are shed in a cellular or soluble form to the recipient's immune system and are then processed by the macrophage and dendritic cells.
- (b) The Initial Recipient's response is activation and proliferation of Thelper cells .
- (c) T-helper cells produce interleukin 2 (IL-2) which stimulates the activation and proliferation of cytotoxic T-lymphocytes.
- (d)Stimulated cytotoxic T-lymphocytes attack the transplanted tissues directly and cause damage to the cells carrying the foreign HLA antigens.

* These steps can be summarized as following 🕏

Allo-antiger Process by T-helper → Interleukin 2→ Cytoxic T lymphocytes Macrophage 5

[2] Humoral Mechanism. The present of complement-fixing cytotoxic antibodies, prior to transplantation, produces hyperacute allograft rejection by attacking vascular endothelium in the transplanted organ leading to platelet aggregation and thrombosis.

*Typing Graft Rejection:

Туре	Onset	Mediators	Graft appearance	Treatment	Prognosia
1) Hyperacute	Immediate	Humoral	Flaccid,cyanotic	Anti-rejection	Reversable
2) Acute	First 6	Cellular and	Graft-oedema and	Steroids	Reversable
	months	humoral	cortical necrosis	immuno-	
			- Analis	suppression	Samuel II
3) Chronic	Variable	Cellular	Shrunken, fibrotic	Resistant	Bad

* Diagnosis of Rejection :

D Sonar, C.T. and MRI:

Can assess the size and gross morphology of the transplanted organ.

② Functional assessment of the Transplanted organ:

(e.g.) Kidney function test, liver function test ... etc.

3 Estimation of the level of

Cytotoxic lymphocytes and antibodies in the recipient serum.

C.T. guided biopsy:

From the transplanted organ then histopathological examination to ensure Also time of rejection.

Examples of

Organs Transplantation

[I] Renal Transplantation:

* Indications :

All cases of end-stage renal diseases which may be secondary to:

- ① Glomerulonephritis (most common cause).
- ② Hypertension.
- @ Diabetes.
- @ Pyelonephritis.
- O Polycystic disease.
- 6 Lupus nephritis.
- O Obstructive uropathy.
- ® Congenital nephrotic syndrome.

* Jechnical considerations:

 The grafted kidney is placed in an extra-peritoneal position in the iliac fossa.

 <u>The Arterial Anastomosis</u>: is performed between the renal artery & external iliac artery (end to side anastomosis).

 The Venous anastomosis: is performed between the renal vein and external iliac vein (end to side anastomosis).

 The ureter of grafter kidney is anastomosed to patient's urinary bladder.

* Complications :

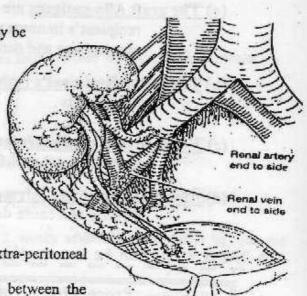
- ① Complications of immunosuppression (see before)
- @ Recurrencey of original disease in the grafted kidney.
- Technical complications as vascular occlusion 2 stenosis, urinary leakage, ureteric stricture and wound infection.

[II] Hepatic Transplantation:

* Indications :

(1) In children:

- Cirrhosis due to biliary atresia, congenital hepatic fibrosis and congenital hepatic cirrhosis.
- Metabolic disorders as glycogen storage disease, alpha I antitrypsin deficiency, galactosemia and histiocytosis.





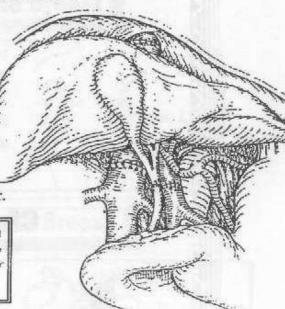
(2) In adults:

- Cirrhosis: Primary and secondary biliary cirrhosis, chronic active hepatitis, sclerosing cholangitis and alcoholic cirrhosis (relative indication).
- Metabolic: Hemochromatosis, Wilson's disease and Budd-Chiari syndrome.
- Neoplastic: Fibrolamellar tumor and primary small intracapsular hepatocellular carcinoma on top of liver cirrhosis. The tumor should be localized and there should be no evidence of metastases.

* Jechnical Consideration :

- The liver of the recipient is removed then the grafted liver (cadaveric) is placed in same position then.
- The following anastomoses are performed.
 - O Supra-hepatic & Intra-hepatic I.V.C.
 - o Portal vein of recipient to donor.
 - o Hepatic artery of recipient to donor.
 - o Common bile duct of recipient to donor.

N.B.: Nowadays, segmental liver transplantation from living donors are being successfully performed. This will overcome the problem of shortage of available liver donors.



* Complications :

- ① Complications of Immune suppression (as before)
- @ Recurrency of the original disease of grafted liver.
- Technical complications: as vascular occlusion or stenosis, bleeding, bile duct leakage and/or stenosis.

[III] Pancreatic Transplantation:

* Indication :

Type I insulin dependent diabetes mellitus with renal failure, so combined (renal & pancreatic transplantation) is performed.

* Technical comiderations:

Whole or segmental pancreatic transplantation is performed with venous anastomosis to portal or systemic venous circulation.

* Complications:

- 1 Complications of Immune suppression (as before)
- @ Pancreatitis.
- ③ <u>Technical complications</u>: as vascular occlusion or stenosis.

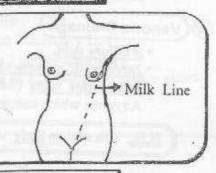
Chapter (9)

Breast Diseases

ke Breast Diseases

Development Of The Female Breast

The Breast is a modified sweat gland which is developed from an Ectodermal ridge which extends between the anterior pectoral fold & the groin. Normally it disappears all through except in front of chest where solid columns of epithelia pass deeply → Canalized → Milk duct.



Surgical Anatomy of the Female Breast

* Extent

- · Above : At 2nd rib. · Below : At 6th rib.
- · Medially : At lat. Border of sternum.
- · Laterally : At ant. Axillary Line.

N.B.: Axillary Tail of Spence: (3rd rib) It is prolongation from upper outer part of gland up to axilla it consider the only part which is deep to pectoral fascia through Foramen of Langer

* Areas: [6 Areas]

- Upper Inner quadrant.
 Lower inner quadrant.
- Upper outer quadrant
 Lower outer quadrant.
- · Retroareolar part
- · Axillary tail.

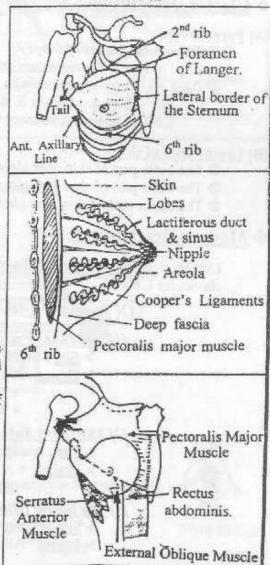
Architecture

- · Breast consists of many Lobules which is aggregated → (15-20) Lobes which arranged in radiating manner → Single duct → Nipple.
- · It is attached to underlying fascia by band of fibrous tissue [Cooper's Ligament]. This ligament can be involved in fibrotic lesions leading to skin dimpling

* Muscle Floor:

It lies on 3 Muscles

- Pectoralis Major Muscle.
- Serratus Anterior Muscle (Inf. Lateral)
- External Oblique Muscle (Inf. Medial)

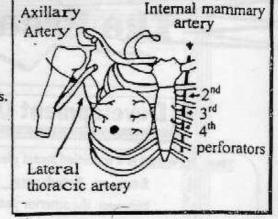




* Blood Supply :

- (A) (Arterial Supply)
 - Axillary artery → Lat. Thoracic artery
 - Internal Mammary artery → 2,3,4 perforators.
 - Intercostal arteries (Perforators).
- (V) (Venous Drainage)
 - · Axillary vein.
 - Internal Mammary vein.
 - Intercostal veins (which drained into
 Azygoze which communicates valveless vertebral veins)

N.B.: This explain Early vertebral metastasis with cancer breast



(++)* Lymphatic drainage :

♦ Classic Description :

[A] Parenchyma:

@ Subareolar plexus of sappey:

For nipple & areola then drains to deep plexus.

@ Deep plexus (over pectoralis)

For subareolar plexus & deep part of the gland then drain to axillary L.Ns & Internal mammary through the pectoralis muscles.

[B] Lymphatics of skin:

- The outer part of skin over gland to Axillary L.Ns.
- ② The inner part of skin over gland to Internal mammary L.Ns.
- The upper part of skin over gland to supraclavicular L.Ns.

♦ Modern description :

Lymphatics drain through axillary L.Ns → internal mammary L.Ns → supraclavicular L.Ns.

(75%) (75%)

[1] The (Ant.) Pectoral group:

- > Site: Under cover the pectoralis major.
- > Drains: Chest wall.
 - Whole breast except <u>Tail</u>.
 - Ant. Abdominal wall above umbilicus.

[2] The (Post) Subscapular group:

- > Site: Along post, axillary fold.
- > Drains : Axillary tail.
 - · Post, abdominal wall above umbilicus.

[3] The lateral (Humeral) group:

- > Site: Along upper part of humerus.
- > Drains : All the upper limb.

[4] The central group:

> Site: Central part of Axilla.

> Drains : [1], [2], [3].

[5] The Apical group:

> Site: Extreme apex of Axilla.

> Drains : [1], [2], [3], [4].

(II) (Other Associated L.Ns)

[1] Internal Mammary L.Ns. Drain Axillary L.Ns.

[2] Supra-clavicular. L.Ns. Drain Internal Mammary L.Ns.

[3] Interpectoral L.Ns of Rotar Between 2 pectoral muscles.

[4] Posterior Intercostal L.Ns Along Neck of ribs & have a minor share.



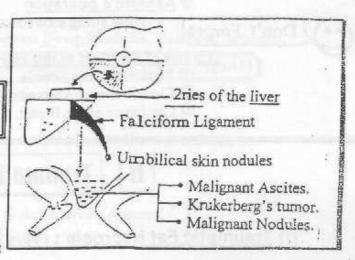
[1] Lymphatics drains Through axillary L.Ns (75%) → Internal mammary L.Ns → Supraclavicular L.Ns

[2]

Connection of the lymphatics of the lower inner quadrant of the breast with the peritoneum.

Lymphatics pierce rectus sheath → spread to Liver leading to liver nodules. Then through (falciform ligament) -> umbilical nodules (Josef sister's nodules).

N.B.: Some malignant cells will lead to malignant Ascites, Krukneberg's tumor and malignant nodules in the dauglas pouch.



[3] From prognostic point of view, Axillary L.Ns are classified by

Pectoralis minor muscle into 3 levels

- level I → L.Ns below the muscle
- Level II → L.Ns behind the muscle
- Level III → L.Ns above the muscle

Disorders of the Female Breast

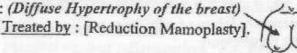




Congenital Anomalies

A- The Breast:

- ① Amazia: Absence of breast (Unilateral or Bilateral).
- @ Polymazia: Accessory breast along milk Line.
- ③ Micromazia: Small breast. → Treated by: [Augmentation Mamoplasty].
- Macromazia: (Diffuse Hypertrophy of the breast)





Silcon Balloon

B- The Nipple:

① Athelia: Absence of nipple (very rare).

Delythelia: Accessory nipple along milk line

③ Congenital Retraction of the Nipple: →

It must be differentiated from Acquired Retraction of the &

	☆ Congenital Retraction:	Acquired Retraction
	Since birth.	• Recent.
* Side :	Bilateral.	Unilateral.
- Mass:	No breast mass	Presence of breast mass
* Sulcus ;	Absent	Present

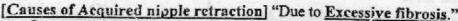
Treatment of congenital nipple retraction:

1 Frequent digital drawing of the nipple.

@ Ashford's operation :

Don't Forget

Purse string suture around the Nipple →



- Mammary Duct Ectazia.
- @ Chronic Breast Abscess.
- @ Carcinoma of the Breast.

II Traumatic Diseases

[1] Traumatic Fat Necrosis: (Very rare)

It may follow a blow → Death of some Fat cells → Libration of fatty acids which combine with calcium from local tissue fluid → Calcium Soaps.

N.B.: Other causes of Traumatic fat necrosis :

Direct Trauma e.g. Needle biopsy

or Indirect trauma e.g. sudden contraction of pectoralis.

- <u>Calcium soaps</u>: * <u>Cyst</u> containing "Thick Oily Fluid".
 - Hard mass If we <u>Do biopsy</u> the cut section will show "Characteristic Chalky white appearance".
- Treatment: Excisional biopsy.

[2] Breast Haematoma:

- It may follow A Blunt Trauma → Blood clot → Organization → Fibrosis
- Fibrosis → Hard mass.
- Treatment : Excisional biopsy.
- [3] Traumatic mastitis : e.g. ill fit braces.
- [4] Cracked nipple: From bad hygiene or from baby's mouth.
- [5] <u>Milk fistula</u>: Due to incision or injury of milk duct or rupture abscess. <u>Treated by fistulectomy.</u>

III Inflammatory Diseases

[1] Acute Lactational Mastitis & Acute Breast Abscess

Mastitis from milk engorgement

- * Incidence: 1st month of 1st lactation.
- * Actiology: Due to obstruction of duct by dry inspisated milk or epithelial debris.
- * Clinical Picture:
 - Symptoms General : Toxic symptoms [Fever, Headache, Malaise & Anorexia] . .

(N.B.: Fever is due to absorption of Milk protein (AgxAb)

- · Local: Dull aching pain.
- * Signs: . Diffuse Tense & Tender.
 - No Physical signs of inflammation, i.e. No Hotness or Redness.
 - . No. Axillary L.Ns.
- * Fate :/If Neglected .

Acute Bacterial Mastitis or Acute Breast Abscess.

Acute Bacterial Mastitis

- * Incidence: 1st month of 1st lactation i.e. Fate from milk engorgement.

 Or when baby is at 6 Months, i.e. Development of Incisors.
- * Actiology:
 - Predisposing factors: Mastitis from milk engorgement.
 - · Abrasions of nipple e.g Cracks or Fissures.
 - · Lack of breast hygiene.
 - * Organism: Staphylococcus aureus (Gram +ve).
 - Route of entery: Organism from baby's Mouth.
 Much less common (Blood born infection).
 - Pathology: Milk engorgement+ Staph. Infection → Diffuse Mastitis → Pus i.e. Acute Breast abscess.

* Clinical Picture:

* Symptoms: * General: Toxic symptoms [Fever, Headache, Malaise & Anorexia].

N.B.: Fever is due to absorption of Organism (AgxAb)

- Local: Dull aching pain but Gets worse.
- Signs: Diffuse Tense & Tender,
 - Physical signs of inflammation. e.g. Redness & Hotness of Skin.
 - Axillary L.Ns: Firm & Tender (Non specific).

* Fate :/If Neglected] & Acute Breast Abscess

Acute Breast Abscess



* Clinical Picture:

• <u>Symptoms</u>: • <u>General</u>: <u>Toxic</u> symptoms [F.H.M.A.]. (Fever, <u>Headache</u>, <u>Malaise & Anorexia</u>).

N.B.: Fever is Hectic i.e. Fluctuant and not reach the basal line at same day.

(Hectic Fever)

- · Local Throbbing pain which more at night
- Signs: Localized: Tense & Tender.
 - <u>Physical signs</u> of inflammation.
 e.g. Redness & Hotness of Skin.
 - · Axillary L.Ns: Firm & Tender (Non specific).
 - · Purulent discharge
 - Pitting oedema of skin overlying the abscess.
 - Fluctuation is very late.

M.B; ① Surgeons not wait for fluctuation for management

② Types of Breast Abscess:

[A] Supra (pre) mammary abscess: just under skin 400

[B] Intra-mammary abscess: inside breast tissue.

[C] Retro (post) mammary abscess: between breast tissues & chest wall. -

	* D.D. Between:	Acute Bacterial: Mastitis	Mastitis Carcinomatosa
History	* Onset & Course	Acute onset & Rapidly progressive course. High grade fever.	Gradull onset & Slowly progressive course. Low grade fever.
Inspection	*Site *Skin over	<u>Sector</u> of breast, <u>Firey</u> red.	• <u>>1/3</u> of breast. • <u>Dusky red.</u>
Palpation	*Tenderness	Markedly tender. Firm & Tender.	• Mild tender. • Hard & Not Tender.
Treatment	* Treatment by A.B	Cured or form <u>abscess</u>	 No response during 1st week → Biopsy.

Treatment of Acute Lactational Mastitis & Acute Breast Abscess

Prophylactic treatment

- Correct Hygiene of breast during lactation.
- IF Nipple Cracked:
 - ① Stop Lactation & Elevate Breast by Braces.
 - ② Wash with Boric lotion + Paint the nipple with Tinc. Benzoic Compound.
 - Antibiotics.

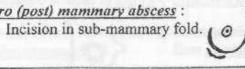
Active treatment

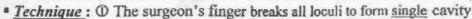
- Stage of Milk Engorgement & Acute Bacterial Mastitis
 - i.e. Before Suppuration [No Abscess]
 - 1 Local Heat "Hot application".
 - @ Support he Breast "strapping".
 - 3 An Antibictic against staphylococci e.g. Flucloxacillin or Cephalosporin.
 - The advisability of weaning:
 - If Baby > 9M → Stop feeding. The agent in conamon use is "PARLODEL" 2.5 mg twice/day.
 - ⑤ If Baby < 9M → Continue feeding with healthy breast & regular</p> evacuation of diseased one by using a Pump.
- II Stage of Acute Abscess Formation

i.e. After suppuration [Don't wait for fluctuation]. (120,000)

- · Angesthesia: General anaesthesia.
- " Incision:
 - B.: Incision & drainage according to type of abscess:
 - D Supra (pre) mammary abscess: Incision any where. _
 - @ Intra-mammary abscess: it may be 3
 - Radial: Radiating from areolar-
 - b. Circum-areolar: at margin of areola. Incision at skin 1st then radial incision is done at breast tissues. So more cosmotic
 - c. Counter incision: If the abscess at upper 1/2, so a 2nd incision is done opposite 1st one & dependent.

@ Retro (post) mammary abscess:





- 2 Pus evacuation for culture & sensitivity.
- 3 Drain is brought out through the most dependent part.



[2] Acute Non Lactational Mastitis

- 1 Infected Haematoma.
- @ Infected Tumors.
- (3) Mastitis from local irritation, e.g. Ill fitting braces. i.e. Traumatic mastitis.
- @ Mastitis Neonatorum (Female and Male).
 - It is due to retention of mother hormones i.e. (maternal prolactine) which stimulate laction in infant.
 - C/P: Swollen breasts on 3rd, 4th day with few drops of milk (witch's milk).
 - It subside 2-3 weeks.
- Mastitis of Mumps (usually uni & common with female).
- 6 Mastitis of puberty (Male only)
 - The condition affects adolescent boys → pain + swelling of breast. Which becomes indurated but (Suppuration Never occur).
 - The condition subsided in 2-3 weeks.

(B) Chronic Inflammatory Disease

[1] Mammary Duct Ectazia [Plasma Cell Mastitis]

- * Definition : Dilatation of major ducts of the Breast.
- * Actiology : Unknown.
- * Pathology: Chronic inflammation of duct system leads to Dilatation of major ducts which are Filled by : Creamy secretions.

(Atrophic epithelium + Fatty material).

<u>Surrounded by</u>: Plasma cells
 So (Called Plasma Cell Mastitis).

- * Clinical Picture :
 - · Age: Around or After menopause.
 - Mass: Hard mass, may associated with → Retraction of nipple, peau d'Orange ... etc
 So Similar to cancer breast.
 - <u>Discharge</u>: Green paste discharge.
- * Treatment : Excision & Biopsy (To exclude malignancy).

[2] Chronic Breast Abscess

Non specific (Chronic Pyogenic Breast Abscess)

- * Definition : Fate of Improper treatment of Acute Abscess.
- * Actiology : Prolonged use of Antibiotics->Killing of bacteria->Sterile pus-> Antibioma
- * Pathology : Cavity : Containing sterile pus
 - · Wall: Thick fibrous wall.

* Clinical Picture :

History of (Acute Abscess).

■ Mass → Hard mass, may associated with → Retraction of nipple, peau d'orange ...etc.

So Similar to Cancer breast.

* D. D :

	Chronic Abscess	Cancer Breast
Toxaemia.	 Low grade fever. 	Absent
 Post-surface. 	 Rounded. 	• Flat.
 History of AB 	• +ve	• -ve
 Paget's test 	• may +ve	• -ve

*Treatment: Excision & Biopsy (To exclude malignancy).

Specific

[A] Tuberculosis (T.B.):

* Definition:

A Rare disease associated with Active pulmonary T.B..

* Actiology:

Tubercle Bacilli (T.B.).

* Pathology:

T.B. Granuloma.

* Clinical Picture :

- History of (Night sweat, Night fever, Loss of weight & Loss of appetite).
- Mass: Multiple nodules of the Breast.
- Axillary L.Ns: Enlarged & matted.
- * Treatment: Anti T.B. drugs + Mastectomy for Resistant cases.

[B] Syphilis (\$):

◆ It may be <u>Irv \$</u>: Chancer in nipple & areola from \$ child (the chancer is painless indurated).

2ry 5: Condyloma in submammary fold + generalized lymphadenopathy.

3ry 5: (Rare) with gumma at skin + No L.Ns enlargement.

* Treatment : Anti-syphilitic drugs.

Mondor's disease

- * Definition: It is a thrombophlebitis of superficial veins the breast.
- * Actiology : Unknown.
- * D.D.: From occult carcinoma.
- * Treatment :

Rest of arm (to restrict movement) the condition usually subside Spontaneously.

IV

Fibrocystic Disease of the Breast

Chronic Interstitial Mastitis

Other Names

- · Mammary Dysplasia.
- · Fibroadenosis.
- · Mestopathy.
- ANDI

[Aberration of Normal Development & Involution].

* Incidence:

This is The Most frequent disorder of the breast. The upper outer quadrant of the breast is the commonest site of affection.

* Actiology:

[Unknown] but may be <u>due to</u> Oversensitivity of oestrogenic receptors. i.e. [Relative Hyperoestrogenaemia].

* Pathology:

[An Image of pathological action of Oestrogen on Breast].

- N/E picture : Site : Localized or Diffuse.
 - . Side: Unilateral or Bilateral
- Microscopic picture: [Panplasia]
 - · Adenosis : ↑ Number of acini.
 - Epitheliosis: Hyperplasia of epithelial lining the ducts → Atypical

Hyperplasia → Pre-cancerous.

N.B.: <u>Duct papilloma</u>:
It is a localized form of Epitheliosis

 <u>Fibrosis</u>: Fibrous tissue replaces the fat & the elastic tissues. i.e. Sclerosing Adenosis

N.B.: Fibroadenoma:

It is a localized form of Adenosis
and Fibrosis.

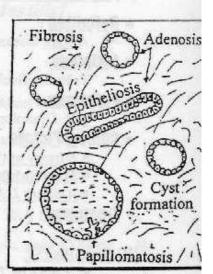
· Cyst Formation :

(A) Microcyst: Degenerating cyst.

- (B) <u>Macrocyst</u>: <u>Retention cyst due to obstruction by</u>:
 - · Epithliosis from inside.
 - Fibrosis from outside.

Cyst of Bloodgood

N.B.: <u>Sometimes</u> Papillomatosis occur inside the cysts.



(Panplasia)



Blue Domed cyst of Bloodgood



Fibruadenosis

* Clinical Picture : [May be Asymptomatic]

* Age : After puberty or before menopause

" Symptoms : • Pain (→ →): Dullache. ↑ before. ↓ after menses.

N.B.: (D) This pain stop with pregnancy

@ If pain marked called MASTALGIA

· Discharge : Serous, Green or Dark.

Mass: a. Painful and <u>Fixed</u> to breast tissues.

b. Away from Areola (V. Important for 3.

(D.D. from Duct papilloma)

· Signs: · Breast: a. Tender & Firm or Fine nodules by Tips of fingers-

b. Discharge: By patient herself.

c. Mass: Away form the Arcola.

N.B.: The mass may be Localized or Diffused or Sector because of changes in (Estrogen Receptors)

· Axillary L.Ns: Firm & Tender [Never Hard].

N.B.: L.Ns enlargement due to chemical irritation by abnormal hypersecretions from hyperplastic epithelium

* Investigations:

[The Aim is to Exclude cancer].

- U/S & Soft Tissue Mammography
- Aspiration + Cytology.
- Biopsy + Histopathology.

* Treatment:

(A) Medical ttt (The Main)

- Reassurance of the patient
- Advice patient To stop caffeine & taken (NSAID) as analgesic

Sedatives & Tranquilizers.

- Support the Breast by <u>Strapping</u> or Tight brassier to decrease pain
- Parlodel (Anti-prolactin): 2.5 mg twice per/day.
- Danazol (synthetic androgen): 100 mg twice per/day.
- <u>Tamoxifen</u> (Anti-aestrogen): 10 mg once daily.

(B) Surgical ttt Indicated with localized mass. So do → [Excision + Biopsy].

(C) Follow up with Atypical Hyperplasia: (Monthly Self examination).

Breast Neoplasm

Benign: * Epithelial: Duct Papilloma.

Mixed: (Epithelial and Fibrous Tissue) Fibroadenoma.

Malignant : * Epithelial : Carcinoma.





III Duct papilloma

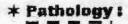
* Incidence: Common at 30 - 40 years.

* Aetiology :

[Benign Tumor of Epithelial Cells] it may be &

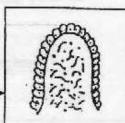
· From the start i.e. De Novo.

Or . On top of Excessive loclaization of Epitheliosis of fibroadenosis.



• N/E Picture: Usually single and Arises from the main lactiferous duct near nipple

Microscopic picture: Core of very vascular C.T covered by hyperplastic epithelial layer.



* Clinical Picture :

Age: 30 – 40 years.

Symptoms : • Bleeding per nipple

· Retrosreolar mass i.e Retention cyst

Signs : • Retroareolar mass V. important for [™]

[D.D from Fibroadenosis]

· Localize the duct by palpation of each quadrant

* Complications:

Malignant Transformation i.e. Duct Carcinoma.

Profuse bleeding per nipple.



Ductography :=

Retroareolar filling defect in major duct.



* Treatment: Microdochectomy

Excision of the affected duct through circum-areolar incision

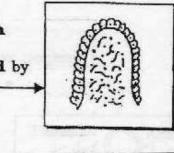
if there is a lump, the excision is easy.

if there is no lump, the duct is identified by inserting a blunt Needle through the discharging nipple .finally the spiccmen should be histoligicaly examined

(III) Papillary cystadenoma

- It is a rare lesion (precancerous).
- Inspite of cystic but firm in consistency because it contains multiple papillomatosis.
- May give bleeding per nipple.
- Treatment is local excision.





IIIII Fibroadenoma

* Incidence: Commonest breast mass of young female.



Fibroact enorma

* Actiology:

[Benign Tumor of Epithelial cells + Fibrous tissue] It may be 3

· From the start i.e. De Novo.

Or . On top of Excessive loclaization of Adenosis & Fibrosis

of Fibroadenosis.

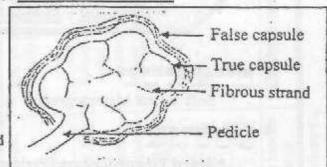
* Pathology I

The Tumor is (Well Capsulated)

. True capsule: Showing fibrous band dividing it into lobules

· False capsule: Formed of compressed breast tissues.

There are 2 Types



	Hard Fibroarienomec (Perl-canalleulor)	Soft Fibroadenoma (Intrascanalicular)
* <u>N/E Picture</u>	Attached to it's capsule by one pedicle.	Attached to it's capsule by multiple pedicles
» Microscopic Picture	Rounded Glands Dense F.T.	Compressed Glands Slit like lumen

Clinical Picture :

- Age	20 - 30 years	30 – 40 years
• <u>C/O</u>	 Hard & Painless mass. Slow Rate of growth i.e.malignancy is Rare. 	• <u>Soft</u> and Painless mass. • <u>Rapid Rate</u> of growth i.e.malignancy is <u>Common</u>
• Exam.	Hard & not tender. Well defined edge. Mobile (Breast Mouse) No L.Ns Enlargement	• <u>Soft</u> & not tender.

* Complications:

Malignancy • Never	Commonly → Sarcoma
- Winighane (

N.B. : Cystasarcoma Phylloides :

(Serocystic disease of Brodie)

 Path.: It is Highly cellular type of fibroadenoma that tends to grows rapidly & > 40 years



Exam.:

It is Giant Soft Fibroadenoma.

· Ulcerate through skin but not attached to it

. No Axillary L.Ns Except if infected.

■ Treatment : Simple Mastectomy

* Investigations :

Soft Tissue Mammography

* Treatment:

- Hard Fibroadenoma (Pericanalicular): Excision & Biopsy.
- Soft Fibroadenoma (Intracanalicular): If small: Excision & Biopsy

If large: Simple Mastectomy



Carcinoma of the Breast

(Incidence)

35% of Total malignancies of Egyptian Females.

② Actiology | [Risk Factors]

- 1. Early menarche < (12 15) years.
- 2. Delayed menopause > 50 years.
- 3. Female get 1st pregnant > 30 years.
- 4. Female with cancer to near relatives.
- 5. Female with cancer to one breast.
- Female with history of benign lesion.
- 7. Relations to prolonged use of oral contraceptive pills.
- Relations to <u>Atypical Hyperplasia</u> of fibrodenosis, duct papilloma or papillary cystadenoma.
- Relation to cancers as <u>Cancer Colon & Endometrium</u>.
- 10. Female Unmarried.
- 11. Female married but Nullipara.
- 12. Female married, multipara but Non lactating.
- 13. Exposure to Irradiation.
- 14. Carcinogenic drugs as Reserpin (1 prolactine level).
- 15. <u>Race</u>: ↓ in Japanese & Chinese.
 ↑ in USA & Europe.
- 16. Dietary oil & fat.
- 17. Obesity as adipose tissue converts steroid hormones to oestrogen.
- Bittner Milk Factor → In (Mice) only
 Bittner says that there's onchogenic virus transmitted through milk from mother to her babies.



Cancer

The Breast!

© Inflammatory Varace	Large, Soft mass. Very rapidly growing tumor. (Anaplastic)	141 114	The Worst prognosis.
@ Muclious Ca. 3%	Soff, gelly like material Usually <u>Bulky</u>	Spheroidal cells, distended with mucoid material. Signet ring like. (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	The Best prognosis.
Constructed from the control of the	Large Soft irregular mass. C.S. → ○ ○ ○ ○ Soft, Convex or Bulging & Non capsulated	Malignant cells more than fibrous tissues Area of Hge & Necrosis. Lymphocytic infelteration.	Better than Scirrhous because of lymphocytic infiltration.
A CANTOPHIC SCIPPIONS 7/4 C	The growth V. slow. The spread V. late.	Fibrous tissues are the main constituent Minimal malignant cells	• V. Good Because of slow growth & Late spread
O Scirrhous Ca. 70% CARROPHIC SCIRROBER	• Small Hard irregular mass. • C.S. → ① 《 》 Gritty, Concave, Pale & Non cansulated	malignant cells Area of Hge & Necrosis.	· Good if carly diagnosed
	•N/E picture	Microscopic Picture	• Prognosis

N.B. Also called Medullary Ca.

(III) Paget's Disease of the Nipple

* Incidence:

1% with female > 40 years.

* Definition:

Malignant Erosion of nipple & areola followed by carcinoma after 1-2 years.

* Actiology :

Intraductal carcinoma → Spread → Nipple → Malignan t Eczema.

* Pathology:

N/E Picture : [Malignant Eczema]

Unilateral with well defined margin.

• Microscopic picture : ① Round cell Infiltration [Dermis].

② Hyperplasia [All Epiderrnis].

@ Paget's Cells [Deep Epiclermis]

· Large.

· Dark multinucleated.

* Clinical Picture: • Vacuolated due to hydropic degeneration

2 Types may be present

1 Ulcerative Type.

@ Eczematous Type.

* D.D. :

<u>Paget's Discase</u> (Malignant Eczema)	<u>Dermatitis</u> (Ordinary Eczema)	
• Old Female.	Young female.	
• Unilateral.	• <u>Bi</u> lateral.	
• Erosion.	• No Erosion.	
• No (Itching and Oozing).	Itching & Oozing.	
Associated with carcinoma.	Associated with Breast abscess.	
Not respond to Eczematous ttt.	Respond to Eczematous ttt.	

* Staging:

Paget's disease alone = (Stage I)

* Treatment:

Radical Mastectomy (considered stage I)
N.B.: Paget's disease Radioresistant.

* Prognosis:

Paget's disease alone = Good prognosis

(Spread)

① Direct : [Skin, Underlying muscle & Chest wall].

D Blood : [Liver, Bone, Lung & Brain].

3 Lymphatic 3

[By Embolization & permeation].

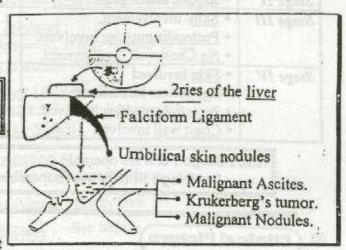
☆ Through axillary L.Ns (75%) → Internal mammary L.Ns → Supra-clavicular L.Ns.

☆ Don't Forget-

Connection of the lymphatics of the lower inner quadrant of the breast with the peritoneum.

Lymphatics pierce rectus sheath → spread to Liver leading to liver nodules. Then through (falciform ligament) → umbilical nodules (Josef sister's nodules).

N.B.: Some malignant cells will lead to malignant
Ascites, Krukneberg's tumor and malignant
nodules in the dauglas pouch.

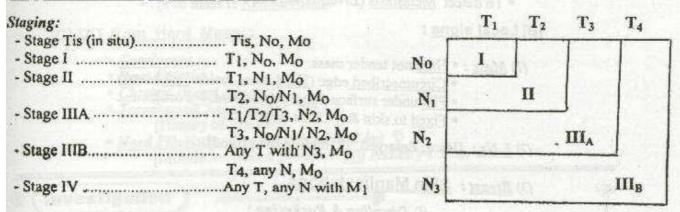


(Staging

(II) TNM Staging

T = Tumor	N = Nodes	M = Metastasis
Tis = Ca in situ or Paget's without mass. T0 = No evidence of Iry tumour. Ti = \(\le 2 \text{cm}. \) T2 = 2-5 cm. T3 = >5 cm. T4= \(\text{Any size} \) with direct extension to Chest wall or skin.	N0 = No palpable L.Ns. N1 = Mobile Axillary L.Ns. N2 = Fixed Axillary L.Ns. N3 = Palpable homolateral Supraclavicular L.Ns.	M0 = No distant metastasis. M1 = Distant metastasis.

So: Correlations of stage & TNM



ne surgeous consider T4 or N3 (i.e. stage IIIB) as stage IV.

(II) Manchester Classifications

di Americani	Tumor	Axillary L.Ns	Metastasis
Stage I	Mobile breast mass.	• NO	• NO
Stage II	Mobile breast mass.	Mobile (At same side).	• <u>NO</u>
Stage III	Skin involvement. Pectoralis muscles involved. No Chest wall involvement.	Fixed (At same side). ± Supraclavicular L.Ns	* <u>NO</u>
Stage IV	Skin involved e.g. Cancer en curirasse Pectoralis muscles involved. Chest wall involved	Involved at opposite side of Axilla.	Metastasis Mainly Bone

N.B.: Stage I & II are operable.

But Stage III & IV are Inoperable.

6 Clinical Picture

- Age: Commonly at 40 60 years + Risk factors.
- Symptoms: [A] General symptoms:

(May be the 1st presentation) i.e. Occult carcinoma.

- Lung: Chest pain, Cough, Dyspnea & Haemoptsis.
- · Bone: Mass in skull, Backache & Pathological fracture.
- Liver : Pain at Rt. hypochondrium & Jaundice.
- Brain: Extremely rare.

[B] Local symptoms:

- <u>Hard</u>, Painless mass, <u>Discovered accidentally</u>.
- · Rapid Rate of growth.
- Discharge: ① Blood If Duct Carcinoma.
 - Necrotic crystals If Degenerating Carcinoms

• Signs : [A] General signs :

• To detect Metastasis (Liver, bone, PR, PV & ... etc).

[B] Local signs:

- (1) Mass: Hard not tender mass.
 - Circumscribed edge (Hard mass inside Soft breast).
 - Flat under surface (local spread Ant. > Post.).
 - Fixed to skin & ± Chest wall.
- (2) L.Ns: [Hard, Enlarged, 1st mobile then fixed]
- (3) Breast: Skin Manifestations
 - 1 Dimpling & Puckering:
 - Due to Contracture of Cooper's ligament.

- ② Nipple Retraction & Deviation:
 - * Due to Escessive fibrosis [Not pathognomonic].
- ③ Peau d'orange : [Pitting oedema]
 - <u>Due to Oblitration</u> Compression of lymphatics by excessive fibrosis [Not pathognomonic].
- 1 Cancerous Skin Nodules :
 - <u>Due to lymphatic spread</u>. It may be near or far from tumor e.g. <u>Around umbilicus</u>.
- (5) Cancer en cuirasse : [Advanced stage]
 - It means Hard, Thick Skin, Metalic brown & Stretched as [War-Shield].
- Ulceration & Fungation:
 Raised everted edge with necrotic floor.
- Daget's Disease of Nipple See before
- ® Mastitis carcinomatosa: See before
- Dilated veins over the skin of the breast.

Differential Diagnosis

[A] DD from Nipple Retraction:

- · Carcinoma.
- <u>Duct Ectazia</u>. (Characterized by) [®] [History of <u>Green</u> paste discharge].
- Chronic Breast Abscess (Characterized by) ♥
 [History of Acute Abscess or A.B intake].

[B] DD from Bloody Discharge:

- Duct carcinoma
- Duct papilloma (Characterized by) The mass is Retroareolar].

[C] DD from Hard Mass :

- · Carcinoma.
- Duct Ectazia.
- · Chronic Breast Abscess .
- <u>Traumatic (Characterized by)</u>

 [History of Trauma].
- Hard Fibroadenoma (Characterized by) [Mobile i.e. Breast Mouse + No Axillary L.Ns].

[A] Soft tissue mammography:

· Cancer appears as A dense opacity.

N.B.: Mammography is of less value with young female.

Because of similarity of lesion to the dense breast.

* Technique :

Ordinary plain x-ray for breast.

② Xeroradiograhy: (more clear & easy to read) the image is recorded on selenium plate.

· Indications:

1 Screening for high risk group.

② Search for occult cancer in female with metastatic disease.

③ Evaluate non palpable breast lump.

Evaluate opposite breast with cancer another breast.

Mammographic finding suggestive of malignancy.:

1 Microcalcification (Stipling sign)

② Irregular outlines from irregular spicules penetrate surrounding breast.

3 Increase vascularity of the breast.

Nipple retraction.

[B] Ultrasonography:

It can differentiate solid from cystic mass.

It is useful in young women whom mammography not helpful

[C] Diagnostic procedures (Biopsy):

• Excision biopsy: (the most reliable) but under general anaesthesia.

 Frozen section biopsy: Diagnosed within 20min while patient under anaesthesia (if +ve → radical mastectomy).

 Tru-cut biopsy: Under local anaesthesia by a special needle cuts a core of tumor tissue. It's disadvantages are:

① Take a false tissue.

@ May disseminate malignancy.

Fine needle aspiration cytology (FNAC) :

① Advantages: 90% accurate, very simple & inexpensive.

Disadvantages: A skilled cytologist is needed.

[D] MRI of the breast :

It can detect recurrent mass & Gold standard of women with synthetic implant.

[E] Thermography:

The skin over the tumor is <u>warmer</u> than surrounding due to high vascularity so
we can record it by infra-red camera <u>but</u> it is <u>not</u> sensitive as not all tumors.

[F] Detection of distant metastasis:

Lung → plain x-ray.

Brain → CT scan & MRI.

Liver → U/S & liver function test.

Rane → bone scan.

[G] Detection of tumor markers:

• CA 15-3: Cancer Antigen. (Prognostic rather than diagnostic)



* Early detection :

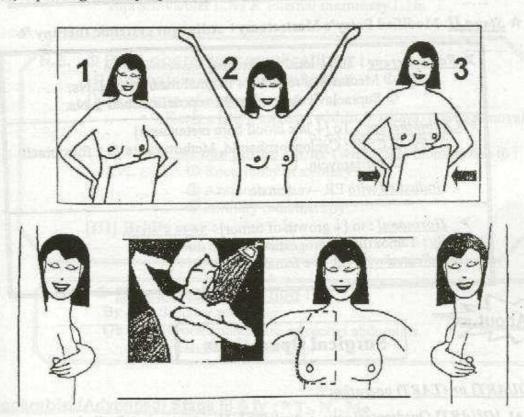
- This aims at the detection of breast cancer very early in the asymptomatic females.
- There are two main methods for early detection of breast cancer:

[1] Breast self examination (BSE)

- All woman over age 20 should be advised to examine their breasts monthly.
- The physician instructs the women as how to conduct a systematic inspection and palpation.
- · The woman suspects the presences of a lump, skin dimpling, or nipple retraction.

[2] Screening programs:

In some Western countries high risk women are subjected to regular clinical examination and mammography. The frequency of examination is every one, two, or three years, depending on the program



	Early breast cancer	Advanced breast cancer	
* Definition	T2 N1 M0 or less Or Manchester stage I or II	- More than T2 N1 Mo Or Manchester stage III or IV	
* Synonyms	- potentially curable breast cancer	- Incurable breast cancer	
* Aim	- Cure	- Palliation .	
* Disease status	- local disease + micro metastases	- systemic disease	
* primary treatment	- Surgery <u>+</u> Radiotherapy i.e., local treatment	Chemotherapy and Endocrine therapy i.e., systemic treatment	
* Adjuvant treatment	Anti-oestrogen Chemotherapy if axillary nodes show malignant deposits	Surgery and chemotherapy have limited role for local control of disease	

9 (Treatment

[A] Operable (Early) Stage | & || := T2, N1, Mo

Different surgical options + Adjuvant systemic therapy if +ve Axillary L.Ns

☆ Stage I: Modified Patey's Mastectomy + Follow up ®

> Follow up :

- · Aim to detect: ① Local Recurrence or Metastasis.
 - ② Any post-operative complications.
- <u>Time</u> → After ttt <u>Then</u> Every 3 month at 1st 2 years <u>Then</u> Every 4 months/Next 3 years <u>Then</u> yearly

☆ Stage II: Modified Patey's Mastectomy+ Adjuvant systemic therapy >>

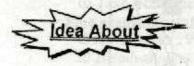
- ➤ <u>Radiotherapy</u>: To [\$\preceq\$ local recurrence]
 - To: ① Mediastinal region for internal mammary L.Ns.
 ② Supraclavicular region for supraclavicular L.Ns.
- > Chemotherapy: To [| late blood born metastasis]
 - By: © CMF: Cyclophosphamid, Methotrexate & 5 flurouracil
 - Adriamycin.

Indicated with ER -ve female

→ Hormonal: to [↓ growth of tumor]

By: Tamoxifen or progestine

Indicated with ER +ve female.



Surgical Operations

1 (OUART) or (TART) operation :

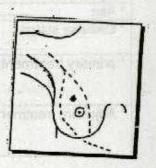
- [A] [OUART] Quadrentectomy + Axillary L.Ns. removal + Radiotherapy.
- [B] [TART] Tumorectomy + Axillary L.Ns. removal + Radiotherapy

N.B. Irradiation to Mediastinum & Supraclavicular regions

- It is suitable for: ① Small masses < 4 cm
 - @ Big Breast
 - Well Differentiated tumour
 - 1 Young Female

2 Radical Mastectomy of (Halsted):

- Removal of D Elliptical part of skin with nipple & Areola
 - Whole Breast Tumor
 - 3 2 Pectoralis muscles.
 - All Axillary L.Ns & fat <u>Medial</u> to Axillary vein



· Preservation of

- Axillary vessels
- @ Cephalic vein

- 3 N. to Serratus Anterior
- 1 N. to Latissmus Dorsi.

3 Modified Radical Mastectomy of (Patey) (Most Widely Accepted)

- The operation differs from Halsted radical mastectomy in preserving the pectoralis major muscle. The pectoralis minor is either removed or its insertion cut.
- 4 Extended Radical Mastectomy (Not done Nowadays).
 - Radical Mastectomy + Removal of Internal Mammary L.Ns., through sternotomy.

5 MC-Whirter Technique:

 Simple mastectomy + post-operative radiotherapy for axillary L.Ns, supraclavicular L.Ns & Internal mammary L.Ns.

N.B.: @ Post-operative complications:

[I] Haematoma or wound infection.

[II] Oedema of upper limb:

- Early pitting odema (within few days) due to removal of excess lymphatics.
- Late non pitting odema (within few months) due to :
 - D Recurrency of axillary L.Ns.
 - 2 Arm infection.
 - 3 Axillary radiotherapy.

[III] Bridle scar:

Limitation of abduction.

N.B. @ Breast reconstruction:

By: @ Silicone prothesis.

[B] Inoperable (Advanced) Stage III & IV: > T2, N1, Mo

☆ Stage III: [1] Local ttt (The Main)

- Radiotherapy : To ① Mediastinum
 - ② Supraclavicular region
 - 3 Axilla
- Surgical Indication [for Fungating mass]
 Through Palliative Simple Mastectomy (Toilet Mastectomy)

[2] Systemic ttt:

- · Chemotherapy through (CMF & Adriamycin)
 - (6 cycles) for (6 months)
 - Indicated especially: ① Rapidly progressive disease.
 ② Failure of hormonal treatment.

* Endocrinal ttt:

- > 60% cancer breast have receptors for oestrogen so termed (ER +ve) which become:
 - · More active in presence of this Hormone
 - · Less active in absence of this Hormone
- Temporary response for anti-oestrogen after 24 30 months occur especially with Post-menopausal female or ER +ve.

- Endocrinal ttt as :

- Tamoxifen (Nolvadex): 1st line of ttt.
- Progestins: 2nd line of ttt if relapsed after Tamoxifen
- Ovariectomy: as an alternative to getride of oestrogen source in premenopausal female.
- Aminoglutathemide: drug producing suppression. For adrenal cortex i.e. ↓ oestrogen (if the patient develops relapse after ovariectomy).

N.B.: Hydrocortisone must be given with Aminoglutathemide.

☆ Stage IV: [1] Local ttt

- * Radiotherapy for painful bony deposities
- · Surgical through D
 - Excision of skin nodules.
 - Internal fixation for pathological fracture.

[2] Systemic ttt (The Main)

- ◆ Chemotherapy through ① CMF.
 - 2 Adriamycin.
- Endocrinal ttt (As above)

[3] ttt of metastasis:

- Liver metastasis: Chemotherapy.
- <u>Brain</u> metastasis: Radiotherapy + Corticosteroids (↓ Intracranial tension)
- <u>Lung</u> metastasis: (Pleural effusion) Chest tube + Cytotoxic Bleomycine through it. i.e. Pleurodesis.
- Bone metastasis: Radiotherapy + Internal fixation.

N.B. @ New concept:

Cancer Breast is a systemic disease from the start at it spread So Early by blood micro-metastasis.

So immuno-therapy is (under trial)

N.B. @ DD of Associateds Axillary Mass:

[1] From contents:

Enlarged L.Ns (The commonest), Enlarged tail of breast, Axillary artery aneurysm, Axillary vein thrombosis, Nerve tumor or Cystic hygroma.

[2] From skin and S.C. tissue: Lipoma or sebaceous cyst ... etc.

N.B. : Management of cancer breast during pregnancy :

- During Ist & 2nd Trimester: Radical Mastectomy + Termination of pregnancy.
- <u>During 3rd Trimestor</u>: Radical Mastectomy + let the pregnancy proceed to full term then radiotherapy is postponed after delivery.

(Prognosis Depending on

- ① Type of Tumor : Paget's & Cancer situ Better than Mastitis carcinomatosa
- D Stages of Tumor: Stage I Better than Stage II, III or IV.
- 3 Sites of Tumor : lateral side Better than Medial side
- Age of Patient: Old age Better than Young [Because of sex Hormones]
- Sex of Patient : Cancer female Better than Cancer male,
- 6 Hormone Receptors : ER +ve Better than ER -ve.

Sarcoma of the Breast

- Incidence: 0.5% of malignant breast tumors.
- Pathology : De Novo
- C/P: It grows rapidly & usually fungate through skin.
- Treatment : Simple mastectomy + Radiotherapy & chemotherapy.
- Prognosis: Very Bad.

* Actiology:

VI

Breast Cyst

(A) Stroma linter-acinar cystsi

- Traumatic : Blood Cyst
- Inflammatory: Cold abscess (T.B) or Acute Abscess
- Neoplastic: Degeneration Carcinoma.
- Parasitic : Hydatid Cyst
- Miscellaneous: Skin Cyst

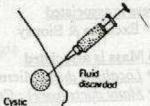
e.g. Sebaceous cyst, Lymphatic cyst etc...

(B) Duct [Acinar cysts]

- · Fibrocystic Disease: e.g. Cyst of blood-good
- Retention Cyst : e.g. Duct Papilloma
- · Galactocele : (Milk. Cyst)
 - Retention cyst blocked by (Inspissated Milk)
 - · Sometimes shows Milky discharge
 - Affect lactating female.
 - · Resolute spontaneously.

* Treatment:

- (A) Aspiration + Cytology
- (B) Excision If @ Rapid Refilling after aspiration Cystic
 - Residual Mass after aspiration
 - 3 Bloody aspirate



(مهم جدا) Nipple Discharge

* Actiology:

A Physiological:

- 1 Milky discharge : during lactation
- ② Serous discharge : during pregnancy

☆ Pathological:

- ① Purulent discharge : Acute breast Abscess
- @ Green paste discharge: Duct Ectazia
- Serous, green, brown: Fibroadenosis
- Bloody discharge: Duct papilloma
 - Duct carcinoma
- (3) Necrotic Crystals: Degeneration carcinoma
- Milky discharge : Galactocele
 - Contraceptive pills
 - Hyper-prolactinaemia

* Diagnosis:

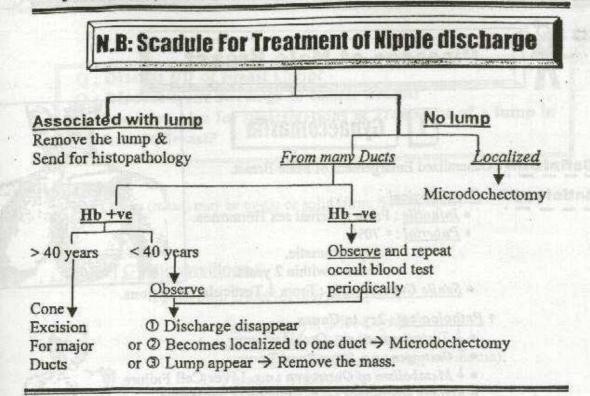
- ☆ History
- **☆** General Examination
- **☆** Local Examination
 - Specially for ① Nature & Side of discharge.
 - ② Associated mass
 - 3 Age of patient
 - Uses of contraceptive pills
 - Tues of drugs as prolactine

* Investigations :

- ☆ Soft Tissue Mammography
- ☆ Ductography:
 - Lipidol injection shows filling defect if mass present
- & Biopsy & Cytology for mass
- ☆ Serum prolactin level
- ☆ Tests for occult blood in discharge [Benzidine test]

* Treatment :

- ☆ If Mass is associated
 - Excision & Biopsy
- ☆ If No Mass is associated
 - Localized ducts Microdochectomy
 - Many ducts (rare): Cone excision of major ducts.



(مهم حدا) <u>DD of Chronic Breast Masses</u>

(1) Cystic swellings: (See before)

(2) Solid Swillings:

[A] Hard masses:

- 1 Traumatic disease.
- Chronic Breast Abscess.
- Mammary Duct Ectazia.
- Hard fibroadenoma.
- (Scirrhous & Atrophic scirrhous)

[B] Soft masses:

- ① Soft fibroadenoma.
- ② Cancer breast (Encephaloid & Mucinous).

[C] Firm.mass.:

Fibroadenosis.



Causes of Huge Breast

- D Virginal Hypertrophy.
- O Soft fibroadenoma.
- Cystasarcoma phylloids.
- Sarcoma.

DD of Pain in The Breast

(I) From the breast:

- O Fibroadenosis.
- ② Milk engorgement, bacterial mastitis, acute abscess & plasma cell mastitis.
- 3 Carcinoma not painful except (advanced, infected or mastitis carcinomatosa).

(II) Outside the breast:

- ① Angina pectoris.
- @ Pleurisy.

- 3 Myositis.
- Intercostal neurologia.
- O Osteitis of rib.
- Tjetze's disease (Rare) :

Idiopathic tender swelling in 2nd & 3rd costal cartilage.

Treated by Hydrocortisone into the perichondrium.

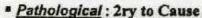


Diseases of Male Breast



Gynaecomastia

- * Definition: Generalized Enlargement of Male Breast.
- * Actiology: * Physiological
 - Infantile: From maternal sex Hormones.
 - Pubertal : * 70%.
 - · Asymptomatic.
 - · Resolve within 2 years.
 - Senile Gynacomasia: From ↓ Testicular Functions.



- † Oestrogen : e.g. Supra Renal Tumor.
- . ↓ Metabolism of Oestrogen : e.g. Liver Cell Failure.
- · Ectopic Hormones : e.g. Bronchial Carcinoma.
- Drugs: e.g. Digitalis, cimitidin, Aldactone. Reserpine or Oestrogen therapy as cancer prostate.



* Clinical Picture:

- Symptoms: Bilateral, Tender mass (i.e. like a disc).
- Sign: Enlargement of the male breast with prominent nipple due to hypertrophy of the glandular tissues.

* Investigations :

- Hormonal Profile.
- Liver Function test.
- Biopsy if doubt of cancer.

* Treatment :

- <u>Medical (Mainly)</u>: ① Physiological: Reassurance.
 - 2 Pathological: ttt of cause.
- Surgical Indication: If persist → S.C. Mastectomy.

II Carcinoma of Male Breast

- * Incidence: Male: Female = 1:100 (1% of all cancer breast)
- * Staning:

As Cancer Female Breast

- * Treatment :
- * Prognosis: Cancer Female Better than Cancer Male.



إزاي تجاوب

Q: Discuss DD of Breast Lump?

Q: Discuss cystic swellings of female Breast?

Q: Mention plan for Investigations & Treatment of a lump in female Breast?

Answer:

Lump (mass) may be cystic or solid (firm, Soft & Hard)

So [A] Cystic swellings:

1) Stroma (Inter-acinar) cysts:

- a. Traumatic cyst (Blood cyst).
- b. Inflammatory (T.B. Abscess).
- c. Neoplastic cysts (Degenerating carcinoma).
- d. Parasitic (Hydatid cyst).
- e. Others (sebaceous, lymphatic etc).

2) Duct (Acinar) cysts:

a. Retention cyst [Duct papilloma]

- <u>Aetiology</u>: Benign Tumor may be De Novo or on top of localized epitheliosis of Fibroadenosis.
- Pathology: Core of vascular C.T. covered by hyperplastic epithelium
- <u>C/P</u>: 30-40 years + bleeding per nipple with Retro-areolar mass.
- · Complications: Duct carcinoma or Anaemia.
- · Investigation : Ductography.
- Treatment: Microduchectomy.

b. Fibrocystic diseases Cyst of Blood good (Fibroadenosis)

- <u>Aetiology</u>: Unknown may be relative hyperoestrogenaemia.
- Pathology: N/E: Localized or diffuse, unilateral or bilateral 15% common at upper-outer quadrant of Breast.
 - M/P: Adenosis, Epitheliosis, fibrosis & cyst formation which may be microcyst or macrocyst (cyst of Blood good).
- <u>C/P</u>: Age: After puberty or before menopause.
 - Symptoms: Pain related to menses with serous, green or dark brown discharge & cystic mass if cyst of blood good.
 - Signs: Tender cystic swelling.
- Investigation: U/S, Soft tissue mammography, Aspiration cytology or Biopsy histopathology.
 - Treatment: Excision of a mass.

c. Galactocele

It is a retention cyst blocked by inspissated milk, may be associated with miky dischange. Usually occur in lactating female. Treated by Aspiration cystology or Excision.

[B] Solid Swellings:

(1) Firm mass: [Fibroadenosis]

(See above mentioned cyst of Blood good)

but it is firm mass felt by <u>Tips</u> of fingers.

<u>Treated</u> by Reassurance & Anti-oestrogen (Parlodel)

(2) Soft masses:

(a) Soft fibroadenoma

- <u>Aetiology</u>: Benign Tumor may be De Novo or on top of Adenosis & Fibrosis of Fibro-adenosis.
- · Pathology: Lobulated mass with multiple pedicle.
- <u>C/P</u>: Age: 30-40 years.
 - Symptoms: Soft, painless & rapidly growing Tumor.
 - Signs: Soft, not tender, No L.Ns & if enlarged it is called (Cysta-sarcoma phylloides).
- Investigation: Soft tissue mammography.
- Treatment: Small (Excision biopsy) or large (simple mastectomy)

(b) Encephaloid Ca. Breast 10%

- It is large, soft, irregular & non capsulated mass.
- · Cut section : Convex.
- Prognosis: The Best prognosis.

(c) Mucinous Ca. Breast 3%

- It is large, soft, irregular & non capsulated mass.
- <u>Cut section</u>: Gelly like & usually bulky.
- M/P: Rounded malignant cells filled with mucoid mucoid material give (signet ring) appearance.

(3) Hard masses:

(a) Traumatic disorders

- Traumatic fat necrosis: Which caused by blow on breast →
 death (Necrosis) of fat cells → release of fatty acids which
 bind to ca → Ca soap i.e. Hard. Treated by Excision.
- Breast Haematoma: Which caused by blunt trauma → bloot clot & Fibrosis i.e. Hard. Treated by Excision.

(b) Chronic Breast Abscess

 Follow improper treatment of Acute Abscess by Antibiotics so it is called <u>Antibioma</u>. Treated by Excision & biopsy.

(c) Mammary Duct Ectazia

- <u>Aetiology</u>: Unknown dilated duct may be due to excessive fibrosis.
- <u>C/P</u>: It represents by Hand mass with Nipple retraction, peau d'orange it similar to carcinoma by characterized by Green paste discharge.
- Treatment: Excision & biopsy.

(D) Hard Fibroadenoma

- · Aetiology: Benign tumor as soft fibroadenoma.
- · Pathology: Lobulated mass with one pedicle.
- C/P: Age: 20-30 years.
 - Symptoms: Hard, painless & slowly growing Tumor.
 - Signs: Hard, Not Tender with No L.Ns.
- Investigation: Soft tissue mammography.
- · Treatment: Excision & biopsy.

(E) Cancer Breast (Scirrhous & Atrophic Scirrhous)

- Commonly at 40 60 years with one or more risk factors.
- The patient represents by Hard, painless mass, discovered accidentally mass.
- <u>C/P</u>: Symptoms: metastasis + Hard mass.
 - Signs: metastasis + L.Ns + Skin manifestations as (Dimpling, puckering, cancerous nodules, pagets etc..).
- Investigations: Soft tissue mammography, Biopsy, Tumor markers & detection of metastasis.

• Treatment:

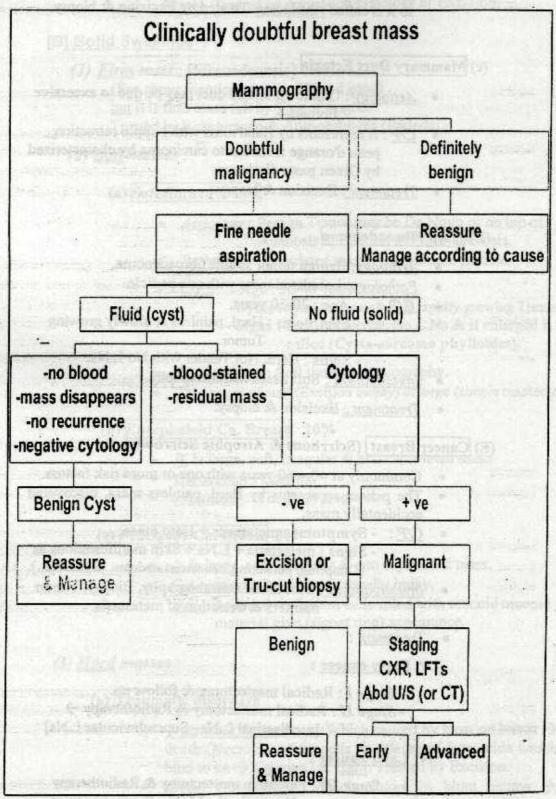
Early cancer:

- Stage I: Radical mastectomy & follow up.
- Stage II: Radical mastectomy & Radiotherapy →
 [mediastinal L.Ns- Supraclavicular L.Ns]

TLater cancer :

- Stage III: Palliative mastectomy & Radiotherapy for mediastinal L.Ns, Supraclavicular L.Ns & Axillary L.Ns.
- Stage IV: Mainly treatment of metastasis.







Final Written Exams



1993 Discuss Fibroadenosis of the Breast.	(10 Marks)
• Anatomy of Lymphatic Drainage of Female Breast.	(15 Marks)
• Discuss Path., C/P & ttt of Acute Breast abscess. • Discuss Skin Manifestations of Female Cancer Breast.	ور ثانی (15 Marks) (10 Marks)
• Discuss C/P & ttt of Acute Breast Abscess.	(10 Marks)
• Discuss C/P of lactational mastitis & Breast Abscess. • Enumerate path. Types of Breast Carcinoma • Discuss 2 systems of staging of Cancer Breast	(10 Marks) (5 Marks) (10 Marks)
• Discuss Path., C/P & ttt of Fibroadenoma of Breast. • Discuss management of Early cancer breast	نور ثان (15 Marks) (15 Marks)
Discuss actiology, dignosis & ttt of Nipple Discharge Describe Lymphatic drainage of the breast. Discuss DD of Breast lump.	ىرد ئتى(10 Marks) ىرد ئتى(10 Marks) ىرد ئتى(25 Marks)
Discuss C/P & treatment of Acute lactational mastitis & Breast Abscess Discuss causes & diagnosis of Nipple discharge	بور ثانی (15 Marks) (10 Marks)
2001 Discuss Anatomy of lymphatic draing of breast Discuss skin manifestations of cancer breast Mention Actiology, pathology, C/P of acute breast abscess	دور ثاني (10 Marks) دور ثاني (10 Marks) (10 Marks)
2002 Mention DD of Breast lump	ا دور ثانی (15 Marks)
Discuss causes & management of Nipple discharge	(12 Mark)

2003

• Enumerate causes & investigations of dischange pr nipple (12 Mark) دور ثانی • Discuss Paget's disease of nipple. (12 Mark) دور ثانی

2004 • Discuss Anatomy of female Breast.

• Discuss DD between paget's & eczema



دور تاني (20 Marks)

(12 Mark)

Chapter [10]

Thyroid Diseases

The Thyroid Gland

Development of the Thyroid Gland

The Thyrold gland is developed as a Bud from the floor of the primitive pharynx i.e. Foramen caecum at 3rd week (Intra-uterine)

N.B.: Foramen Caecum:

It is the junction between Ant . 2/3 & Post. 1/3 of the Tongue

Then it descends being connected to the foramen caecum of the tongue by <u>Thyroglossal duct</u> which disappear later.

During it's descend, it joined by para-follicular "C" cells which is derived from Neuronal crest.

Foramen Caecum

Tongue

Thyroglossal duct Hyoid bone

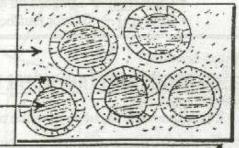
Thyroid gland

Histology of the Thyroid Gland

The Thyroid Gland formed of Acini

Which is &

- · Separated by : Connective Tissue .-
- Lined by: Simple Cubical Epithelium.
- · Filled with : Colloid Substance.



Surgical Anatomy of the Thyroid Gland

* Parts:

1

- = 2 Lobes.
- · Isthmus.
- Pyramidal lobe.80% of people is attached to hyoid bone by (Levator

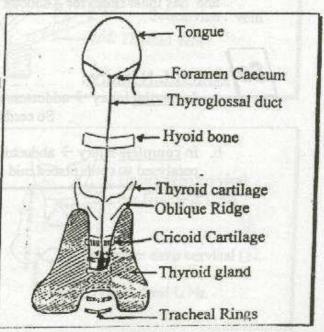
* Weight:

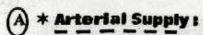
Glandulae Thyroidae)

20-25 Gram

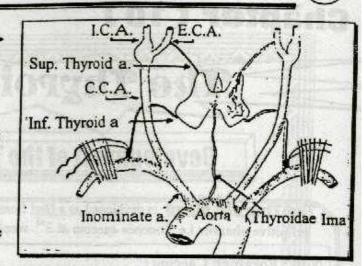
* Level:

- <u>Upwards</u>: Oblique line of the thyroid cartilage.
- •Isthmus: Opposite 2nd, 3rd, 4th
 Tracheal rings.
- Base : At level of 5th Tracheal ring.





- 1 Superior Thyroid Artery:
 - From E.C.A & Related to External laryngeal nerve.
- @ Inferior Thyroid Artery:
 - From Thyrocervical trunk of 1st part of subclavian artery & related to RLN.
- 3 Thyroida Ima Artery:
 - From aortic arch (occasionally present & enters lower part of the isthmus).



N.B. : Surgical Importance :

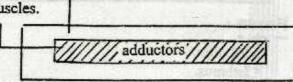
- > Ligature of Superior Thyroid Artery (near) the upper pole, Why?
 - <u>To avoid</u> injury of (<u>External Laryngeal Nerve</u>) which supply Cricothyroid muscle <u>So</u> If injury occur:
 - <u>Unilateral</u> → Loss of high pitched voice.
 - · Bilateral → Choking.
- > Ligature of Inferior Thyroid Artery (away from) the lower pole, Why?
 - . To avoid injury of RLN (Recurrent Laryngeal Nerve). So if injury occur:
 - Unilateral → Dyspnea on exertion or Hoarseness of voice.
 - · Bilateral → : Stridor (suffocation) or Aphonia.

N.B.Z: RECURRENT LARYNGEAL NERVE (R.L.N):

It is responsible about co-aptation of vocal cord so produce Voice.

For <u>inspiration</u> = complete abduction of cords is needed.

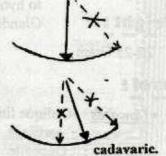
 R.L.N. has outer fibers for Abductor muscles and has Inner fibres for Adductor muscles.



mark limited of T. Tracked ring.

With R.L.N Injury:

- In <u>partial</u> injury → adductors only are acting
 So cords in mid line
- b. In <u>complete</u> injury → abductors & adductors are paralysed so cords placed mid way = cadavaric position —

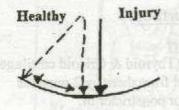


to view tone

The effect of injury of R.L.N as follows:

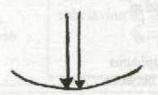
(A) Unilateral partial >

* Dyspnea on exertion.



(B) Bilateral partial →

* Stridor & suffocation.



(C) Unilateral complete →

* Harsense of voice.



(D) Bilateral complete →

* Aphonia.



Bilateral cadavaric.

(v) * Venous Drainage :

Superior Thyroid Vein:

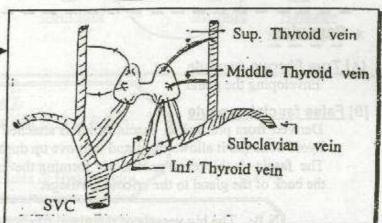
Drained to I.J.V

@ Middle Thyroid Vein:

Drained to I.J.V

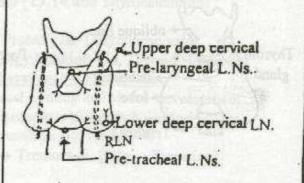
③ Inferior Thyroid Vein :

Drained to Inominate vein



(L) * Lymphatic Drainage :

- · Upper Level:
 - Lateral: Upper Deep Cervical L.Ns.
 - · Medial : Pre-laryngeal L.Ns.
- · Lower Level:
 - <u>Lateral</u>: Lower Deep Cervical L.Ns
 - <u>Medial</u>: Pre-tracheal L.Ns. (Delphic L.Ns)
- Some lymphatics may pass to superior



*Relations of Thyroid Gland:

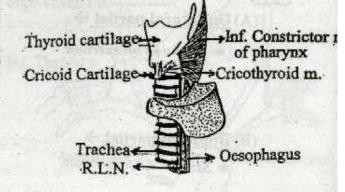
[A] Medial surface:

1. Upper part

Larynx: (Thyroid & Cricoid cartilage) Separated from them by 2 muscles

- a. Inferior constrictor m.
- b. Crico-thyroid m.

2. Lower part
Trachea & oesophagus
with (RLN) in between



[B] Posterior surface:

- 1. Carotid sheath & it's content
- 2. Superior & Inferior parathyroid gland

[C] Superficial surfaces:

- 1. Superior belly of omohyoid
- 2. Sterno-hyoid
- 3. Sterno-thyroid
- 4. Thyro-hyoid
- 5. Anterior border of sternomastoid
- 6. Platysma
- 7. Skin

Superior belly of Omohyoid m. sympathetic chain Carotid sheath Sterno-mastoid in Sterno-thyroid m. Sterno-hyoid m.

* Capsules:

[A] True fibrous capsule

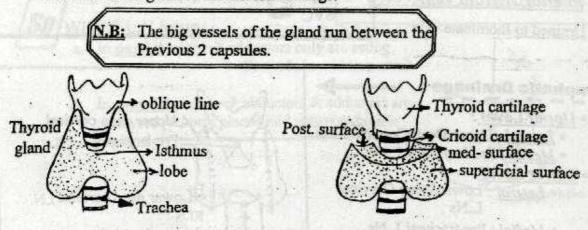
Enveloping the gland

[B] False fascial capsule

Derived from pretrachial fascia which is attached above to thyroid cartilage & hyoid bone (so it allows the gland to move up during deglutition).

The fascia is thickened posteriorly forming the Ligament of Berry which fixes.

the back of the gland to the cricoid cartilage.

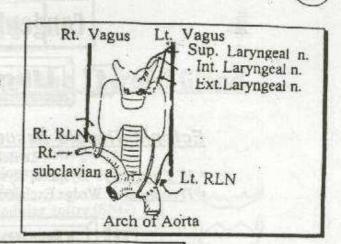


N * Nerves Related to the Gland :

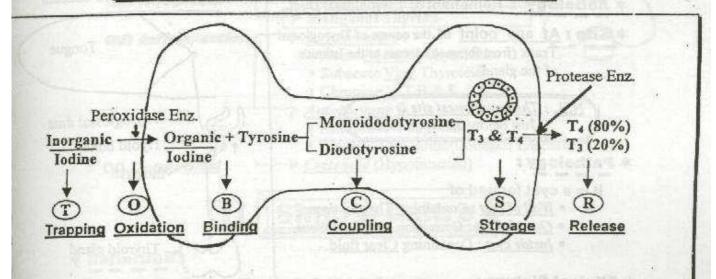
- ① External Laryngeal Nerve:
 - <u>From</u> superior Laryngeal Nerve <u>from</u> Vagus Nerve.
- ② <u>Recurrent Laryngeal Nerve</u>: (From Vagus Nerve).

• <u>Rt. RLN</u>: Hooks around Rt. subclavian artery.

• Lt. RLN: Hooks around the arch
of the aorta.



Physiology of the Thyroid Gland



N.B.

① Perchlorate → Prevent T.

② Carbimazole & Thiouracil $\rightarrow \frac{1}{2} \times \frac{1}{$

① Lugol's Iodine $\rightarrow \frac{\downarrow R}{\downarrow R}$.

③ TSH → +++ T, O & B.

Excess TSH leads to Hyperplasia & Hypertrophy.

Physiological Functions of the Thyroid gland

<u>The Gland secretes</u> 3 Types of Hormones [T3,T4 and Thyrocalcitonin]

The Effect of Thyroid Hormones:-

- Catabolic effect: (†Lipolysis -†Proteolysis-†Glycogenolysis).
- Metabolic effect: († MR & Energy libration)So, Thyroid Hormones is called Thermogenic Hormones.
- Stimulate:→ Skeletal growth, Sexual maturity and Mental development.
- Increase <u>sensitivity</u> of: (α & β Receptors) for catecholamine
 e g. Adrenaline. So, leads to ^{*}δ

 (<u>Heart</u> → ↑ HR, <u>Hand</u> → Tremors & <u>Skin</u> → Sweating).
- · Decrease serum cholesterol level

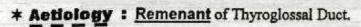
Congenital Anomalis



Ectopic Thyroid tissue occurs at base of tongue i.e Behind foramen caecum

- IF Enlarged → Dyspnea, Dysphagia & Dysarthria.
- Treatment → Wedge Excision + L-Thyroxine for life.





* Site: At any point of the course of Thyroglossal Track (from foramen caecum to the Isthmus of the gland).

> N.B.: The commonest site is Just below the Hyoid bone

* Pathology:

It is a cyst formed of

- Wall of cyst: Containing Thyroid tissue.
- Outside cyst: Containing Lymphoid tissue.
- Inside cyst: Containing Clear fluid.

* Clinical Picture:

Age: Common at Childhood.

[Thyroglossal Cyst]

* DD : Subhyoid bursitis

- · Symptoms: 1 Mass at middle line of neck i.e. Disfigurement.
 - 2 Pain if infected.
 - 3 Fistula if complicated.
- Signs: ① Rounded mass at middle line of neck.
 - Tense & Cystic in consistency.
 - 1 Moves up & down with deglutition & protrusion of tongue.

Complication: [Thyroglossal Fistula]

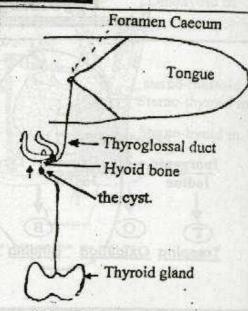
Incidence: Acquired Never congenital. ■ Aetiology: Infection of cyst due to high lymphoid tissue outside the cyst.

■ Manifestations: ① Discharge: Viscid fluid or Pus.
② Firm tract: From fistula (below) to hyoid bone (above).

3 The opening: Crescentic due to fibrosis, from infection.

* Treatment : [Sistrunk Operation]

- Elliptical Inscison over cyst or fistula,
- Excision of cyst or fistula.
 Removal of ① The Track.
 - The centre of Hyoid bone to prevent recurrence.
 - 3 Core of tissue up to foramen caecum of tongue

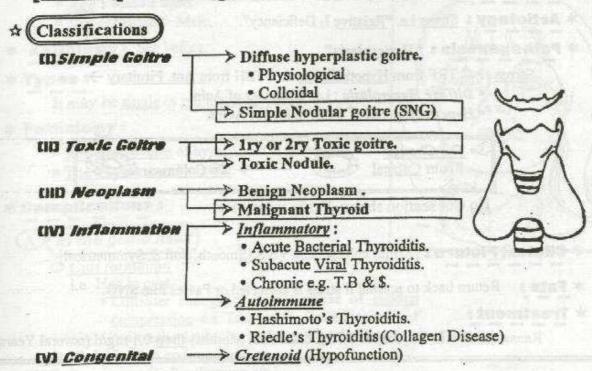




yroglossal fistula

Goitre

[Goitre] = Enlargement of the Thyroid Gland





* Definition :

Non Toxic, Non Neoplastic & Non Inflammatory enlargement i.e. [patient is euthyroid]

* Actiology:

[Simple Groitre results from TSH as sequence of Iodine]

- 1 Iodine Deficiency: which may be
 - > Absolute : Endemic as Fayoum.
 - > Relative : As Pregnancy, Puberty etc..

@ Enzyme Deficiency:

- > <u>Congenital deficency of Peroxidase Enzyme</u> [Pendred's syndrome].

 Which convert inorganic I₂ into organic I₂.
 - <u>C/P</u>: Goitre + <u>D</u>warfism + <u>D</u>eafness& Mutism

Congenital deficiency of dehalogenase enzyme
 Which convert Mono-iodo Tyrosine → Di-iodo Tyrosine

- 3 Goitrogenic Substance:
 - > Diet: Thiocyanates in Cabbage & Cauliflower.
 - > Drugs : Antithyroid drugs as Thiouracil & PASA.

* Types :

- (1) Simple Physiological (Diffuse Hyperplastic) Goitre ..
- (2) Simple Colloid Goitre.
- (3) Simple Nodular Goitre.

[11] Simple physiological (diffuse Hyperplastic) Goitre

- * Incidence: Common in young girls "Venus Neck"
- * Actiology: Stress i.e. "Relative I2 Deficiency".
- * Pathogenesis: "Hyperplasia"

Stress → ↑ TRF from Hypothalamus → ↑ TSH from Ant. Pituitary →

- Diffuse Hyperplasia: i.e. ↑ Number of Acini.
- Hypertrophy: i.e. ↑ Cells lining the Acini.



So Cut section shows Fleshy appearance

- * Clinical Picture : Diffuse enlargement + 3 § [Smooth, Soft & Symmetrical]
- * Fate: Return back to normal if stress is corrected or Passes into SNG.
- * Treatment:

Reassurance + L. Thyroxine 0.2 mg/d. (several Months) then 0.1 mg/d (several Years).

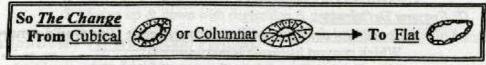
121 Simple colloid Goitre

[It is Intermediate stage between Physiological & Nodular goitre].

- * Incidence: Common in Endemic area.
- * Aetiology: Patient with (Diffuse Hyperplastic Goitre) receiving large doses of <u>Iodine</u>.
- * Pathogenesis: "Hyperinvolution"

If the actiology removed suddenly

As large dose of Iodine is taken. This leads to Hyperinvolution.



So Cut section shows golden brown appearance, i.e Colloid

- * Clinical Picture: Diffuse enlargement + 3 S [Smooth, Soft & Symmetrical]
- * Fate: If untreated, it may passes into SNG.
- * Treatment: Subtotal Thyroidectomy.

[3]

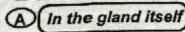
Simple Nodular Goitre

- * Incidence: (The commonest disease of Thyroid gland)
 - Age : Middle aged.
 - · Sex : Female > Male.
- * Actiology : See before
- * Types :

It may be single or multinodular goitre.

- * Pathology:
 - Repeated cycles of hyperplasia & Involution
 - The Nodules are Inactive.

* Complications :



① Cyst formation

i.e. Hge in cyst.

- Consider emergency case because of <u>sudden</u> <u>compression</u> on Trachea → Reflex spasm of pre-tracheal muscles → <u>Impending Suffocation</u>.
- @ Calcification on long standing.
- (3) Carcinoma [Follicular type 3%].
- @ 2ry Thyrotoxicosis [30%].
- (R.S.E.) Retro Sternal Extension from lower pole.
- © Carotid artery displacement → fainting attachs due to ↓ blood supply to the brain
- @ Complications of treatment.

B Pressure on Trachea

- ① Unilateral compression → Kinking of Trachea.
- ② <u>Bilateral compression</u> → Antero-posterior slit → Scabbard Trachea
- ③ Tracheomalacia: Absorption of Tracheal rings → Collapse.

N.B.: Tracheomalacia is detected by:

Kocker's Test: Slight compression on lateral lobe if produces strider this means Tracheomalacia.

The value: To get concent from patient to do permenant Tracheostomy.

* Clinical Picture :

- Symptoms: Slowly enlarged neck swelling i.e. Disfigurement. or Pictures of complications.
- Signs : Examination
 - (A) General Examination "Exclusion of Complications"
 - Exclude Toxicity Pulse, ABP, Eye sign ... etc
 - Exclude Metastasis (Liver, Bone, Lung & Brain) metastasis.



(B) Local Examination :

I-Inspection

- = Number : usually Single.
- = Site : At Muscular Δ
 - · Shape: Localized or Diffused.
 - Size: In (Cm x Cm)
 - Skin over: Normal except

dilated veins with RSE.

- Surface: Nodular.
- Special sign: Moves up & down with deglutition.

N.B.: 1 Because It enclosed in Pre-tracheal fascia.

> Absent with Huge SNG & + RSE

= Edge: Well defined edge.

N.B.: ① Seen with deglutition.

Q Lower pole seen or not to exclude RSE.

= • Draining L.Ns

Upper or Lower deep cervical L.Ns seen or not To exclude (malignancy or 2ry infection).

- Deep Relations :
 - ⊕ Sternomastoid muscle → Not attached.
 - ② Trachea. → Not shifted except if RSE
- Distal Effects: Only with RSE Tilting of head to one side (1/2min.) → face flushing.

II-Palpation

- = * Tenderness: Not except infected.
 - Temp. : At body temp.
 - Thrill: No Thrill.
- = Mobility: Mobile in All directions
 - · Up & down.
 - · Side to side.

N.B.: Absent with huge SNG & RSE

= (Site, Shape, Size etc...)

Same as inspection

Edge: Well defined edge.

N.B. : 1 Felt with deglutition.

D Lower pole felt or not to exclude RSE

= Consistency : Firm

N.B.: 1 Hard if Calcified.

@ Cystic if Hge in cyst.

= * Draining L.Ns:

Upper or Lower deep cervical L.Ns felt or not

- Deep structures :
 - D Sternomastoid muscle: Not attached.
 - @ Trachea: Not Shifted except if RSE
 - 3 Carotid artery: Felt but may be shifted if Huge SNG.

Deep Effect :

(Kocker's Test)

For Tracheomalacia.

By Slight compression on lat. Lobe-> Stridor → Tracheomalacia.

III- Percussion On Manubrium Sterni (Normally) Resonant. So Dullness = RSE.

IV- Auscultation | No value

* investigations :

- [A] To Diagnose SNG → Thyroid scan: Cold Nodule or Nodules.
- [B] To Exclude complications
 - Thyroid function test → To (Exclude Toxicity).

 - ⊕ Biopsy for mass → To (Exclude Malignancy).
 - Neck U/S. → Multinodular + cyst or solid
 - D Indirect Larvagasconu to accese uncal corde

[Retro-sternal Goltre]

* Treatment:

- Indicated with (1) Bad cosmotic (2) RSE
- (3) Pressure (if Huge). (4) Suspecious of malignancy.
- So For single: Lobectomy + Ismuectomy i.e. Hemithyroidectomy
 - For multiple: Subtotal thyroidectomy, leaving about 8 gm of normal thyroid

N.B.: ① We leave postro-medial part to preserve Parathyroid & RLN

② All operations followed by L. thyroxine.

Surgery Not advised below 25 year to avoid recurrency.



* Types : (3 Varieties)

1 Retrosternal Extension of large goitre:

Downwards of thyroid gland with it's capsule

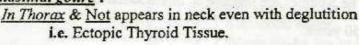
Due to @ Pushed by Pre-tracheal muscles.

@ Pulled by -ve Intrathoracic Pressure.

D Plunging goitre:

In Thorax. But appears only in neck with deglutition.

3 Mediastinal goitre:



* Clinical Picture :

■ Type of patient: more common with male due to short neck & strong muscle.

· Symptoms : Mediastinal syndrome

(Dyspnea, Congested neck veins & Brassy cough)

■ Signs: ① Inspection: a. Dilated veins on Neck & Chest.

b. + Cann't be move up & down with deglutition

c. Lower border cann't be seen.

d. Trachea may Shifted.

② Palpation: Lower border can't be felt.

Dullness over Manubrium sterni

* Investigations:

· X-ray Chest: Shows Soft tissue shadow & Shifting of the Ttrachea.

· CT scan Chest : More Accurate.

Thyroid scan (Tc99) Diagnostic

* Treatment:

• Preoperative preparation: By Inderal, especially with toxic R.S.E..

(N.B.: Antithyroid drugs is contraindicated because →↑ Size of gland

· Operative procedures : Subtotal thyroidectomy Then

Deliver it to neck after devascularisation of the gland.

② If failed → Piecemeal removal.

If failed → Median Sternotomy.



① (1ry Toxic = Diffuse Toxic = Grave's = Exopthalmic Goitre

• It is Autoimmune: Intiated by IgG antibodies stimulating TSH Receptors.

N.B.: LATS = Long Acting Thyroid Stimulator is one of these IgG or called LATS P (Protector) & Now called TsAb (Thyroid Stimulator Antibody)

& man be precipitated by stress e.g. psychic trauma, emotional stress & acute infection.

- Affect: 20 30 years.
- Characterized by : Diffuse enlargement (Soft, Smooth & Symmetrical)
- Mass: Occur at same time of Toxicity.

• Eye signs & Reticulo Endothelial System {RES} Hyperplasia.

② (2ry Toxic = Nodular Goitre = Plummer's disease)

• It is complicated from Simple Nodular Goitre (SNG).

N.B.: The Nodules are Inactive & Internodular tissues only active.

- Affect: 30 50 years.
- Characterized by: Localized enlargement (Firm, Nodular & Asymmetrical)
- Mass : Occur before time of Toxicity.
- No Eye signs (Extremely Rare).

Toxic Nodule

- It is a Solitary (Overactive) Nodule.
- It is Autonomous Characterized by
 - (Non Hormonal dependency).
 - (Hypertrophy & Hyperplasia) Not affected by TSH.
- Investigation: Thyroid Scan shows Hot Nodule.
- Treatment: Hemithyroidectomy after Control of Toxicity.



* Rare Types of Toxic Goiter:

- O Neonatal Thyrotoxicosis: New born of thyrotoxic mothers. -
- Thyrotoxicosis factitia: Due to excess intake of L. thyroxine.
- ③ Jod-Basedow Thyrotoxicosis: Due to large dose of Iodine given to hyperplastic gland → Temporary ↑ T₄.
- Hashitoxicosis: 5% of Hashimoto's thyroiditis in early stages are thyrotoxic.
- (5) Decurvan's thyroiditis: Due to libration of Hormones from destroyed tissue.
- 6 Functioning carcinoma.
- TSH secreting adenoma of the pituitary gland.

② Clinical Picture [Toxic Goitre]

- <u>Age</u>: <u>1ry</u> Toxic goitre (20-30 years).
 <u>2ry</u> Toxic goitre (30-50 years).
- · Symptoms Toxic Manifestations i.e Hyperthyroidism
 - Metabolic:
 Doss of weight Inspite of good appetite (Other causes)

(D) Uncontrolled D.M

@Parasitic Infestation i.e. Hydatid cyst.

Malabsorption Syndrome.

D Intolerance to Heat.

3 Excessive Sweating.

· C.V.S: Palpitation even (at Rest).

· Chest: Exertional dyspnea.

• C.N.S: ① Fine Tremors of Tongue & Hand

O Irritability Anexity & Insomnia.

D Weakness of Proximal Limb Muscles.

· G.I.T: Polyphagia + Diarrhea.

· Urin ary : Polyuria

N.B.: Causes of polyuria in This case

· Glucosuria.

 † Metabolic water.

† Water intake 2ry to Polyphagia.

† Renal Blood Flow.

Skeletal: Generalized Bone aches. i.e. Osteoprosis.
 General: Diplopia of Eye or corneal ulceration.

· Gonadal: D Impotence in Male.

@ Menstrual Disturbance in Female.

	1 ry Toxic	2ry Toxie
• Age • Onset • Courses	 20 – 30 years Abrupt Slowly progressive. 	• 30 – 50 years. • Gradual. • Steady
• Degree	• Severe. • True	Mild. Apparent.
Metabolio CVS & Chest CNS	• +++ • + • +++	• + • +++ • +

• Signs : A General Examination

B Local Examination

General Examination

Vital signs

[Hyperdynamic Circulation]

① Temp: (1) With toxic goitre.

Pulse Rate (Full comment on Radial pulse) with Toxic goitre it is "Tachycardia, Irregular, Large volume, Equal on both sides and Water hummer pulse as Special characters". Because of (↑ Systole & ↓ Diastole).



DAII Types of Arrhythmia can occur except Heart Block. N.B.

D Sleep pulse means Examination of pulse during sleep

(Mild 90 - 100/min, Moderate 100 - 110/min & Severe > 110/min)

- The value: To exclude Anexity & for follow up.
- The pulse may be Unequal as in R.S.E.

3 A.B.P.: "High systole and Low diastole"

@ R.R. : " May be Increased"

(B) General Signs

= Appearance : Normal.

= Built : Underbuilt.

= Concieous : Concious.

= Decubitus: "Orthopnea" If Heard Failure occur.

= Emotion: " Imitable & Alert".

= Face : "Staring look".

Systemic Examinations

1 Face: Flushed face. (Head)

Discourse Tongue: For Tremors (N.B. Unsupported Tongue).

② Eve: For ① Tremors in upper eye lid. ② Exopthalmos (see later).

3 Eve signs 3.

How To Examine Eye Signs

[1] Stellwag's sign: Staring look or Infrequent blinking (Normally = 5 - 8 Times / min.)

[2] Von Graefe's sign: Upper eye lid lags behind the eye on moving the eye downwards.

[3] Dalrymple's sign: A Rim of sclera is seen above the cornea on moving the eye downwards.

[4] Joffroy's sign: Loss of Wrinkling of the forehead on looking upwards.

[5] Mobius sign: Lack of Convergence on looking at near object.



Mobius Sign

Don't Forget Exophthalmos Exophthalmos

Types: ① False: Due to retraction of upper eye lids because of contraction of Muller's muscle because of 1 T₃ & T₄.

N.B.: T₃ & T₄ →↑ Sensitivity to catecholamines.

2 True: (A) Moderate:

- · Actual protrusion of eye ball.
- · Due to deposition of Retro-orbital fluid.

N.B.: Aggrevated by: Ophthalmic vein compression.

(B) Malignant:

- · Progressive form of Exophthalmos.
- Due to weakness of extra occular muscles.

A How To Examine Exophthalmos:

To Show True or False

[1] <u>Naffziger Test</u>: To see the level of Supra & Infra-orbital ridge <u>with</u> the comea

[2] <u>Frazer's Test</u>: To see the <u>oblitration of sulcus</u> of orbital margin <u>with</u> slight closed eye.

[3] <u>Ruler Test</u>: To see the level of Supra & Infra-orbital margin with the cornea by a <u>Ruler</u>.

To Determine The Degree

- [1] Exophthalmometer
- [2] <u>Ruler</u>: To measure distance <u>between</u> lateral Orbital margin and Apex of the cornea (normally = 15 - 17 mm).
- (Neck) (See local examination)
- Upper limb For ① Tremors of Hand i.e. Fine.
 - @ Exagerated Reflexes.
 - (1) Warm Sweaty Hand.
 - Myopathy of Proximal muscles.
- Lower limb For

Pretibial myxedema which is \$

- · Multiple yellow patches of the skin.
- Due to mucin deposition not due to T T3 or T4.
- Chest For
- Heart Examination shows ®
 - Theart sound & Functional murmur over P++
 - . Dilatation of both ventricles.
- Abdomen For Liver Enlargement
 Spleen Enlargement
- _ May be associated with 1ry Toxic goitre

A Don't Forget : (BACK)

B local Examination:

1 ry Toxic Goitre	2ry Toxic Goitre	
Grave's (Basedow's) Disease.	Plummer's Disease.	
• Symmetrical.	Asymmetrical.	
Soft and Smooth.	• Firm and Nodular.	
 Young (20–30years). 	Middle (30-50years).	
• The Enlargement at same time of Toxicity.	The Enlargement before time of Toxicity	
• Eye sign.	No (Extreme rare) Eye Sign	

N.B.: Iry toxic goitre characterized by

① Pulsation by Inspection.
② Thrill by Palpation.
② Bruit by Auscultation.

3 Investigations

- [A] Thyroid Function Tests.
- [B] Radioactive I123 Studies.
- [C] Others.

[A] Thyroid Function Tests:

☐ Measurement of serum thyroid Hormones:

[1] Measurement of protein bounded iodine (PBI) :

(It is Not used nowadays) because it is not accurate as it affected by fluctuation of serum level of plasma proteins.

SO May by (a) False High with ↑ ptn (Pregnancy).

(b) False Low with ↓ ptn (Nephrotic syndrome).

SO MEASURES FREE T3 & T4 ARE MORE ACCURATE

[2] Measurement of free hinding sites for thyroid hormones in the blood (T3 Uptake Test):

Radioactive T3 is incubated with the patient's serum \rightarrow T3 will bind to the free thyroid binding proteins \rightarrow Estimate the number of free binding sites in the serum.

SO May by (a) Low with Thyrotoxicosis.

(b) High with Hypothyroidism.

[3] T3 Suppression Test:

(done only if 123 I uptake is high).

- Normal: 123 uptake by the thyroid gland can be suppressed by given T3 for 7 days.
- In Thyrotoxicosis T3 has no effect.

□ Estimation of TSH in serum:

◆ <u>Low</u> concentration = <u>Hyperthyroidism</u> & <u>High</u> concentration = <u>Hypothyroidism</u>.

☐ TRH stimulating Test:

To exclude hypothalamic lesion i.e ↓ TSH.

So Give I.V. TRH - If still ↓ TSH -> hyperthyroidism.

▲ If increase ↑ TSH → hypothalamic lesion.

[B] Radioactive I123 studies or TC99:

□ Uptake studies :

Give Tracer dose (5 μci) then measures the uptake by gland after 4, 24, 48h
 [N = 11 - 55% of Tracer dose]

So may be

(a) High uptake (> 55%)= Hyperthyroidism.

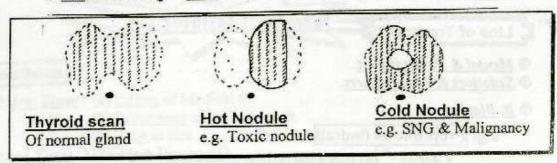
(b) Low uptake (< 11%) = Hypothyroidism.

□ Thyroid scan :

After given a dose of I¹²³ or Tc⁹⁹ the radioactivity of the gland is screend by (GAMMA) camera.

Show so it → Functioning = Hot = Toxic Nodule.

→ Not functioning = Cold = SNG or Malignancy.



[C] Others :

① ECG to exclude Arrhythmia.

② Blood sugar & urine analysis for glucosuria.

⑤ Serum Ca⁺ & Alkaline phosphatase if ↑ destruction of bone matrix.

Thyroid antibodies titre (LATS, LATS P & TsAb) increased with grave's disease.

⑤ BMR ↑ with Hyperthyroidism.

⑤ Serum cholesterol level : ↓ with Hyperthyroidism.

N.B.: ① Investigation like BMR, PBI, Serum cholesterol level are not done nowadays.

2 T3 Thyrotoxicosis:

It is a case in which normal T₄ with high T₃ only, it occur with elderly & manifest with AF & heart failure.

4 Treatment

	1ry	2ry	Toxic Nodule
Medical ttt	+ Main ttt.	As pre-operative	
Surgical ttt	Failure of Med. ttt Recurrent. Huge in size.	• Main ttt	Hemithyroidectomy (Isthmusectomy + lobectomy).
• I2 radiotherapy	• If pt > 45 years.		• If pt > 45 years.



* Indications

- 1 Iry Toxic: "All Cases".
- 2 2ry Toxic: "As Pre-operative preparation".
- ③ Children & Young patient: No surgery because of "↑ Risk of recurrence".
- Refusal of operation or Bad general condition.

* Contraindications

- 1 Solitary Toxic Nodule "Because it is Non Hormonal Dependent".
- ② Retrosternal Goitre "Because Medical ttt leads to 1 Size of the gland".
- 3 Pregnancy
- Lactation "Because Medical ttt affect on Foetus leading to Cretenold goftre".

Line of Treatment

- 1 Mental & Physical Rest.
- 2 Sedatives & Tranquilisers.
- 3 B. Blocker

e.g. Propronolol (Indral)

- Action: (a) Block the peripheral adrenergic features of hyperthyroidism.
 - (b) Partially decrease Conversion of $T_4 \rightarrow T_3$.
- Dose: 10 40 mg T.D.S. Orally.

(Antithyroid drugs :

[A] Carbimazole (Neomercazole)

- Action: (a) Prevents Oxidation of inorganic iodine.
 - (b) Interfere with Binding of I2 & Tyrosin.
- Dose: 10 mg / 8h Orally till euthyroid state

Then 5 mg / 8h. Orally for 1 - 1.5 year.

■ Onset: After 7 - 14 days

(This means the already formed T3 & T4 not affected).

- Side effects (a) Aplastic Anaemia.
 - (b) Agranulocytosis:
 - C/P: Sorethroat & fever are early sign.
 - ttt: Stop the drug, pencilline, fresh blood transfusion & vit.
 B₁₂ 300mg/d

[B] Propyl Thiouracil

- Action: As Carbimazole + ↓ conversion of T4 ____ more active T3
- Dose: 100 mg t.d.s till euthyroid state then a maintance dose 50 mg/d is given.
- Side effects: (a) Bone marrow depression.
 - (b) GIT disturbance.
 - (c) Joint pain.

[C] K perchlorate

■ Action : It interfere with I2 Trapping & very safe & can be used with children.

Dose: 200 – 300 mg/8h.



Other complications of Anti-thyroid drugs :

Allergy : Itching, skin rashes & vomiting.

② ↑ vascularity → Tachycardia (A-V) shunt so mislead doctor to increase the dose → Myxodema

3 Myxodema: from over dose.

① Cretenoid: if given during lactation.



* Indications

1 Iry Toxic: (a) Failure of Medical ttt.

(b) Recurrence after medical ttt. .

(c) Huge in size.

22rv Toxic : [The Main Treatment].

3 Solitary Toxic Nodule: i.e. Hemithyroidectomy.

* | Pre-operative preparation |

[A] Long Term preparation:

Neormercazole till reach the euthyroid state (for 2-3 months)

Then Lugol's Iodine (5% Iodine + 10%, KI in water) &

Actions: ① ▼ Protease Enz. which release T3 & T4

② ▼Organic Iodine formation .

③ ▼Effect of TSH on gland.

· Dose: 5-15 drops T.D.S for 14 days before operation .

Side Effects: Skin rashes, Excessive saliva & parotid enlargement.

[B] Short Term preparation:

Indral 40 mg (4 Times / day)

For I week pre-operative & continued for 1 week after

Operation [Subtotal Thyroldectomy] leaving 1/8 of the gland.

* Post - operative follow up

① Indirect laryngoscopy before hospital discharge.

② Serum Ca⁺ after 6 weeks.

③ Serum T3 & T4 every 6 months to detect recurrency or myoxdema.

N.B.: The common post-operative complication (See later)



* Indications

- 1 Iry Toxic > 45 years.
- D Solitary Toxic nodule > 45 years.
- 3 Recurrence of Toxicity after surgical ttt.
- @ Poor general condition.

* Contraindications

- 1 Iodine Allergy.
- 2 Young (To prevent the Risk of Carcinoma).
- (To prevent the Risk on Foetus)

Line of Treatment

(Radio-lodine 1131)

- Action: I¹³¹ → Destruction of Thyroid cells by Beta particle → sublethal damage.
- Dose: 160 μci/1gm Thyroid tissue. [N.B. μ ci = Microcuris].
- · Onset: 2-5 Months.

[If No Improvement after 3 months, Further dose is given].

- Side effects:

 Myxoedema (80% after 10 years).
 - ② Leukaemia (Doubtful)
 - ③ Thyroid Carcinoma



[A] Thyrotoxic with Pregnancy

- . Medical ttt: No because, It may leads to foetal hypothyroidism.
- * Surgical ttt: Indicated in 2nd & 3rd trimester.

So we give minimal dose of Propranolol before surgery.

· Radio-Iodine : No because, It leads to destruction of foetal thyroid.

[B] Children & Adolescents

- * Medical ttt : The Ideal.
- · Surgical ttt: No to avoid high risk of Recurrence.
- <u>Radio-Iodine</u>.: No to avoid high risk of Malignancy.

[C] Thyrocardiac Patient

- · Medical ttt : As Preoperative preparation only by [Inderal or Neomercazole].
- · Surgical ttt : The Ideal.
- <u>Radio-Iodine</u>: No <u>Except</u> for unfit patient for surgery.

[D] Retro-sternal Toxic Goitre

• Medical ttt : As Preoperative preparation only By [Inderal].

N.B.: Thiouracil is contraindicated because of → ↑ size of gland.

· Surgical ttt : The Ideal.

. Radio-Iodine: Not used.

[E] Exophthalmos

· Medical ttt:

O Salt's Restriction & Diuretics.

② L-Thyroxine may ↓ E.P.S.

. Surgical ttt : [The aim : To avoid complications]

① Lateral Tarsorrhaphy.

② Orbital Decompression [Naffziger's operation] (Not done) By Removal of (a) Part of roof.

(b) Lateral wall of Orbit.

· Radio Iodine : Not used.

[F] Thyrotoxic Crisis

 <u>Incidence</u>: Rare Nowadays, <u>because of</u> good preparation & control of toxicity before operation.

· Manifestations :

Symptoms: Muscular Excitability up to convulsion.

• Signs: (a) Temp. = Hyperpyrexia up to 41°C or more.

(b) Pulse = Irregular & Rapid up to 160/min or more.

(c) A.B.P. = ↑ (Systole & Diastole) → Heart Failure.

· Treatment: [Should be Urgent]

Ice Packs to limb, head & abdomen → ↓ Pyrexia.

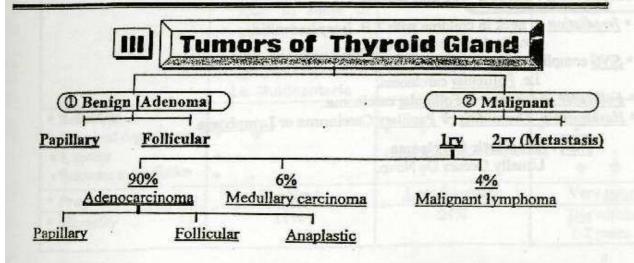
Morphia → Sedation.

A.B. → To prevent chest infection.

• O2 Inhalation & I.V (Hydrocortison) 25mg.

 Beta Blocker (Inderal): I.V drips in glucose under ECG screen (Till pulse reached to normal)

Lugol's I₂ 3cc in 1000 cc glucose solution.



Benign (Adenoma)

It may be

- O Papillary Adenoma
- D Follicular Adenoma which is &

Follicular Adenoma

- Represent as a Solitary Nodule.
- Complicated by Follicular Carcinoma.
- Investigation [Histopathological Examination] To detect evidence of invasion to capsule i.e. Turn to malignancy.
- > Treatment (Hemithyroidectorny) Lobectomy + Isthmusectomy

Follicular adenoma (5 Histological subtypes) : N.B.

@ Embryonal type:

Acini without lumen.



@ Foetal type:

Empty well defined acini.

@ Microfollicular type:

Well formed acini + little colloid

@ Macrofollicular type:

Well formed acini + Normal colloid.

@ Hurthle - cell type :

Well formed acini + granular acidophlic cytoplasm.



N.B. Papillary Adenoma: Is usually with papillary projection inside (most pathologist consider it as malignant. So there is nothing called papillary adenoma).

2 Malignant Goitre

Predisposing Factors) i.e Risk Factors

- Irradiation to neck in children with T.B. lymphadenitis.
 - i.e. Papillary carcinoma.
- SNG complicated by carcinoma
 - i.e. Follicular carcinoma.
- Follicular Adenoma → Follicular carcinoma.
- Hashimoto's Thyroiditis → Papillary Carcinoma or Lymphoma.

N.B.: Anaplastic Carcinoma Usually Occurs De Novo.

② (Types of Carcinoma

	Papillarg*	Follicular	Anaplastic
Incidence	60%	17%	13%
• Age	Children and Young Adult	Middle Age	Elderly
. Sex (Female : Male)		2:1	1:1.3
Pathology NE picture	• Localized & slowly growing nodule.	• III defined and irregular temor.	• Large & rapidly growing tumor.
■ <u>Microscopic pleture</u>			
	Cystic area with intracystic papillary projections. Composed of C.T center & covered with single layer of malignant cells with Scattered Calie, Psammoma bodies	Thyroid fellicles with variable degree of differentiation. Vascular & Capsular invasion.	Clusters of spindle cells which is small or giant cells. Separated by little fibrous tissue. Local infiltration is seen.
· Differentiation	Differentiated	Differentiated	Undifferentiated
• Spread	 Mainly Lymphatic N.B.: It is called "Lateral Aberrant Thyroid" = Thyroid with Neck L.Ns Metastasis. 	Mainly <u>Blood</u> especially Bone.	• Mainly <u>Direct</u> .
Multiplicity	+ve • It means multiple foci in same or other lobe. • Due to intrathyroid lymphatic spread i.e. Multicenteric	e e e e e e e e e e e e e e e e e e e	-ye
Behaviour Hormonal dependency. I ₂ uptake Response to irradiation		of all enemal transfer action must be a fig.	
* Prognosis	The Best	Less favorable	Very poor
Mortality	- 11%	24%	Die within 1-2 years.

N.B. Medullary Carcinoma

· Incidence : 6%

· Origin: Parafollicular (C) cells secreting calcitonin.

Spread: 50% are lymphatic spread.

Some Tumors are Familial

So form part of <u>MEN</u> type IIa (<u>Slpple's syndrome</u>). Which is [Medullary ca.+ Pheochromocytoma + Hyperparathyroidism].

- Manifestation: Diarrhea in 30% due to 5HT (5 Hydroxy Tyramine) also may be due to ↑ PGs.
- Investigation : 1 level of calcitonin in blood.
- Treatment: Total Thyroidectomy + Selective Neck Node Dissection.

N.B. Lymphoma

· Incidence: 4%

• Origin : Lymphoid Elements.

(May predisposed by Hashimoto's Thyroiditis)

• Treatment: Radiotherapy & chemotherapy [prognosis: is good]

3 Clinical Picture of Carcinoma

Age: Usually > 50 Years.

Symptoms | Malignant Manifestations

Rapid increase in size with short duration.

Pain is related to swelling or Referred to Ear.
 i.e. Arnold nerve (Branch from Vagus nerve)

Metastasis As [Liver, Bone, Lung, Brain].

· Symptoms of Infiltration:

Trachea → Dyspnea.

Oesophagus → Dysphagia but (Rare).

Sympathetic Chain → (Homer's syndrome)
 (Ptosis, Myosis, Enopthalmose, Anhydrosis).

Cartoid Artery → Postural Fainting.

Internal Jugular Vein → Oedema of face.

• Recurrent laryngeal nerve → May be ❖

D Hoarsness of voice if Unilateral affection.

D Stridor if Bilateral affection.

N.B.: Some patients represent 1st by L.Ns in the Neck i.e. Occult carcinoma = Papillary carcinoma.

• Signs : A General Examination :

Examine for Metastasis e.g. Bony Swelling.

B Local Examination:

- Swelling is Tender, Hard, Irregular, Enlarged and Fixed
- "Berry's sign" (Absent carotid pulsation).
- L.Ns (Enlarged, Hard, 1st mobile Then Fixed).

(C) Atypical presentation :

- Metastasis i.e. occult carcinoma.
- Thyrotoxicosis i.e. functioning carcinoma.
- AS S.N.G i.e. Low grade tumor
- Histological surprise :

i.e. suddenly discovered malignancy from histological report of a removed benign thyroid.

How to deal with (see later)

Staging De Groot staging (Phialdelphia 1989): Journal of cancer:

- * Stage I: Tumour with single or multiple intra-thyroid foci.
- * Stage II: Tumour with mobile Neck L.Ns.
- * Stage III: Tumour with fixed Neck L.Ns + local invasion of surrounding.
- * Stage IV: Tumour with Distant metastasis.

(Investigations

[A] Diagnostic Procedures:

- Radioactive I¹²³ scan → Cold Nodule.
- U/S: For Cyscic (Papillary carcinoma) or Solid.

If cystic: Do aspiration 3

N.B.: Criteria of malignant Aspirate:

- · Hge.
- · Residual Mass.
- · Rapid reaccumolation of fluid.
- +ve cytology for malignancy.

Biopsy:

- FNAC "Accurate with Papillary carcinoma".
- Open biopsy i.e. Lobectomy + Isthmusectomy.

[B] Detection of Distant Metastasis:

- Lung: X-ray.
- Bone: Bone Scan (Mainly with Follicular Carcinoma).
- Liver: Sonar (U/S).
- Brain: (Extremely rare) So No investigations done.

[C] Detection of Complications:

- · Laryngoscopy for RLN invasion.
- Bronchoscopy for Tracheal invasion.
- Oesophagoscov for Oesophageal invasion.

[D] Detection of Tumor Marker:

- ↑ Serum Calcitonin = Medullary carcinoma.
- ↑ Thyroglobulin = Differentiated carcinoma.

(Treatment) According to Operable or Inoperable.

I) Inoperable case

> Criteria of Inoperability:

① Unfit for surgery e.g. Cardiac disease.

@ Patient with metastasis.

> Indicated also with :

Anaplastic carcinoma.

② Infiltration to vital structures with papillary or follicular carcinoma.

Management

> Palliative Isthmusectomy

> According to Types:

• Papillary: give L. Thyroxin.

· Follicular : I2 uptake

* Anaplastic : give Ext. Radiation.

> ttt of complications as :

Tracheostomy if Tracheal invasion.

· Gastrostomy if Oesophageal invasion.

II) Operable case : "Total Thuroidectomu"

> Indications: ① Pupillary Carcinoma: Because it is Multicenteric.

@ Follicular Carcinoma .

@ Early Anaplastic carcinoma.

@ Medullary carcinoma.

Postoperative (L. Thyroxine 0.1-0.2 mg/day) As Replacement Therapy.

> Preservation of: 10 RLN. 2 At least one of Parathyroid gland.

> Removal of L.Ns: ① If No L.Ns: No need for prophylactic block dissection of L.Ns.

© If few L.Ns: Selective picking of L.Ns.

① If extensive: Block Dissection of L.Ns.

> Treatment of Histological Surprise:

(1) Follicular type:

a. Non invasive: No further surgery if total lobectomy was done.

b. Invasive: Re-operation to remove remenants of thyroid tissue.

(2) Papillary type:

Re-operation is necessary to remove remenants of thyroid tissue + thyroid lymph nodes.

> Postoperative follow up :

Every 6 months by thyroid scanning, clinical exam & tumor marker to detect © local recurrence, © Metastasis © Complications.

(Prognosis Depending on %

O Age > 40 years.

O Distant metastasis.

@ Size > 5 cm.

Anaplastic.



Complications After Thyroidectomy

(مهم جدا)

Recurrent Laryngeal Nerve Injury

- <u>Cause</u>: Pressure on the nerve by ① Oedema & Blood clot. ② Accidentaly ligated.
- · Manifestations :
 - If Unilateral paralysis → Hoarsness of voice & dyspnea.
 - Bilateral paralysis → Stridor & Suffocation.

② External Laryngeal Nerve Injury

- · Cause : Accidentally during ligation of superior thyroid vessels
- · Manifestations: Loss of high pitched voice.

Post-operative Thyroid crisis (storm) Discuss: (see before)

Hypoparathyroidism

- Causes: ① Removal of all parathyroid gland.
 - D Interrupt with their blood supply.
- · Manifestations : O Tetany within a day.
 - ② Typical Carpo-pedal Spasm.
- Treatment: Slow I.V Ca gluconate 10 cc 10%.

Hypothyroidism

Removal of too much thyroid tissue.
(It needs replacement therapy)

Reactionary Haemorrhage

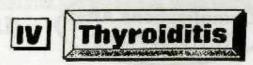
- <u>Cause</u>: Result from continuous oozing (bad haemostasis).
- · Manifestation : Suffocation.
- Treatment: Urgent opened wound in bed.

Adherent Scar

Scar adherent to the trachea.

- Increase of Exophthalmos i.e. progressive
- ® Recurrence of Hyperthyroidism

Because of Inadequate removal or Hyperplasia of that has been left.



[A] Inflammatory Thyroiditis

Acute Bacterial Thyroiditis

- Cause: Rare follows Bacterial infection of Mouth, Pharynx & L.Ns.
- Manifestation : Acute onset of severe neck pain, Fever & Chills.
- Investigation: Culture for rarely formed pus.
- <u>Treatment</u>: Antibiotics + <u>draining</u> of abscess which is rarely formed.

Subacute Viral Thyroiditis

"Dequervains's" Granulomatous Thyroiditis

- · Cause: Viral infection.
- Manifestation: Incidious onset of severe neck pain, Fever (No Chills) + Swollen, firm & Slightly tender (pain radiate to ear).
- Investigations: ↑ ESR (Erythrocyte Sedimentation Rate).
 - ↓ TLC (Total Leucocytic Count).
 - Thyroid functions: ↓ I2 uptake & ↑ production of T4.
- Treatment : Prednison Orally

[B] Autoimmune Thyroiditis

Hashimoto's Thyroiditis

- Cause : Autoimmune (middle age female).
- Manifestations: ① Onset is Asymptomatic or Incidious & rarly acute.
 - Mild hyperthyroidism due to destruction of thyroid follicles→ Release of T4 in blood.
 - 3 Swollen, firm gland.

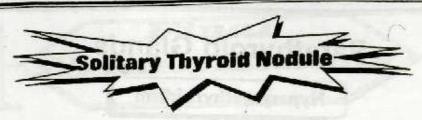
N.B. : It may be complicated by

- Hypofunction i.e. Excess follicular destruction.
- Carcinoma i.e. Papillary carcinoma or Lymphoma.
- Investigations: ① ↑ thyroid antibodies.
 - 2 Biopsy to DD from carcinoma.
- Treatment: ① Replacement therapy by L.Thyroxine.
 - Subtotal thyroidectomy if enlarged and leading to pressure symptoms.

Riedel's Thyroditis

Collagen disease [Woody Thyroiditis]

- <u>Cause</u>: Autoimmune (very rare) only 0.5%.
- Manifestations: ① Hard (woody) gland from excessive fibrosis.
 - ② Infiltration to surroundings.
 - May be complicated by hypofunction.
- Investigation: Biopsy to DD from Anaplastic Carcinoma.
- <u>Treatment</u>: ① <u>Replacement</u> therapy by L-Thyroxine.
 - @ Palliative Isthmusectomy.

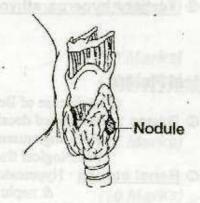


Definition

- A Goiter which clinically appears to be a Single Nodule. Which may be ®
 - 1 True solitary: If one nodule is Felt & the rest of the gland is not felt.
 - Dominant : If one nodule is felt & the rest of the gland is slighty felt.

Aetiology

- Simple nodule.
- @ Toxic nodule.
- ③ Neoplastic nodule: a. Adenoma. b. Carcinoma.
- Colloid nodule



How to Differentiate?

· History (onset, course & duration) of each cause.

♦ General & Local Examination (for Toxic or Metastatic or Pressure manifestations).

· Investigations :

[A] Laboratory:

Thyroid function tests: † in Thyrotoxicosis.

* Thyroid antibodies titre: † in 1ry Thyrotoxicosis or Thyroiditis.

[B] Thyroid scan:

* Hot nodule : Toxic nodule.

<u>Cold</u> nodule: More suspicious of malignancy.

[C] Neck U/S:

• To differentiate cyst from solid + Aspiration (criteria of malignancy).

[D] Biopsy:

1. FNAC : It is very useful in papillary tumor but can't differentiate benign from malignant follicular lesion.

2. Tru cut needle biopsy (Another option).

3. Excision biopsy: the only diagnostic with Hemi-thyroidectomy

[E] Tumor Markers: if suspicious of malignancy.

Treatment

According to the underlying aetiology:

- ⊕ If cyst → Aspiration → malignant criteria → proceed to surgery.
- ② If benign condition → Hemi-thyroidectomy is enough.
- ③ If Malignant condition → proceed to Total thyroidectomy if hemi-thyroidectomy was done before.

Parathyroid Glands

Hyperparathyroidism

* Actiology : (3 Types)

1 1ry hyperparathyroldism : (The commonest variety) it is due to adenoma

80% or carcinoma.

Zry Hyperparathyroidism : Secondary parathyroid hyperplasia due to hypocalcaemic states e.g. chronic renal failure, malabsorption syndrome

Tertiary hyperparathyroidism: With prolonged stimulation the reactive hyperplasia acquires autonomy it secretes excess hormone without stimulation.

* Clinical Picture :

(The disease of Bones, Stones, Abdomen and psychic moans)

⊕ Bones : Generalized decalcification of bones = ostitis fibrosa cystica (Von Recklinghausen's disease) → multiple bone cysts → pathological fractures.

@ Renal stones : Hypercalcuria & phosphaturia cause recurrent renal stones

& nephrocalcinosis.

Abdomen : Increases gastric & pancreatic secretion by hypercalcaemia may precipitate Peptic ulceration or Acute pancreatitis.

Psychic moans: Common in women. Restlessness, irritability, personality changes and even neurosis may occur.

* Investigations :

① Investigations for hyperparathyroidism:

· Serum Ca+ & P04: ↑ Ca+ ↓P04.

Urinary Ca⁺⁺ & P04 : ↑ Ca⁺⁺ ↑ Po4.

Radio immune assay for parathormone, ↑ PTH

X-ray bone: multiple bone cysts

② Investigation for localization of parathyroid glands:

Ultrasonie scan :

CT scan (Very helpful)

Thallium Technetium subtraction scan:
The Idea of this test is that Tcm is taken only by thyroid gland while Thallium is taken by both thyroid parathyroid gland by computerized subtraction of the two captured images, the parathyroids appear as hot spots.

* Treatment:

⊕ Parathyroid adenoma → Resection of the adenoma.

② Parathyroid hyperplasia → Resect the 4 glands and implant part of one in sternomastoid muscle to facilitate its re-exploration if needed.



Final Written Exams



4	-	-	-	-
1		20	100	1
ĸ.	п	vv	4	21
V	A	11	100	
-3	-			•

- Discuss Anatomy of Thyroid Gland
- Discuss C/P, Investigations & ttt of Toxic Goitre
- · Discuss path., Investigations & ttt of Malignant Thyroid

(1995)

• Give an account on Complication of SNG

(1996)

- Discuss Complication & ttt of SNG
- Discuss Complications of Thyroidectomy

(1997)

• Discuss the ttt of Diffuse (1ry) Toxic Goitre

(1998)

- Discuss Anatomy of the Thyroid Gland.
- Discuss Path. of Cancer Thyroid. What are the differences. between the commonest 3 types. (Table form comparison)

1999

- <u>Discuss</u> post-operative <u>Complications</u> of thyroid gland
- Discuss C/P of Thyrotoxicosis

2000

- Discuss Post-operative complications of Thyroid gland
- Discuss Origin, C/P & Treatment of Thyroglossal cyst.
- Discuss Pathology, C/P & Investigation of R.S.G.

2001

- Discuss complications of S.N.G.
- Mention DD & Investigations of solitary thyroid nodule. (15 Marks)

2002

- Discuss Post-operative complications of thyroid gland
- Discuss complications of S.N.G.
- Discuss Management of solitary nodule

2003

- Discuss complications of S.N.G.
- What are risks & precautions with toxic goiter
- Discuss thyroglossal cyst
- Discuss path, C/P &management of cancer thyroid

2004

- Discuss Anatomy of thyroid gland
- <u>Discuss</u> clinical presentations of Hyperparathyroidism

- ىور ئاتى (10 Marks)
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- (30 Marks)

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- نور ثانی (10 Marks)
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The Arterial Disorders



[Diminished Arterial Blood Supply]



Definition

<u>Diminished arterial blood supply</u> sufficient to interfere with nutrition and functions of the Limb.

Aetiology

<u>Due to</u> arterial occlusion by trauma or vascular disease.

Types

It may be

- · Acute Ischaemia.
- · Chronic Ischaemia

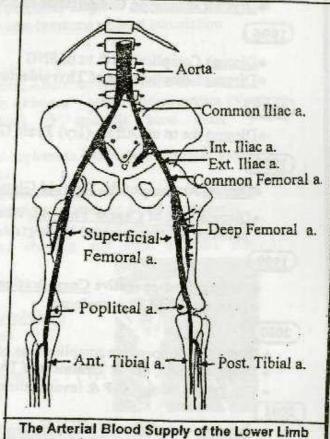
The Effect of Ischaemia Depend Upon

1 The Degree of Arterial Occlusion :

- · Partial : Mild Ischaemia.
- · Complete: Severe Ischaemia.

2 The rate of arterial occlusion:

- · Acute : Sudden Ischaemia.
- · Chronic: Gradual Ischaemia.



AND THE STREET

N.B.: Acute ischaemia more serious

Because No time for development of Collaterals.

The Type of artery for (Collateral Circulation).

- · Some arteries have good collaterals as Subclavian artery & Iliac artery.
- · Other arteries have poor collaterals as Brachial artery & Popliteal artery.
- Heart failure → ↓ Cardiac output → ↑ Ischaemia.
- D Anaemia → ↓ O2 → ↑ Ischaemia.
- 6 Smoking → ↑ Ischaemia.
- ® Cold weather → Maintain spasm → ↑ Ischaemia.



Definition

Sudden Total occlusion of a previously patent artery suppling a limb.

Aetiology

- ☆A Embolism "The Commonest".
- Arterial Injuries.
 - (C) Acute Thrombosis On Top of Atherosclerosis.
 - D As Complication of Dissecting Aneurysm.
 - E) Phlegmasia Alba Dolens.
 - F Compression on Artery e.g. Tourniquet, Fractured bone etc...

Pathology

- a- <u>Sudden occlusion</u> of an artery → <u>Reflex spasm</u> of the near by vein → Tissues will be loaded with fluid → [<u>If Gangrene</u>] it will be moist aseptic.
- b- Different Tissues Tolerate Ischaemia to variable Extent :
 - Muscle → Irreversible damage within 6 hours.
 - Skin → Moist aseptic gangrene within <u>24 hours</u>.

Clinical Picture

[6PS] + History - fear b- him or traum-+ muscle (Franker, swoller, tense)

- · Pain : * Sudden onset.
 - Bursting or Cramp like in character.
 - . Starts at point of occlusion.
 - · Shoots distally.
 - ↑ By Movement or Warmth.

N.B.: The pain may be absent in some patient Because of rapid onset of anaesthesia.

- Pallor: Which is replaced (<u>later on</u>) by Mottled Cyanosis <u>due to</u> accumulation of deoxygenated blood.
- · Pulselessness.
- Paraesthesia: Cutaneous hyposthesia progresses slowly to be frank anaesthesia.
- Paralysis: e.g. Paraplegia occur with occlusion of "Aortic Bifurcation".
 - Progressive coldness

clinical - cappilaries circulation (capillary led pulsation)

Volkmann's isch. Contractive

Witnesd Colour @ muscle necrosis (Tense culf in.) Complications (Irrevenible Acute Ischenica) @ Acute Paraplegia (saddle aarti embolion

Cul progress in delayed. It

Sequelae of Acute Limb Ischaemia

Secondary Distal Thrombosis: After circulatory arrest → widespread distally → Intravascular Thrombosis.

Peripheral Oedema: especially after revascularization, because of associated thrombus (DVT) of the affected limb. Also the clot may dislodge & Trisk of pulmonary embolism.

Nerve Ischaemia: Impaired nerve conduction.

N.B.: Nerve damage never occur

Muscle: [Compartmental Syndrome = Muscle Compression Syndrome]

 Prolonged ischaemia → Oedema → ↑ Pressure inside the fascial compartments of the leg especially after Revascularization → ↑ Impairment of arterial flow → ↑↑ Ischaemia.

N.B.: Irreversible Muscle damage within 6 hours

Skin: Gangrene occur if skin neglected without treatment.

N.B.: Gangrene occur within 24 hour

Incomplete Recovery: Leads to development of clinical picture of chronic Ischaemia.

A) (Arterial Embolism)

[Embolic Ischaemia]

- * Definition: Sudden impaction of an embolus in a narrow blood vessels.
- * Incidence: Commonest with cardiac patient.

[Congenital, Rheumatic H.D, Infarction or Valve lesion].

Pathology: See before + 3

(A) (Source of an Embolus

1 Lt. Atrium : MS with AF.

② Lt. Ventricle: After Recent infarction

③ The Aorta: From an Aneurysm.

Valves: If Subacute Bacterial Endocarditis.

⑤ <u>Paradoxical Embolism</u>: (Rare) If ASD or VSD.

Atheromatous plaque from atheromatous vessels

@ Rare : Air, Fat, Amniotic fluid, Clot or Tumor cells.

(B) (Site of Impaction) (Bifurcation of vessels) Due to %

- **Decreasing in Diameter.**
- ② Slowing in Blood Circulation.
- Turbulence of Blood Flow.

N.B. : Saddle Embolus :

Embolus impacted in the aortic bifurcation





* Clinical Picture:

As before [6PS] But 3

· Examination of heart may reveal the cause.

* Complications :

As Before But &

- Gangrene is more common because of poor collaterals due to
 - ① Reflex V.C of Collaterals.
 - 2 2ry Thrombosis including Collaterals.
 - 3 Showers of embolism may block Collaterals.

* Differential Diagnosis:

1 Acute Arterial Thrombosis i.e. Thrombotic Ischaemia.

Claudication Found
Heart
A ye
Redul Pale
Truphis Characis
Source of combaling

I and a local		Embolic Ischaemia	Thrombotic Ischaemia
History	* <u>Personal H</u>		Our Syntail 9
	• Age.	• Common with Young.	Common with <u>Elderly</u> .
	• Present H.		
	• Onset.	• Sudden.	Gradual.
	• Source of Embolus:	• Present.	• Absent.
	• Past History		
	• Heart disease.	• Present.	• Absent.
	• Claudications:	• Absent.	• Present.
Inspection	Trophic Changes	• Absent	• Present
Palpation	* Radial Pulse	• Irregular with A.F.	• Regular
Investigation	• Angiography	• Minimal Collaterals	• <u>Marked</u> Collaterals

- 2 Phlegmasia Alba Dolens. Massive venous thrombosis of Ilio-femoral vein with Arterial spasm
- * Investigations :
 - (A) To Detect The Source of an Embolus: (Evidence of valvular lesion).
 - · ECG.
 - · Echocardiography.
 - (B) To Detect the Level of Arterial Obstruction: (Angiography).
 - · Doppler U/S.
 - · Duplex Scanning.
- * Treatment : -

رفاح دماف

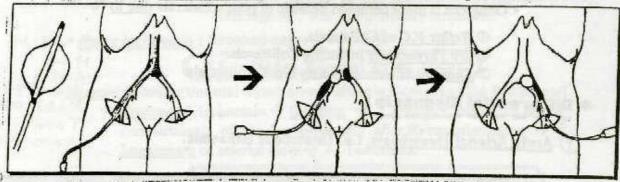
Treatment [Embolism is a Surgical Emergency]

Urgent Embolectomy: @ 1 N. fluid > to correct Dehydration

Anaesthesia (Better under local anaesthesia (may be spinal anaesthesia).

• Pre-operative
^(*) Immediate Heparinization → Prevention of propagated thrombus

· Operative : [Embolectomy] [Fogarty Balloon Catheter]



. It must be within 6 hours to save the limb. But if done after that time called Delayed Embolectomy

 The only value of Delayed Embolectomy is lowering the level of Amputation. Because of irreversible muscle damage which occurs

· Complications of Embolectomy & It's treatment ™

(1) <u>Sudden Death</u> Due to pulmonary Embolism. Because of venous spasm → Thrombosis → Pulmonary embolism → <u>Death</u> .	① Thrombectomy of femoral vein at same time of embolectomy. ② Putting IVC Filter
(2) <u>Compartmental syndrome</u> i.e. Muscle Compression Syndrome As before	• <u>Fasciotomy</u> Done to save the vitality of the limb i.e ↓ Tension.
(3) Reperfusion injury: (Kidney & Heart). Due to passage of large amount of Myoglobin & K ⁺ from ischaemic Muscles leads to Renal Shutdown or Cardiac Arrest	 ① <u>I.V. Manitol</u> →↑ Diuresis ② <u>I.V. Insulin + Glucose</u> → ↑intracellular shift of K⁺ ③ <u>Dialysis</u> If Anuria.

N.B. : In case of :

(a) Femoral Bifurcation Block → Femoral Arteriotomy

(b) Aortic Bifurcation Block → Bilateral Femoral arteriotomies

Sale Post-operative: Heparinization (Continued till cardiac conditions is assessed)

N.B. A Completion Angiogram (should be done)

· To be sure that all emboli have been removed.

(B) Fibrinolysins:

(Recent) i.e. No surgery.

- As Streptokinase, Urokinase & Tissue Plasminogen Activator (TPA).
- They are given I.V or I.A through a catheter. N.B. Heparin should not be used at same time.
- (C) Amputation: If Established gangrene.

B) (Arterial Injury)

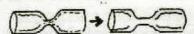
- * Definition : Sudden interruption of arterial supply of the limb by injury
- Incidence : Common Nowadays due to 3 [Car Accidents, TWar Injuries & <u>latrogenic as</u> Invasive Investigations].
- * Actiology : The Injury may be.
 - Open injury: Stabs, Bullets etc...
 - Closed injury:
 ① Pluster or Tourniquet Compression.
 - @ Following Arterial Cannulation.
 - ⑤ Fracture Dislocations with Arterial injury e.g. Supracondylar fracture Humerus with Brachial a. Injury. or supracondylar fracture Femur with Popliteal a. Injury.

Arterial Injui

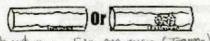
Without Division (No Bleeding)

(A) Arterial Spasm

- · Due to Arterial Irritation by blunt trauma or missile near the artery.
- · Associated with Intimal Tear but not diagnosed as a cause except after exploration.



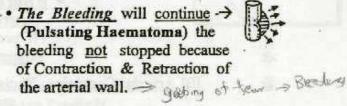
- (B) Arterial Contusion
 - · Due to Arterial contusion
 - Associated with + Superadded thrombosis.



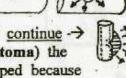
* full still Homatimu - File Memrysm (Flenm-) & External or internal

With Division (Bleeding)

- (A) Complete Division
 - · Both Ends bleed profusely but soon the bleeding decreases because of 3
 - The intima Curls inside Lumen.
 - The Media Contracts.
 - The Divided Stumps Retract.
 - The pulse is lost Distally.
- (B) Partial Division ()



The pulse is weak Distally





couls taken a CP of Ischamia 60 * Clinical Picture: G External Bleeding (Bright red & following)

Hernotoma (following or expension) & Assisted injury (wound, Name, Freth - 55) > O History of Ttrauma General Exam as vital signs to evaluate the blood loss. · Local Exam

(A) Hard signs: as before [6PS]

(B) Soft signs: not specific because of small or moderate sized Haematoma that not pulsating

* Investigations :

[A] In patients with Hard signs:

Immediate surgical exploration is indicatd.

[B] In patients with Soft signs :

(1) Plain X.ray: to detect foreign bodies (bullets) or fractures.

(2) Doppler & Duplex: to detect collaterales.

(3) Angiography: The most Accurate

* Treatment :

(A) First Aid Treatment :

@ Elevation of Limb.

3 Tourniquet : Simple, Rubbei a rneumane.

4 Anti ① Anti-shock measures.

Anti-biotics.

3 Anti-tetanic serum

Anti-gas gangrene serum.

• Associated fractures must be fixed to stabilize the repair

(B) Definitive Treatment : [1] Immediate Exploration + Fushing through by Heperin Salir [II] Fasciotomy (to prevent Compartemental Syndrome)

According To Types of Arterial Injury:

D Arterial Injury without division:

[A] Arterial Spasm: 1 Intra-arterial injection of papaverine.

Intra-arterial injection of Heparin in saline

If Not successful:

Forcible dilatation by Fogarty Catheter is performed.

If Not successful:

Arteriotomy to detect intimal tear. If present -> Excise the spastic segment then saphenous vein graft is performed.

[B] Arterial Contusion: Excision of contused segment then saphenous vein graft is performed.

inlovoostin gonft

(Non absorbable < best)

Prolene - == 17/16

② Arterial Injury with Division :

[A] Complete Division: • No gap: Direct End to End Anastomosis.

. Gap: . Small Artery:

Natural (Saphenous vein) Graft.

* Large Artery:

Synthetic (Dacron or Teflon) Graft.

[B] Partial Division: • Longitudinal Tear > 0

. Small Artery: Vein Patch Graft.

· Large Artery : Direct Suture.

• Transverse Tear → () 0

• <1/2 Circumference: Direct Anastomosis

• > 1/2 Circumference: Turn it into Complete.

N.B. : Don't Forget :

Damaged main veins should be repaired.

Damaged Nerves can be repaired or left for another sitting

II CHRONIC ISCHAEMIA

Definition

Slowly Progressive Arterial Obstruction.

Aetiology

[A] Above 45 years:

Atherosclerosis is the commonest cause.

[B] Below 45 years:

*In non Diabetics:

I. In Males : Burger's disease i.e Arteritis.

II. <u>In Females</u>: Raynad's disease i.e vasospstic disease.

*In Diabetics:

Diabetic foot & Gangrene.

A Atherosclerosis

* Definition :

Degenerative arterial disease due to aging process affecting the whole arterial system.

* incidence:

Age: > 40 years.

• Sex : Male > Female

· Risk Factors :

Hypertension

· Hypercholesterolaemia

· Hypertriglycerides.

Obesity

· +ve Family H.

· Heavy Smokers



* Pathology:

It is a Generalized Disease :

Affecting Large & Medium sized vessels.

The 1" pathology called "Atheroma":

- ① Started as an elevated yellow plaque on the Intimal surface of the artery.
- @ Subintimal layer shows Accumulation of lipid & C.T matrix.
- The Media & Adventitia shows fibrosis.

N.B.: The plaques may be calcified so be apparent by (x-ray).

* Clinical Picture:

"Press And See How Colour Fades" . P (Pain).

· A (Arterial pulsation).

· S (Skin & Sensory changes).

· H (Lost Hotness).

· C (Colour changes).

F (Functional changes).

+ Gammere + special test

P= Pain

	s). Intermittent Claudications "Muscle Ischemia"	Rest Pain =
* Characters	• Cramp Like pain	• Burning pain series approach
* <u>Site:</u> Depending on occlusion	• Gluteal = Claudications due to ♣ Aorto-iliac Occlusion. • Thigh = Claudications due to ♣ Ilio-femoral Occlusion. • Calf = Claudications due to ♣ Femoro-popliteal Occlusion. • Sole = Claudications due to ♣ Poplitio-tibial Occlusion.	Foot (Dorsum > Sole) Because of dorsum of foot less vascular than sole so more affected than sole. South september Sole So
• Increased by	Walking & Warmth	*Elevation of limb & Warmth
• <u>Decreased</u> by	• Rest (stood to refeated	*Lowering or Uncovered limb or Rubing the dorsum of foot.
• <u>Degree</u>	• According to ♣ [Boyd's Classification]	Continuous and Severe i.e. pregangrene.

Don't Forget Boyd's Classification

• <u>Grade I</u> $\rightarrow \downarrow \downarrow \downarrow \downarrow \downarrow =$ Pain starts on walking but gradually \downarrow by walking so \rightarrow <u>Good</u> Collaterals i.e mild ischaemia.

• Grade II → ↓↓↓ = Pain starts on walking and gradually ↑ by walking so → Poor Collaterals, i.e. moderate ischaemia.

• Grade III →

= Pain starts on walking but force the patient to stop walking so → Severe Ischaemia.

Arto Sant Dotal

A metabalic

ري رجيد م سکد ح

N.B.: Intermittent Claudication Pain Also Characterized by:

· Claudication Distance: Distance after which the pain is felt. The shorter the distance the advanced ischaemia.

· Claudication Time : Time after which the pain is felt.

Rest Time: Time of Rest needed to start walking again.

Arterial Pulsation : [All accessible Arteries all over the body are palpated]

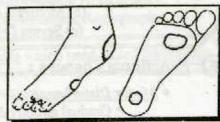
Distal Arterial Pulsation → May be diminished in amplitude or absent

S Skin Changes: [Trophic Changes]

Loss of <u>Hair</u>, brittle <u>Nail</u> and dry scaly <u>Skin</u>.

Interdigital infection, i.e. Tinea Pedis.

 Ulceration over pressure sites e.g. site of bigs toe, heal & tips of toes, also tapering digits



② Sensory Changes:

Paraesthesia "Gradual loss".

Tingling & Numbness.

loss subcidences simusch

Coldness (Lost Hotness): [Examine Temperature]

Should be <u>bilateral</u> starting with normal limb.

 Before examination of temp. let the limb uncovered for 5min. To avoid false covered warm limb.

N.B. : Causes of False warm ischaemic limb :

O Covered limb.

(2) Under ttt by Sympathectomy

@ Infected limb.

D.M. "Auto-sympethectomized pt"

 Detect the <u>level</u> of change of temp = <u>level</u> of obstruction. By palpation from distal to proximal

Colour Changes: [The pt. is lying down and exposed his both LL from groin downwards]

Normal Colour indicates → Mild ischaemia.

Postural Changes indicates -> Moderate ischaemia.

☆ <u>Burger's Test</u> (Elevate the limb gradually)

Normally, limb not affected by elevation.

N.B.: Burger's Angle: It is angle at which.

Limb becomes pale on elevation from horizontal.

So: The Smaller the angle the advanced ischaemia.

Fixed Colour indicate → Severe ischaemia (Pregangrene).

Ruber (Capitas Blad) - 25 5-1

Band

Pirilled of

1985W riego angle - Pain not

Pallor

> Elevation of ischaemic limb cause Pallor Serve > Lowering of ischaemic limb cause Cyanosis. Rapit declaration of blood



230 - Praymyra

speedial test?

N.B.: @ Capillary Circulation Test: (When we press on nail bed 2 sec)

- · Normally : Blanching then rapid return to normal colour.
- · If Delayed: Ischaemia, Stungish Cupiles Circulation
- · If No Return : Gangrene.

(even the black colouration not present).

N.B. : @ Harvey's Venous Refilling Time : " Sold Street for the lars of

- Elevate the limb till vein empty then allow dependency and record time of filling veins.
- · Normally: (5-10) sec.
- IF (a) Mild (10-30) sec.
 - (b) Moderate (30-120) sec.
 - (c) Severe (>120) sec. i.e. > 2min. (Pregangrene)

F Functional Changes:

- * Motor Disturbance
 - · Gradual atrophy & loss of strength of the muscles.
 - 1st muscle showing atrophy of the lower limb is <u>Vastus Medialis</u> muscle
- . Sexual Disturbance = Impotence [Leriche's Syndrome] 5-4dla Sheps throughts
 - Aorto-iliac block with occluded both internal iliac arteries →
 Occlusion of Median Sacral Artery which supplying nerve erigentes
 (S_{2,3}) which responsible for Erection.

* Investigations :

1 Clinical Investigations :

(I) Clinical Tests To Determine the Degree of Ischaemia :

- Degree of Pain : O Claudication Time.
 - O Claudication Distance.
 - @ Rest Time.
- · Colour Changes : OBurger's Test & Angle.
 - Capillary Circulation Test.
 - 4 Venous Filling Time.

(II) Clinical Tests To Determine the Level of Ischaemia:

- Site of Claudication Pain.
- Leriche's Syndrome.
- Level of Coldness.
- Level of Absent pulse.

2 Laboratory Investigations :

(1) Urine Analysis: For Sugar.

(II) Blood:

- · Complete Blood picture for Anaemia.
- Blood Sugar Curve for D.M.
- Blood Urea & Kidney Function Tests.
- Serum Cholesterol & Lipid.

3 Radiological Investigations:

(1) Arteriography [The Main Methods].

Indicated if Direct Arterial Surgery is indicated.

Value: Shows ① The Condition of arteries.

The Site & Length of obstruction.

The Collateral circulation.

4 Distal Run off (agad) i.e. distal flow beyound

the occlusion.

Methods: O Direct Percutaneous Femoral Arterigraphy.

@ Direct Trans-lumbar Aortography. If Commen Nacc

Ante-grade Trans-brachial Aortography.
 Aorta

@ Retro-grade Trans-femoral Aortography. The femoral

N.B. : The Needle which used called Seldinger.

Hazards: O Dissecting Aneurysm.

@ Haemorrhage.

3 Spasm & Thrombosis.

Dislodgement of plaques = <u>Embolism</u>.

(A replaces)

(II) Digital Subtraction Angiography [D.S.A]

Less Invasive.

+ 6.1.

quide

The day is injected I.V to reach the heart then Computerized subtraction image.

Needs computer for inter-pretation.

(III) Magnetic Resonance Angiography

Less Invasive.

No dye used.

More recent & More accurate.

4 Instrumental Investigations:

(1) ECG & ECG Stress Test: (Demonestrating) 3

The Coronary Arterial Disease.

The Condition of Myocardium.

(II) Doppler Ultrasound: (It's value) &

* To Detect

The blood flow along an artery in which the pulse palpable or not,

② Degree of ischemia.

Site of obstruction.

To Measure (Ankle-Brachial pressure index)

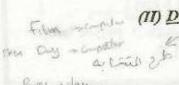
Which is the Ratio between pressure in both ant. Tibial Artery i.e. (Ankle) & Brachial Artery Which is normally > 1. - 1/2

If < 0.9 = mild to moderate ischemia.

If < 0.7 = severe ischemia.

If < 0.3 = Impending gangrene.





LL >UL

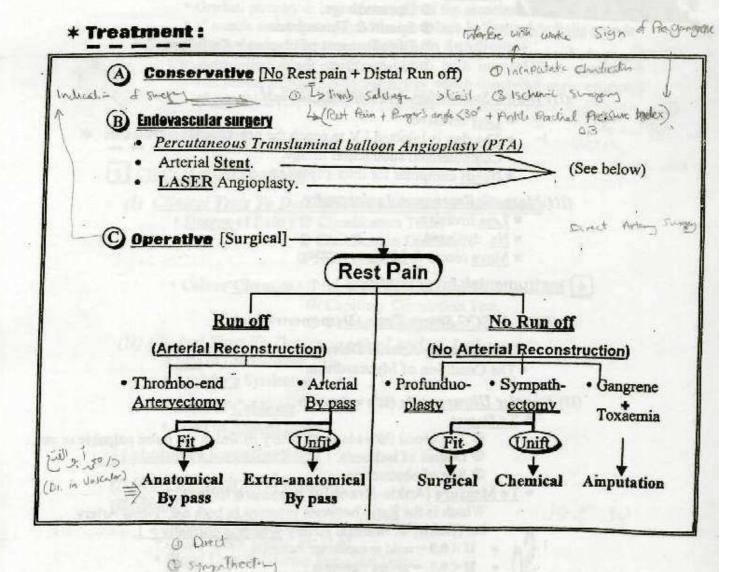
(III) Coloured Duplex:

- The most important investigations.
- It combines imaging of vessels & reveal blood flow.
- Coloured image shows →
 - 1 Blood flow.
 - Degree of ischemia.
 - 3 Site of obstruction (Image)
 - 1 State of collaterals (Image)
 - (5) Velocity of the flow.

(IV) Plethysmography:

(3 OTHER

- Through application of a cuff over the limb, which is attached to a painter over a drum.
- It can draw a curve representing the changes which depend on the arterial flow in the limb.



Trust alleter 6 5



Distal Run off (Feasible).

O Contraindicated to surgery as pt. With Heart Lesion. or Advanced malignancy

· Methods :

(A) Relief of Symptoms

- 1 Improve General Health & Tissue oxygenation:
 - Correction of Anaemia.
 - Correction of Any associated lesion e.g. Heart Lesion.
- @ Pain Relief:

· Claudication pain : Morphia (Better Avoided) i.e. Addiction.

Protection of Ischaemia Parts:

. Carefully Washed, Dried & Powdered ischaemic parts , Later digital function with uses of Suitable Shoses. with uses of Suitable Shoses.

. Nail & Corns are cut continously. Trans of roll and a least

Improve Blood Supply:

V.D. drugs as Trental or PGE₁.

Antiplatelets Aggregation as Persantine or Aspirin.

(B) \$\progression of the disease

1 Stop smoking & Regular exercise i.e Burger Excercises

@ Proper control of D.M, Hypertension ...etc

Endovascular surgery

Indications:

Day case surgery (No hospital stay)

@ Suitable only for localized occlusion in a large & medium sized vessels.

2 Suitable for unfit for surgery.

But restenosis or thrombosis may occur later.

Methods:

@ Percutaneous Transluminal balloon Angioplasty (PTA)

Frank didation . A special balloon catheter is introduced at site of narrowing of the blood vessel. The balloon is inflated to dilate the stenosed segment.

Rarely successful with arteries below knee or segment > 10cm.

@ Arterial Stents : (After balloon dilatation)

A stent is introduced to keep the lumen patent.

@ LASER Angioplasty:

Destruction of the atheromatous plaque by LASER. Through vaporization.

> SE - lead to Thrombonis

M General Condition in Good

1 Arterial Reconstruction: Indicated with [Rest pain + Run off]

[A] Thrombo-endo-arteryectomy:

(in mult) interpretable < S.E. P. (Proble)

Indications ① As Above [Rest pain + Run off].

O Localized Obstruction.

(1) Large Arteries.

■ Technique: ① Arteriotomy then Removal of thrombus & thickened atherosclerotic intima leaving a patent lumen.

Defore closing, The distal intima should be attached to Thrombodic - By Pub arterial wall by interrupted sutures to prevent it's dissection later on.

After closing the patent lumen will be endothelialized.

The Instrument which is used called [Arterectomy Loop].

[B] <u>Arterial By Pass</u> :

@ Multiple Lesions.

② Large & Medium sized Arteries.

. Technique : -

Anatomical By pass (10.00) Extra-anatomical by pass (Fit Patient) (Unfit Patient) e.g. Aortoiliac Block 3 e.g. Bilateral e.g Unilateral Common Iliac Block Common Iliac Block e.g. Femoro-popliteal Block % Axillo-femoral Graft

Types of Grafts:

1 Synthetic Grafts [e.g. Aorto-Iliac Graft]. (No Tronbutt , No Conjected - After out tody) By void - decrease by time

It may be (a) Teflon or Dacron.

(b) Poly Tetra Flouro Ethylene (PTFE).

② Natural Grafts [e.g. Femoro-Popliteal Graft].

It may be (a) Reversed long Saphenous Vein

N.B.: Reversed to avoid obstruction by it's valves.

الاف وتدالان حل

(b) In situ long Saphenous Vein N.B.: Valves are destroyed by a stripper.

مكرة تفاويو الباديات

awas C Leonto

god dist run off

Femoro-Femoral Grafts

NV. Fitulo

2 Non Arterial Reconstruction : Indicated with [Rest pain + No Run off]

[A] Profundoplasty:

■ Indications ① As Above [Rest pain+ No Femoro-Popliteal Run off].

2 Narrowing of Profunda Femoris Artery (P.F.A) With superficial

Dilatation of (P.F.A) to give adequate blood supply to lower limb Using venous patch.

As Atherosclerosis may affect the osteum of the profunda only the main trunk is healthy.

[B] Lumbar Sympathectomy: A Ulcar.

Indications : 1 As above [Rest pain + No Run off].

After Amputation to help wound healing.

■ <u>Technique</u>: ① <u>Fit</u>: (<u>Surgical</u>)

(Preganglionic Section of L_{2,3} Ganglia).

Unfit : [Chemical]
 (Paravertebral Block of L_{2,3} Ganglia).

(a) Temporary: 1% Lignocain as test to show

patient suitable or not to surgical sympathectomy.

(b) Permenant: 5% Phonol in H2O

N.B.: Lumbar Sympatectomy Contraindicate with

· Gangrene i.e. Ineffective.

· Intermittent Claudications if severe.

[C] Amputation: There are 2 Possibilites

[I] | Conservative Amputation

■ Indications: ① If Good blood supply of adjecent tissues..

② If <u>Line of separation & demarcation</u> are well defined.

• Technique: ① Excision at line of demarcation.

@ The skin should be neither redundant nor undertension.

[II] Urgent High Amputation

Indications: ① If Spreading gangrene.

② If Uncontroled Infection & Toxaemia.

Technique: 1 (A.K.A.) Above Knee Amputation

(B.K.A) Below Knee Amputation - Population

\ nine o

R-A

B) (Arteritis

☆ D Burger's disease "See below"

- @ Infective Arteritis may leads to aneurysm.
- @ End. Arteritis Obliterans of (\$ & rarely T.B) not seen because of successful treatment.
- @ Takayasau's Arteritis (Auto immune disease, affect young female & Treated by Cortison).
- @ Polyarteritis Nodosa (Collagen disease, Associated with Scleroderma & Systemic Lupus).
- @ Purpuric flumenans i.e. Purpuric arterities.



[Thrombo-Angitis Obliterance]

* Definition :

Inflammation & Thrombosis of small arteries and veins with perivascular fibrosis which blends (Artery, vein & Nerve) into one mass, causing early Neuritis & Severe Rest pain.

* Aetiology:

Unknown But may be intiated by Spasm & followed by thrombosis & perivascular fibrosis. The Actiology of spasm is mainly due to Smoking.

(I) Atherosclerosis	(II) Burger's disease	
Common (> 40 years). Males, possibly Females.	Rare (< 40 years). Male 95%.	
Atheroma & Thrombosis. Calcification.	Inflammation & Thrombosis No Calcification	
No Upper limb ischaemic sympte No Superficial Thrombophlebitis	Upper & <u>lower</u> limb are involved. Superficial Thrombophlebitis.	
Calf Claudication. Absent (Popliteal pulse).	Sole Claudication. (Early) Present (Popliteal pulse).	
Late Rest pain & Massive gangrene No Raynaud's Phenomenon	Early Rest pain & limited gangrene Raynaud's Phenomenon.	
Calcification. Irregular Narrowing of main arteries. Proximal block & distal Run off.	No calcification. Not needed because of Distal block with no run off.	
Stop Smoking → ↓ Disease. Arterial by pass (The Main).	Stop Smoking (The Main). Arterial bypass (No Value).	
Sympathectomy (No Value). Urgent High Amputation.	Sympathectomy (The Best). Conservative Amputation.	
	Common (> 40 years). Males, possibly Females. Atheroma & Thrombosis. Calcification. No Upper limb ischaemic sympte No Superficial Thrombophlebitis Calf Claudication. Absent (Popliteal pulse). Late Rest pain & Massive gangrene No Raynaud's Phenomenon Calcification. Irregular Narrowing of main arteries. Proximal block & distal Run off. Stop Smoking → ↓ Disease. Arterial by pass (The Main). Sympathectomy (No Value).	

© Vasospastic Disorders

- ☆ ① Raynaud's Disease "See below"
 - Acrocaynosis.
 - (5) Causalgia.

- @ Erythocynosis Frigida (Bazine Disease)
- @ Erythromylagia.
- @ Sudeck's Atrophy.

Raynaud's Disease

* Definition:

Vasospastic disease affecting digital arteries.

* incidence:

It affects young female, Bilaterally & In Cold Weather.

* Actiology:

Unkown, But may be arteriolar over-sensitivity to Cold.

N.B.: The Spasm is not due to sympathetic overactivity

* Clinical Picture :

- During the Attacks: (3 phases).
 - . Pallor: Due to Arteriolar spasm

N.B.: Pain is Dull aching

Cyanosis : Due to spasm → ↑ Metabolites → Congestion & Cyanosis.

N.B.: Pain is Burning

• Rubor : The attacks end & the arterioles relax.

N.B.: Pain is disappeared

Between the Attacks: (Normal)

In Late Cases:

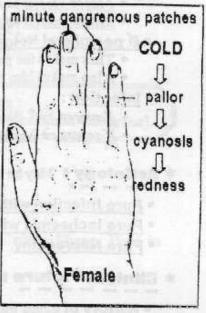
- Trophic Changes: @ Brittle Nail.
 - D Loss of Hair.
 - Dry & Scaly Skin.
- · Superficial Ulcer
- Dry gangrene of digits tips

* Management: Only successful in early cases.

- Conservative Treatment: [Avoid Cold + Vasodilator drugs as Trental].
- Sympathectomy: With severe cases.
 - Good result immediately occur but after few months, mild sensitivity to Cold returns. i.e. Raynaud's disease not due to sympathetic overactivity.

N.B. : Raynaud's phenomenon = (known cause) 2ry to

- Occupations using vibrating tools as Drills, typists or pianists. Or associated with certain disease as Burgers, Rheumatoid arthritis & Thoracic outlet syndrome
- © Treatment: Change the occupation (No value of sympathectomy) + V.D



D Winbetic Foot Infection & Gangrene

* Definition : B patients are susceptible to serious foot infection & gangrene.

* Predisposing Factors : It may be &

Vascular affection :

- * Major vessels as Atherosclerosis i.e. & Macroangiopathy.
- Minor vessels as Arteritis i.e. D Microangiopathy.

Ø peripheral Neuropathy :

- · This makes the patient unware of injuries.
- Also makes him neglect the Trophic changes.

Infection:

- Favored by T Blood sugar which act as good media for infection.
- If severe → Moist septic gangrene.

* Actiology: May be due to one of the following or Mixed ...

- Pure Infection with No vascular affection → Moist septic gangrene
- Pure Ischaemia with No infection → Dry gangrene.
- · Pure Neuropathy.

* Clinical Picture :

- History of minor trauma of p foot.
- Foot infection, Offensive odour & Black discoluration if gangrene occur.
- Complication as Osteomyelitis.

* Investigation:

- Urine Analysis & Blood Sugar Curve for <u>D.M.</u>
- Culture & Sensitivity for <u>Discharge</u>.
- " X-ray on foot for Osteomyelitis.

* Management:

- [1] Prevention: Treatment of all Predisposing Factors.
- [2] Active Treatment: [D foot infection not successfully controlled except after draining of pus].
 - O Draining of pus.
 - @ Proper controle of D.M.
 - Antibiotics according to Culture & Sensitivity Test.
 - Excision of gangrenous parts.
 - Glycerin Magnasia dressings.

N.B. : No Role of Sympathectomy because pt. is Auto-sympathectomized.

[3] Treatment of complication:

- Conservative Amputation if osteomyelitis.
- Or Urgent High Amputation if marked gangrene & toxacmia.



- * Definition : Death & Putrefaction of a Macroscopic Tissue.
- * Actiology: It may be &
 - D 2ry to Arterial obstruction [Acute or Chronic].
 - D Venous gangrene "Phlygmasia Cerulae Dolans".
 - (3) Neuropathic gangrene "Leprosy"
 - ① Infected: [Infective D gangrene & Gas gangrene].
 - (injury)].
 - @ Physiochemical: [Burn & Frost bite].

N.B.: The commonest 2 causes are :

[Infective Gangrene & Atherosclerotic Gangrene]

* Clinical Types : According to the Cause :

• Dry Gangrene:

Occur with Chronic Ischaemla.

• Characterized by: Shrunken in Size, Wrinkled in Shape, Hard in Consistancy & No Odour.

Moist Aseptic Gangrene:

Occur with * Acute Ischaemla i.e. Reflex spasm of near by vein.

. Chronic ischaemla i.e. On Top of pre-existing oedema as H.F.

 <u>Characterized by</u>: Swollen in size, adematous, <u>Mild</u> toxaemia & offensive odour <u>without</u> pus gangrene spreads <u>rapid</u>.

Moist Septic Gangrene:

Occur with infected gangrene, i.e. Diabetic foot

 <u>Characterized by</u>: Swollen in size, adematous, Marked toxaemia & offensive odour with pus-gangrene spreads very rapid.

* Sequelae: Progression of gangrene: [one of these may occur].

Death from progressive spread & severe Toxaemia.

If Blood Supply Adequate for Adjecent Tissues:

 <u>Line of Demarcation occurs</u> between dead & living tissues. Which is a band of hyperaemia & Anaesthesia.

Line of Separation occurs At which the dead tissues start to fall which is
ulceration & guttering appears & deepens off to
continue the separation.

If Blood Supply Poor for Adjecent Tissues :

- · Line of demarcation, appears very slowly i.e. vague.
- · No Line of Separation, Because gangrene spread by skip patches.

* Cardinal signs:

5 cardinal signs of local death are:

1. Loss of pulsation .

- 2. Change of skin colour into blue and later black.
- 3. Loss of heat.
- 4. Loss of sensation.
- 5. Loss of function.

The sentence "Press and See How Colour Fades" is a good reminder of these signs.

* Special varieties of gangrene:

[1] Senile (Atherosclerotic) gangrene

The gangrenous process is usually precipitated by slight trauma

 The onset is often preceded by signs and symptoms of progressive ischaemia, such as intermittent claudication pain.

The slough may separate leaving an ulcer.

 The big toe is the commonest site for the onset of the disease which spreads to the foot or neighbouring toes.

[2] Traumatic gangrene:

Due to local injury, and or bed sores.

- (A) <u>Crushing</u>: leads to moist gangrene. Amputation is performed close to the damaged part to leave a useful limb.
- (B) Bed sores (decubitus ulcers) affect bed-ridden patients

Decubitus Ulcer (Bed Sores)

Procleitating Factors :

1) Pressure of the bed over bony prominences.

2) Pressure of Plaster cast or Thomas splint over the skin.

Commonest sites:

Sacrum, ischeal tuberosity, greater trochanters, heels & scapular blades.

Treatment:

[A] Prevention:

1) Soft bed, water or air mattress.

2) Pressure areas protected by air tyres.

 Repeated turning of the patient with massage of the back with alcohol or talk powder.

[B] Curative:

Repeated dressing with glycerine Magnesia to help slough separation

[3] Venous gangrene:

This is a rare condition caused by extensive thrombosis of the ilio-femoral (phlegmasia cerulea dolens).

* Treatment of gangrene: See Amputation (page 154).

Congenital:



It may be (True, False or A/V fistula).

- * Definition : Sac filled with blood & communicating with the lumen of an artery.
- Classifications: They can be classified according to I, II and III

(I) <u>Actiology of the Ancurysm</u>

(20 Solemic, renal & Cocke arrang ☼ Commonest in Circle of Willis (Berry's Aneurysm) → Sub-arachnoid Hge.

Acquired: (A) Pathological: The Commonest Causes:

Atherosclerosis: (The commonest cause Nowadays).

• \$, affect Aortic Arch.

 Subacute Bacterial Endocarditis → Infected Emboli → Mycotic Aneurysms.

Collagen Disease c.g. Behcet Disease, Marfan' Syndrome.

(B) Traumatic:

 Weakening of the all of the artery and dilatation later (True Anenrysm).

 Interruption of the wall leading to <u>Pulsating Haematoma</u> which when organised forms an ancurysm (False Ancurgem).

(II) Structure of the Aneurysm

 True aneurysm: The wall of the aneurysm is formed by the stretched wall of the artery (3 layers). (wechin - nation - Adventin)

■ False aneurysm: The wall is formed of fibrous tissue due to organization of pulsating haematoma.

(III) Shape of the Aneurysm

(A) Fusiform.

(B) Saccular.

(c) Dissecting.



Don't Forget

butween later

of B.V.

(False Aneurysm)

(Pulsating Haematoma)

<u>Definition</u>: Extravasated blood from partial torn artery.

· Actiology : Trauma.

- Mechanism: Trauma → Blood filled sac which communicating the Torn artery & Lined with compressed surrounding Tissues.
- Clinical Picture : As True Aneurysm · Complications:
- <u>Treatment</u>: Evacuation (Not Excision) <u>Then</u> arterial repair by suture.

care church

* Clinical Picture: May be Silent

A General Examination

· To Detect the Cause e.g. \$, Atherosclerosis, SBE ...etc

B Local Examination

Inspection:

Usually <u>Single</u>, <u>Along the Course</u> of an artery, variable in size & <u>Rounded</u> in shape with <u>Smooth</u> surface.

Course in all direction

- Expansile pulsation are Seen.
- · Proximal pressure Reduces the size & pulsation of the aneurysm.
- · Distal pressure Increases the size of the aneurysm.
- ★ (Compression on adjacent structures

Ocdema (i.e. Compression of main veins), Colour & Trophic changes (i.e. compression of main Artery) & Paralysis (i.e. compression of nerve).

Palpation:

- Usually <u>Single</u>, <u>Along the Course</u> of an artery, variable in size & <u>Rounded</u> in shape with <u>Smooth</u> surface.
- · Expansile pulsation are Feft with systolic thrill which propagated distally.
- Moves side to side Across but not along the course of an artery.
- Compressible (but Absent if filled with a thrombus).
- * (Compression on adjacent structures

Oedema (i.e. compression of main veins), The distal pulse is delayed or weak (i.e. compression of main Artery) & sensory loss (i.e. compression of nerve).

Auscultation : Systolic Murmur.

moul

* Complications: It may be &

[A] Intrinsic O Rupture: The Most serious.

② Infection → Suppuration → Rupture → Haemorrhage.

Thrombosis or Embolisation with detached thrombi.

1 Distal Ischaemia due to: (a) Thrombosis of the aneurysm. by The the

(b) Compression on Main artery.

(c) Embolization.

(d) Associated Atherosclerosis.

[B] Extrinsic ① Compression Vein → Oedema & Varicosities.

② Compression on <u>Artery</u> → Ischaemia Changes.

○ Compression on <u>Nerve</u> → Impaired Sensation ± Paralysis.

⊕ Compression on <u>Bone</u> → Erosion may occur.

XABd. Mass a frond present copy - Anopyl of Aceta 12,000 0 ac By Knee Elbert Postinia Robotion Strapper -

* D.D. : Aneurysm must be differentiated from &

Transmitted Pulsation: which is Characterized by: Not expansile, pulsation disappears if you push it away from the artery & Not 1 in size if you compress the artery distally e.g pseudo-pancreatic cyst.

 Puslating Tumor: e.g. Vascular Sarcoma. (Sing Sarcoma) Irregular in shape, Ill defined, Not compressible & Not overlie the line of main artery.

 A-V Fistula: Which is Characterized by: Machinary (continuous) murmur propagated Distally + Proximally, Tachycardia & Branham's sign +ve.

N.B: If Clotted Aneurysm must DD from Anatomical L.Ns

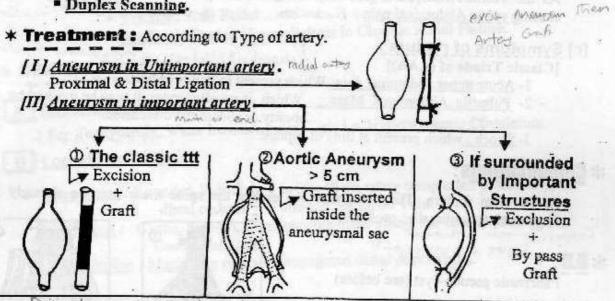
* investigations:

Plain X-ray: For Calcified plaques or Eroded bone.

Anoi-osim & Osins Arteriography: Useless if Clotted aneurysm.

Sonar & CT scan :The Choice.

Duplex Scanning.



N.B.: Aneurysmorrhaphy: Types 3

1 Restorative Aneurysmorrhaphy:

For saccular aneurysm, excision of aneurysm & closure of the defect by venous patch.

Leuch to

SUMPE Pain

② Reconstructive Aneurysmorrhaphy:

For fusiform ancurysm, excision of aneurysm & closure of the defect by multiple sutures over a catheter which is removed before the last suture.

Obliterative Aneurysmorrhaphy:

Oblitration of the aneurysm if unimportant artery.



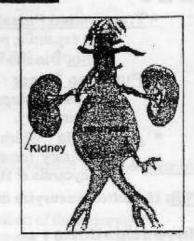
Abdominal Aortic Aneurysm

*Incidence

- The commonest Arterial Ancurysm
- Age: 50 60 Years Sex : Male > Female



Atherosclerosis is the commonest cancer (95%.)



* Clinical Picture:

[A] Asymptomatic (75%) Discovered accidentally during a routine radiological study for other reason.

[B] Pain:

As the Aortic Aneurysm is gradually enlarged & compress the surrounding structures Disc prolupes e las cosis causing vague Abdominal pain . Backache

[c] Symptoms of rupture : [Classic Triade of (AAA)]

1- Acute upper abdominal pain: Which present in flanks or back .

2- Pulsatile Abdomimal Mass: Which is usually tender. It may be masked by obesity or abdominal dissension.

3- Shock: which present at time of rupture.

leukart = apulias

Interpretation lenkage - Retro Portural Hernatura

* Complications:

Rather than rupture. The Aneurysm can erodes the spine these may be wrongly

diagnosed as lumbar disc prolapse. Compress - nere - Panikada

* D.D:

Pancreatic pseudo-cyst (see before)

IVE = DVT (bilateral)

* Investigations:

As before Spal CT

I Rupture

* Treatment :

TIT of Shock ■ If Asymptomatic & < 5 cm followed be sonar /6 months .

■ But if > 5cm → surgical graft inserted inside the Aneurysm

Endluminal stented graft is indicated with high risk patient who con not tolerate general Anaesthesia.







3 Lilve Elud





Arterio -Venous Fistula

* Definition:

Abnormal Connection between an Artery & a Vein.

* Types:

It may be

- Aneurysmal Varix i.e. <u>Direct</u> Communication.
- Varicose Aneurysm i.e. False sac Communication.

* Actiology:

It may be &

- · Congenital [Local Gigantism].
 - · Usually Small & Multiple.
 - Common at <u>lower limb</u> → Giant limb.



· Trauma: Stab, Bullet ...etc

· Artificial: During Haemodialysis in Chronic Renal Failure.

* Clinical Picture :

A General Examination :

For Tachycardia, Water hummer pulse ...etc i.e. Hyperdynamic Circulation.

B Local Examination:

Inspection: Rounded, Pulsating, ↓ in Size (if the artery compressed proximally) & distal oedema + Pulsating Varicose Vein.

Palpation: Cystic, Smooth, Compressible mass along the course of artery & Continuous Thrill.

Auscultation: Machinary murmur propagated distal & proximal.

Special Test: [Branham's Sign]

Slowing of Heart Rate as soon as the Fistula is compressed.

* Investigation: Arteriography, Doppler & Duplex.

* Complications :

Chronic ischaemia, 2ry V.V., Heart failure & if ruptured → bleeding

* Treatment:

According to the cause

- Congenital: No surgery except if Single → Excision + Vascular repair.
- Acquired: Excision + vascular repair.

If Failed > Ligate Proximally & Distally i.e. quadriple ligation.
then by pass graft.

N.B.: Gel foam embolization may be used in small fistula



Aneurysmal varix



Varicose aneurysm





Final Written Exams



4000	ъ
1447	

• Discuss Causes, C/P & ttt of Acute Ischaemia of L.L (

(15 Marks)

1993

• Discuss Causes & Diagnosis of Chronic Ischaemia of L.L.

دور ثانی (10 Marks)

1994

• Discuss Actiology, Types & C/P of Arterial Ancurysm

(15 Marks)

• Stab Wound in the Femoral Triangle :

Complications and Management

يور ثاني (10 Marks)

1995

• Discuss Acute Arterial Injury as regards

(15 Marks)

Path. types & C/P (Not including sequelae)].

• Discuss Actiology, Path., C/P & Investigations of Embolic gangrene.

نور ثاني(Marks)

1996

• Mention Causes & Discuss complications of

Acute Ischaemia Lower Limb.

(15 Marks)

(1997)

• Discuss the Diagnosis of Acute Ischaemia

(15 Marks)

1998

 <u>Discuss</u> the Classification of Arterial aneurysm (According to aetiology, structure and shape), C/P & Complications

ىرر ئان (15 Marks)

1999

• Discuss causes & complication of Acute limb ischaemia

دور ثانی (15 Marks)

Discuss C/P & Complications of Aortic Aneurysm

(15 Marks)

2000

Discuss Arterial Embolism of lower limb

(20 Marks)

2001

Discuss Actiology, C/P of Ancurysm

(10 Marks)

2002

* Discuss Actiology & C/P of Acute embolic Ischaemia of lower limb (12 Marks)

2003

* Mention C/P, investigations of Burger's disease

دور ثانی (12 Marks)

* Discuss types & diagnosis of arterial injuries

دور ثانی (12 Marks)

• Discuss path, c/p & management of Diabetic foot & gangrene

(20 marks)

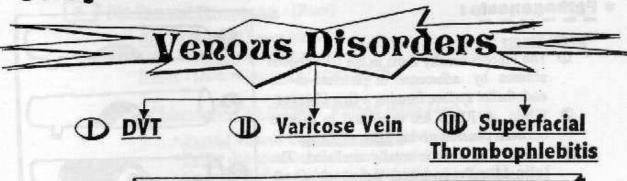
2004

• Discuss Aetiology, Types. C/P & management of Arterial injuries (20 marks) دور تاني

Chapter [12]

enous Diseases

Chapter[12]



Deep Venous Thrombosis (DVT

* Definition :

DVT means thrombosis in the deep veins.

* Types:

I make the same	Phlebothrombosis	Thrombophlebitis
Definition	Thrombosed uninflammed veins	Thrombosed inflammed veins
Causes	Stasis or hyperviscosity	Draining inflammed organs
Site	Common with leg veins	Common with pelvic veins
Size of 1ry thrombus	Small	Large
Emboli	Common & Sterile	Rare & Infective.

* Incidence : [Risk Factors].

- Common (>50%) after operations as Prostatectomy & fracture Neck femur.
- Common site is Calf veins because of Being valveless & sinusoids.

* Actiology :

•[Vircow's Triad]

[1] Changes in Vessel Wall i.e. Endothelial Damage.

<u>Either Trauma</u> to venous wall e.g. During pelvic operations.

<u>Or Inflammatory</u> process near the vein e.g. pelvic sepsis.

[2] Changes in Blood Flow i.e. Venous Stasis

<u>Either Prolonged Recumbancy</u> As shock or Heart failure.

<u>Or Venous Compression</u> by Tumor or Pregnant uterus.

[3] Changes in Blood Composition i.e. Hypercoagulability.

Either Oral contraceptive pills or polycythaemia.

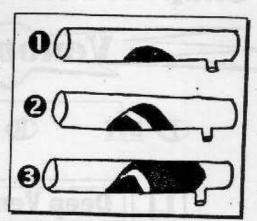
Or Deficiency of (Antiprothrombin III) or deficiency of protein C & S which are normal anticoagulant

Other Causes as: Old age & Previous DVT.

* Pathogenesis:

Early Stages :

- The Process usually starts in the Calf venous sinuses by adherence of platelets to the endothelial surface forming a Gry Cluster.
- ② Fibrin & RBCs are deposited in a layer between platelets giving Line of Zahn.
- When The vein is totally occluded. The <u>Iellu-Like Propagated</u> thrombosis spreads upwards as far as the near major tributery.



N.B.: At This Stage, pulmonary Embolism occurs because of loosely attached thrombus.

"Late stages :

- The Thrombus becomes tightly adherent to the venous wall producing Destruction of valves + occlusion of lumen = Post-Phlebitic Limb.
- (5) Reconalization occur by fibrinolysis but the valves are permenantly destroyed.

* Clinical Picture:

- * Asymptomatic group i.e. Most of cases are Silent, or unexplained fever & Tachycardia
- Symptomatic group
 - Pulmonary Embolism may be the 1st manifestation.
 - The Classic picture ① Pain: Aching discomfort related to Calf or Thigh.
 - ② Swelling i.e. Oedema (The reliable physical sign).
 - 3 Tenderness on pressing muscles against bone.

N.B.: Symptoms & Signs depend on the level of thrombosis

So There are [4 Possipilities] &

1 Deep Calf Veins Thrombosis : [The Commonest]

- Site : Affects Venous Sinuses of Calf muscles especially Soleus.
- <u>C/P</u>: Tenderness & Tense oedema affect Calf muscles.
- Exam. : Homan's sign

(Sudden dorsiflexion → Calf pain by stretching veins)

N.B. : Homan's Sign (Not done)

To avoid spread of thrombus to circulation.

2 Femoral Vein Thrombosis : [Less Common]

- Site : Affects Leg & Distal Thigh.
- C/P : Severe Tenderness.
- Exam. : Femoral vein Felt as a Tender, Firm Cord in femoral Δ.

N.B.: Femoral Vein Thrombosis

Occur as an extension of Deep Calf Thrombosis

3 Ilio-Femoral Thrombosis : [Rare]

- · Site: Affects all lower limb.
- C/P: The worst manifestations.
- Exam. : [According to The severity]

(A) Phlegmasia Alba Dolans: "Painful White Limb"

- Partial Venous Obstruction "less severe".
- · Pallor due to associated arterial spasm.
- Complicated by Coldness & Diminished pulsation

B Phlegmasic Cerulae Dolans: "Painful Blue Limb"

- · Complete Venous Obstruction "More severe"
- · Cyanosis due to (No Venous Return).
- · Complicated by Venous gangrene.

4 LV.C Obstruction : [The Rarest]

- · Site: Affects Inferior Vena Cava.
- · C/P : Manifestations affect both legs.
- · Exam. : Dilated Veins on Groin.

* D.D :

- 1 Contusion of Calf muscles: Confirmed by History.
- @ Rupture of Plantaris muscle : Excluded by Venography.
- Other causes of leg swelling: e.g. local gigantism, A.V fistula, cellulites osteosarcoma, venous odema or lymphatic odema.

4 Other Causes of Leg pain

- Arterial = Ischaemic pain.
- Venous = DVT & V.V.
- Lymphatic = Tender L.Ns.
- · Nerve = Sciatica.

- Muscle = Myopathy.
- Bone = Osteomyelitis.
- · Joint = Osteoarthritis & Osteoarthrosis.
- · Ligament = Flat Foot.

* Investigations:

① Venography: Most important but if reliable.

Deep veins are opacified & thrombi appears as filling defect

② <u>Doppler U/S</u> proves <u>absent</u> flow in completely obstructed leg veins & show incompetent perforators (Accuracy 85%)

② Coulured Duplex shows an image of veins & determine the direction of blood flow (Accuracy 90-100%).

Radio-iodine labeled Fibrinogen:

• Before Technique : Give KI to block Iodine uptake by thyroid gland.

<u>Technique</u>: Labelled fibrinogen with I₁₂₅.
 Will incorporated in <u>newly</u> forming thrombi which can be detected by scanning over it [so can't detect already formed thrombi].

• Value : It can be repeated daily, so that it is useful for follow up.

* Complications:

- Early Complications:
 - O Pulmonary Embolism :
 - ② Venous Gangrene with Phlegmasia Cerulae Dolans
- · Late Complications :
 - 1 2ry Varicose Vein.
 - ② Chronic Venous Insufficiency [Post-Phlebitic Syndrome]
 - <u>Cause</u> (follow Ilio-femoral Thrombosis & <u>Not</u> Deep Calf Thrombosis)
 due to † pressure in Deep veins i.e Reflux of blood from
 occluded deep veins. (Blow out syndrome)
 - <u>Characters</u> ① Extensive and indurated, i.e. Lipodermatosclerosis (Inverted Champagne bottle)
 - O Non pitting oedema (Fibrosis) & venous ulcer
 - High pressure in superficial veins accurs during walking (Walking Venous Hypertension)
 - · Complications of venous ulcer:
 - · Malignancy "Marjoline ulcer"
 - · Periostiteis : If fixed to tibia.
- * Treatment:



- Measures to Prevent Stasis & Improve Venous Return
 - Before Operation: ① Stop Oral Contraceptive Pills.
 - @ Regular Walking.
 - 3 Any heart lesion must be controlled.
 - - @ Pneumatic sleeves.
 - 3 Legs are slightly raised.
 - - ② Adequate Hydration.
 - 3 Leg Elevation 15-20 degree.
- Prophylatic Anticoagulants for High Risk patients:
 - Indications:
 - 1- Obesity
- 2- Old age
- 3- previous history of D.V.T

4- After major operation

5- Females on contraceptive piles.

- Methods:
 - [1] Low dose Heparim (Mini-heparim):

5000 IU S.C 2 hours before operations & then every 12 hours for 7 days.

[2] Low Molecular weight (LMW) Heparin:

Given once daily & has lower risk of bleeding so more popular.



1 Conservative ttt :

Aim To prevent: Propagated clot, Formation of new thrombi & Detachment or Embolization.

Regimen

Leg Elevation 15-20 degree & Elastic bandage

Anti-coagulants

Heparin I.V or S.C

· Action : † Activity of fibrinolysis.

Methods of administrations:

① I.V. (5000 I.U) every 4 hours.

Or ② I.V infusion of glucose 5% containing heparin at rate of 20-30 I.U/Kg/hour after giving initial dose of 5000 IU.

Or ③ S.C Heparin (Calciparin) 150 IU/kg every 12 hours.

The dose monitored by [APTT]
 Activated Partial Thrombo-plastin Time

Antidote: Protamine Sulphate

■ Complications : Bleeding from overdose & failure to response i.e. heparin resistant.

Oral Anticoagulants (Warfarin)

- Action: Block synthesis of (prothrombin & factor VII, IX and X).
- Methods: 10 mg Initially then 5 mg for 5 days.
- The dose monitored by:
 Prothrombin Time.

· Antidote : Vit. K.

■ <u>Complications</u>: Bleeding from overdose, interaction with Aspirin, Hypertension & Peptic ulcer.

2 Fibrinolysins:

- As Streptokinase, Urokinase and Tissue Plasminogen Activator
- Complications: Severe bleeding, Allergic reactions and Very expensive.

3 Surgical : Rare

- Venous Thrombectomy with Phlegmasia Cerulae Dolans by Fogarty Venous Catheter.
- Pulmonary Thrombectomy with massive pulmonary embolism.
- I.V.C interruption to Prevent Recurrent Embolism.

II Varicose Vein

♦ <u>Varicose Vein</u> are Multiple, Dilated, Elongated, Tortuous, Soft, Bluish & Compressible veins of <u>Superficial veins</u> of lower limb.

Anatomical Considerations

Veins of Lower Limb:

The lower limb is drained by the following venous systems.

I- Superficial system : (Superficial to deep fascia).

It includes &

Greater (Long) saphenous vein :

It begins at the medial end of the dorsal venous arch of the foot and ascends infront of the medial malleolus to the medial aspect of the leg then behind the knee to the inner aspect of the thigh till the saphenous opening (1.5 inch below & lateral to the pubic tubercle) where it arches to join the femoral vein.

Major tributaries of the greater saphenous vein.

A- In the thigh:

- 1. Superficial Circumflex Iliac Vein.
- 2. Superficial Epigastric Vein.
- 3. Superficial Pudendal Vein.
- 4. Postero-medial Vein.
- 5. Antero-lateral Vein. -

B- In the lea:

- 6. Posterior arch vein.
- 7. Anterior vein of the leg.
- Tributaries from the short saphenous vein.

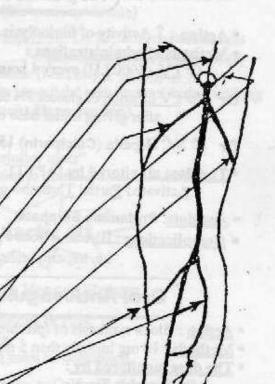
C- in the foot:

9. The dorsal venous arch.

② Lesser (short) saphenous vein :

Greater Saphenous System

It begins at the lateral end of the dorsal venous arch and ascends below & behind the lateral malleolus to run along the lateral edge of tendo-achilles in the posterior midline of the leg to the middle of the popliteal fossa where it pierces the deep fascia to join the popliteal vein.



II- Deep system: (Deep to the deep fascia)

It includes 3

Below the knee :

They consists of venae commitantes of the arteries + the venous sinuses inside the calf muscles (soleus).

2 The level of the knee :

They unite to form the popliteal vein which ascends to the thigh to become the femoral vein at the adductor canal the passes deep to the inguinal ligament to change its name into the external iliac vein.

III- The connecting system:

 These veins connect the superficial to deep veins (They have valves which allow a uni-directional blood flow from superficial to deep veins).

· They either &

Direct communicators = Perforators

Directly from superficial to deep veins.

SO The constant perforators of the

long saphenous are:

 3 Ankle Perforators 2, 4 and 6 inches above medial malleolus they drain blood directly from the venous plexus of the skin to the deep system.

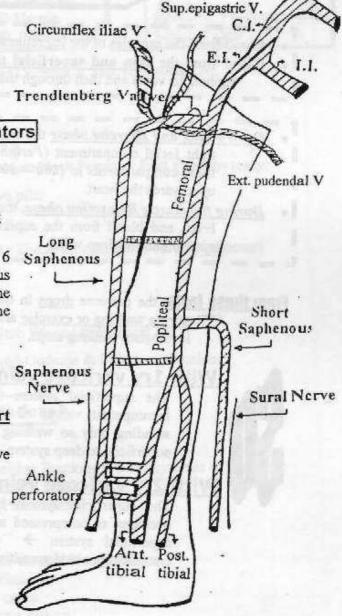
- · The sapheno-femoral junction.
- · 1 perforator just below the knee.
- · 1 perforator at the midthigh.

The perforators of the short saphenous are:

- I lateral perforator 5 inches above the lateral malleolus.
- The sapheno popliteal junction.

2 Indirect communicators

Veins passes from superficial vein to the muscles & another vein passes from the muscles to the deep veins.



Don't forget :

All vein are containing valves except at soleus muscle.

@Saphena varix:

- Saccular dilatation at sapheno-femoral junction.
- منافي = Saphena
- Varix = Dilatation.
- Long Saphenous vein is the longest vein all over the body.
- Sapheno-femoral junction = Trendlenberge valve.

Venous Pathophysiology

Blood from the muscles of the leg returns to the deep veins.

Blood from the skin and superficial tissues drains via the long and short saphenous veins and then through the connecting system to the deep veins.

On Walking and Exercise phase the calf and thigh muscles contracts within a tight facial compartment (Peripheral heart) rises the pressure within these compartments to (200 - 300 mmHg) → squeeze the deep veins up towards the heart.

During the muscle Relaxation phase, the pressure within the calf falls to a low level, and blood from the superficial veins flow through connecting

system into the deep veins.

From these facts, the pressure drops in the superficial veins of the lower limb during walking or exercise and returns gradually to the pre-exercise level when walking stops.



With 1ry varicose vein:

The superficial system is weak wall or absent valves or incompetent valves -> High pressure (heaveness pain) with standing only so walking or Exercise > shift of blood from superficial to deep system. So the pain is decreased

With 2ry varicose vein:

The superficial system is Normal but the deep system is occluded or compressed so during Exercise the blood shift to superficial system → (walking venous hypertension) → complications as dermatitis, ulcers & varicosities

@ (Actiology

due to

(1)1ry VV= non obstructive

- Congenital weakness of venous wall.
- Congenital absence or incompetent valves.
 - This is precipitated by :- Prolonged standing or sitting as (surgeons, hair dressers,etc)
 - · Due to weak mesenchyme :-

N.B.: Manifestations of week mesenchyme

- ① Kyphosis
- @ Flat Foot.
- 3 Visceroptosis.
- 4 Hernia.
- (3) Varicocele
- 6 Piles



N.B: 1 ry V.V associated with minimal Oedema & Skin complications.

(2) 2ry VV= obstructive | due to

- DVT (deep venous thrombosis) due to
 - > 50% Postoperative (old age) as Fracture Neck Femur or Post Prostatectomy.
 - → ↑ Risk of DVT as Oral contraceptive pils.
- Deep venous compressio, due to
 - > Pelvic or abdominal swellings. (N.B: The Most common swelling is Foetus).
- Arterio-venous fistula. may be
 - ➤ Congenital → If Child.
 - ➤ Acquired → If <u>Trauma</u> (Bullut or Stab Wound in Femoral Δ).

N.B.: 2ry V.V associated with Marked Oedema & Skin complications.

Complications

Venous Complications:

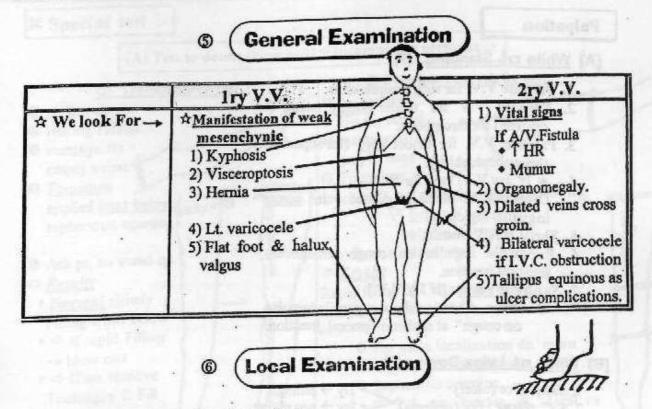
- 1- Hemorrhage: From minor trauma either Frank or S.C Ecchymosis or Bruises.
- 2-Superficial Thrombophlebitis of dilated veins
- 3-Calcification of thrombosed veins (Phlebolith)

② Skin Complications:

- 1- Brownish pigmentation due to extra-vasated Haemosidrins.
- 2- Dermatitis From irritant Haemosidrins...
- 3- Ulcer Common with post-phlebitic cases
- 4- Oedema: at 1st pitting but later on non pitting...
- 5- Eczema: Follows scratching of Dermatitis.
- 6- Malignancy: on top of long standing ulcer (Marjolin's ulcer)

(History

	in the Try V-Version.	es 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
O Personal H.		and the same of the later care
Name, Age, Sex Occupation.	(commonly) Adult and male or female. Precipitated factors.	• (Commonly) Old and may be child.
Marital status. Special habits	•	Multiple pregnancy. Tight corset.
O Complaint		Collins
1. <u>Pain</u> or 2. <u>Oedema</u> or 3. <u>Skin complication</u>	•At L.L (commonly <u>Bilateral</u>) •Minimal •Minimal	• At LL (commonly <u>Unilateral)</u> • Marked. • Marked.
O Present H.		
1. <u>Pain</u> ➤ O.C.D ➤ Severity ➤ Characters	(Commonly bilateral) O.C.D. Mild Heaviness pain burning localized pain due to superficial	(Commonly <u>Unilateral</u>) • O.C.D. • Severe • <u>Bursting</u> pain due to D.V.T.
➤ Increased by ↑ ➤ Decreased by ↓	thrombophlebitis. • ↑ with prolonged standing or sitting. • ↓ by Walking.	↑ with prolonged standing of sitting or by walking. ↓ by <u>Elevation.</u> of the affected limb.
2. Oedema	Mild & Appear at evening then resolute after sleep.	Marked & persist not related to time.
3. Skin complications	• ± Minimal	• Marked Brownish pigment Dermatitis. Ulcer
4. Associated swellings	Groin: e.g (Saphena varix) Abdomen or pelvis: -ve	• Groin : e.g (L.Ns) • Abdomen or pelvis : mass.
5. Investigations & ttt	• Usually -ve	• Usually + ve
Past H.	• No History suggest DVT	• Factors suggest ↑ DVT (see before) • Pelvic or abdominal mass e.g. compression on GIT. • Trauma (A/V fistula) • Bullut. • Stab wound
		DM & hypertension etc
Family H.	Congenital mesenchymal wall	



☆ Proper Position = Standing patient.

☆ Proper Exposur = from Umbilicus to toes.

☆ Don't forget: * Examination of both limb.

Examination of back as well as front & side.

· General examination part of local examination.

Inspection	1ry V.V	2ry V.V.
Inspection		nous, Visible Swellings"
1) <u>S</u> ide	• Usually (bilateral)	Usually (<u>Unilateral</u>) Except I.V.C. obstruction.
2) <u>S</u> ite	 Along course of veins, (long or short saphenous or both). Never crosses the groin 	Along any vein or venule. V.V. crosses the groin
3) <u>S</u> hape	• Tubular. • Saccular	• Serpantin. • Spider.
4) Skin over	• Minimal complications.	Marked • Pigmentation. Ulcer
5) Swollen limb (oedema)	• Minimal	• Marked
6) Skeletal deformity	Flat foot or hallux valgus.	Tallipus equinous.
* Look for (Inguinal region)	Saphena varix. Hernia.	• L.Ns.

edge wilk down

Congression to other ste

Palpation

[A] While pt. Standing: (7)

- 1. Palpate V.V. for soft, compressible.
- Palpate V.V for tender <u>nodule</u> (along the course) for thrombosis.
- Palpate V.V. for tender <u>cord</u> (for superficial thrombophlebitis).
- ★ If 2ry V.V. look for [®]
 Direction of blood of dilated veins across inguinal region.
- 5. Thrill if A.V fistula.
- Expansile impulse on cough at Saphenofemoral junction.
- 7. Saphena varix : [If 1ry V.V.]
 - * Saccular dilatation show expansile impulse on cough" at sapheno-femoral junction.

[B] While pt. Lying Down: (7)

- 2. S.C. tissue: For (oederna). 2ry → non pitting
- 3. Muscle: For(Tone & Tender calf muscle)

> Homan's Test (not done)

- 4. Bone: For (Periostitis of tibia)
- Vein: If defect in deep fascia.
 Artery: Arterial pulsation as dorsalis pedis artery.
- 7. L.Ns: Inguinal L.Ns.

Percussion Schwartz percussion

- The vein is percussed by index of one hand & palpate distally by fingers of other hand.
- If the valves are incompetent = The wave is transmitted distally.

Auscultation

If A/V. fistulla = Continuous machinary murmer.

Special Test

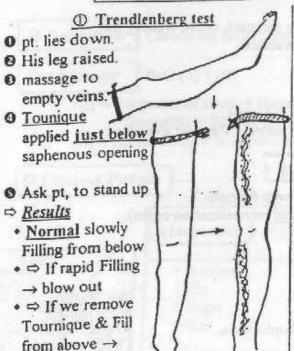


- (A) Test to detect (Blow out = Incompetent perforators):
 - O Trendlenberg Test
 - Multiple Tournique Test.
 - Manual Localization Test.
 - ⊕ Fegan's Test.
- (B) Test to Differentiate between occluded & patent deep veins :
 - O Perthe's Test.
 - @ Modified Perthe's Test.



Special test :-

(A) Test to detect (blow out) = Incompetent perforator .



@ Multiple tournique test.

o pt. lies down.

O His leg raised.

o massage to empty veins

O Tournique

applied Just below saphenous ring below Knee

above Knee

Ask pt, to stand up

⇒ Results

Rapid filling of a segment means that there is "blow out".

N.B &

O For more localization do more Tounique in the segmant

Saphenous opening :

-> 4 cm below & lateral to pubic tubercle.

'آهن' <u>O Manual localization Test</u> "Two finger Test"

A Pt, stand and The two index are pressed at a point on great saphenous vein-then empty at opposite direction.

☆ Results → If vein fill between two fingers → blow out.

Fegan's test أواقف ثم نائم

sapheno-femoral incompetent

Pt, stand & Then mark the varicositis.

(i.e blow out) then mark by (x).



(B) Test to diffrentiate between occluded & patent deep vein

D Perthe's Test (not done) : depend on pain .

ن الله عن Modified perthe's test : A pt, stand & tournique applied below saphenous opening.

"Ochsner's test"

Ask pt, to walk insitue for (10 min).

Results → 1- If engarge (prominent) → occluded deep system. patent deep system. 2- If shrunken -

Investigations 0

Venography:

To shows @ Patency & Size of deep veins. 2 Presence of valves or Blow out.

- Doppler U/S
- Arteriography for A/V. fistula.
- Abdominal & Pelvic sonar.

Treatment

Conservative Treatment

- Indications: ① Iry V.V. if early, patient is pregnant, unfit, waiting for. Or Refusing operations.
 - ② Post-operative V.V

O Periodic leg elevation to prevent stasis.

Avoid prolonged standing & sitting + Regular exercises.

(2) ! Injection-Compression Scierotherap

- Aim: To decongest by occlusion of lumen with fibrosis (Not thrombosis to avoid reconalization again).
- Indications: ① If Spider Varicosities. @ Residual after operations.
- Contraindications © 2ry V.V with DVT.

@ Pregnancy.

- 3 Acute Septic Thrombophlebitis.
- Sclerosing Materials:
 ① 3% Na Tetradecyle Sulphate.

② 5% Ethanolamine Oleate.

- @ 5% Na Morrhuate.
- Technique: Empty of segment of blood. Then isolated by 2 fingers. Then injection Then Firm elastic bandage is applied for 6 weeks.
- Precautions: ① Small dose (lmL).
 - ② One is done only then others at other visites.
 - Walking & Exercises are advised

Operative Treatment

- Indications ① Saphena Varix. ② Blow out.

 - Repeated superficial thrombophlebitis.

Operations

Trendlenbarg's operation:

- Indicated: with sapheno-Fernoral incompetence i.e saphena varix.
- Principle: ligation of long saphenous & it's tributaries.

Subcutaneous stripping of long saphenous:

- Indicated: if whole system is severly affected
- Principle: Trendlenbarg's operation then S.C stripping of whole long saphenous

@ Subfascial Tripple ligation of Incompetent perforators:

Indicated: with Incompetent perforators.

■ Principle: 3 ligature are applied on perforator & long saphenous vein then Inverting "T" Segment is removed



Don't Forget

Venous (Varicose) Ulcer

O Definition

Chronic leg ulcer complicating 2ry V.V (Rare 1ry V.V)

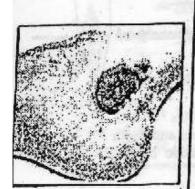
O Actiology

Both (A) + (B)

(A) = Stagnation of blood → Haemolysis → ↑ Haemosiderns → Brown pigment. + Dermatitis → Itching → <u>Ulcer</u>.

(B) = Reflux of blood to superficial veins → Anoxis → ↓ Skin vitality.

O Clinical Picture



AInspection

- Number
- · Site
- · Shape
- Size
- Edge
- Margin
- Floor
- Discharge

- · Usually single.
- · Leg (gaitre area).
- · Oval (usually).
- · Variable (in Cm x Cm).
- · Sloping edge or punched out edge.
- · Brownish pigment.
- · Unhealthy or healthy granulation tissue
- Pus (purulent discharge)

A Palpation

- O Temp.
- 9 Tendemess
- O Skin around
- O Base
- NAME OF THE OWNER,
- O Artery
- Vein
- L O L.Ns
 - O Nerve

- · At body temp.
- · (Not) Except if infected
 - or post-phlebitic limb.
- Thick, brown & varicosities.
- · (hard if chronic)
- · Normal pulsation.
- · Oedema.
 - If 1ry V.V. → pitting
 - If 2rv V.V. → Non pitting
- Not enlarged except (infected).
- · Intact sensation.

O Complications

- Malignancy: Marjolin ulcer which is Raised Everted Edge, Hard & Fixed
 Base with Hard L.Ns.
- 2 Periosteitis.
- 3 Talipes Equinous.

O Investigation

- & Lab., (blood, urine, stool)
- Aspiration Biopsy Cytology (A.B.C)
- A Biopsy (must include the edge)
- ☆ Specific to the cause, e.g. X-ray to exclude periosteities

OTreatment

- (A) Conservative ttt :- AS (V.V) + [Daily Dressing & Systemic AB]
- (B) Surgical ttt:
 - 1 Covering ulcer by:
 - (a) Thiersch graft
 - or (b) Cross Leg Flap,

N.B.: (Depridement must be done 1").



② Sub-fascial ligation of perforator (Cockett & Dodd operation)

- By passing from muscles to perforate deep fascia
- Through postro-medial incision behind Tibia.
- Complicated with ugly scar & high rate of recurrence.

3 Treatment of complications:

- Malignancy: Excision with safety margin 1cm of surface and depth with <u>plastic</u> reconstruction and Prophylactic block dissection of L.Ns.
- · Periosteitis: Saucerization.
- · Talipes Equinous : Physiotherapy.

111

Superficial Thrombophlebitis

- * Definition: Thrombosis of inflamed superficial veins.
- * Aetiology: ① Systemic: Polycythaemia, SLE. and Ulcerative colitis. ② Local: V.V. Trauma, Burger's disease & venous cut down.
- * Types: ① Sterile type. --- ② Bacterial type.
- * C/P: ① Symptoms: Pain + Fever, Headache, Malaise and Anorexia.
 ② Signs: Tender Cord like structure With overlying skin redness
- * Treatment : 1 Plastic Bandage.
 - @ Analgesics & A. B if bacterial type.

N.B.: Thrombophlebitis Migrans: (Trousseau sign)

Due to ↑ blood viscosity with Internal carcinoma
as stomach & pancreas.

Ocup tancia



"Discontinuty of The Skin"

Classification

- ☆ Congenital → (Sickle cell Anaemia)
 - → (Congenital Spherocytosis)
- ☆ <u>Traumatic</u> → (Bed sore or Trauma) (i.e History of Trauma)
- A Inflammatory -- T.B ulcer (Night sweat & fever + loss of weight & appetit).
 - → \$ ulcer [Skin Rashes + F.H.M.A]
- A Neoplsatic -- Marjoline ulcer
- ∀ Venous ulcer.
 (i.e History of associated V.V)
- A Arterial → Ischaemic ulcer.
 (i.e History of Claudication pain)
- D ☆ Lymphatic → Lymphoedema ulcer
- (N) \$ Nervous → Neurotrophic ulcer as D neuritis.

N.B. Chronic Foot Ulcers

Traumatic, Neoplastic, Ischaemic, Lymphatic and Neurotrophic

O Congenital Ulcer

e.g. Sickle Cell Anaemia & Congenital Spherocytosis
[The site: Middle 2/4 of Tibia]

2) (

Traumatic Ulcer

	Wounds, Burn	, Radiation & Bed sore
• Number • Site • Shape • Size	Single Middle 2/4 of Tibia Variable. Variable	Edge Margin. Floor.
• Edge • Margin • Floor • Discharge	Punched out But if healed sloping + pigmentation. Granulation tissues Healthy if Healed. Unhealthy if Recent Serous or purulent	N.B.: Treatment: Rest & Elevation of leg. Discharge. Base N.B.: A B. Grafting if needed.
☆ Base	Indurated at Margin	

Inflammatory Ulce

	T.B. 213	A Real Property of the Control of th
• Number • Site • Shape	Single Metaphysis of Tibia Variable Variable	Single or Multiple Middle 2/4 of Tibia. Variable Variable
• Size • Edge • Margin • Floor	Undernined Cyanotic Caseous Material Serous	Skin Rashes. Granulation Tissues. Ooze pus & blood.
• Discharge	• Soft	Indurated at margin

Malignant Ulcer

(3 Types)

- Marjoline ulcer on Top of venous @ Raised Everted Edge. 2 Hard & Fixed Base.

 - (3) Hard L.Ns.
- 1ry Skin Tumor e.g. Melanoma
- Ulcerating Deep Malignancy e.g. Osteosarcoma

Venous (Varicose) Ulcer

- * Healthy granulation tissue : Painless, pink, not ooze or blood easily.
- Unhealthy granulation tissue: Painful, yellow, ooze or blood easily.

Arterial (Ischaemic) Ulcer

Varicose Ulcer Ischaemic Ulcer * Superficial Ulcer * Deep Ulcer. * Affect (Above Med. Maleolus). * Affect Foot. * Post-phlebitic syndrome. * [Ischaemic Disease]. ★ V.V Manifestations. * Ischaemic Manifestations. * Leg swelling i.e. oedema. * No Leg swelling i.e No oedema. * Pain by Foot elevation * Pain by foot dependency

Neurotrophic Uicer

- * Definition : Occur at area deprived from it's nerve supply
- * Cause: Peripheral Neuropathy as D.M.
- * Mechanism: The foot is anaesthetized & the patient is unaware of trauma → ulcer.
- * Clinical Pictures : · Site : Sole of foot.
 - · Size : Variable.
 - · Margin : Corns & Callosities.
- * Treatment: 1 Conservative : Rest, Elevation & Dressing.
 - D Excision of callosities.
 - ③ Amputation if destroyed bone i.e osteomyelitis

Lymphoedema Ulcer

- Commonest site At dorsum of foot.
- Due to rupture infected bulla.
- Associated with @ Papillary projections. @ Lymphorrhaea. @ Swollen limb oedema.



Final Written Exams



(10 Marks) • DD of Chronic Leg ulcer (1993)

• Discuss Deep Venous Thrombosis (D.V.T.) (1994) (25 Marks)

• Discuss C/P of (D.V.T) in the L.L veins (1996)(10 Marks)

• (D.V.T): Causes, C/P & Management (15 Marks)

(1998) • Discuss predisposing factors and prevention (15 Marks) دور ثانی (10 Marks)

Discuss C/P & treatment of (D.V.T.)

(10 Marks) Mention path., C/P of (D.V.T.) دور تانی (20 Marks

Discuss deep venous thrombosis (D.V.T.) 2002

دور ثاني (12 Mark) 2003 Describe the Anatomy of long saphenous vein Mention Actiology & diagnosis of D.V.T.

Discuss C/P & DD of varicose ulcer

يور ثانى (12 Mark) دور ثانی (12 Mark) Chapter C 13 3

Chapter [13]

bympkatic Disorder



seases of Lymphatic Vesse

Lymphoedema

* Definition:

Lymphoedema is a hypertrophic condition of skin and S.C Tissues caused by chronic lymphatic obstruction.

* Site :

S.C Tissues of Limbs, Breast, Scrotum & Vulva.

* Actiology : It may be 3

(A) Congenital (1ry Type): Rare

- Congenital Aplasia or Hypoplasia.
- It may be Familial (Milroy's Disease)
- · It may be Manifested
 - · At birth -> Congenita.
 - At puberty > Precox.
 - · At adult -> Tarda.

B Acquired (2ry Type) : Common

- · Traumatic: ① Circumfrential skin loss of the limbs.e.g Burn
 - @ Extensive block dissection of L.Ns during the operations.
- Inflammatory: ① Fliariasis
 - ② Chronic specific lymphangitis, e.g. T.B.
- · Neoplastic: 1 Metastasis occluding the nodes.
 - D Lymphoma but rare.

Pathology:

Lymphoedema → lymph stasis → Recurrent lymphangitis (Streptococcal), each attack oblitrate more lymphatics > 4 stages 3

- D Stage of soft pitting oedema
- ② Stage of lymphorrhoea Due to rupture of lymphatic vesicles which leads to discharge of their lymph.
- (Non-pitting oedema): Extravasated fluid with its high protein content excites fibrosis of skin and subcutaneous tissues.
- (4) Stage of Warty Pseudo-papillomatous formation: i.e. Elephantiasis. The skin in roughened, puckered and non pitting like elephant skin.

* Complications:

It may be &

- · Recurrent Cellulitis and Lymphangitis (The most frequent).
- Lymphoedema ulcers from ruptured and infected blebs.
- Huge and Heavy limb
- Lymphangiosarcoma (very rare).

* D.D :

[Causes of Swollen limb]

Bilateral) i.e. Generalized oedema

- · Renal oedema.
- Cushing syndrome
- · Cardiac oedema.
- Myxoedema
- · Hepatic oedema.
- Allergic oedema.

Unilateral) i.e. Localized oedema

- Venous oedema (low protein content).
- Lymphatic oedema (high protein content).
- · Congenital A.V fistula (local gigantism).
- · Neurofibromatosis Elephantiasis.

* Clinical Picture:

Filarial lymphoedema

- · Age: Adult or Elderly.
- Residence : [Endemic Area] for filariasis.

e.g. Rasheed, Damietta, Giza, Imbaba & Sharkaya.

- remession from recurrent lymphangitis.
 - @ Elephantoid Fever
 - (3) In late Cases: Dark, Thick skin with Callosities i.e. Elephantiasis.
- · Signs: 1 Oedema

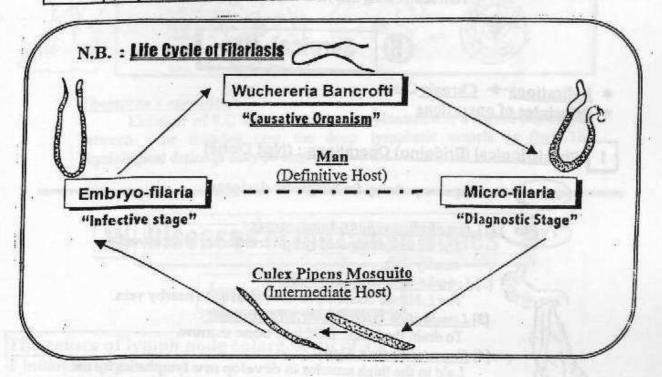
(Ranges from pitting to non pitting According to it's stage)

N.B.: No ocdema in the following sites:

- · Sole: Because of planter apponeurosis.
- · Crease: Because it drains directly to the Ankle joint, i.e deep lymphatics.
- @ Inguinal L.Ns may be Enlarged, Firm & Tender or may form soft lobulated mass
- 3 Other Filarial Manifestations
 - (a) Scrotum: Lymphadema → Mechanical impotence (sunken penis)
 - (b) Spermatic Cord & Epididymis: Funiculo-Epididymitis.
 - (c) Tunica Vaginalis: 2ry Hydrocelei.e Chylocele

* <u>Clinical Classification of Lymphoedema</u> (Bruner):

Grade	Clinical features
Latent	Excess interstitial fluid and histological abnormalities of lymphatics but no clinical lymphodema.
1	Oedema pits on pressure and swelling disappears on elevation and bed rest
II	Oedema does not pit and not reduced on elevation.
III	Oedema is associated with irreversible skin changes, fibrosis, papillae (elephantiasis).



* Investigations:

1 Lymphangography (Not done Nowadays).

By injecting ultra-fluid lipidol in lymphatics on the dorsum of foot.

- It <u>shows</u> the state of lymphatic vessels.
- It asses Extent of L.Ns affection in tumors.

2 Investigations of [Filariasis]

- · Complete Blood Picture shows High Esinophilia.
- Night Film shows Micro-filaria.
- · Serological Tests: e.g. Intradermal Test.

N.B.: Inguinal L.Ns biopsy shows Dead fibrial Worms + Calcifications or malignant deposites.

- Lymphocintigraphy: Scaning of lymphatic vessels & Nodes using radioactive TC⁹⁹ labelled colloidal particle.
- MRI : Provides image of lymphatic vessels & Nodes.

* Treatment :



Conservative ttt

- * Indications → Early Cases only
- * Regimen : ① Rest & Elevation of foot.
 - ② Massage & Elastic stocking.
 - Diureties & Antibiotics, e.g. penicillin 1.200.000 units/3weeks
 - Antifilariai Drugs

 Topical Drugs

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Hetrazan 50 mg t.d.s for 3 weeks.



Surgical ttt

- * Indications → Chronic Cases.
- * Principles of operations
- | Physiological (Bridging) Operations : (Not Done)

Aim Creating new pathway for lymphatic drainage.

Types

[1] Lymphatico-venous Anastomosis:

The dilated obstructed lymph trunks are anastmosed to nearby vein.

[2] Lympho-venous Anastomosis:

The L.Ns are bissected & anastmosed to nearby vein.

[3] <u>Lymphatico-interosseous Anastomosis</u>: To drain the lymph fluid into bone marrow.

~[4] Omental Pedicle Flap:

Laid in the thigh muscles to develop new lymphatics by the omentum.

[5] Kondoleon's Operations:

A long strip of deep fascia is removed, with the idea that the Skin & S.C Tissues will be drained into deep lymphatics.

Disadvantage They leave the thick subcutaneous tissues, i.e. bad cosmetic.

II Excisional Operations : (Mostly Done)

Removing the thick S.C Tissues for Cosmetic & Functional reasons..

Types

Aim

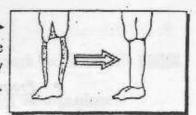
[1] Sistrunk Operation :-

A long strip of deep fascia & thick S.C tissues are excised allowing the skin to adhere to the muscles and acquire new lymph drainage, but high rate of recurrency.



[2] Charle's (Flaying) Operation .

Skin, S.C Tissue & Deep fascia are removed (flaying) then Covered by Thiersch graft leads to Recurrence.



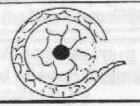
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Physiological & Excisional Operation:

Thompson's (Swiss roll) operation









Thompson's operation:

Excision of S.C Tissues and then implantation of a shaved flap of skin between the muscles near the deep lymphatic vessels so that. The physiological drainage may be improved.



Diseases of the Lymph Nodes

Lymphadenopathy

The causes of lymph node enlargement are

① Inflammatory:

- a. Acute non specific.
 - Septic lymphadenitis.
 - Infectious mononucleosis.

b. Chronic:

- · Non specific.
 - Child with tonsillitis or pharyngitis.
 - Scalp infection.
 - Pediculosis capitis.

· Specific :

Bacterial A- T.B. (See later)

B-\$ - Iry \$ (chancre + L.Ns).

 2ry \$ (skin rashes + mucous patches + generalized lymphadenopathy.

- 3ry \$ (gumma) very rare L.Ns.

- Parasitic : Filarial (See before)
- Viral: A. Lymphogranuloma inguinal:
 - It is a <u>venereal</u> disease, carry from person to another by contact.
 - Few weeks from contact, papule appears near the genitalia with inguinal LNs.

B. Cat scratch disease:

- Unknown but may be history of cat scratch with lymphadenopathy 1-2 weeks later.
- C. AIDS.
- Protozoal: Toxoplasma.

② Lymphomas :

- 1. Hodgkin's lymphoma.
- 2. Non Hodgkin's lymphoma.

(See later)

3. Burkitt's lymphoma.

N.B. : Brill's disease :

Similar to Hodgkin's lymphoma but with the following differences

- @ Generalized from the start.
- @ Early extra-nodal affection.

3 Blood diseases:

- 1. Acute leukaemia.
- 2. Chronic myeloid leukaemia.
- 3. Chronic lymphatic leukaemia.
- @ Lipoidosis.
- Metastases.
- 6 Collagen disease.

① Tuberculous Lymphadenitis

Incidence

- Age : Children & Young adult.
- · Residence : Bad hygienic areas.

Types

(A) Lymph Borne 1ry Type

- Fibrocaseous type.
- Localized L.Ns
- Affect the cortex of L.Ns

Blood Borne

2ry Type

- Lymphadenoid type.
- Generalized L.Ns.
- · Affect the Medulla of L.Ns

(Fibrocaseous)

Irv Type

* Actiology:

- Source of Infection : Infected Milk.
- Organism : Mycobacterium Tuberculosis (Bovine type).
- Route of Infection : Lymphatic vessels.

* Pathology:

- <u>T.B ingested</u> with infected milk then filtered through the <u>Tonsils</u> → <u>cortex</u> of upper deep cervical L.Ns.
- The Body reacts by sending macrophages to engulf the organism.
- End result will depend on -

The Body Resistance & the Virulence of Organism

- I Body Resistance > Virulence of Organism:
 - Macrophages phagocytose the bacilli → Epithelioid Cells.
- II Body Resistance = Virulence of Organism :
 - · Rare & Affect adult.
 - · Fibrosis (No Caseation) occur.
- III Body Resistance < Virulence of Organism :
 - Cemmon & Affect children.
 - The Macrophges fail to abort the lesion so they fuse together → Langhans Giant Cells surround the lesion, further cells like (lymphocytes, plasma cells & Fibroblasts) will surround the lesion as outer manner to form finally → Inhercie Follicle
 - · Within 2 weeks

Necrosis (Caseation) occur in the center due to 30

- D Hypersensitivity to bacilli toxins.
- ② Ischaemia i.e. Cellular proliferation without Vascular proliferation

* Clinical Picture :

- No T.B Toxaemia
- Localized lymphadenopathy
 - Site, Upper Deep Cervical L.Ns.
 - Consistency: Firm, Cystic (Abscess) or Hard (Calcification).
 - Characters : Painless, Matted (Adherent to each other) i.e. Periadenitis or Rosary Beads due to associated thick lymphangitis.

Pictures of Complications

① Cold Abscess: Due to Cascation.

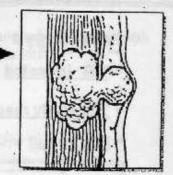
(It is Actually not cold & not abscess).

- * Not Cold → Because it is clinically warm.
- * Not Abscess → Because [The content is caseous material not pus].
- ② Calcification: It becomes hard mass.
- 3 2ry Infection.

Rupture through deep fascia i.e. S.C abscess
So called Collur Studd Abscess

① Rupture through skin T.B Sinus →

6 Local spread to adjacent L.Ns.



* Investigations:

- Laboratory :

- Blood Picture (Anaemia, Leucopenia & Relative lymphocytosis).
- Tuberculin Test: Serves as good -ve Test.

Aspiration of Cold Abscess for Bacteriology

- Zichl-Helson's stals → Will demonestrate tubercle bacilli which is (acid fast, Alcohol fast) in 72% of cases.
- Culture on Lowenstein Media → for 6 weeks in 98% of cases.
- Guina Pig Inoculation → 94%

Radiological:

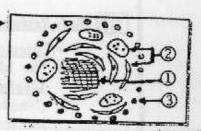
X-ray for Chest & Mediastinum.

■ Surgical : (L.N biopsy) → Tubercle fellicie

O Central Zone: Caseation with Tubercle bacilli.

@ Midzone : Epithelioid cells + Langhans giant cells.

Peripheral Zone: Small rounded cell as (Lymphocytes, plasma cells & fibroblasts).



* Treatment:



- [1] Sanitorium (6-9) months.
- [2] Dietetic rich in vitamins : e.g. Vit. D.
- [3] Therapeutic : (Anti-tuberculous drugs)

1st 3 months (Streptomycine) 1gm IM day after day then (At least 2 drugs) &

O INH 5 mg/KBW

3 Ethambutal 15 mg/KBW

② Rifampicine 10 mg/KBW.

Pyrinzimanide 20 mg/KBW.



- Surgical Excision of L.Ns: If localized group of L.Ns persist inspite of
- ttt of Cold Abscess :

medical ttt.

- Repeated aspiration with injection of Streptomycin.
- > Technique : 1 Healthy skin & Aseptic technique.
 - ② In Non dependant area & wide bore needle.
 - 3 In a Valvular manner.
- > Stop Aspiration when blood comes out.
- Incision & Drainage If 2ry infected.
- Excision of Underlying L.N If resist and to treatment.

ttt of T.B sinus :

- Repeated dressing with Streptomycin Powder.
- · Excision of Underlying L.N If resists to treatment.

Blood Borne (Lymphadenoid) 2rv Type

* Pathology:

- T.B. reach the L.N through the artery at hilum → Medulia is affected & L.Ns show hyperplasia and not caseation.
- There is No Periadenitis, No Matting, No Caseation, No Cold abscess, No Calcification & No Sinus.

* Clinical Picture:

مهم جداً) T.B Toxaemia (مهم جداً)

"Night Sweat, Night Fever, Loss of weight & Loss of appetit"

Generalized Lymphadenopathy

 <u>Site</u>: Start as <u>one</u> group at Cervical group of L.Ns <u>then</u> becomes generalized.

· Consistency : Firm.

• Characters : Painless, Discrete, Mobile & uniform in size

* Investigations : "As Before"

But L.Ns biopsy show Hyperplasia.

* Treatment:

· General ttt : As before

Local ttt: No Role of surgery except for L.N biopsy.

② Lymphomas

Definition

1ry Malignant Neoplasm of Reticulo-endothelial System (RES).

Types

• The Main Types are: I - Hodgkin's Lymphoma.

II - Non-Hodgkin's Lymphoma.

III- Burkitt's Lymphoma.

Hodgkin's Lymphoma "Lymphadenoma"

* Incidence: The Commonest Type of Lymphoma.

* Site: Whenever there is lymphoid tissues, Hodgkin's Disease may occur i.e. L.N, Thymus, Spleen, Liver, Bone marrow, Payer's patches etc...

N.B.: Hodgkin Disease may be primarily

- <u>Nodal</u> (Common): Starts in <u>lower</u> deep cervical L.Ns <u>then</u> becomes generalized.
- Extra-nodal (Rare) : In late cases e.g. Liver, Spleen etc..

* Pathology:

- N.E Picture: The L.Ns are replaced by <u>Pinkish Neoplasm</u> which doesn't infiltrate the surroundings <u>except</u> very late.
 - Very late cases there are deposits in Spleen, Liver, Bone marrow & Lungs.
- Microscopic picture : [Pleomorphism]
 - Reticulum cells (Histiocytes), Lymphocytes, Plasma cells, Neutrophils & Oesinophils.
 - Reed Sternhern Cells are pathognomonic giant cells which is multinucleated 2-8 nuclei arranged in mirror images >
- * Classification: "Histological Types"
 - Lymphocyte Predominant Type: The Best prognosis.
 - Nodular Sclerosis Type: The Cell nodules surrounded by fibrosis.
 - Mixed Cellularity Type .
 - Lymphocyte Depleted Type: The Worst prognosis

* Clinical Picture:

- Age: Commonly with Young or Adult.
- Sex : Male > Female.
- Nodal Picture Site: Start as one group (lower deep cervical L.Ns)
 then becomes generalized.
 - · Consistency : Firm (Rubbery).
 - Characters : Painless, Discrete, Mobile & Bifferent in size → ○
- Extra-nodal Picture :
 - Systemic:
- · Night sweat, Loss of weight, Pruritis, Anaemia.
- Pel-Ebstein Fever (Characteristic Fever) which is
 weeks of fever alternating with 2 weeks freedom.
- Alcoholics →↑ Pain at site of Hodgkin's disease.
- Local : i.e. Pressure symptoms

Abdominal Manifestations

- * Slight Splenomegaly.
- ★ Liver Enlargement & Jaundice.
- * Ascities from Hepatic dysfunctions.
- * I.V.C & Ureteric compression by Para-aortic L.Ns.

Chest Manifestations.

* Dyspnea, Cough & Chest paini.e Mediastinal Syndrome. -

Skeletal Manifestations

* Bone aches + Vertebral Collapse.

Neurological Manifestations

* Peripheral Neuropathy + Spinal Cord Compression.

* Staging : [Ann Arbor Staging System]

■ Stage I: One group only of L.Ns.

* (Stage IE) if Single Extra-nodal organ affection.

Stage II : More than one group of L.Ns at same side of diaphragm.

★ (Stage II^E) if More than one Extra-nodal affection at same side of diaphragm.

Stage III: L.Ns are involved Above & Below Diaphragm.

Stage IV: Extra-nodal spread as Liver, Spleen, B.M etc...

N.B. : Each stage is further Subdivided into &

"A" → No Systemic symptoms.

"B" → One or more of systemic symptoms as Fever Night sweat, Pruritis, Anaemia etc.

* Investigations:

Laboratory

- Blood picture: † ESR + (Anaemia, Oesinophilia or Lymphopenia).
- Liver function Tests: Alkaline Phosphatase with liver involvement.

Radiological:

- Chest (X-тау & CT scan).
- · Abdominal (U/S & CT scan).
- Bone Marrow Puncture.
- Staging Laparotomy: Indicated with Stage I (A&B) & Stage II A.
 Includes ♣
 - · Splenectomy: For staging & Avoids the need of its irradiation.
 - · Biopsy of both liver lobes.
 - Biopsy of all intra-abdominal lymph node groups, which are marked by (Metal Clips) to help future localization by the radiotherapist.
 - · Bone Marrow Biopsy from the Iliac crest.

N.B.: Staging laparotomy is not preferred in many Centres Because of Accuracy of CT scan & MRI.

* Treatment: "Depending on Staning"

- Stage I (A&B) & stage IIA: Treated by Radiotherapy alone
- Stage II B: 6 cycles chemotherapy (MOPP) supplemented by Radiotherapy.
- <u>Stage III & IV</u>: 12 cycles chemotherapy (MOPP) supplemented by Radiotherapy.
- N.B.:

 MOPP: Mustin (IV), Onchovine (IV), Procanbazine (ORAL) & Role of surgery:

 Prednisone (ORAL)
 - Splenectomy if hypersplenism.
 - b. Decompression of ureter of IVC by LNs.
 - In young female, ovaries are sutured retro-uterine to be away from radiotherapy.

* Prognosis: "Relatively Good Prognosis"

(5 years survival rate of 80% of patients with proper treatment)

!! Non-Hodgkin's Lymphoma (NHL)

* Incidence: Rare Type of Lymphoma.

But common with the following diseases &

- O Sjogren's Disease.
- ② Systemic Lupus Erythromatosus (S.L.E).
- Immuno-suppression after organ Transplantation.
- @ AIDS

* Site:

- Nodal: Starts in the Cervical group of L.Ns then becomes generalized.
- Extra-nodal: e.g. Liver, Spleen, Bone marrow, Skin "Mycosis Fungalds" & GIT mucosa So may leads to 30

Gastric Lymphoma

Which produce manifestations similar to Carcinoma.

Intestinal Lymphoma

Which may produce intestinal obstruction, bleeding or even perforation.

* Pathology :

- <u>N.E Picture</u>: ① The L.Ns are replaced by <u>White Neoplasm</u> which infiltrate the surrounding tissues.
 - ② <u>Similar deposits</u> are formed in Liver, Spleen, Bone marrow & Lungs.
- Microscopic picture: "The normal architecture of nodes are lost"
 - The Architecture is replaced by <u>Sarcomatous cells</u>, Lymphocytes & Reticulum cells.
 - ② The Lymphocytes being predominant in lymphosarcoma & Reticulum Cells being predominant in <u>Reticulum Cell</u> Sarcoma. & both of them being predominant in lymphoma Mixed Cell type.

* Classification: "Based on Cell of origin"

- B-Cell Lymphoma : Small Cell Lymphoma,
 - · Large Cell Lymphoma,
 - Mixed Cell Lymphoma
 - Immunoblastic Lymphoma.
- T-Cell Lymphoma.
- Lymphoblastic Lymphoma.
- Histocystic Lymphoma.

* Clinical Picture:

- Age: Commonly with Elderly.
- Sex : Male > Female.

- Nodal Picture Site: Start as one group (Cervical group of L.Ns) then becomes generalized.
 - Consistency: Firm, Soft (if Degenerated) or Hard (if calcified)
 - Characters : Painless, Amalyamated > i.e. Cann't be counted.
- Extra-nodal Picture : As Hodgkin's i.e. Infiltration.



As Hodgkin's Lymphoma.

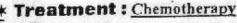
- Investigations +
- * Treatment :
 - Radiotherapy & Chemotherapy according to stage as Hodgkin's lymphoma.
 - Surgical ttt: Indicated with Gastric & Intestinal Lymphoma.
 - Technique By Gastric & Intestinal Resection.
- * Prognosis: "Very Bad"

Burkitt's Lymphoma

- * Incidence: The Rarest Type of Lymphosarcoma
- * Actiology : Unkown, But may be related to infection with Ebstein Barr (EB) virus which cause I.M.N in healthy people & Burkitt's Lymphoma in patient with Chronic Malaria.
- * Clinical Picture : [Common < 12 years & In Western Africa]

The usual presentation is painless, progressively enlarged jaw swelling. It may also affect the Kidneys, Ovaries, Long bone & Central Nervous System.

* Pathology: (Starry sky) appearance = pale retinaculum with dark lymphocytes.



Treatment: Chemotherapy (N.B.: Nodal Affection is very rare.



Final Written Exam



· Discuss the Pathology, C/P & ttt of Hodgkin's Lymphoma.

ىور ئانى(Marks) 25

- •Discuss Actiology & pathology of chronic (15 Marks) (1998)lymphatic obstruction
- Discuss Actiology & pathology of chronic (15 Marks) دور ثانی 2000 lymphatic obstruction
- Discuss C/P & Treatment of T.B. lymphadenitis

(10 Marks)

2003 * Enumerate the causes of lymphoedema ىرى ئاتى (9 Marks)

Chapter (14)

Min, S.C Tissues, Bursae, Tendons & Fascia

Chapter [14]

Skin, S.G Tissues, Bursae,

— Tendons & Fascia

Disease of Skin & S.C Tissues

THE RESERVE	III LIPOMA	121 SEBACEOUS CYST
I- Definition	* Benign tumor of adipose * It may be: 1- Pure lipoma (Commonest). 2- Fibrolipoma i.e. Contain excess F.T 3- Haemangiolipoma = Naevolipoma 4- Myxolipoma i.e. contain	* Retention cyst * It is caused by: (obstruction of the duct of sebaceaus cyst) by * 1. Inspissated sebum 2. Dirts.
II- Pathology	* Yellowish lobulated aggregations of fat cells False capsule True Capsule Blood vessels (pedicle)	★ Epidermoid cyst: 1- Stratified squamous epithelium. 2- Sebum with bad odour. 3- Blocked by black dot called (Punctum).
III- Site	① Sub-cutaneous: (Back) commonest. ② Sub-fascial: Deep to deep fascia. ③ Sub-periosteal: i.e. flat bone. ④ Sub-synovial i.e. osteoporosis of knee. ⑤ Sub-mucous: e.g. larynx or intestine. ⑥ Sub-serous: i.e. Retroperitoneal. ② Intermusclar → simulate abscess. ⑧ Intra musclar → D.D Fibrosarcoma. ⑤ Extradural (spinal) → Paraplegia (rare). ⑥ Intra glandular: e.g. Breast.	Hairy area (Back). [Face — Scalp Trunk — Scrotum etc]
IV- Complications	 Never in Brain, Eye lid, penis ① Compression manifestations. ② Retropertioneal type → Myxomatous Degenerations. Sarcomatous Transformations. ③ Calcifications especially in. Axilla & groin. Buttocks. 	* Mever in Palm or Sole ① Infection & suppurations ② Local Alopecia. ③ Cock's Tumor: ulcerated Infected scalp with raised edge and No Indurated base. ④ Sebaceous Horn Successive layer of dried inspissated Sebum.
V-Treatment	IF Solitary: Excision under local anaesthesia i.e. Enucleation by elleptical incision. IF Multiple: Removal of the most complicating one. IF Huge in size: As above + use drain	 IF Uncomplicated: Excision with local anaesthesia. IF Complicated: Incision drainage then Excision. IF Multiple at scrotum Excision of part of scrotum.

131 Dermoid cyst

* Definition:

It is a Cyst lined by Stratified Squamous Epithelium.

* Types:

Sequestration Dermoid Cyst

- It is a Congenital inclusion of a piece of epithelium in the S.C. Tissue at line
 of fusion of the body during the foetal Life
- The Commonest sites:

 Face: External & Internal Angular Dermoid.
 - @ Neck & Trunk: Middle line (Ant. & post.)
 - @ Ear : Pre & Post-auricular Dermoid.

N.B: Dermoid Cyst Never appears in upper & Lower Limbs because they appears as Buds & not by fusion.

· Examination of Dermoid Cyst:

- A Inspection: 10 Usually Single, At line of fusion.
 - @ Hemispherical in shape with variable size.
 - 3 Well defined edge.
- (B) Paination: O Not Attached to skin
 - D Lax & Cystic in consistency.
 - @ Bony depression due to constant pressure

② Tubulo-dermoid

★ <u>Due to</u> distension of Remnants of Embryonic ducts <u>as</u> <u>Thyroglossal cyst</u> & Embryonic cyst as <u>Branchial Cyst</u>.

3 Teratomatous Dermoid

- ★ It is a Benign Teratoma contains Teeth, Hair, Bone, Cartilage etc
 & It occurs mainly in Ovary & Testis.
- Inclusion Dermoid
 - ★ It is due to inclusion of epidermis during closure of a cavity as Supra-sternal region.

6 Implantation Dermoid

* It occur 2ry to puncture of wounds which displace some epithelial cells into S.C. Tissue -> Cyst formation. It occurs mainly in the Fingers, Palm & Sole.

*Treatment: All Cases are treated by Excision

<u>N.B.</u>: <u>In children</u> with sequestrated dermoid in the scalp. It is better to wait until closure of skull sutures because some cysts may communicat with the dura.





Skin

Bone

(4) Chaemangioma IB) Arterial (A) Capillary IC) Venous

It is not a true tumor, but tumor like i.e. Hamartoma Hamartoma = Congenital Malformation or Error of vessels

Capillary Heamangioma IAI

Strawberry Naevus

- It is also called "Haemanyloma Simplex".
- Site: The commonest site is Face.
- Colour: Bright red.
- Surface: Slightly Raised above the surface.
- Course: Present shortly after birth [1-3 weeks] then after one year it starts to undergo involution.
- Treatment: Not required because of it's spontaneous involution

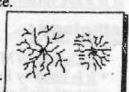


Portwine Stain

- It is also called "Naevus Flammeus"
- · Site : Along the distribution of cutaneous nerve frequently trigeminal nerve of the face and never crosses the middle line.
- Colour: Dark Purple.
- · Surface : Usually Flat.
- Course: Present Since Birth & Doesn't undergo involution.
- Treatment : LASER Application is the choice. Excision & grafting is very difficult as it may involve a large area of the face.

Spider Naevi

- It occurs with patients having L.C.F. or Portal Hypertension.
- It is due to Hyperoestrogenaemia or unkown cause.
- It consists of multiple dilated arterioles at the distribution of S.V.C.

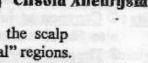


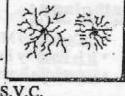
Arterial Haemangioma

"Cirsoid Aneurusm"

- It is a dilated Tortuous arterioles occurring mostly in the scalp "Temporal & occipital" regions.
- It appears as Soft Compressible & Pulsating mass with Marked bruit over it.
- . The treatment: Pre-operative Embolisation by Gel foam

Then D Ligation of feeding vessels. Then @ Excision of Aneurysm.





(Venous Haemangloma)"Cavernous Haemangloma"

- It is a Spongy Network of dilated veins like a cavity. It is connected to the systemic circulation →
- 1 Since birth with no involution · Examination :
 - @ Reddish swelling of mucus membrane of lips & Tongue. It may involve internal organs as liver
 - D Soft, Compressible but Non Pulsating mass.

N.B.: It is complicated by Severe bleeding due to mild trauma or Septicemia due to 2ry infections.

① LASER Therapy · Treatment:

Or @ Injection of sclerosing material.

Or @ Surgical Excision.

151 (Tymphangioma)

IAI Capillary lymphangioma

IBI Caverneous Lymphanglema

It is not a true tumor, but tumor like i.e. Hamartoma Hamartoma = Congenital Malformation or Error of vessels

Capillary lymphangioma IAI

★ They are Small, Soft brownish papules formed by Dilated Lymph Capillary

[B] Cavernous Lymphangioma

"Cystic Hygroma"

* Definition:

It is a sac formed from sequestrated part of jugular lymph sac of foetus.

* Pathology:

- It Consists of Multiple Intercommunicating Cystic Lymph Space.
- It is lined by Endothelium.
- It contains Lymph.

* Clinical picture :

- Age: Since Birth or Shortly after.
- Site: O Common at lower part of side of neck superficial to Stemo-mastoid & extends to post. Triangle.
 - @ The next common site is Axilla alone or with Neck.
 - The less common Cheek, Lip (Macrocheilia) and Tongue (Macroglossia).
- · Characters: Irregular shape, large in size, Ill defined edge, Translucent, Lax, Cystic & Compressible, but Non pulsating mass.



* Treatment:

1 Excision as early as possible

or @ Injection of boiling water of sclerosing material / weekly -> Fibrosis.

or 3 IF infected give A.B. > Fibrosis.

161 (Neurofibroma)

It is a congenital Disease affecting Nerves.

The tumor arises from Fibrous neurolemmal sheath.

[A] Generalized Neurofibromatosis "Von Reckling-housen's Disease"

• It is Multiple Tumors of the body along the course of cranial & spinal nerves.

· It is diagnosed by

O Painless swelling.

② <u>Fusiform</u> in <u>Shape</u>, <u>Firm</u> in consistency and <u>Mobile</u> across but not along the course of nerve.

Associated with brown pigments "Café au lait" patches

• Treatment: Removal only of tumors causing pain or pressure effect.

[B] Solitary Neurofibroma

* As Generalized but single.



[C] Acoustic Neuroma

★ Neurofibroma arising from acoustic nerve leading to Deafness & cerebellar symptoms. It may be single or part of generalized type.

[D] Molluscum Fibrosum

★ It is a neurofibroma arising from the <u>Termination of cutaneous nerves</u>. <u>It affects</u> any part of the skin <u>except</u> the Palms & Soles.

[E] Elephantiasis Neruomatosa

★ It is Elephantiasis of the limb + Mechanical block of the joint + "Café au lait" patches.

[F] Plexiform Neuroma "Pachydermatocele"

★ It affect S.C nerve plexuses leading to thickening of the nerves & Redundant thickened skin

N.B.

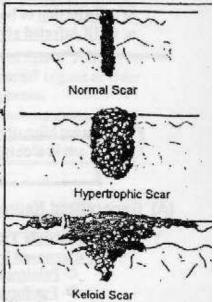
Hamartoma	True benign tumour
 Dating since birth. Not capsulated. Stop growth at the age of puberty or when mother tissues stop growth. 	Never congenital. Usually have a true capsule. Never stop growth spontaneously.

Mypertrophic Scars

- <u>Definition</u>: It is an excessive amount of fibrous tissue Confined to scar
- Aetiology: It occurs if Extra-stimulus to fibrous tissue formation during healing such as infection or Excessive tension.
- Treatment: Excision + Plastic repair.



- <u>Definition</u>: It is a localized <u>over growth</u> of the fibrous tissues extends <u>beyond</u> the original wound into normal tissues.
- Aetiology: It occurs after Wounds, Burns or Surgical operations.
- · Treatment: It is Difficult because of high rate of recurrence
 - Description of the property of the pr
 - @ Excision.
 - ③ Intra-lesional steroid injections → Give Excellent Result.



[9] Melanocytic Tumors

From Melanocytic cells (Melanin pigment) present at Basal layer of Epidermis

" Types:

- ① Lentigo:
 - The Melanocytes replace the basal layer of epidermis in certain sites.
 - Clinically: It appears as flat Black or Brown spots.
- @ Junctional Naveus:
 - More proliferation of Melanocytes → Small Nodules of epidermis and bulge downwards in the Dermis.
 - · Clinically: Like Lentigo
- ③ Compound Naveus:
 - Present in both Epidermis & Dermis.
 - Clinically: It appears as Raised Brown to Black nodule.
- Intra-dermal Naveus:
 - Present mainly in Dermis
 - · Clinically Like Compound Naveus.
- · Can Pigmented naevi undergo malignancy?

Yes, if present at site of chronic irritation.

- Indications for surgical Excision?
 - O Cosmetic reasons.
 - ② IF Subjected to repeated irritation as (Face).
 - (a) IF Malignant transformation is suspected.

Premalignant Conditions of the Skin

[1] Actinic (senile) (solar) keratosis:

■ The commonest precancerous lesion of skin.

■ It is due to prolonged exposure to sun as farmers and fishermen

· Pathology:

- Site: multiple lesions on the face and backs of hand.

- N/E: usually the lesions < 1cm and have dry, Hard scales

- M/P : Abnormal epithelial cells limited to epidermis

· Treatment:

⊕ If single: a. Superficial lesion → Freezing with liquid nitrogen.

b. Horny lesion → diathermy curettage.

c. Indurated lesion → Excision.

@ If Multiple :

Chemotherapy (5 fluro-uracil) & No radiotherapy.

[2] Chronic Radiodermititis:

■ Area of skin damaged by Excessive exposure to irradiation.
Early: Erythema or ulceration but later on irregular hyperpigmentation & Hair loss. Eventually → squamous cell carcinoma.

[3] Xeroderma pigmentosa: (Rare disease of children)

The condition starts by <u>Hyperpigmentation</u> followed by Atrophy and thinning of the skin.

[4] Leukoplakia : e.g. lip.

[5] Carcinogens : e.g. Tar derivatives.

[6] Lupus vulgaris (T.B. of skin).

[7] Chronic ulcer (Marjoline ulcers).

e.g chronic venous ulcer, untreated burn.

[8] Seborrhoeic keratosis.

[9] Bowen's disease:

It is a potentially malignant disease (seen with Elderly).

It is due to <u>Arsenic ingestion e.g.</u> medically taken or due to viral cause.

Usually red, flat, scaly or crusted <u>mistaken</u> with solar keratosis

Investigation: biopsy may be needed.

• Treatment:

① Destructive therapy by <u>Cryotherapy</u>, <u>Curettage</u> or <u>Cauterization</u>.

@ Chemotherapy may be needed if small lesion.

3 Surgical Excision if large lesion.

Tumor Like Conditions of the Skin

[1] Wart

* Actiology: Localized epithelial proliferation due to viral infection.

* Clinical picture:

- · Small horny projection that is usually multiple & grayish.
- Common in the dorsum of the hands & feet.
- Only the plantar warts are painful.

* Treatment:

① Surgical excision with diathermy.

@ Cryosurgery by freezing the wart using liquid nitrogen.

N.B.: Condylomata acuminate are giant warts transmitted by sexual contact.

[2] Callosity

* Actiology: Localized thickening of the skin due to repeated friction & pressure.

* Clinical picture :

Area of thickened skin which they are painless, yellowish plaques elevated above the surface.

* <u>Treatment</u>: (Removal of the cause) +
Shaving with sterile Razor & application of keratolytic agent e.g. salicylic acid.

[3] Corn

* Actiology: Neglected callosity with downgrowth of hard horny plug pressing on sensory nerve endings.

* Clinical picture:

Circumscribed conical mass with depression in the center which is very tender.

* Treatment: Like callosity but excision is usually needed.

[4] Keratoacanthoma : (Molluscum Schaceum)

* Actiology: It was thought that it is a true tumour, but its progressive then regressive course raises the suspicion of its inflammatory nature.

* Clinical picture:

It is common on the face of middle aged people.

- It forms a red firm rounded papule that enlarges rapidly to about 2 cm in one week then regresses slowly to heal within 3 to 6 months. There is a keratin plug in the center.
- * Treatment: Excisional biopsy.

Malignant Neoplasm | Malignant melanoma | 2 Basal Cell | 3 Squamous cell | carcinoma | ca

* Incidence:

Age: 30-60 years
 Sex: Male > Female

• Commoner in Western countries due to ♣ defective Ozoner layer.

* Predisposing Factors:

- Prolonged exposure to Ultraviolet rays.
- Albinism & Xeroderma pigmentosa.
- On top of Benign naevus(Chronic Irritation).

N.B. Criteria of Malignant Transformation of benign Naevus are

- ① Increased in <u>Size or thickness</u>.
- ② Increased in Pigmentation.
- 1 It becomes Painful & Indurated.
- Hard Enlarged <u>Draining L.Ns.</u>
- D Surrounded by Multiple Satellite Nodules.
- © Ulceration & Bleeding.

* Pathology & Clinical Types:

	①Superficial spreading Melanoma	@Nodular Melanoma	③Lentigo Melanoma	Acrai lentiginous melanoma	Amelanetic melanema
* Incidence	64%	12-25%	1-15%	Rare	Rare
*Age	Middle	Young	Elderly	B I	1 4444
*Site	Any part of the body	Any part of the body	Usually of Face	In the palm & sole	T (3)
• N/E	The lesion is raised above surface with irregular edge	The lesion is nodular, dark in color & very liable to ulcerate	The lesion is begins as a flat brown macule with slowly growth		gart t
• M/P	Spindle cells, E	pitheloid cells & Po	olymorphocellular o	ells.	0
Prognosis		Bad	Good	Poor	V. poor

*Classifications : i.e. Factors affecting the prognosis

Breslow Classification "Depend on Thickness of Turnor"

<u>Stage I</u> (< 0.75 mm), <u>Stage II</u> (0.75 mm - 1.5 mm), <u>Stage III</u> (1.5 mm - 2.25 mm) <u>Stage IV</u> (2.25 mm - 3 mm) & <u>Stage V</u> (> 3 mm)

B Clark's Classification

"Depend on Depth of Invasion"

• Level I : Epidermal.

: Dermo-epidermal Junction.

• <u>Level III</u> • <u>Level III</u>

: Superficial papillary Dermis.

• Level IV

: Deep papillary Dermis.

• Level V

: Subcutaneous Tissue.

* Spread:

Direct spread : To surrounding tissues

■ Lymphatic spread : By Both 3

Permeation (i.e. Satellites) and Embolization.

Blood spread: very rare. 2ry deposits are usually Black

* Clinical picture : * See pathological Types .

* D. D. :

- O Pigmented Basal Cell Carcinoma.
- @ Granuloma or Haemangioma.
- 3 Compound or Junctional Naevus.

* Investigations ; *

The Only Sure Methods are Biopsy & Histological Examination.

* Treatment: (Radio-resistent)

[A] <u>The 1ry lesion</u>: Should be excised with safety margin 2-3 cm together with subcutaneous tissue.

N.B. The Deep Fascia Never excised

[B] The L.Ns: IF Not Clinically involved &

Fine Needle Aspiration is done to ensure that they are free

But IF Clinically involved ♣

Radical Block dissection must be done.

[C] The Metastasis:

Treated by Chemotherapy, Interferons and by Interler-kin-2.

* Prognosis:

According to Pathological Types

- O Nodular Melanoma: Bad prognosis.
- O Lentigo Melanoma: Good prognosis.
- Acral Lentiginous Melanoma: Poor prognosis.
 Amelanotic Melanoma: Very poor prognosis.

	2 Basal cell Carcinoma	3 Squamous cell carcinoms
	Rodent ulcer	Epithelioma .
*Definition:	Locally Malignant tumor arises from the Basal Layer of skin	Malignant Tumor arises from Stratified Squamous Epithelium of the skin
* Incidence: Age Sex Race	"Common" • > 40 years • Male > female • White > Black	"Less common" • >50 years • Male > Female • White > Black
*Predisposing Factors:	O Prolonged Exposure to Sun rays i.e. Ultravilot Rays. Albinism. Xeroderma Pigmentosa	 ① Prolonged Exposure to Sun rays i.e. Ultrtavilot Rays. ② Albinism. ③ Xeroderma Pigmentosa. ④ Previous Irradiation. ⑤ Long standing irritation as Chronic ulcer, Sinus or Burn scar. ⑥ Carcinogens as Tar derivatives.
* Pathology : • <u>Site</u>	• 90% in the Face especially above a line from lobule of ear to the angle of mouth. • Other sites as Dorsum of hand & Perianal regions.	Upper part of Face, scalp Lip, Gums & Tongue. Other sites as Dorsum of hand, Oesophagus & Anal canal
• <u>N/E</u>	Minninalina	Alm Min
• N° • Site • Shape • Size	Usually single As above Oval or rounded Usually small	 Usually <u>single</u> <u>As</u> above Irregular in shape. Usually <u>large</u> because of rapid rate of growth.

	2 Basal cell Carcinoma	3 Squamous cell carcinoms	
The second second	Rodent ulcer	Epitheliom a	
Edge Margin Floor Discharge	Rolled in & Beaded Dilated capillaries. Covered by <u>Crusts</u> . Blood & pus	• Raised everted. • Necrotic • Blood & pus.	
★ Base	★ Indurate but <u>not</u> beyond the edge.	★Indurated & Fixed to the underlying tissue	
• <u>M/P</u>		Keratia	
*	 ⊕Peripheral columnar cells arranged in palisad manner. ⊕Central Polyhedral cells with basophilic neuclei. ⊕No Tendency for keratinization 	D Epithelia pearls or <u>Cell nests</u> Mass of malignant epithelial cells. Central keratin	
*Spread:	Direct Spread: The only spread to surroundings and the underlying structures. Do Lymphatic spread: But if enlarged L. Ns. it is due to 2ry Infections or Epithelio-	① <u>Direct Spread</u> : The tumor is rapidly infiltrates the adjacent structures. ② <u>Lymphatic Spread</u> : By Embolization to the regional L.N.s. which is hard & stony in consistency.	
*	matous transformation ① No Blood spread.	©Blood spread: Late & rare.	
*Types:	Nodular Form: The lesion starts as a small nodule which ulcerate later. Ulcer Form. Excavating Type: The ulcer erodes deep into the under lying structures leading to destruction of the nose.	T self ut 2000 a 100 file and a 100	
T PROBLEM	N.B. Other types as Pigmented, Flat superficial spreading typess (Field - fire type)		
* Clinical Picture :	Description Descripti	 ①Patient represents by an ulcer which grows rapidly. ②Hard draining L. Ns ②Examine ulcer "As before" 	

	2 Basal cell Carcinoma	3 Squamous cell carcinema	
	Rodent ulcer	Epitheliom a	
* Complications :	 ①2ry infections → Meningitis& Cavernous Sinus Thrombosis i.e. cause of death. ② Severe Hemorrhage from Erosion of big vessels. ③ Epitheliomatous Transformation 	METASTASIS	
* <u>D.D.</u> :	Squamous cell carcinoma Malignant melanoma. Kerato-acanthoma.	Basal cell carcinema Malignant melanoma. Kerato-acanthoma.	
* Investigations	① Lab (Blood, Urine, Stool). ② Aspiration Biopsy Cytology (A.B.C) ② Biopsy (must include the edge). N.B: Specific as X-ray skull	① <u>Lab</u> . (Blood, Urine, Stool). ② <u>Aspiration Biopsy Cytology</u> (A.B.C) ① <u>Biopsy</u> (must include the edge). N.B: <u>Specific</u> as X-ray skull	
*Treatment	 ★ Irradiation: ▶ Indicated in : Old patient with large lesion. ▶ Contraindicated : (see indications of surgical ttt). 	Same as Rodent ulcer o IF regional L.Ns are involved	
	*Surgical Excision: > Indicated in: 1- Very small 2- Ulcer near the eye. 3- Recurrence after irradiation. 4- Resistant to irradiation. 5- Ulcer infiltrating bone or cartilage because malignant cells are hidden so → • Efficient dose will leads to Irradiation Necrosis. • Low dose will leads to High Risk of Recurrence. > Technique: Excision with safety margin about 1 cm of surface & depth. * Curettage & cautery: if multiple * Cryosurgery: if small. * Flurouracil: if superficial but this	Block Dissection is indicated Otherwise they are monthly Examined.	
	line has high rate of recurrence.	Cure Rate = 90%	



Diseases of Bursae, Tendons & Fascia



Introduction

- The Bursa resembles the synovial capsule of joint.
- It contains clear mucinous fluid to minimize friction.
- Types: (A) Anatomical Bursae

Present where Tendon passes over Bony surface or where superficial fascia & skin covering bony prominence.

(B) Adventitious Bursae (Non Anatomical)

Developed over areas of repeated friction it is non anatomical i.e. Newly formed.

Chronic Serous Burshis

Acute Simple Bursitis

Treated by : Rest

Acute Septic Bursitis

Treated by: Drainage

Types of Chronic Bursitis

- O House-maid's knee (Pre-patellar Bursa) 🗗
 - · Present as S.C fluctuant swelling.
 - · Site: Over the lower part of patella.
- (Olecranon Bursa)
 - · Present as lax fluctuant swelling.
 - · Site: Over the Olecranon process
- **® Semi-membranous Bursa-**
 - Present as Tense, fluctuant swelling & characterized by becoming Tense on Extension of knee & flaccid on Flexion of knee.
 - Site: Medial part of popliteal fosse & above the joint line.

N.B. D.D from Baker's Cust which is

Herniation of synovial membrane
of knee joint with oste-oarthritic
patients & present at center of
popliteal fossa below joint line.



Housemald Bursa

Medial Lateral

Semi-membranou
Bursa

Joint line
Baker's Cyst

Semi-membranous Bursa

Treatment

Excision of Bursa

2 Simple Ganglion

- <u>Definition</u>: It is a <u>Myxomatous degeneration</u> of fibrous tissue of <u>Tendon sheath</u> & Joint capsule. It <u>contain</u> jelly like mucin.
- Clinical picture:
 - · Localized, Tense, Cystic, painless & related to tendon
 - · Back of wrist is the commonest site.
 - It is mobile across but not along and it's mobility restricted with tendon action.
- Treatment

Rupture by compression or Excision



3 Compound Ganglion

- <u>Definition</u>: It is a <u>T.B Synovitis</u> of synovial sheath of the tendons passing under flexor Retinaculum. The synovial sheath becomes <u>distended</u> with T.B. granulation tissue.
- · Clinical picture :
 - O Localized, Fluctuant swelling.
 - D At the lower part of flexor Retinaculum.
 - @ Characterized by "Gross Fluctuation Test"
- Ireatment: Anti-T.B drugs + Immobilization in Plaster Cast.

Swelling of Popliteal fossa:

- A- Cystic swellings:
 - ① Skin and S.C. tissue: Abscess, Haemangioma, Lymphangioma.
 - 2 Yein: Saccular varicosity of upper end of short saphenous vein, VV.
 - (2) Artery: Popliteal aneurysm, arterio venous fistula.
 - Semimembranosus bursitis.
- B- Solid swellings:
 - O Skin and S.C. tissue: Lipoma, Neurofibroma.
 - @ Muscles: Fibrosarcoma.
 - 3 Nerves: Neurofibroma.
 - Periosteum: Fibrosarcoma.
 - ⑤ Bones: Acute and chronic ostemoyelitis, osteoclastoma, osteosarcoma, secondaries of lower end of femur or upper end of tibia.

III Superficial Swellings & Tumors 1 Desmoid Tumor

* Definition:

Locally malignant tumor arising from the fibers of Anterior rectus sheath.

- * Incidence :
 - Multipara female (80%).
 - · Common with (Gardener's syndrome)

<u>N.B.</u>: Gardner's syndrome : Familial polyposis coli + osteoma + sebaceous cyst + Desmoid tumor.

* Actiology:

Due to previous surgical incision or overstretching of Anterior rectus sheath.

* Pathology:

- · Site:
 - o It arises in the rectus sheath below level of umbilicus.
 - o It is usually arises to one side (usually Rt.) Never in midline.
- N/E:
 - o Pinkish, hard & non capsulated mass.
 - Cut section shows parallel fibers like tendon and hence the name (Desmoid tumor).
- M/P: It resemble to fibroma but with giant body cells, so called (Recurrent fibroma of paget).
- * Suread: Only local, early to mother muscle then to surrounding.
- * Clinical Picture:
 - Slowly growing, hard (painless swelling in the lower abdomen with ill defined edge.
 - At site of a previous abdominal scar.
 - It can moves side to side & becomes fixed on contraction of the muscle.
- * Investigations : CT scan & MRI.
- * Treatment: Only by side excision with 1 inch safety margin including the whole thickness of the muscle and the defect in the abdominal wall is repaired with Proline or Nylon mesh.

2 Spinal Bifida

* **Definition**: Congenital absence of Post. Neural arch of the vertebrae with or without meningeal & cord compression.

* Site: Most common at lumbo-sacral.



Spinous process.

Transverse process.

Lamina

* Types :

[1] Spina Bifida Occulta:

The defect in spine & lamina only, there is dimpling in the skin over it with tuff of Hair & dilated veins.



[II] Spina Bifida Manifesta:

@ Meningocele:

- Protrusion of meninges through lumbar defect.
- C/P: No paralytic lesion & Hydrocephalus is common.
- <u>Diagnosis</u>: Cystic <u>Transluscent</u> mass.

2 Myelocele:

- Protrusion of cord through lumbar defect.

3 Meningomyclocele:

- Protrusion of meninges & cord through lumbar defect.
- C/P: Paralytic lesion & Hydrocephalus is rare.
- Diagnosis: Cystic Opaque mass.

* Treatment:

- ① Excision with repair of the defect to avoid rupture & meningitis.
- ② Shunt operations if hydrocephalus developed.

Final	
Written Exams	
1995 • Give an account on Cystic Hygroma.	ر ئاني (10 Marks)
1996 • Discuss the Actiology, Pathology & Treatment of	
Basal Cell Carcinoma of skin	دور ثاني (25 Marks)
• Rodent ulcer : pathology & treatment	دور ثاني (10 Marks)
• <u>Discuss</u> Pathology, Diagnosis & treatment of Rodent Ulcer of the face.	دور ثاني (10 Marks)
• <u>Discuss</u> Malignant Melanoma.	(10 Marks)
2000 • Discuss Actiology & pathology of Rodent ulcer	(10 Marks)
2001 Discuss C/P & Treatment of squamous cell carcinoma	دور تاني (10 Marks)
2002 * Discuss path & C/P of Rodent ulcer	(12 Marks)
• Discuss DD of an ulcers of the face	(10 Marks)

Chapter (15)

The Hernia

epigastric

umbllical

inquinal

femoral

Chapter [15]



* Definition:

· Hernia is the protrusion of a viscus or part of viscus within a peritoneal sac through an opening or a weak part of abdominal wall.

* Site:

[1] Inquinal Region : (i.e. Inquinal Hernia) [1" common]

· Area above inguinal ligament (Groin crease). N.B. It may be Indirect or Direct.

[2] Femoral Region: (i.e. Femoral Hernia).

Area below inguinal ligament (Groin crease).

N.B.: [1] & [2] called Groin Hernia.

[3] Umbilical Region : (i.e. Umbilical Hernia).

· Area midway between the xiphisternum and symphysis pubis i.e. At normal site of umbilicus.

M.B.: a) Umbilical Hernia: Is Central and Rounded in shape.

b) Para-umbilical Hernia: Is Excentric and Creasentic in shape.

[4] Epigastric Region : (i.e. Epigastric Hernia).

· Area away from umbilicus at site of linea Alba.

M.B.: [3] & [4] called Abdominal Hernia.

[5] Incisional hernia: (i.e. Post-operative Hernia) 2[™] common.

N.B.: The commonest incisional hernia is post-appendicectomy.

[6] Others: Rare sties of Hernia as 3

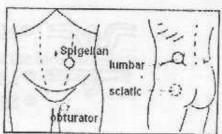
· Obturator Hernia: Through Obturator foramen.

· Lumbar Hernia : Through Lumbar region

· Gluteal Hernia : Through Greater sciatic foramen.

· Sciatic Hernia : Through Lesser sciatic foramen.

· Spigelian Hernia : Through Linea semi-lunaris



* Actiology : It may be &

(A) Congenital: due to presence of a Congenital Performed Sac.

e.g. the Remains of processus vaginalis (Congenital Inguinal Hernia).

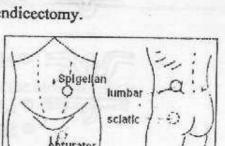
(B) Acquired : (due to).

[1] î intra abdominal pressure:

 Chronic straining → Cough, Constipation or Senile Enlargement of Prostate (SEP).

Abdominal swelling → Pregnancy, Ascites or Hepato-splenomegaly (HSM)

Occupational as Porters.



0

Oncisional

Covering

Fundus

Neck

· Mouth

[2] Weakness of abdominal wall:

Previous operations.

- Obesity -> Fat separate the muscle bundles and weakens the aponeurosis.
- Stretching by pregnancy.

* Structure :

A The Defect + B The sac + C the content + D coverings

(A) The Defect : Through which sac bulges out.

B) The Sac: •

The sac has many shapes (see below)
 Pear-Shaped: Indirect (oblique) inguinal hemia.

• Hemispherical : Direct inguinal hernia

• Tube-Like : Funicular type of (O.I.H.)

· Multilocular : Para-umbilical Hernia (P.U.H.).

· Conical: Infantile hernia.

C The Content :

* It may be any organ except the Pancreas.

	⊕ Il intestine ↓	O II Omentum
	Enterocele	Omentecele
Consistency >	• Soft	Doughy
Reducibility >	• 1st part difficult, because of gases.	Last part difficult, because adhesion of sac and omentum.
4	Show gurgling sensation	Show doughy sensation.
Percussion. >	• Resonant,	Duliness.
Palpation >	Lobulated surface.	Smooth surface

N.B. Special Contents



@ Richter's Hernia:

- · Aportion of Cirumference of intestine.
- · It occurs with femoral hernia.
- Diagnosed only if strangulated.



Maydl's Hernia: Two loops of the bowel (Hernia-in-W) the intermediate loop lies in peritoneal cavity.



- O Littre's Hernia: The content is Mickle's Diverticulum.
- Sliding Hernia: <u>Urinary Bladder may</u> be adherent to the wall of hernial sac.
- The are 2 sacs which saddle the Inf. Epigastric artery pulling on the neck of one sac to be single sac then Trans-fixiation & excision is done.
- Interstitial Hernia: If the sac of hernia passes between the layers
 of abdominal wall instead of descending into serotum.

It may pass:

- 1 Between the peritoneum & Transversalis fascia(Propertioneal type).
- Detween the internal & external oblique (Intraparietal type).
- 3 Between the skin & external oblique (Proparietal type).
- (D) The coverings : Derived from layers of Abdominal wall.

Complications of Hernia

1 Inflammation

★ It is Inflammation of contents or 2ry to using a truss. The patient complaint of (Fever, Headach, Malaise & Anorexia). The Treatment is observation only.

2 Irreducibility

* Definition:

Failure to return the contents into the Abdomen.

* Aetiology :

- Adhesions between the contents & the sac.
- · Adhesions between the contents themselves.
- · Protusion of new content during strain.

* D.D:

enia taka 1955 Kepada	irreducible	Obstructed	Strangulated
· Acute Obstruction	-	+.	+
· Impulse on cough	+	+	
· Tense & Tender			+ 1/1

* Treatment:

Irreducibility increases the risk of obstruction & strangulation. This means early operation {must be according to type of Hernia} Then cut of adhesions & reduction of hernia.

3 Obstruction

* Definition:

Occlusion of intestinal lumen from outside or inside but the blood supply is still unaffected.

* Actiology:

Usually 2ry to irreducibility.

* Clinical picture:

Symptoms of A.I.O (Constipation, Colics, Distention & Vomiting)

* D.D :

As above

* Treatment:

Early surgery as DD between it & Strangulation is very difficult.

4 Strangulation

* Definition :

The Hernia becomes strangulated when the blood supply of it's content is seriously impaired.

* incidence:

[A] It varies according to the Type of Hernia

 Inguinal 2-4% 25-30% · Femoral 15-20% Para-umbilical 3-5% Incisional

[B] Although the incidence is higher in Femoral Hernia, yet strangulated inguinal hernia account for more than 50% (As it is more common)

[C] Strangulation occur at any age & commoner after Truss

* Predisposing Factors:

- ① Inflammation, Irreducibility & Obstruction.
- ② Sudden Expulsion of new contents following straining.
- Repeated attempts at reduction producing oedema

* Pathology :

(A) The Constricting Agents

Any Resistant structure outside the sac As

Neck of the sac.

Bands of adhesions within the sac.

Superficial or Deep ring. With inguinal Hernia

Sharp edge of lacumar ligament.

With femoral Hernia.

Defect in linea Alba. - With para-umbilical Hernia

(B) The Contents

- Constricting Agents will compress the veins in the intestinal mesentery (Thin walled) → ↑ Venous pressure → Oedema and Congestion of intestinal loops. IF the congestion is marked increased -> Haemorrhage in intestinal Wall & lumen
- Further rise of pressure → Impairment of arterial blood supply So the contents lose their vitality & may be undergo gangrene.
- Finally, Gangrene occurs: It starts at ring of constriction then affects the anti-mesenteric border of intestine. If perforated > Peritonitis.

N.B. Neglected Cases will die from Septic Shock & Debydration

* Clinical picture :

(A) General Examination

- Manifestations of (A.I.0) (Constipation, Colics, Distention and Vomiting).
- Hypovolamic shock & signs of dehydration
- If Gangrene occurs → Peritonitis → Paralytic ileus i.e. No colics which is "Bad sign" → Finally septic shock.

N.B.

- Manifestations of (A.I.O) are absent with &
 - 1 Strangulated Omentum.
 - D Strangulated Richter's Hernia.
 - D Strangulated Littre's Hernia.
- * In Maydle's Hernla: The Gangrene affect the intermediate loop which lies in the Abdomen as it has the most distant blood supply. So that you must looking for it during the operation.

(B) Local Examination "Cardinal signs of Strangulation"

- ① Tense & Tender
- @ Irreducible
- 3 No Impulse on cough.

* D.D :

	Irreducibi e	Obstructed	Strangulated
Acute obstruction		+	+
· Impulse on cough	0 = +	+	-
Tense & Tender	Sections To a		+

* Treatment: [Emergency operation after Resuscitation]

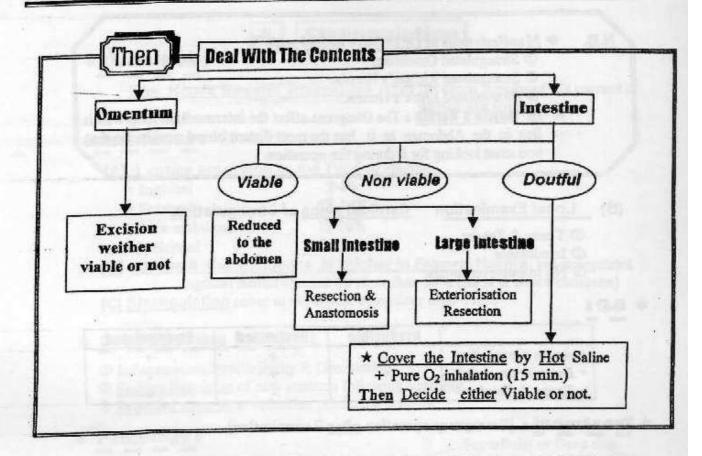
A Immediate Resuscitation

- O Hospitalization.
- O Ryle's Tube for suction.
- ② <u>Urinary Catheter</u> is applied.
- 1.V Fluids To correct electrolyte imbalance
- O I.V Blood & Ringer's Lactate to correct Hypovolaemia.
- 6 I.V. Broad spectrum A.B. to guard against Septic Shock.

(B) Immediate Operation

- ① <u>Incision</u> should be planned to <u>Expose</u> the fundus of sac and Open it to
 Evacuate Toxic fluid 1st.
- ② The constricting agents should be divided over the fingers to avoid injury
 of intestine.
- The contents are pulled out & Examined, viable or not

	Viable Intestine	Hon-viable intestine
 Intestinal Color Peritoneal Lusters Mesenteric Arteries 	Pink or Dark red Present. Pulsating	Brown or Black. Absent. Non-pulsating
By <u>Pinching</u> Consistency If Injured	Contracts Firm Bleeding occur	No Response Floppy No Bleeding



N.B.: Intra-operative Test to Detect the Vitality: 3

- · Doppler U/S.
- Fluroscein Test: Inject 1gm Fluroscein I.V then Inspect the bowel under ultra-vilot rays. If the bowel has good Blood supply it will fluroyce.
- · Oximeter.
- Repair the Hernial Defect by Proline sutures.
- O Subcutaneous Drain is usually used.
- 6 Post-operative Care (a) Continue Ryle's suction with I.V fluid.
 - (b) Prophylactic A.B.
 - (c) Removal of drain after 5 days.

N.B. Special Case

- [Conservative measure occur during pre-operative preparation in infants with O.I.H, which has strangulated for less than 6 hours].
- Through Gental TAXIS
 In a number of infants the reduction of Hernia is easily obtained by gentle Flexion of thigh & Internal rotation to hip.
- · Complications of Taxis
 - ① Rupture of sac or Intestine at neck of sac.
 - ② Reduction of gangrenous part into the abdomen → Peritonitis.
 - Reduction-in-mass:
 The sac Together with it's content are forced back in one mass i.e. swelling disappear but symptoms are persist.

5 | Hydrocele of Hernial Sac

* Actiology:

When narrow necked sacs becomes occluded by omentum or adhesions after reduction of it's contents → collection of serous fluid in the sac.

* Clinical Picture :

Cystic transluscent inguino scrotal swelling.

* Treatment: Excision.

6 | Rupture of Hernial Sac

Excessive manipulation of the Hernia → Rupture of sac → protrusion of hernial contents in the S.C. tissue.



* Incidence: 10% (75% indirect & 25% direct)

* Actioilogy: As incisional Hernial +

D Leaving part of the original Sac.

Missing a second sac at operation e.g. Pantaloon Hernia.

* Treatment :

Correction of predisposing factors + Hernioplasty.



* Definition:

An Extra-peritoneal organ may be adherent to wall of hernial sac.

* incidence :

① Common with old males & common with inguinal & femoral Hernia.

② The commonest sliding organs, urinary bladder, caccum & sigmoid colon.

* Clinical Picture :

Old male with incomplete reducible Hernia.

• Urinary symptoms (double micturation) if sliding urinary bladder.

* Treatment: Graham's operation

Cut the part of the wall of the sac adherent to the sliding organ & separate it from the sac then the sliding organ is pushed back into the abdomen then the remnant of the sac is Transfixed & excised Then Finally repair is done.

Surgical Anatomy

Layers of Anterior Abdominal Wall

- Skin
- O Superficial Fascia
 - Superficial Fatty Layer & Deep Membranous Layer.
- 3 Muscles:
 - External Oblique Muscle
 - Origin: From outer surface of lower 8 ribs.
 - Insertion: Xiphoid process, Linea Alba, A.s.i.s, outer lip of Iliac crest & Pubic tubercle.
 - · Surgical Importance:
 - Fibers run Downwards, Forwards & Medially
 - The lower part becomes aponeurotic and it's free border enfolded as Inguinal Ilgament
 - External Inguinal Ring is an opening of external oblique aponeurosis.

② Internal Oblique Muscle

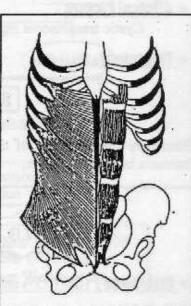
- Origin: From lateral half of upper surface of inguinal ligament.
- Insertion: Lower 6 Costal cartilage, Xiphoid process & Linea Alba.
- Surgical Importance:
 - · Fibers run Upwards, Forwards and medially
 - The lower fibers inserted as <u>Conjoined Tendon</u> with (Transversus Abdominis) muscle into the Pubic crest & Pectineal line.
 - The lower border covers the deep ring and the beginning of spermatic cord.

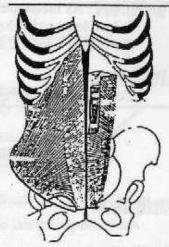
3 Transversus Abdominis Muscle

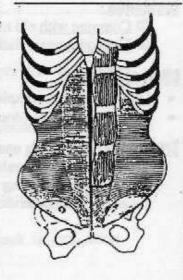
- Origin: From lateral 1/3 of upper surface of inguinal ligament & lower 6 Costal cartilage.
- Insertion: Xiphoid process & Linea Alba.
- Surgical Importance:
 It is inserted as Conjoined Tendon with Internal Oblique muscle

⊃ Fascia Transversalis:

Thin but Strong fascial layer lies infront of the peritoneium. It gives the Deep Inguinal Ring.









* Superficial (External) Inguinal Ring:

- It is a (A shaped) opening in Ext. Oblique Aponeurosis.
- · It presents 1/2 inch above & medial to Pubic Tubercle.
- It is an Exit for Spermatic cord & Ilio-inguinal nerve.

* Deep (Internal) Inquinal Ring:

- It is a (U-shaped) opening at Fascia Transversalis.
- · It present 1/2 inch above mid-point of Inguinal ligament.
- It is an Inlet for Spermatic cord. The Inferior epigasiric vessels run medial to it.

Inguinal Canal

(مهم جدآ)

* Definition:

It is an Oblique passage in the lower part of the Ant. Abdominal wall.

* Course:

- It begins at Deep ring (1/2 inch above mid-point of Inguinal Ligament) then directed downward, forwards & medially.
- . It's length about 1.5 inches (4 cm)
- It Ends at superficial ring (1/2 inch above & medial to pubic tubercle).

* Contents:

* Ilio-inguinal Nerve:

which pierces the post-wall of the canal then passes through superficial inguinal ring.

* Spermatic Cord if Male

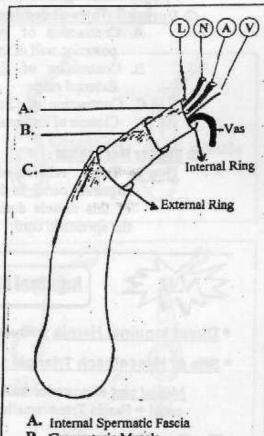
or Round Ligament If Female

Contents of the Spermatic Cord:

- O Vas Deferens.
- Artery of vas & Testicular artery.
- (3) Vein of vas & Pampiniform plexus.
- Autonomic Nerves.
- S Lymphatic vessels.
- © Vestige of Processus Vaginalis.
- @ Genital br. of Genito-femoral n.

Coverings of the Spermatic Cord:

- External Spermatic Fascia from External Oblique Aponeurosis.
- ② <u>Cremasteric muscle</u> from Internal Oblique Muscle.
- Internal spermatic fascia from Fascia Transversalis.



- B. Cremasteric Muscle.
- C External Spermatic Fascia

* Boundaries:

- (A) Anterior wall:
 - External Oblique Aponeurosis.
 - Lower parts of Internal Oblique Muscle <u>laterally</u>.
- B Posterior wall :
 - · Fascia Transversalis.
 - · Conjoined Tendon medially.
- C Floor:
 - · Upper grooved surface of Inguinal ligament
- (D) Roof:
 - · High arched fibers of conjoined Tendon.

* Factors prevent Inguinal Hernia:

1 Inguinal canal is oblique So

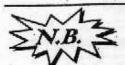
The Internal ring & External ring not at same Plane.

During 1 (Intra-abdominal pressure) the followings occur 3

- A. Contraction of Anterior abdominal wall. So that the anterior & posterior wall of inguinal canal are approximated.
- B. Contraction of External oblique muscle leads to narrowing of External ring.
- C. Contraction of <u>Cremesteric muscle</u> leads to elevation of scrotum, so Closure of External rings occur.

3 Shutter Mechanism :

<u>Due to Triple</u> relation of the lower fibers of <u>Internal oblique muscle</u> to the inguinal canal. In the [Anterior, Roof & Posterior wall] So contraction of this muscle during strain leads to closure of Inguinal canal around the spermatic cord.



Inguinal I Hasselbach I Triangle

- Direct Inguinal Hernia protrude through this Triangle
- Site of Hasselbach Triangle:

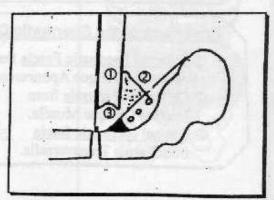
Medial part of posterior wall of Inguinal canal = Fascia Transversalis.

■ The Boundaries:

O Medially: Lateral border of Rectus sheath.

Laterally: Inferior Epigastric vessels.

(3) Inferiorly : Inguinal ligament.



	Indirect (Oblique) Inguinal Hernia	Direct Inguinal Hernia
* Clinical Picture: 1. Age. 2. Sex. 3. Side 4. Shape. 5. Direction of desend. 6. Desent Into scrotum. 7. Reduction. 8. Internal Ring Test. 9. External Ring Test. 10. Complications.	 Any Age. More in Male. Less common bilateral 30%. Pyriform (Oblong). Downwards, forwards and medially Can descend. Upward, backwards and laterally. Not desend. Wide ring and show impulse at tip of little finger. More common. 	 Usually old age Always in Male. More common bilateral 5%. Hemispherical (Rounded). Forwards only. Extremely Rare. Backwards only. Desend. Normal ring and show impulse at medial side of little finger. Less common.



Special Types of Indirect (Oblique) Inguinal Hernia

O Congenital Hernia:

- Due to persistency of processus vaginalis.
- It reaches down the scrotum from the start & lies among it's content.
- Although being Congenital but may be appeared with adult life.

O Infantile Hernia:

- <u>Tunica vaginalis</u> extends upwards to the External Ring.
- True hernial sac passes behind it i.e. 2 Sacs.
- It is operative finding only .

3 Adult Type : Which may be 3

A Bubonocele Type:

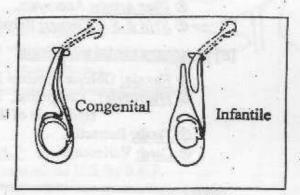
Hernia is <u>Limited to the inguinal canal</u> & <u>Seen as</u> bulge or mass at Inguinal region.

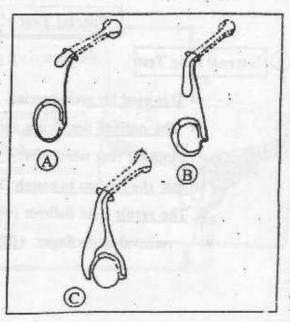
B Funicular Type:

Hernia passes with cord & stops just Above the Epididymis

C Complete scrotal Hernia:

Hernia descends to the bottom of Scrotum. The Testis behind the hernia





N.B. Special Types of Direct Inguinal Hernia

1 Lateral Type:

Which bulges through the <u>lateral</u> part of Hasselbach's \triangle (made by Fascia Transversalis) only & Thus has a very <u>wide</u> neck & is <u>less</u> liable to complicate.

@ Medial Type:

Which bulges through a defect in the conjoint Tendon infront of fascia transversalis in the medial part of Hasselbach's \triangle . The edge of the defect is sharp + narrow neck & is more liable to complicate.

* DD of Inguinal Hernias:

From (other Inguinal & Inguino-scrotal swellings)

[A] Inquinal Swellings:

- 1 Hernia: Bubonocele & Direct Inguinal Hernia.
- D Hydrocele: Hydrocele of Hernial sac. & Encysted hydrocele of the cord.
- Testis: Undescended, Ectopic or Retractile.
- @ Cord: Nodule or Lipoma.
- (5) Iliac L.Ns.: Just above inguinal ligament.
- 6 Iliac Artery: Aneurysm.
- D Skin & S.C Tissues: Sebaceous, lipomaetc.

[B] Inquino-scrotal swellings:

- Hernia: Oblique Inguinal Hernia (Complete Type)
- ② <u>Hydrocele</u>: Congenital, Infantil, Hydrocele of Hernial sac & Encysted Hydrocele of the cord.
- @ Testis: Retractile.
- @ Cord: Varicocele

Special Test of Hernia

V. Important

Internal Ring Test

- A It is used for groin hernias.
- The patient lies down and the hernia is reduced then put your finger over the internal ring which lies ½ Inch above mid point of inguinal ligament
- Ask the Patient to cough. Then repeat while standing.
- ★ The result: An indirect (oblique) inguinal hernia does not protrude except after removal of the finger. (DD direct inguinal hernia).

(المريض واقف) External ring test

- A It is used for groin hernias.
- The patient is standing and the hernia is reduced then put your little finger is passed into the external ring, invaginating the scrotum, with your nail towards the spermatic cord.
 - → Normally : The external ring admits just the tip of the little finger.
 - → If the ring is wide: Indirect inguinal hernia.
- Ask the patient to cough then &
- ☆ The result
 - → Impulse on the tip of the little finger : Indirect inguinal herina
 - → Impulse on the medial side of the little finger = Direct inguinal herina.

Zieman's Technique

(المريض واقف)

Zeiman's Technique

- A Indication : If no obivous lump is detected, the presence and site of hernia may be by it.
- ☆ Technique: Placing you index finger over internal ring, and the middle finger over external ring, and the Ring finger over femoral canal.
- Ask the patient to cough. &
- ☆ The result -> At Index finger (Internal ring) = Indirect hernia. At Middle finger (Inguinal canal) = Direct hernia. At Ring finger (Femoral canal) = Femoral hemia.

* Management of Inguinal Hernia:

[A] Investigations: To detect underlying cause of I.A.P:

Chest X-ray, Abdominal U/S & Trans-rectal U/S for S.E.P.

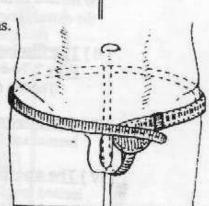
[B] Treatment:

@ Truss :

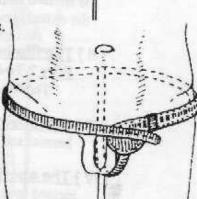
- Indications: O Infant below 3 months waiting for operations.
 - @ Old patient.
 - ③ Unfit for surgery.
- Contraindications:

 ① Irreducible hernia or femoral Hernia.
 - ② Obese patient (Diffuct to use truss).
 - ③ Presence of another pathology as varicocele or undescended testis.
- Complications: ① Infection.
 - ② Adhesion → strangulation.
 - ③ Pressure atrophy of local muscle.

@ Operations : See below







HERNIAL OPERATIONS

I Operations for Inguinal Hernias

1. Indirect (oblique) Inguinal Hernia

Herniotomy

* Removal of hemial sac + reduction of the contents only.

Herniorrhaphy

* Herniotomy + Narrowing the defect & Repaire of posterior wall of inguinal canal

Hernioplasty

* Herniotomy + Repair the defect by synthetic material like proline Mesh

2. Direct Inguinal Hernia

 The Above mentioned 3 Types of Hernial operations are suitable for "Indirect Inguinal Hernia" only.

But Direct Inguinal Hernia: Herniorrhaphy or Hernioplasty is done i.e no Herniotomy is done alone

(A) Herniotomy

* Indications

Indicated with infants & children below 12 years. Why? Because the Deep ring is unstretched + good musculature for Inguinal canal

- * Anesthesia "General or Spinal"
- * Position "Supine"
- ★ Incision Inguinal incision: 1 finger above & parallel to medial 2/3 of Inguinal ligament:

* Steps

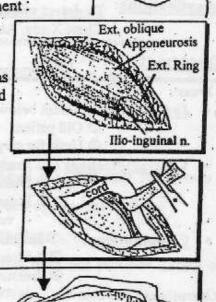
[1] The External oblique Apponeurosis is incised in line of it's fibers, So That it opens the external ring so the inguinal canal is opened

[II] The Ilio-ingulnal nerve is protected Why? To avoid paralysis of conjoint Tendon so prevent Direct Hernia.

[III] The spermatic cord in which the hernial sac lies is hooked by ring forceps.

[IV] The spermatic cord coverings are incised longitudinally and the hemial sac is Identified by being *>

- O Pearly in shape
- @ white in colour .
- Antro-lateral to their cord structures .



Then The neck of the sac is identified by being

- 1 The narrowest part of the sac .
- D surrounded by Extra-peritoneal Fat .
- (Lateral to inferior Epigastric vessels .

[V] The sac is opened and the contents are reduced

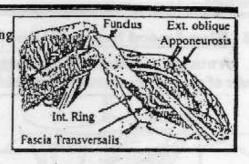
[VI] The Neck of Hernial sac:

Transfixed & ligated as high as possible then Excised.

[VII] The Cord coverings :

Resutured again then the wound is closed in

N.B: No drains are used





B Herniorrhaphy

* Indications

Indicated with large Hernial defect in adult or Elderly with good musculature

* Anesthesia + pesition + Incision -> same as Herniotomy

* Steps

A Herniotomy: As Above

2 steps 1- Narrowing of stretched Internal ring to the size of tip of little finger.

By plication of the Fascia Transversalis

2- Reinforcement of posterior wall of Inguinal canal
By One of the followings %

[I] Bassini Repair

 Suture the conjoint Tendon down to the inguinal ligament behind the cord .

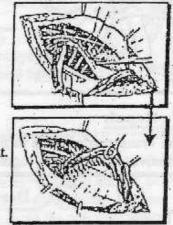
O: Why Bassini repair is unphysicological?

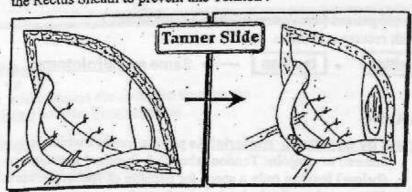
Because © Interferes with shutter mechanism of inguinal canal during I.A.P

② Healing is very week between fleshy muscle & Tendinous ligament.

Q: What is meant by "Tanner slide "?

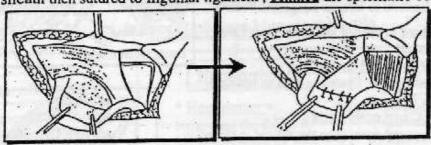
If there is tension in the repair, we do
"Tanner slide "= Relaxing incision in
the Rectus Sheath to prevent this Tension.





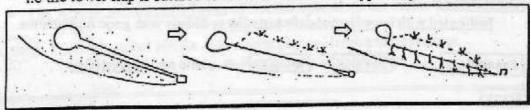
[II] Blood-good Repair (Uses of Rectus sheath)

A triangle of Anterior Rectus sheath is turned laterally & hinged on lateral border of sheath then sutured to Inguinal ligament, behined the spermatic cord.

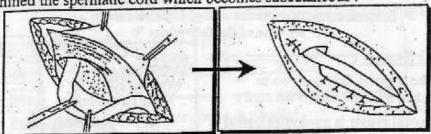


[III] Shouldice Repair

The Fascia Transversals is divided longitudinally along the posterior border of the canal. Then <u>Double Brusting</u> is done i.e the lower flap is sutured to the under surface of upper flap.



[IV] Halsted Repair (Anterior Transposition of the cord)
suturing the External oblique Apponeurosis to the inguinal ligament
behined the spermatic cord which becomes subcutaneous.



[V] Mc vay's Repair

Brings the Transversals Fascia further posteriorly & Inferiorly to pectineal ligament. It is effective in the repair of inguinal hernia associated with fernoral Hernia.

C Hernioplasty

* Indications

Indicated with old patient (weak musculature + wide defect)
or with recurrent Hernias

* Anesthesia + Position + Incision -> Same as Herniotomy

- A Herniotomy : As Above
- B Repair of the defect by synthetic material As proline meshes which is sutured to conjoint Tendon (above) & Inguinal ligament (below) leaving only a space for passage of spermatic cord.

Q: What are the old natural methods for hernioplasty?

Answer: using skin graft or fascia lata i.e. Natural graft.

2 Femoral Hernia

Surgical anatomy of femoral canal

⇒ Femoral Canal:

Structure:

o It the most medial compartment of fernoral sheath, the intermediate compartment is occupied by the fernoral vein and the lateral one by the fernoral artery.

o Cone shaped, 1/2 inch long.

o lt's mouth (femoral ring) opens up behind the inguinal ligament.

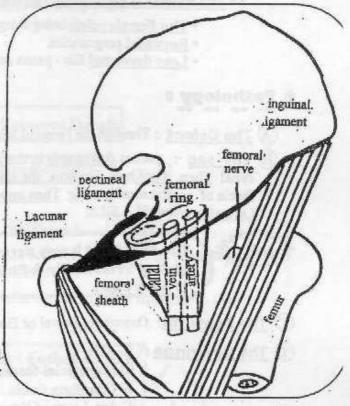
o It's apex: is below and is formed of fusion of medial border of the fernoral sheath & septum between the femoral canal & the femoral vein.

@ Contents :

Fat, lymphetics & L.Ns of Cloquet.

@ Function :

Give space for expansion of the femoral vein during venous return with lower limb exercise.



Temoral Ring: (Mouth of the femoral canal)

· Boundaries :

• Anteriorly : Inguinal ligament (pupart's ligament).

* Posteriorly: (Cooper's pectineal ligament).

* Medially : Lacunar ligament.

· Laterally : femoral vein.



ABNORMAL OBTURATOR ARTERY:

It 30% of population the obturator artery is <u>absent</u> and the pubic branch of epigastric artery descends behind the lacunar lig. and passes through the obturator foramen to replaced the obturator artery.

* Definition:

Hernia which leaves the abdomen through the Femoral ring into the Femoral canal.

* Actiology:

Always Acquired never congenital.

* Incidence :

- E The 3 rd common after incisional hernia
- It represent 20% of Hernial Female
 5% of Hernial Male.
- The Hernia is common in Female due to ®
 - The Female pelvis being Larger.
 - Repeated pregnancies.
 - · Less developed Ilio psoas muscle .

* Pathology :

- (A) The Defect : Through the Femoral Ring.
- B The sac: passes downwards in the Femoral canal Then forwards Towards the cribriform fascia of saphenous opening Then upwards & Laterally towards A.S.I.S.

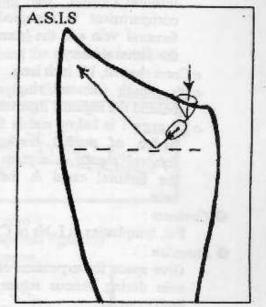


The Neck of Sac is very narrow So the risk of irreducibility & Strangulation is Very high.

- The Contents: Omentum, Bowel or Both
- (D) The Coverings: 1 Skin
 - O Superficial fascia.
 - 3 Cribriform fascia.
 - Ant. Layer of Femoral Sheath.



- Age: 29-48 years
- · Sex : Female > Male
- Mass :
 - Rt . > Lt but 20% Bilateral
 - Present (Below Inguinal Ligament) & (Below & Lateral to Pubic Tubercle)
 - Give impulse on cough. It can be reduced Downwards, Backwards & Finally upwards. But Clinically Impossible.



* P.D. of swelling in Femoral Triangle :

- Lipoma: Characterized by (soft, smooth, slippery edge, superficial to muscles & skin over show dimpling).
- ② Femoral aneurysm: Characterized by (expansile pulsation).
- Saphena varix: Characterized by (thrill on cough, completely disappear on lying down, venous hum on auscultation & apparent varicose vein).

- Femoral L.Ns: As cloquet or part of generalized L.Ns.
- (3) <u>Psoas abscess</u>: Characterized by (cross fluctuation & x-ray spine shows pott's disease)
- @ Ectopic testis: Characterized by empty scrotum.
- @ Psoas bursitis: Characterized by osteoarthritis of hip joint.
- ® Inguiral hernia: Above & medial to pubic tubercle.
- Femoral hernia.

* Treatment :

Operations for Femoral Hernia

A Low Approach (lockwood)

Steps

- 1 The sac is Identified & dissected till it's neck .
- The sac is opened. The contents are reduced & Transfixed as higher as possible and excised.
- Repair: Femoral ring is closed by suturing the Inguinal ligament to the pectineal ligament.

尹

High approach (Lotheissen's

Steps

- The Inquinal Canal is opened then the lower skin flap is dissected down to expose the fundus of the sac which is pushed up from below to help the delivery of sac above inquinal ligament.
- ② The sac is opened. The contents are reduced

 Then the sac is transfixed & excised.
- Repair: Suturing the conjoint tendon to the inguinal ligament then to the pectineal ligament



Pre-peritoneal approach

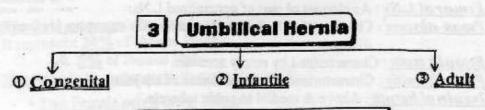
Incision

para-rectal incision at outer border of the lower of the rectus abdominis.

Steps

- The Anterior rectus sheath is opened, the muscle is retracted medially then
 the posterior rectus sheath is opened & Exposing the peritoneum.
- ② The Hernial sac is Identified and opened. Then the contents are reduced & Transfixed as higher as possible and excised.
- 1 Repair : see Mc Vay's Repair .





A Congenital umbilical Hernia

[Exomphalos		l e l	
	Exomphalos Minor	Exomphalos Major	
		5	
* Pathology: (A) The Defect (B) The sac (C) The Contents (D) The Coverings	 Small(< 5 cm) at he umbilicum Formed by Peritoneum. Usually Bowel. Wharton's lefty + Layer of Amniotic membrane. During Ligation of the an umbilicul atturn. 	■ Large (> 5 cm) at the center of abdomen. ■ Formed by Peritoneum ■ Usually Bowel ± Liver ■ Layer of Amniotic membrane only ■ Rupture may occur with infection → Peritonitis	
* Complications:	umbilical stump, a loop of Intestine may be Entangled in the ligature		
* Treatment:	Content are reduced and returned to the abdomen Then sac is excised & The defect is repaired in layers	Urgent operation: The Problem: No Space in abdomen to accommodate the contents So: The skin on either sides of the defect is undercut then flaps will be sutured togerther over the sac + release incision over the flanks. Later on: If infant survive, definitive repair is done.	

Rectus

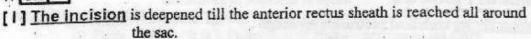
* Treatment: See Operative

III Operations for Para-umbilical Hernia (P. U. H.)

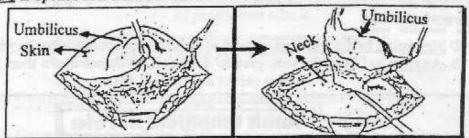
(A) Mayo's Repair

- * Indication Small defect
- * Anesthesia "General"
- * Position "Supine"
- ★ Incision
 Transverse Elliptical incision is done over the

Hernia & Enclosing The umbilicus



[II] The sac is opened at it's neck & the contents are reduced .

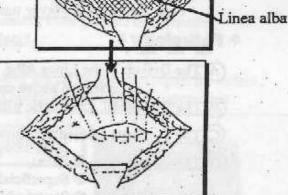


[III] The sac is excised with overlying skin and the defect in the linea Alba is

widened on both sides till the red fibers of recti muscles appear.

[IV] Finally the upper flap of linea alba is sutured over the lower flap by Interrupted . transverse mattress sutures

[V] The free edge of upper flap is sutured in the lower flap.



[VI] The wound is closed over a subcutaneous drain .

B (Hernioplasty)

Indicated with Large defect & Recurrent Hernias



Infantile Umbilical Hernia

*Actiology:

★ Weakness of the umbilical scar form infection or ↑ I.A.P form cough.

* Pathology:

- (A) The Defect: From Umbilical Scar.
- (B) The Sac: Small, conical with wide Neck
- The Contents: Omentum, Bowel or Both.
- (D) Coverings: ① Stretched umbilical scar. ② Extra-peritoneal Fat.

* Clinical Picture :

Patient shows umbilical protrusion on cough.



UMBILICAL HERNIA

* Complications : Rare

* Treatment;

1 Strapping better avoided as most of cases closed spontaneausly within 2 years

 Anatomical Repair with proline sutures if the defect more than 2 Fingers or the hernia persist more than 2 years

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Adult Umbilical Hernia

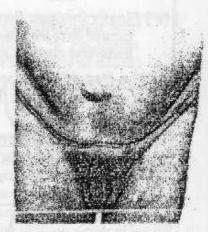
[Para - Umbilical Hernia]

* Actiology: Usually

- · Middle aged .
- · Obese multipara.
- Para- umbilical & Never umbilical.

* Pathology:

- (A) The Defect: In the Linea Alba. But the hernia is more common above umbilicus than below.
- (B) The Sac: Small, Crescentic with narrow Neck
- (The Contents : Omentum, Bowel or Both
- (D) The Coverings : O Skin.
 - O Superficial fascia.
 - 3 Stretched linea Alba.



PARA-UMBILICAL HERNIA

* Clinical picture :

Patient shows para-umbilical protrusion on cough (DD between supraumbilical & Infra- umbilical hernias by the crescentic shape)

* Complications : Common

Especially Irreducible & Strangulated Complications

N.B. : Adult Umbilical Hernia (Acquired)

Usually seen with patient with Ascites or TIAP as Everted umbilicus.

Epigastric Hernia

* Definition:

It is Herniation of Extra - peritoneal fat. It may be single or multiple.

* Actiology:

Usually Acquired . It is formed as a direct result of sudden strain -> Tearing of the Interlacing fibers of linea Alba.

* Pathology:

- (A) The Defect : In the linea Alba (Midway between umbilicus & Xiphoid process.
- (B) The Sac : may be 2 Types
 - O Fatty Hernia: it is a Protrusion of Extra peritoneal fat only
 - D True Epigastric Hernia: Occurs if the protrusion enlarged, it drags a pouch of peritoneum after it.



- (C) The Contents: The Sac is Empty (Because of Narrow Neck) or it contains a small portion of greater omentum.
- (D) The Coverings : Skin & S.C Tissue.

* Clinical picture:

Patient Shows a small Irreducible protrusion simulating to lipoma.

* Complications:

Severe Epigastric pain with Nausia & Vomiting from friction of herniated omentum on the stomach (DD Peptic ulcer)

Treatment:

* Small Hernia: Excision of the fat lobule then repair the defect . * Large Hernia: Mayo's operation as for P.U.H. operations.

Incisional Hernia

* Definition:

Hernia developing after Abdominal incision.

- * Actiology: It is frequently seen with
- ① Pre- operative Causes:
 - (a) Obesity.
 - (b) Poor health or D.M.
 - (c) Anaemia & Hypoprotéinaemia.



INCISIONAL HERNIA



O Operative Causes:

- (a) Uses of absorbable sutures .
- (b) Tight stitches → Devitalized tissues.
- (c) Insertion of a drain through the wound.

Dest - operative causes:

- Persistent pre-operative causes or post-operative distension.
- · Infection of wound .
- · Lifting heavy object before 3 months of operation .

* Treatment:

Steps

- Dissection is done till the edge of defect at the abdominal wall

Then ONE OF THE FOLLOWING WILL BE DONE:-

[1] Anatomical Repair (If the defect is small).

The sac is excised & the Abdominal layers are defined & closed separately
[11] Keel repair operation (If the defect is wide).



The sac is identified & dissected down to the neck, without opening the sac, it is invaginated in the Abdomen by a series of investing sutures. The edges of the defect are closed. So as, the repair if viewed in cross section. Look like the keel of the Boat.
[III] Catell's Repair (5 layers)

The sac is dissected & opened. The contents are returned to Abdomen. Then Declared by the followings.

O IST LAYER :-

The neck of the sac is closed from inside the sac

@ 2ND LAYER :----

The sac is excised 2 cm distal to 1st layer & it's edges are sutured as 2 layer.

③ 3RD LAYER:

Longitudinal Incision is made in anterior rectus sheath 2 cm any from the edge of defect. & then the medial flaps are sutured as 3rd layer.

⊕ 4TH LAYER :----

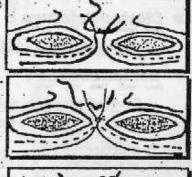
The Recti muscles on either sides are approximated & sutured in the middle line as 4th layer.

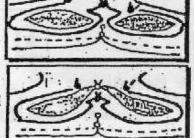
S 5TH LAYER :

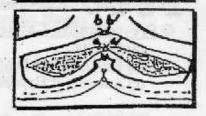
The 2 lateral flaps of anterior rectus sheath are sutured infront of muscles in middle line as 5th layer. Finally: skin is closed over a drain.

[IV] Hernioplasty:

The Best Repair by using proline mesh .







€N.B.} (Burst Abdomen)

* Definition:

Complete disruption of an abdominal incision in the early post-operative period

* Actiology: As incisional Hernia +

[Malnutrition, Vit. C, Malignancy & Ascites]

* Pathology: (At 6-8th post-operative day)

It may be Complete (Separated skin) or Partial (Intact skin).

- Warning sign (RED sign)= Serosanginous discharge, Soaks the dressing.
- If intestine prolapse through wound → called Evisceration
- If intestine doesn't prolaps through wound → called Dehiscence

*Treatment:

[A] Preoperative care:

- Cover the prolapsed bowel by a sterile dressing
- Ryle's tube suction, I.V fluid & antibiotics.
- Morphia & blood transfusion.

[B] Operative:

The protruded intestinal loops are washed with saline and retuned to the abdomen, the omentum is spread over the intestine, the abdominal wall is closed as one layer by prolene (TENSION SUTURES) then retained at leat 3 weeks.



[C] Post-operative care:

Abdominal Binder is used.

6

Rare Hernias

(A) OBTURATOR HERNIA

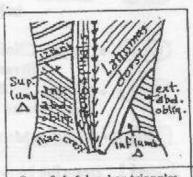
- The Sac passes through the obturator foramen inside the pelvis so No External swelling So unlooked until strangulation occurs.
- Treatment: (Trans-abdominal approach)
 contents are reduced, sac is excised then sutures to close the obturator canal

(B) LUMBAR HERNIA

The sac is passed Defect in lumbar area.

It may be

- 1 2ry on top of lumbar incision.
- 2 1ry (types)
 - Inferior lumbar Hernia:
 Bounded by Iliac crest, latissmus dorsi
 Ext. oblique muscle.
 - Superior lumbar Hernia: Bounded by last rib, sacro spinalis & int. oblique muscle.
- Treatment: Better Hernioplasty.



Sup. & Inf. lumber triangles

(C) GLUTEAL & SCIATIC HERNIA

- Gluteal Hernia → protrude through Greater sciatic notch.
- Sciatic Hernia → protrude through Lesser sciatic notch.

(D) SPIGELIAN HERNIA

It is Hernia through linea semilunaris (lat. border of rectus) mid way between symphysis pubis & umbilicus. The strangulation is very common.

Treatment: Better Hemiorrhaphy.



Spigelian hernia

(E) DIVERICATION OF RECTI

- It is a separation of Recti due to stretching of linea Alba by chronic increased Intraabdominal pressure.e.g. with cough
- Treatment: Abdominal Belt is satisfactory after dealing with the cause.

(1995)

[1996]

1998

Final Written Exam



ىرى ئانى (15 Marks)

بور ثقي (15 Marks) يور

ىرى ئاتى(30 Marks)

(15 Marks)

(10 Marks)

(10 Marks)

(10 Marks)

		t.e.
(1990)	• Discuss Complication of I	nguinal Hernia.
	 Discuss Complications of 	O.I.H

Discuss Complication of Inquinal Hernia

Discuss Anatomy of Inguinal Canal of Male

Discuss Anatomy of Inguinal Canal of Male.

 Discuss Diagnosis of Strangulated Hernia Discuss Pathology, Clinical picture & Treatment of

Strangulated Inguinal Hernia

(10 Marks)

 Mention Boundaries & Contents of Inguinal Canal 1997 in Male (Discuss Anatomy)

> Discuss, Clinical picture and principles of Treatment of بور ثاني (15 Marks) Strangulated Hernia

 Discuss C/P & Management of 2000 Strangulated Hernia

Mention Management of strangulated Herma

(10 Marks)

* Describe boundaries & content of inguinal canal 2003

دور ثانی (9 Marks)

دور تان (10 Marks)

• Discuss c/p & management of stragulated inguinal Hernia (20 Marks)

Discuss Anatomy of inguinal canal

(20 Marks)

Chapter [16]

dead & Neck Surgery

② Cleft Lip ③ Cleft palate:

[See Below]

* Macrostomia

* Pre-auricular sinus

II) Abnormalities due to Excessive fusion.

- ★ Narrow palpebral fissures.
- * Microstomia.
- III) Dermoid cyst

Cleft Lip & Cleft Palate

I- Predisposing Factors & Complications

O | Predisposing Factors

e.g. +ve Consanguinity, Prenatal exposure to viral infections or drugs as Alcohol. Anticonvulsants etc...

O (Complications)

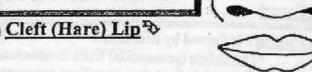
- A Cleft Lip: doesn't interfere with suckling, but may be associated with
 - (1) Abnormal Teeth growth.
 - @ Psychological upset of the parents .
 - ③ It may be associated with cleft palate.

(B) Cleft Palate:

- ① Impairment of normal sucking, due to inability to create a ve intra-oral pressure.
- ② Regurgitation predisposes to Aspiration pneumonia.
- Speech defect 2ry to Hearing loss or Nasal Tone.
- 3 Abnormal Teeth growth.
- 6 It may be associated with cleft lip

III- Local Examination

(A) Cleft (Hare) Lip 🕏



Normal



(I) Upper (Hare) Lip:

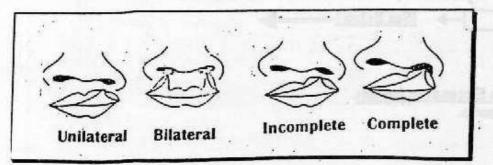
1. Unilateral or Bilateral Cleft lip:

e.g. Unilateral (85%): Due to failure of between maxillary proces on one side forming (lateral part of the lip) and frontonasal proces on other side forming (Philtrum)

- 2. Partial (Incomplete) or Complete: Whether the cleft extends in the floor of th nostril or not.
- 3. Simple or Alveolar: i.e. Associated with ununited premaxilla or not.

(II) Lower (Hare) lip : (Very Rare) Median type.

Due to failure between the two mandibular processes





- O (Investigation) U/S In utero during ante-natal care
- O (Treatment) [Plastic Operative Repair]
 - . Aim of Treatment: To improve appearance and to prevent complications
 - Timing of Repair: 10 gm% (Hb),10 weeks (age) & 10 pound (weight)
 - · Principles
 - 1 Paring the edges.
 - ② Releasing incision in the gingivolabial sulcus to have lax flaps.
 - Symmetry of lip without vertical.
 Shortening with minimal scaring.
 Using Z-plasty



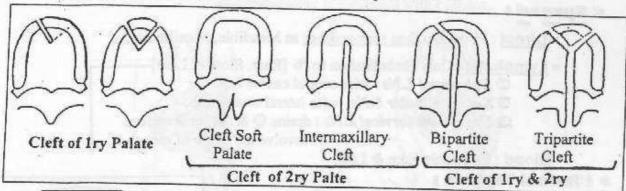
Suture in (3 layers) of lip [Skin, Muscle & Mucous membrane]

N.B: ① Incomplete hare lip should be transformed into complete
② If Cleft lip is associated with a cleft palate, Lip is repaired first

B Cleft Palate &

O (Types)

- ① Cleft of the 1ry palate: Unilateral or Bilateral.
- @ Cleft of the 2ry palate in isolation: Cleft Soft, Palate, Inter-maxillary Cleft & Bifid Uvula.
- 3 Cleft of the 1ry and 2ry palates : Bipartite & Tripartite Clefts.

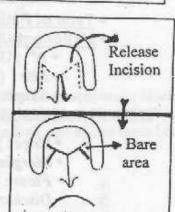


O (Treatment) [Plastic Operative Repair]

- · Aim: To achieve adequate speech and dentition.
- * Timing of repair: At the age of 1-1.5 year before phonation
- · Principles:
 - D Paring of the edges.
 - ② Releasing incisions of the mucoperiosteum creating lax flaps
 - 3 Fracture of head of hamulus to relax the tensor palati muscle.
 - Suture in (3 layers) [Nasal mucosa, Muscle layer then Oral mucosa].

N.B.: Pharyngoplasty: Repair of nasopharyngeal sphincters indicated in nasopharyngeal incompetence.

Post-operative Speech Therapy



2 Carcinoma of The Lip

* incidence:

• Age: > 60 years

Sex : Male > Female

Smokers > Non smokers

* Predisposing factors:

- · Chronic Irritations as 5S (Spirits, Spices, Smoking, Sepsis & S)
- Leukoplakia
- · Benign Tumors as Squamous cell Papilloma.

* Pathology:

- . Site 1 The upper lip 5%
 - @ The Angle of mouth 2%
 - 1 The Lower lip 93%
- · NIE picture :
 - O Malignant ulcer.
 - @ Malignant Nodule.
 - Malignant Fissure.







N.B. Diffuse Infiltrating Type = Woody Lip.

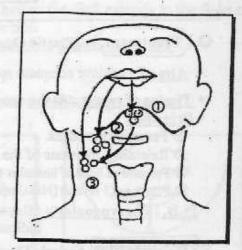
· Microscopic picture: Squamous Cell Carcinoma .

* Spread:

- Direct : In the Lip then surroundings as Mandible, Maxilla etc...
- Lymphatic : Only Embolisation to ♣ [Rare, Slow & Late]-
 - ① Submental L.Ns: with central cancer Lip.
 - D Submandibular L.Ns: with lateral cancer Lip.
 - ② Upper deep cervical L.Ns: drains ① & ② or if cancer involve the angle of mouth.
- Blood : Extremely Rare & Late.

* Clinical Picture:

- Type of Patient: Elderly Male.
- Malignant Ulcer: "The commonest"
 - No : Usually single
 - Site: (see above).
 - · Shape: Variable .
 - · Size : Variable.
 - · Edge: Raised & Everted
 - · Margin : Indurated
 - Floor : Necrotic Floor .
 - · Discharge: Bloody discharge.
 - * Base : Indurated.
- Involved L.Ns are Stony Hard, Painless & 1st mobile but later fixed.



* Complication:

- · Bleeding or Infection .
- Dysphagia & Dysarthria .
- Upper Respiratory Tract Infection from inhaled necrotic tissue.

* investigation:

Excisional biopsy (if small) or Incisional biopsy (if whole lip)

* Treatment:

A Treatment of 1ry Lesion

[I] Irradiation

N.B: Radium Needle is used for buccal lesion

[II] Surgical Excision:

- Indications ① Small lesion
 - @ Cancer on top of \$
 - 3 Others:
 - a. Recurrent lesion after irradiation
 - b. Resistant lesion to irradiation .
 - c. Lesion infiltrating Bone .
- · Technique
- ① Excision with safety margin 1.5 cm all around
- Delastic Reconstruction of the Lip.
- ③ If Mandible is involved → Central Hemimandibulectomy is combined with excision.





Wedge excision of carcinoma of the lip

B Treatment of L.N.s

It may be due to 2ry infections SO wait for one month i.e. No place for prophylactic block dissection. After that period IF they are due to metastasis "Supra-kyeld Block Bissection" is done be removal of submandibular & upper deep cervical L.Ns on both side as one mass i.e. [en Block]

* Prognosis:

★ Extremely Favorable in early cases é out L.Ns metastasis.



3 Carcinoma of The Tongue

* incidence:

- Age : > 60 years .

• Sex : Male > Female .

Smokers > Non smokers.

* Predisposing Factors: (Precancerous Lesions)

① Chronic Irritations. as 5S (Spirits, Spices, Smoking, Sepsis, & \$)

D Benign Tumors, as Squamous cell Papilloma.

3 Leukoplakia 3

→ Definition :

It is a case of Hyperkeratosis & possiply dysplasia

→ Pathology :

Circumscribed white plaque, involve wide areas of oral mucosa.

@ Erytheroplakia : 3

→ Definition :

It is a case of mucosal Atrophy.

→ Pathology:

Irregular Reddish plaque, involve small area of oral mucosa.

(5) Chornic superficial glossitis: 30

→ Definition :

It is a case of chronic Irritation of tongue.

> Pathology :

• Site: It affects the anterior 2/3 of the tongue.

. N/E:

It may be:

o beefy glazed tongue.

Oro Leukoplakia.

or o Fissuring.

Finallyo Carcinoma.

. M/E:

It may be

o Hyperkeratosis.

Then O A canthosis proliferation of prikle cell layer

Then o Basal cell layer.

Finally o Thickened & fibrosed dermis.

→ Treatment:

- 1 Treatment of the cause of irritation.
- @ Non irritant diet & Mouthwash
- ② Excised and biopsied if localized.



* Pathology:

• Site : 1 Lateral margin of Ant. 2/3 = 50 %

@ Post. 1/3 = 20 %

② Less common ventral & dorsal surface of Ant 2/3 of the tongue & Rarely the till of Tongue.

N/E picture:

O Malignant Ulcer

@ Malignant Nodule

3 Malignant Fissure.



N.B : Diffuse Infiltrating Type = Woody Tongue.

· Microscopic picture; Squamous Cell Carcinoma .

* Spread:

- Direct: In the Tongue then surroundings as mandible, gums etc..
- Lymphatic: Both Embolisation & Permeation [Common, Rapid & Early] &

① Tip: Spread to submental L.Ns Then to upper deep cervical L.Ns on both sides.

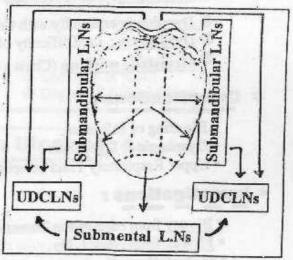
② Lateral margin of Ant. 2/3: To the Ipsilateral submandibular L.Ns. <u>Then</u> to Ipsilateral upper deep cervical L.Ns.

© Central part of Ant. 2/3 To both

Submandibular L.Ns Then to both
upper deep cervical L.Ns.

Post 1/3 of Tongue: To upper deep cervical L.Ns directly

• Blood : Rare & Late if cancer (post 1/3)



* Staging:

T = <u>T</u> umor	N = Lymph <u>N</u> odes	M = Metastasis
Tis = Carcinoma in situe	No= NO Evidence of L.Ns	M _o = NO Metastasis
To=NO Evidence of Turnor	$N_1 = L.N_S < 3$ cm	M _I = Distant
T ₁ = < 2 cm	N _{2a} = Ipsilateral & single 3-6 cm	Metastasis
$T_2 = 2 - 4 \text{ cm}$	2b= Ipsilateral & Multiple 3-6 cm	
$T_3 = > 4$ cm	₂= Bilateral 3-6 cm	
T ₄ = Base involvement	N ₃ = L.Ns > 6 cm.	

* Clinical Picture:

Types of patient: Elderly Male

" Malignant ulcer: "The commonest"

• No : Usually single • Site : (See before)

· Shape : Variable

· Size : Variable

· Edge: Raised & Everted

· Margin : Indurated .

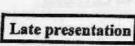
. Floor : Necrotic Floor .

· Discharge : Bloody discharge .

* Base : Indurated .

Involved L.Ns are Stony Hard, Painless & 1st mobile but later fixed.





As To

Pain: Localized to Tongue or referred to ear through the auriculo - temporal n. of the mandible.

@ Profuse Salivation : which may be bloody stained.

(3) Fetor Oris: Due to Necrosis & Infection.

① Dysphagia especially with Cancer post. 1/3 of Tongue.

Dysarthria: i.e. Difficulty of speech.

Metastatic work up (Chest x-ray, Bone scan, CT brain & liver U/S)

* Complications:

Bleeding or Infection.

Dysphagia & Dysarthria .

Upper Respiratory Tract Infection from inhaled necrotic tissues.

* investigations :

Biopsy from edge of the Tumor.

• FNAC from Neck L.Ns.

Metastatic work up.

* Treatment:

A Treatment of 1ry lesion

[I] Irradiation (T₁ & T₂)

N.B: Radium Needle is used

[II] Surgical Excision

• Indications: O Small Tumor

Cancer on top of S.

3 Others :

a. Recurrent lesion after irradiation

b. Resistant lesion to irradiation .

c. Lesion infiltrating bone.

• <u>Technique</u>: <u>Excision</u> of tumor with safety margin but <u>according</u> to the site of tumor •

[A] Carcinoma of Tip of tongue we will do partial glossectomy

[B] Carcinoma of Ant. 2/3:

Excision with safety margin (1.5cm) &

may reaching up to Hemi-glossectomy.

[C] Carcinoma of Post, 1/3:

We will do Total Glossectomy.

N.B.: IF Mandible is involved -> Commando - operation is done

Combined mandibulectomy And Neck Dissection Operation.

then the defect closed by myocutaneous <u>flap</u> (e.g. pectoralis major) + Rib <u>graft</u> from (contralateral 5th rib)

B Treatment of L.Ns

Whether L.Ns are palpable or not → Total Block Dissection is done as Nodal involvement is early & Common.

- (C) Palliative treatment : (for inoperable patient)
 - By @ Palliative resection.
 - 2 Radiotherapy & chemotherapy.
 - 3 Analgesic, naso-gastric feeding or tracheostomy may be required.

* Prognosis: 5 years survival rate

Depending on (1) Presence of L.Ns or not.

- 3 Site (Ant. or post.)
- @ T.N.M staging.
- Degree of differentiation.

4 Tongue Ulcers

(مهم جدا)

[A] Traumatic ulcers:

- 1 Fraenal (Post-pertussis) ulcer :
 - It is usually affect children with whooping cough.
 - It is due to violent attacks of cough with trauma to franulum.
 - It is usually small, rounded with sloping edge & soft base.
- @ Post-epileptic ulcer:

It is due to trauma (bitting) of the tongue during epileptic fit.

@ Dental ulcer (See table)

[B] Inflammatory ulcers :

- (I) Acute:
- Despeptic ulcer (See table)
- D Herptic ulcer: multiple, painless with children.
- ② Lichen planus: Auto immune affects the skin & oral mucosa
 → ulcers.
- (II) Chronic: ① T.B. ulcer (See table).
 - D Sulcer (See table).
- [C] Malignant ulcer: See before

- The most serious is malignant ulcer e.g. Cancer Tongue.
 The most common are 1. Dyspeptic ulcer.
 2. Dental ulcer.
- The uncommon are 1. T.B.

2. \$.

Jentingen (Dyspeptic Ulcer	Dental Ulcer
* Causes	GIT troubles & follows influenza	Sharp Tooth.
* Description Number Site Shape Size	• Multiple. • Tip & side of tongue or buccal mucosa. • Rounded • Very small.	Usually single. Side of tongue & opposite to causative tooth. Oval Moderate.
 Edge Margin Floor Discharge 	• Sloping. • Hyperaemic Yellowish • No.	Punched out Hyperaemic Unhealthy granulations Blood & pus
> Base	• Soft	Indurated
➤ Regional L.Ns	Not present	• Firm & Tender
* Treatment	Treat the cause + painting the ulcer by gention vilot	Treat the cause i.e removal of septic tooth.

F FURNIS	T.B Ulcer	S Ulcer
* Causes	Open pulmonary T.B.	• 3ry stage [Gumma]
* Description • Number • Site • Shape • Size	• Multiple. • Tip & base of the Tongue. • Rounded • Small.	• Single. • Dorsum of the Tongue (At the middle line). • Oval • Large.
 Edge Margin Floor Discharge 	Undermined. Bluish (cyanotic) Casseation Serous	• Punched out • Leathery sloughes • Scanty
≻ Base	• Soft	• Indurated
➤ Regional L.Ns	Matted L.Ns	•
* Treatment	General: Anti-T.B. drugs Local: Improve Oral Hygiene	General : Anti-syphilitic drugs Local : Improve Oral Hygiene.

5

Cystic Swellings of the Floor of the Mouth

[1] Ranula (Ranula = frog) (The commonest)

- ★ Actiology: It is a retention cyst or extravasation cyst of sublingual gland.
- * Pathology:
 - Site: In one side of the floor of the mouth pushing the tongue to the other side (simple Ranula). It may dissect its way behind the posterior border of the mylohyoid muscle to appear in the neck (submandibular region) (Plunging or dissecting Ranula).
 - · Composition:
 - It is lined with columnar epith.
 - It contains jelly like material rich in mucin no salivary enzymes.



* Clinical Picture:

- · Usually in infancy or early childhood.
- Bluish translucent large cystic swelling pushing the tongue to one side and it
 may cross he midline and become constricted by the fraenum linguae giving
 an hourglass appearance.
- It may cause dysphagia, dysarthria & dyspnea.

* Treatment:

- <u>Simple Ranula</u>: Surgical excision is very difficult <u>Marsupilization</u> is the treatment of choice by deroofing of the cyst and suturing the wall to the oral rraucosa.
- Plunging Ranula: may need cervical incision for its dissection.

(2) Sublingual dermold :

* Aetiology:

Sequestred dermoid during fusion of epithelium on both halves of the tongue.

- * Pathology: There are two varieties *
 - Supramylohyoid type:

. Appears in the floor of the mouth.

· Inframylohyoid type:

Appears in the anterior triangle of the neck. It may be median in the submental Δ below the chin (Bouble chin)

* Clinical Picture:

- · Supramyohyoid type: It may cause dysplagia, dysarthria & dyspnea.
- Inframylohyoid type: Swelling in the submental or digastric triangle it gets more prominent during deglutition i.e. contraction of mylohyoid muscle.
- * Treatment: Surgical excision.

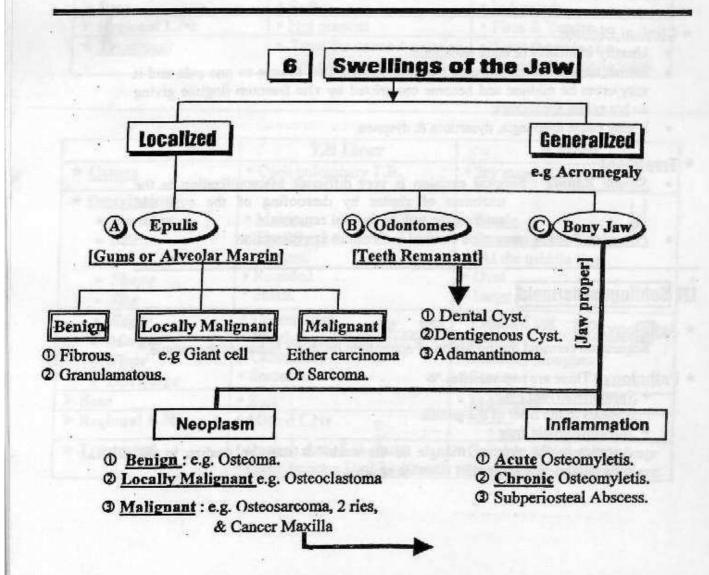
(3) Mucous retention cyst

- . It is A Retention cyst of buccal mucous gland.
- . It is small bluish translucent globular cyst anywhere in the buccal cavity.
- The treatment is excision under local anaesthesia.

[4] Suprahyold thyroglossal cyst

[5] Cystic tumours

e.g. Haemangioma, Lymphangioma.



Carcinoma of Maxillary Antrum

* Predisposing factes :

Multiple maxillary polyps & Chronic sinusitis.

* Incidence:

[Male > Female & 40 years].

* Pathology:

· Site: At maxillary antrum.

 <u>N/E</u>: It invades the surrounding structure by a papillary growth & rarely malignant ulcer.

<u>M/P</u>: - Columnar cell carcinoma from maxillary antrum.
 Or - Squamous cell carcinoma from hard palate orgums.

* Spread :

• Direct: To the surroundings.

◆ <u>Lymphatics</u>: to upper deep cervical LNs.

* Blood : Rare & Late.

* Clinical picture :

· Early:

Pain & chronic sinusitis in old patient Not respond to treatment.

+ Late:

[Depends on which wall of the Maxillary Antrum is Involved]

- Medial wall of Antrum: Unilateral Nasal Obstruction.
- · Roof of the Antrum: Unilateral Proptosis & Diplopia.
- · Floor of the Antrum : Bulging in the roof of oral cavity.
- Antro-lateral wall: Bulging & Swelling of the cheek.
- Post wall of Antrum: Encoraches on the Naso-pharynx →
 change of voice & Difficulty of
 breathings.

* Investigations:

⊕ X-ray : Opacity & ↑ size of maxillary antrum.

② CT scan & MRI: Diagnostic.

3 Biopsy: Sure method.

* Treatment:

[A] Operable:

Total maxillectomy + total block neck dissection + plastic repair.

[B] Inoperable:

Intra-cavity radiation by radium needle.



An Epulis = Mass riding over gums

Benign Epulides

1 Fibrous Epulis

*Pathology:

· Site: Between 2 tooth.

 N/E picture : Arising from the outer fibrous layer of perisoteum.

Microscopic picture: Fibrous tissue with Spindle cells & Plasma cells.

*Clinical Picture:

The swelling is painless, well defined edge, pedunculated shape, Firm in consistency, pinkish in colour & covered with intact mucous membrane.

*Treatment:

Excision of Tumor with adjecent Tooth + Removal of wedge of bone with it's mucoperiosteum.

② Granulomatous Epulis

* Pathology:

· Site : Around a Carious Tooth.

· N/E picture : Mass of Granulation tissue.

Microscopic picture : Granulation Tissue (Capillaries & Fibroblasts).

* Clinical Picture:

The Granulation Tissue may be &

* Healthy: Pink, Painless, doesn't bleed or ooze easily.

* Unhealthy: Yellow, Painful, bleed or ooze easily.

* Treatment:

Extraction of the Carious Tooth + Curretage of unhealthy G.T.

Locally Malignant Epulides

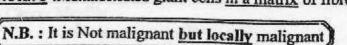
[Giant cell (Myeloid) Epulis]

*Pathology:

• Site : Undergums [Lower jaw > Upper jaw].

N/E picture: Arising from osteoclastic layer of periosteum.

Microscopic picture : Multinucleated giant cells in a matrix of fibrous tissue.



* Clinical Picture :

The swelling is painless, Sessile in shape, soft in consistency, vilot in colour from vascularity So ulceration leads to severe Hge.

* Treatment:

Wide Excision with part of bone which carring the epulis.

Malignant Epulides

- Carcinoma: Squamous cell Ca. of gums.
- Sarcoma: Parosteal fibrosarcoma or periosteum of mandible.
- → <u>Treatment</u>: Hemimandibelectomy + Rib graft (contralateral 5th)





These are cysts related to teeth Remenant

V-02-4-70	① Dental cyst	② Dentigerous cyst
* Incidence: * Age : * Sex : * Site :	•Old •Male > Female •Upper Jaw	*Adult & young *Male > Female *Lower Jaw
* Actiology	Chronic infected root of a tooth.	• Non erupted permenant tooth.
* Pathology • Mechanism	 Chronic Infection → stimulation of epithelial debris of the Malassez → proliferation → Mass which undergo central degeneration → Cyst. 	follicle → <u>Cyst</u> .
• <u>N/E</u>	 Small <u>unilocular</u> cyst. Which is slowly growing → Expansion of Jaw <u>on both sides Equally</u>. 	 Expanded outer (thin) table of the Jaw only.
• <u>M/E</u>	Lined by squamous epith. & Contains mucoid fluid rich in cholesterol.	Lined by squamous epith. & Contains a missed tooth at viscid fluid.
* <u>c/</u> P:	Painless, well defined mass related to infected tooth at upper jaw	Painless, <u>Ill</u> defined mass related to <u>missed</u> tooth at <u>lower</u> jaw.
* Investigation:	• [X-729] Shows & Radiolucent area at upper jaw	• IX-ray I Shows & Cyst with tooth inside it

*Treatment:

- ★ <u>Dental Cyst</u>: Extraction of the affected tooth & <u>Excision</u> of the wall of the cyst.
- * Dentigerous Cyst: Removal of the roof of the cyst and linning epithelium with missed Tooth.

3 Adamantinoma

"Eves Tumor"

[Ameloblastoma-Multilocular cystic disease of the Jaw]

*Origin: "Locally Malignant Tumor"

Arising from (Ameloblastoma) = Para-dental cells of Malass ez.

*Pathology:

 Site: Starts at angle of mandible & grows slowly in both Vertical & Horizontal directions.

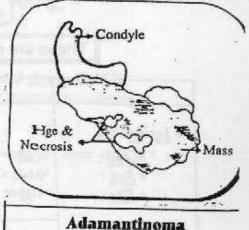
N/E: ① Pink or white in colour & Well encapsulated.

- ② Solid mass with cystic areas & Almost equal lobulation.
- Fibrous Tissue Trabeculation in between.
- M/E: Basal Cell Carcinoma

* Clinical Picture :

- . Age : 20 40 years.
- Sex : Female > Male.
- Presentation :
- A) Symptoms





Painless, lobulated, slowly growing swelling in lower jaw.

B) Signs

- ① Expansion with intact overlying skin & mucus membrane
- @ Egg shell crackling sensation if enlarged with No L.Ns.
- ① Later on a) Ulceration & Infection
 - b) Bleeding from mucus membrane.
 - c) Falling of Teeth

D.O.:	Adamantinoma Teves Tumer	Ostevelastoma "Giant Cell Tumer"
ds d'Agra ig dinet à		State of the state
Site: Growth Shape	• Angle of Mandible. • Both Horizontal & vertical. • Almost Equal Lobulation &	• Symphysis Menti • Only Horizonal • Unequal Lobulation & Expanded

* Investigation:

IX-rayl shows Fine soap bubbles appearance related to angle of mandible.

*Treatment:

Resection of tumor bearing segment of the jaw i.e Hemi-mandibulectomy then bone graft.

7	Salivary	Gland	Diseases
---	----------	-------	----------

- Inflammation : e.g Acute Parotitis = Acute sialadenitis.
- Salivary Calculi (Stones) = Chronic sialadenitis.
- Sallvary Tumors : Benign & Malignant





* Actiology:

• Organism : Staph. Aureus. Less common Strept., Pneumococci etc..

Predisposing Factors: ① Reduced saliva with fasting or medications with Atropine.

D Lack of Oral hygiene.

@ Obstruction of duct e.g F.B or Stones

• Mode of Infection : Along the duct from the mouth

i.e. Retrograde infection or Blood borne infection.

* Clinical picture:

(A) General

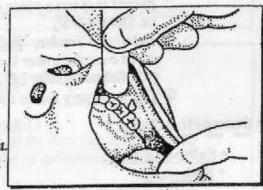
Toxic Symptoms (Fever, Headache,etc)

B Local

Painful swelling at parotid region.

Oedmatous swelling but fluctuation is later.

3 The opening of the duct is red, raised with



*Treatment:

Prophylactic : Correct Dehydration & Care of Oral hygiene

In Early Cases: A.B therapy

In Fulminating Cases : i.e. Parotld Abscess

[Don't wait for Fluctuation] So 3

O A vertical skin incision is done infront of Ear.

Then @ The Deep fascia is incised Transversally To avoid injury of Facial nerve & it's branches.

Then 3 A sinus Forceps is introduced closed and then opened to drain the pus i.e. [Hilton's Method].





*incidence:

The Submandibular glands to Parotid gland ratio is 50:1

Why? because O The Submandibular secretion is more viscid.

- The Submandibular <u>duct lies</u> in the floor of mouth <u>so</u> liable to be blocked by food particles.
- The Submandibular gland <u>drainage</u> is inadequate as it ascends upwards.

*Pathogenesis:

Obstruction → Stasis → Infection → Change of pH of Saliva.

* Pathology : [stone]

- The Site: The stones impacted inside the gland or in the duct.
- The Number : may be single or multiple.
- The Nature composed of Calcium, Magnesium phosphate & Carbonate.

* Clinical Picture :

A Symptoms

Attacks of pain at submandibular swelling during meal.

B Signs

- Pain and size of gland is increased when patient is given a piece of lemon to suck i.e. [Lemon Test].
- © Enlarged, Tender, Palpable and cannot rolled over the lower border of the mandible (B.D. Submandibular L.Ks)
- The stone may felt in the duct

*Complications:

- · Salivary Fistula.
- Sialectasis
 i.e. Dilated duct.

* Investigations:

- A Plain x-ray : Stones are 100% Radio-opaque.
- B Sialography: Dilated ducts + Filling defect of stone.



* Treatment: "According to site of impacted stone"

- Stone at orifice : Removed through Meatotomy.
- Stone in the duct : Cutting Directly over it.
- Stone in the Gland: Total Excision of the gland.
 i.e Staladenectomy.





Salivary Fistula:

* Definition: - It is a fistula of salivary gland or duct.

- It may be (single or multiple).

* TYPES: ① Internal: opens in the mucus membrane.

DExternal: opens in the skin.

* Acitology:

[A] Trumatic: Usually operative or penetrating facial injuries.

[B] Inflammatory:

a. Acute Abscess -> Rupture.

b. Chronic Inflammation with stone.

[C] Neoplastic : Malignant tumors infiltrating the skin.

★G/P: Watery discharge from ectopic site over the gland.

* Investigations: Sialogram .

* D.D :

* From parotid e.g pre-auricular sinus.

* From submandibular : e.g. Branchial Fistula.

* Treatment :

[A] If submandibular (Duct or Gland)

Submandibular sialadenectomy.

[B] If Parotid Gland:

Superficial conservative paratidectomy.

[C] If parotid Duct:

Excision & end to end anastomosis or mucosal flape repair.



Other Types of Sialadenitis:

[A] Recurrent subacute and chronic sialadenitis:

Usually caused by partial obstruction of the duct (stone or stricture)
 Sialectasis. Or Auto-immune disease of the salivary glands.

[B] Viral parotitis :

Due to mumps virus.

Causes bilateral, painful enlargement of the parotids with fever.
 Usually occurs in children. Self-limiting.

[C] Endemic parotitis: Bilateral painless parotid enlargement occurs in 3

O Chronic parasitic infestation (Anclystoma) and

2 Protein malnutrition.

III Salivary Tumors

O (Classifications

A Benign Tumors

- O Pleomorphic Adenoma (Mixed Tumor)
- (Warthin's tumor = Adenolymphoma)
- 3 Oxyphil Adenoma (Oncocytoma)
- Adenocystic Lymphoma.

Malignant Tumors

- Muco-epidermoid Carcinoma.
- Adeno-cystic Carcinoma. = Cylindroma.
- Acinic Cell Carcinorna.
- Miscellaneous Adeno-carcinoma.

(A)

Benign Tumors



Pleomorphic Adenoma

[Mixed Parotld Tumor]

* Incidence :

- · Age : At 4th decades of life.
- The commonest Tumor of salivary gland.
- · Common with parotid > submandibular gland.

* Pathology:

- · Site: Usually superficial part.
- N/E: Lobulated, Well encapsulated Tumor.
- M/E: Epithelial cells arranged in sheets with Blue stroma (thought to be Cartilagenous).

* Spread:

Strands of Tumor tend to penetrate the Capsule. So there is high rate of recurrency

* Clinical Picture:

A Symptoms

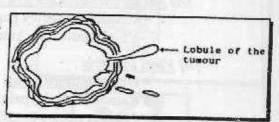
Unilateral, Painless & Well defined mass.

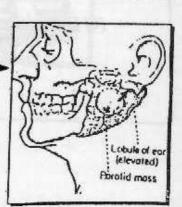


- The swelling may elevated lobule of Ear and—
 consistency is <u>Firm</u> (Never Hard)
- Facial nerve is not affected & the Superficial Temporal artery pulsation is felt.
- ③ If affect the deep part → pushing the Tonsil medially.

N.B: It turns into malignancy in 3%







* D.D:

A DD of Parotid Swellings

[I] Skin & S.C Tissue:

- O Sebaceous cyst.
- D Lipoma.
- ③ Haemangioma.
- Neurofibroma
- O Lymphangioma.

- @ Warts, boil or keloids.
- 7 Haematoma or Abscess.
- ® Pre-auricular dermoid cyst.
- @ Papilloma.
- @ Melanoma.

[III] Parotid gland diseases :

e.g. Inflammations, stones, Tumors etc...

[III] Others: O Pre-auricular or Parotid L.Ns.

Mandibular Tumor.

3 Hypertrophy of Masseter Muscle.

B DD of Submandibular Swellings

[I] Skin & S.C Tissue : As before.

[II] Submandibular gland : As before.

[III] Others: ① Submandibular L.Ns.

@ Mandibular Tumor.

* Investigations: FNAC is usually enough to reach the diagnose.

* Treatment: [Enucleation of pleomorphic adenoma is easy but followed by

The Standard Operations are

High rate of recurrency] 50

I- Conservative Superficial Parotidectomy:

Removal of superficial part of gland with preservation of facial nerve.

II- Conservative Total Parotidectomy:

As above + Removal of deep part.

III- Submandibular Sialadectomy: If Affect submandibular gland,

2 Monomorphic Adenoma

[Adenolymphoma = Warthins Tumor]

[It is an Epithelial Tumour]

- * Pathology:
 - Site: Superficial part only.
 - N/E: Multiple Cystic & Variable in size.
 - M/E: Epithelial cells spaces with lymphoid stroma.
- * Clinical picture: Same as pleomorphic but cystic in consistency & Not raising the ear lobule.
- *Treatment: Conservative Superficial Parotidectomy.



Malignant Tumor

*incidence:

- · Age : Elderly
- Sex : Female > Male
- Parotid gland > Submandibular gland

*Predisposing Factors:

De novo or on Top of Mixed Parotid Tumor (3%)

Pathology:

- Site : Superficial or Deep parts
- N/E: Infiltrating, Non capsulated mass with area of Haemorrhage & Necrosis
- . M/E: "Pathological Types"
 - 1 Muco-epidermoid Carcinoma:
 - · Arises from epithelial lining ducts of salivary gland.
 - · It is rare but common with Children.
 - Treated by Removal of gland + Radiotherapy.
 - ② Adeno-cystic Carcinoma (Cylindroma)
 - D Acinic cells Carcinoma
 - Miscellaneous Adenocarcinoma

* Spread:

- Direct: To surroundings e.g. Mandible, Masseter etc....
- Lymphatic: Parotid L.Ns → Submandibular L.Ns → Upper deep cervical L.Ns.
- Blood: Late & Rare to lung, bone etc....

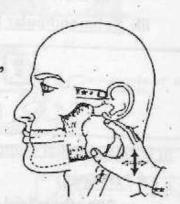
*Clinical Picture:

- * Salivary gland swelling showing "Criteria of Malignancy"
 - ① Pain which may referred to ear
 - @ Hard in consistency
 - Irregular surface with <u>ill defined</u> edge
 - @ Rapid rate of growth
 - (5) Infiltration of skin, muscles, vessels & Nerves

N.B.: Facial nerve is affected with Parotid Carcinoma but Hypoglossal & Lingual nerves are affected with Submandibular Carcinoma.

© Enlarged Stony Hard L.Ns 1st mobile then fixed





*Complications:

- Ulceration & Infection
- Haemorrhage
- Facial Nerve palsy with parotid tumors

*Investigations: (Not Routine)

- Metastatic work up (Chest x-ray, Bone scan, CT brain & liver U/S)
- Isotopic scan with Te⁹⁹ → Cold spots
- FNABC : Fine Needle Aspiration Biopsy Cytology.

*Treatment: (According to ₺)

(A) Operable

[I] Cancer Parotid Gland: Total Parotidectomy + Total Block Dissection.

N.H.: ① The Facial nerve is sacrified but may be grafted by great auricular nerve

- 2 Part of ramus of mandible may be excised if Infiltrated.
- ② Post-operative persistent facial paralysis: we will do either A or B.
 - (A) Transposition of Hypoglossal nerve then anastomosing it to the peripheral branches of facial nerve.
 - (B)Facial Sling :-

The Aim is to support the facial Tissues & To mask the deformity.

[II] Cancer Submandibular Gland

Total Submandibular Sialadenectomy

+ Total Block Dissection

(B) Inoperable

[I] Palliative Resection

[III Radiotherapy : But poor result



Maxilo-Facial Injuries

Priorities in treatment :

Ensure patent airway.

© Ensure effective breathing (Tracheostomy or Mechanical ventilation).

3 Control any visible bleeding source.

Anti shock measures, Antibiotics, Antititatic serum & Analgesics.

[A] Soft Tissue Injuries

① Skin wounds : (look wounds)

@ Facial nerve:

- · Nerve repair by direct end to end anastomosis.
- · Nerve graft if lacerated or lost segment.

3 Parotid injury:

- Duct → end to end anastomosis over a stent.
- Gland → if extensive injury or persistent salivary fistula → superficial conservative parotidectomy.

@ Eye lids :

- Suture all layers but avoid ptosis or ectropion from over correction.
- Lacrimal duct → repair microsurgicaly over a stent.
- Masal injuries : Sutured in 2 layers.
- 6 Lips: Sutured in 3 layers with respect to the red margin.
- To For injuries: Sutured by cutaneous perichondral sutures.

[B] Fracture of Facial Bones

[1] Mandibular Fractures:

- * Site: ① The body: Fracture usually occurs close to the mental foramen.
 - The coronoid process: least important, as the temporalis muscle prevent displacement.
 - 3 The condule: Usually indirect # caused by blow to the chin.
 - The angle: the # line is usually splinted by the masseter and pterygoid muscles, with minimal displacement.

* Clinical Picture:

- Pain on attempts to open the mouth.
- · Dribbling of blood stained saliva.
- Impairement of speech & swallowing.
- Swelling & haematoma of the floor of the mouth + tenderness & crepitus.
- Irregularity of the line of the teeth.

* Treatment :

Reduction & fixation (3 weeks)

By a. Interdental wire.

- b. Arch bons.
- c. Plate & screws.

Then mouth wash by Anti-septic solutions.

[2] Fractures Maxilla:

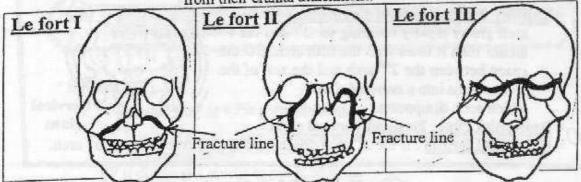
★ Clinical Picture: Pain, salivation, epistaxis, diplopia, swelling and crepitation.

* Classification : (Le fort)

<u>Le Fort I</u>: Transverse # above the level of the teeth. It is treated by inter
maxillary fixation, which in turn is fixed to the inferior
orbital margin.

 <u>Le fort II</u>: Pyramidal #, traversing the nasal bones, frontal process of maxilla, lacrimal bones, inferior orbital margin and lateral wall of maxilla.

 <u>Le fort III</u>: craniofacial disjunction (i.e.) separation of the facial bones from their cranial attachment.



[3] Nasal Fractures :

- * Clinically: Pain, swelling, epistaxis & crepitus.
- * Treatment: Instrumental manipulation to reduce the fracture. The position is then fixed by intra-nasal packing for 3 days with an external splint for 7 days.

[4] Zygomatic Fractures:

- * Clinically: There is pain, swelling in eyelids, flat cheek + numbness due to injury

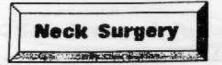
 - of the infra-orbital nerve, crepitus and irregular infra-orbital margin.
- * Treatment: Reduction of the depressed bone + fixation by wires ligated through burn holes.

[5] Tempro-mandibular joint dislocation:

* Clinically: Pain & dysarthria, the mouth is held open with fixed jaws. In unilateral cases, the chin is deviated to the opposite side.

* Treatment :

- O Reduction by downward traction on the molars with the padded thumb, together with upward rotation of the body with the outside fingers.
- ② In neglected cases condylectomy is performed.
- 3 In recurrent cases excision of the meniscus is done to deepen the glenoid cavity.





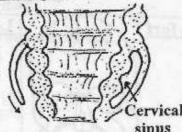
Branchial cyst & Fistula

In Embryo:

- The neck starts to develop between the head and the developing heart.
- 5 Ridges develop on each side of the neck called branchial arches.
 - The 1st arch forms the Mandible and the Ear.
 - The 2nd arch forms the Hyoid region.
 - The 3rd arch forms the neck over the thyroid region.
- During Embryological development the 2nd arch grows rapidly covering the 3rd and the 4th arches then it fuses with the fifth arch. SO the space between the 2nd arch and the rest of the arches turns into a cervical sinus which soon disappears.

Branchial cyst: Persistant cervical sinus.

■ Branchial fistula: If the 2nd arch doesn't completely fuse with the 5th arch.



Branchial Cyst

* Clinical Picture :

- Age : Congenital but may represented at childhood or later at age of 20 years.
- Site: Upper part of side of neck just below the angle of mandible deep to anterior border of upper 1/3 of sternomastoid
- · Characters:
 - ① Moderate in size about 5 cm.
 - @ Globular, Smooth, Well defined, Tense cystic & Opaque.
 - ② On contracting Sternomastoid, the mass bulges out.

* Pathology:

- · Linned by Squamous epithelium.
- · Surrounded by Lymphoid tissues which explain it's frequent inflammation.
- Contains mucus rich in Cholesterol crystals.

* Treatment:

Complete Excision through a transverse incision.



BRANCHIALCYST

B Branchial Fistula

If the 2nd arch doesn't completely fuse with the 5th arch. It is usually **Congenital** <u>but</u> sometimes it is **Acquired**.

Congenital Branchial Fistula

* Clinica! Picture :

- · Age : Present since birth.
- Site: External opening lies deep to lower 1/3 of Sternomastoid near it's anterior border.

N.B.: The Fistula passes between E.C.A & I.C.A to end highly in lateral wail of pharynx behind tonsil, usually blind or rarely opened into it

· Characters :

- 1 It represents as a Pin point opening.
- ② <u>Fistula is felt</u> as a thread passing up & deeply through anterior part of sternomastoid.
- ③ It discharges mucus or pus if infected.

N.B.: The fistula may be confused with T.B sinus

* Pathology: The Track is &

- Linned by Squamous Epithelium & Extends up to the side wall of nasopharynx "Fossa of Rosenmuller"
- Surrounded by Lymphoid tissues which explain it's frequent inflammation.
- <u>Contains</u> mucus rich in Cholesterol crystals.

* Treatment!

<u>Complete Excision</u> of whole track through, multiple Transverse neck incisions; a <u>Small one</u> around External opening & <u>The Other</u> at a higher level just below the Jaw.

Acquired Branchial Fistula

- Due to Rupture of inflamed branchial cyst or Incomplete removal of cyst.
- Clinical picture & Pathology as Congenital type.
- Treatment as Congenital type.



Thoracic Outlet Syndrome

"Cervical Rib"



The Brachial plexus & The Subclavian artery pass to the upper limb through a narrow triangle in the base of the neck. This triangle is made up of 30

Anteriorly:

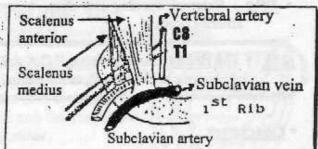
Scalenous anterior muscle.

· Posteriorly:

Scalenous medius muscle.

· Inferiorly:

The 1st rib.



At this narrow space compression of nerves & artery may occur.

* Actiology:

Cervical Rib : Which may be complete or incomplete
 This bony structure extends from the 7th cervical vertebra to the 1st rib.

N.B.: Hhrous Band Extending from an incomplete cervical rib & Ending at 1st rib

- · A tight scalene muscles.
- Post-fixation of brachial plexus.

In this case the lower root of brachial plexus arises from Is instead of Is. Thus, This nerve becomes excessively bent over the 1st rib.

* Complications:

- The Lower root of <u>brachial plexus is compressed</u> so leads to Sensory & Autonomic affection of upper limb.
- The <u>Subclavian artery is compressed</u> so leads to Chronic ischaemia of upper limb but less common.

· Pest-stenetic Dilatation :

It is Aneurysmal dilatation of Subclavian artery, which may send a shower of emboli to the Index & Middle fingers as they are the direct continuation of the brachial artery.

* Clinical Picture:

Age : > 20 years.

• Sex : Female > Male.

· Manifestations :

(A) Symptoms

1 Vascular: Intermittent Claudications.

② Vasomotor: Raynaud's Phenomenon due to irritation of sympathetic fibers.

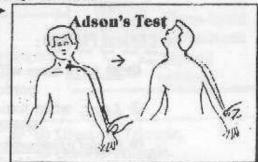
③ Nervous: Tingling & Numbness especially in the medial aspect of forearm and Hand due to compression on lower root of plexus.

B) Signs

① Bony swelling at base of post. Trianlge i.e. Cervical rib.

D Hypothesia & Wasting of hand muscles may be noticed.

Adson's Test:
 1st palpate the radial pulse then Ask patient to turn his head elevate his chin & Take deep inspiration Then palpate again, if disappear → +ve Test for cervical rib.



* D.D:

(A) Other causes of Localized pressure

As Cervical Spondylosis or Carpal Tunnel Syndrome.

(B) Other causes of Raynaud's phenomenon
As Systemic Lupus or Collagen Disease.

* Investigations:

Plain X-ray (Neck & Chest) may detect Bony cervical rib.

N.B.: In many persons a cervical rib is detected by radiography, yet it is asymptomatic. Also in many patients who have the clinical picture of thoracic outlet syndrome, radiography does not reveal a cervical rib.

Arteriography: As Subclavian Angiography.

Nerve conduction Study: To detect delayed conduction between neck and
Forearm so help in D.D between Thoracic Outlet
Syndrome & Carpal Tunnel Syndrome

* Treatment:

- · Asymptomatic cases : No Treatment.
- Physiotherapy: To Strenthen the shoulder muscles.
- · Surgery : 1 Excision of bony cervical rib including it's periosteum.
 - Excision of 1st rib to relieve the lower compression.
 Scalenotomy i.e. Incision of Scalenus Anterior Muscle.



Congenital Torticulis

The second second second second

* Embryology:

Sternomastoid muscle develops through the union of three somites each with it's blood supply.

* Actiology :

- Sometimes at birth, an interruption of blood supply to the central portion occurs causing muscle infarction. The infracted portion becomes swollen, hence the name (Sternomastoid Tumor)
- After A while the infracted portion is replaced by fibrous tissue that contracts causing congenital torticollis.

* Clinical Picture :

- ① <u>At birth</u> there will be a swelling, which is firm in consistency, at the middle portion of the sternomastoid muscle.
- ② <u>Later</u>, when torticollis develops, the head will be tilted to the side of the lesion with the face looking to the opposite side.
- Facial asymmetry will later occur with flattening of the side of the face at the side of the lesion
- This condition should be differentiated from [Wry Neck] which is fibrositis causing spasm of the sternomastoid muscle. This a temporary disorder lasting for a day or two and responds to anti-inflammatory drugs.

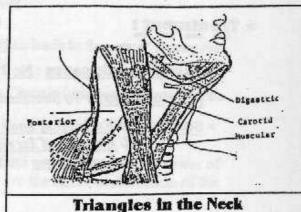
* Treatment:

- Early after birth (physiotherapy) is an attempt to prevent the development of the deformity by stretching the neck may be done.
- If the deformity is established: Division of the sternomastoid at it's lower part should be done.

IV

DD of A Mass in the Neck

- The Diagnosis of a mass in the Neck, depends upon the Age of the patient, clinical course of the mass, it's site & it's consistency whether solid or cystic.
- The Most Common Swellings of neck are L.Ns & Thyroid gland.
- The 2nd Common Swelling of neck is Salivary Glands.



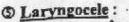
I) DD of swellings at Mid line

A Solid Swellings:

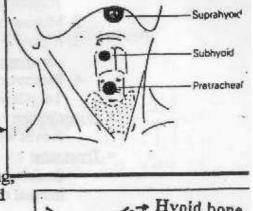
- Submental L.Ns.
- 2) Pre-tracheal & Pre-laryngeal L.Ns.
- 3 Nodule of isthmus of thyroid gland.

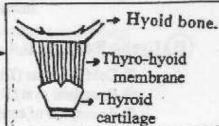
B Cystic Swellings:

- O Cold Abscess.
- @ Thyroglossal Cyst (Discuss) -
- @ Dermoid cyst : Sublingual or Supra-sternal.
- Subhyoid Bursitis: (Rare) Tender & oval swelling, which moves up and down with deglutition and protrusion of the tongue.



- It is due to 1 Intra-laryngeal pressure.
- It occurs with glass bower or trumpt players or singers.
- It is cystic, Resonant, Compressible & Shows expansile impulse on cough.
- © Cystadenoma of thyroid isthmus.





DD of swellings at lateral Triangle



- Digastric Triangle.
 - ② Carotid Triangle.
 - 3 Posterior Triangle.

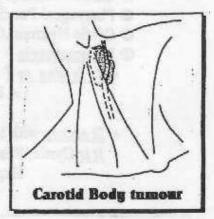
O Swellings at Digastric Triangle

- (A) Enlarged Submandibular L.Ns.
- (B) Enlarged Submandibular Salivary gland.
 - ★ For DD: The Submandibular L.Ns are multiple & can be rolled over edge of mandible unlike the submandibular gland.

② Swellings at Carotid Triangle

A Solid Swellings :

- ① Enlarged upper deep cervical L.Ns.
- @ Enlarged upper part of lateral lobe of a goitre.
- (Potato Tumor)
 - It is a rare slowly growing malignant tumor.
 - It arises from the chemoreceptors which present at bifurcation of carotid artery.



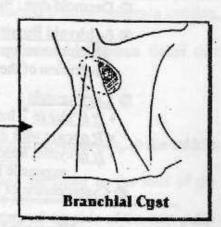
" It is characterized by :

- Oval hard swelling with smooth or lobulated surface.
- 2. Moving from side to side but not vertically.
- 3. It may <u>Pulsating</u> the pulsation either <u>Transmitted</u> from carotid or expansile from high vascularity.
- Pressure on swelling may cause fainting attack i.e. [Carotid sinus syndrome].
- Investigation: (Angiography)
 Proves widening of carotid bifurcation.
- Treatment:

Excision of tumor with preservation of Internal carotid artery.

B) Cystic Swellings:

- 1 Cold Abscess (Discuss).
- @ Branchial cyst (Discuss)
- 3 Aneurysm of carotid artery.



Swellings at Posterior Triangle

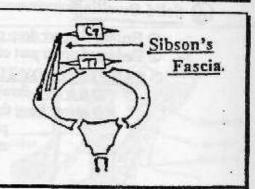
(A) Solid Swellings :

- O Cervical rib. (Discuss)
- D Neurofibroma arising from brachial plexus.
- @ Enlarged L.Ns.
- Sternomastoid tumor (Discuss)

B Cystic Swellings:

- O Cold Abscess.(Discuss)
- ② Pharyngeal Pouch (See next page)
- Cystic Hygroma (Discuss)
- 1 Pneumatocele
 - It is due to T Intra thoracic pressure
 i.e. Herniation of pleura. Through,
 Sibson's Fascia.
 - It occurs with Emphysematous patients.
 - It is Cystic, Resonant, Compressible & Shows Expansile impulse on cough.





★ In Addition to that Any Skin or S.C Tissue Swellings as lipoma, Sebaceous etc...

Pharyngeal Diverticulum

(Zenker's Diverticulum = Pharynge-oesophageal diverticulum)

* Definition:

Herniation of pharyngeal mucosa through a weak area in the posterior phyarngeal wall.



* Actiology:

Spasm of crico-pharyngeus muscle (which fall to relax during swallowing) $\rightarrow \uparrow$ pressure in the pharynx \rightarrow Herniation of the mucous membrane posteriorly $\rightarrow So$, food enter the diverticulum.

* Clinical Picture :

■ Type of patient : old male.

■ Symptoms:

Progressive dysphagia with regurge of non digested food after meals.

signs:

Swelling characterized by 3

O Soft & compressible at posterior triangle.

Dull or resonant on percussion.

② Gurgling sound can be elicited if patient swallow several glups of air.

* Complications:

- O Aspiration pneumonia,
- Diverticulitis.
- O Carcinoma (0.3%).

* Investinations:

[A] Barium swallow: The Best.

[B] Endoscopy (Not done) because high risk of perforation.

* Treatment:

According to the size of diverticulum

- [A] Small: Repeated dilatation of crico-pharyngeus muscle.
- [B] Moderate : Diverticulopexy by invagination & plication.
- [C] Large : Diverticulectomy.



Phargageal Ponch



Final Written Exams



Head & Neck

1987 • Discuss cystic swellings of Post. Δ of Neck	(10 Marks)
 Discuss DD of Ulcer of Tongue. Anatomy of Post. Triangle of Neck. Discuss DD of swelling of Post. Δ of Neck. 	بور ثاني (10 Marks) (5 Marks) (15 Marks)
(1990) • Discuss swellings of the Jaw	رور ثاني (25 Marks)
 Anatomy of Post. Triangle of Neck. Discuss DD of swellings in same Δ 	(10 Marks) (20 Marks)
• Discuss DD of ulcer of Tongue. • Give an account on Branchial cyst.	دور ثانی (10 Marks) دور ثانی (10 Marks)
1993 • Discuss Path., C/P & ttt of Cancer Lip	يور ثلثي (20 Marks)
1995 • Discuss Anatomy of submandibular salivary gland	يور ئاتى (10 Marks)
1997 • Discuss Path. & Spread of Cancer Tongue	(15 Marks)
• Discuss Parotid tumors • Discuss Tongue ulcers	(10 Marks) (10 Marks)
Discuss Path. & Spread of Cancer Tongue Discuss pathology & C/P of Odontomas Discuss C/P & Spread of Cancer Tonge	بور ثانی (10 Marks) بور ثانی (15 Marks) بور ثانی (10 Marks)
2001 • Discuss Path., C/P of cancer Tongue	(10 Marks)
 Mention Pre-cancerous lesions of Tongue Discuss DD of ulcers of tongue. Discuss DD of swellings in post. Δ 	دور ثانهی (10 Marks) (12 Marks) (12 Marks)
Discuss DD of swellings in post Δ Discuss DD of ulcers of tongue	دور ثانبي (9 Marks) دور ثانبي (9 Marks)
• Discuss C/P & ttt of thoracic outlet syndrome	ىور ئلاى (20 marks)