

ENT posters

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# LOBULAR CAPILLARY HEMANGIOMA (BLEEDING SEPTAL POLYP / PYOGENIC GRANULOMA)

## A VASCULAR TUMOR OF THE NASAL CAVITY

40-year-old male with **profuse right nostril epistaxis**  
and a **pinkish-purple** nasal mass.

Pinkish-red, friable  
vascular mass

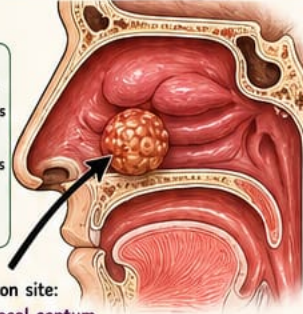
### COMPLETE DIAGNOSIS

#### Lobular Capillary Hemangioma (Bleeding Septal Polyp / Pyogenic Granuloma)

– a benign vascular tumor  
of the nasal cavity.

### DEFINITION

A benign, highly vascular lesion  
composed of proliferating capillaries  
arranged in lobules within an  
inflammatory stroma. It presents as  
a friable mass that bleeds easily.



Common site:  
Anterior nasal septum

### ETIOPATHOGENESIS

- Exact cause unknown.
- Thought to be a reactive lesion rather than a true neoplasm.
- Precipitating factors:
  - Local irritation or trauma
  - Chronic inflammation
  - Hormonal influences (pregnancy)
  - Use of nasal steroids
  - Foreign body
- Increased angiogenesis leading to proliferation of capillaries.

### CLINICAL FEATURES

#### Symptoms

- Recurrent, unilateral epistaxis (often profuse)
- Nasal obstruction
- Nasal mass
- Occasionally discharge or crusting

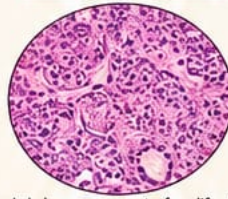
#### Signs

- Solitary, red to pinkish, smooth or lobulated mass, usually pedunculated.
- Arises most commonly from anterior nasal septum (Kiesselbach's area).
- Bleeds on touch.
- Size varies from few mm to several cm.



Vascular mass  
bleeds on touch

### HISTOPATHOLOGY



- Lobular arrangement of proliferating capillaries.
- Edematous stroma with mixed inflammatory cells.
- Overlying ulcerated epithelium.

### DIFFERENTIAL DIAGNOSIS

- Nasopharyngeal angiofibroma
- Hemangioma
- Inverted papilloma
- Antrochoanal polyp
- Angiosarcoma
- Esthesioneuroblastoma
- Nasal polyp
- Pyogenic granuloma of skin (extranasal origin)

#### Distinguishing points

LCH is a red, friable, highly vascular lesion, usually anterior, whereas JNA is posterior, more aggressive and seen in adolescent males.

### INVESTIGATIONS

- Diagnostic Nasal Endoscopy
  - Red, friable vascular mass seen (usually from anterior septum)



CT PNS (Coronal view)  
Soft tissue mass arising  
from nasal septum

- Imaging (if required)

- CT PNS: Soft tissue mass, no bony destruction (except pressure effect).
- MRI: Not routinely required.

- Laboratory

- CBC, Blood grouping
- Coagulation profile (if bleed history)

- Note: Biopsy is usually done after adequate control of bleeding.



Nasal endoscopic view  
of vascular mass

### TREATMENT STRATEGY

#### 1. Medical Preparation

- Control bleeding (packing if required)
- Correct anemia
- Discontinue irritants (if any)



Excision of lesion

#### 2. Definitive Treatment

##### Surgical Excision

- Complete excision of the lesion including its base.
- Can be done under local or general anesthesia.
- Diathermy / cautery to base to reduce recurrence.



Cauterization of base

#### 3. Adjuncts (if needed)

- Preoperative cauterization
- Endoscopic excision for better vision



Postoperative healing

#### 4. Follow Up

- Regular follow-up to detect recurrence (rare but possible).

### COMPLICATIONS

- Recurrence (2–15%)
- Secondary infection
- Excessive intraoperative bleeding
- Septal perforation (rare)
- Anemia (if recurrent bleeding)



### PROGNOSIS

- Excellent after complete excision.
- Recurrence is uncommon if the base is completely removed.
- No malignant potential.

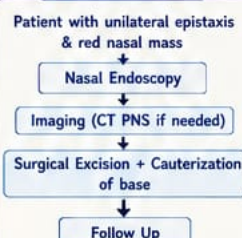
### KEY POINTS

- ✓ Most common vascular tumor of nasal cavity.
- ✓ Common in adults (20–50 yrs).
- ✓ Presents with recurrent epistaxis and red vascular mass.
- ✓ Usually arises from anterior nasal septum.
- ✓ Treatment is complete surgical excision with cauterization of base.

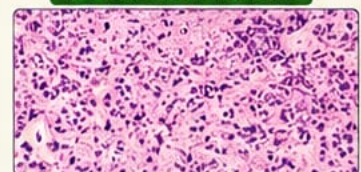
### COMPARISON WITH NASOPHARYNGEAL ANGIOFIBROMA

| Feature     | Lobular Capillary Hemangioma   | Nasopharyngeal Angiofibroma    |
|-------------|--------------------------------|--------------------------------|
| Age         | Adults (20–50 yrs)             | Adolescents (10–20 yrs)        |
| Site        | Anterior nasal septum (common) | Nasopharynx (posterior)        |
| Epistaxis   | Recurrent, variable            | Profuse, torrential            |
| Vascularity | Moderate                       | Highly vascular                |
| Imaging     | No bone destruction            | Bone remodeling / erosion      |
| Treatment   | Simple excision                | Pre-op embolization + excision |
| Recurrence  | Low                            | Higher (10–30%)                |

### FLOW CHART



### HISTOLOGICAL PICTURE



Lobular capillary proliferation  
with inflammatory stroma (H&E)

# JUVENILE NASOPHARYNGEAL ANGIOFIBROMA (JNA)

## THE COMMONEST NASOPHARYNGEAL TUMOR IN ADOLESCENT MALES

A **benign** but locally aggressive, **highly vascular** tumor arising from the posterolateral wall of the nasopharynx in **adolescent males**.



Typical reddish vascular mass seen on endoscopy

### EPIDEMIOLOGY

- Age : 10 – 20 years (peak 13–17 yrs)
- Sex : Almost exclusively males (95%)
- Incidence: 1 in 150,000 males
- Rare after 25 years

### SITE OF ORIGIN

Arises from the mucosa of the sphenopalatine foramen in the posterolateral wall of the nasopharynx.

Sphenopalatine foramen



### CLINICAL FEATURES

- Progressive, recurrent and profuse epistaxis (most common and earliest symptom)
- Nasal obstruction
- Mass in nasopharynx / oropharynx
- Mouth breathing
- Aural symptoms (Eustachian tube block)
- Headache
- Facial swelling (advanced cases)
- Cranial nerve palsies (advanced cases)
- Symptoms increase with puberty

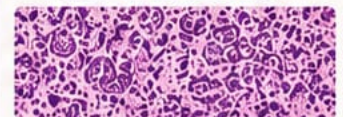


Reddish, lobulated, highly vascular mass that bleeds on touch

### ETIOLOGY

- Exact cause unknown.
- Androgen dependent (regresses after puberty)
- Increased vascularity due to:
  - High estrogen receptor level
  - High VEGF levels
- No malignant potential.

### HISTOPATHOLOGY



- Numerous blood vessels of varying size
- Thin-walled vascular channels
- Fibrous stroma
- Covered by respiratory epithelium

### INVESTIGATIONS

#### 1. NASAL ENDOSCOPY

- Reddish, smooth or lobulated mass in nasopharynx
- Bleeds on touch
- May extend to choana, nasal cavity or oropharynx



#### 2. IMAGING

##### CT SCAN (CECT)



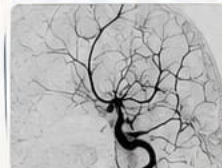
- Soft tissue mass in nasopharynx
- Expansile remodelling / erosion of bony walls
- Intense enhancement (post-contrast)

##### MRI



- Isointense on T1
- Hyperintense on T2
- Flow voids
- Defines extent and intracranial extension

#### 3. DIGITAL SUBTRACTION ANGIOGRAPHY (DSA)



- Demonstrates feeding vessels (usually from IMA – sphenopalatine branch)
- Helps in pre-operative embolization

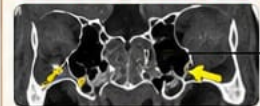
### RADIOLOGICAL SIGNS (CT)

#### 1. HOLMAN-MILLER SIGN

- Anterior bowing of posterior wall of maxillary sinus due to tumor in pterygopalatine fossa.

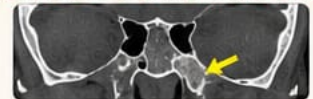


#### 2. WIDENING OF PTERYGOPALATINE FOSSA



Widened pterygopalatine fossa

#### 3. ENLARGEMENT OF SPHENOPALATINE FORAMEN



- 4. Bone remodeling / erosion of pterygoid plates, sphenoid sinus, maxillary sinus walls & skull base.
- 5. Intense contrast enhancement (highly vascular).
- 6. Flow voids on MRI.
- 7. Intracranial / orbital extension in advanced cases.

(JNA causes pressure erosion, not aggressive destruction.)

### STAGING – RADKOWSKI

| Stage | Extent                                           |
|-------|--------------------------------------------------|
| IA    | Confined to nasopharynx                          |
| IB    | Extends to nasal cavity and/or paranasal sinuses |
| IIA   | Minimal pterygopalatine fossa involvement        |
| IIB   | Full pterygopalatine fossa involvement           |
| IIC   | Infratemporal fossa involvement                  |
| III   | Intracranial extension                           |

### BLOOD SUPPLY

- Primarily from Internal Maxillary Artery (sphenopalatine branch)
- Also from ascending pharyngeal, facial, palatine, and ascending palatine arteries

### DIAGNOSTIC TRIAD

- Adolescent male (10–20 yrs)
- Recurrent, profuse epistaxis
- Reddish vascular mass in nasopharynx

### DIFFERENTIAL DIAGNOSIS

- Nasal polyp
- Inverted papilloma
- Nasopharyngeal carcinoma
- Hemangioma
- Rhinosporidiosis
- Lymphoma
- Other vascular tumors

### TREATMENT STRATEGY

#### 1. PRE-OPERATIVE EMBOLIZATION

- 24–72 hours before surgery
- Embolize feeding vessels (mostly IMA)
- Reduces intraoperative blood loss



#### 2. SURGICAL EXCISION

- Endoscopic endonasal approach – preferred for early & moderate tumors
- Open approach (lateral rhinotomy / midfacial degloving) for advanced tumors
- Complete excision with clearance of attachment (pterygopalatine fossa)



#### 3. BASE CAUTERIZATION

- Cauterize the attachment (sphenopalatine foramen and surrounding area)
- Prevent recurrence



#### 4. POST-OPERATIVE CARE

- Nasal packing
- Hematinics
- Antibiotics
- Regular follow up with endoscopy & imaging



### COMPLICATIONS

- Intraoperative hemorrhage
- Residual / recurrent tumor (10–30%)
- Cranial nerve palsies
- CSF leak
- Orbital complications
- Soft tissue / bony infection
- Facial deformity (rare)

### FOLLOW UP

- Regular nasal endoscopy
- Imaging (CT/MRI) if indicated
- Recurrence usually occurs within 2–3 years
- Long term follow up is necessary

### PROGNOSIS

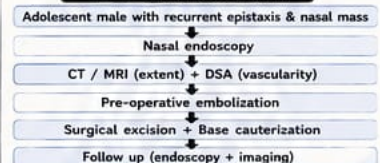
- Excellent with complete excision
- Recurrence rate: 10–30%
- No malignant potential
- Quality of life – excellent

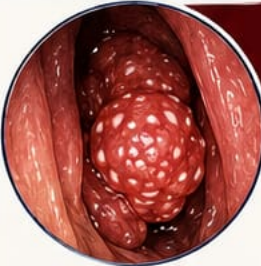


### KEY RADIOLOGICAL FEATURES (CT)

| Feature      | Finding                                                                      |
|--------------|------------------------------------------------------------------------------|
| Location     | Nasopharyngeal mass                                                          |
| Nature       | Enhancing soft tissue mass                                                   |
| Bone changes | Remodeling / erosion of pterygoid plates, sphenoid, maxilla                  |
| Extension    | Nasal cavity, paranasal sinuses, pterygopalatine fossa, ITF, or intracranial |
| Enhancement  | Intense and homogeneous enhancement                                          |

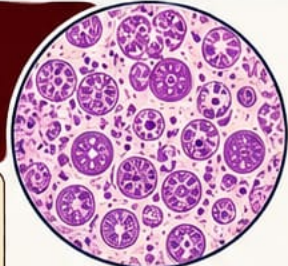
### FLOW CHART (SUMMARY)





# RHINOSPORIDIOSIS

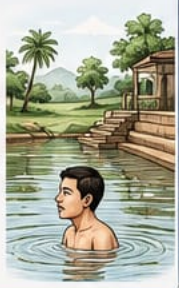
A CHRONIC GRANULOMATOUS DISEASE OF THE NOSE AND NASOPHARYNX



Rhinosporidiosis is a chronic granulomatous disease caused by *Rhinosporidium seeberi*, characterised by the presence of **polypoidal, friable, reddish** lesions in the nasal cavity and nasopharynx.

## EPIDEMIOLOGY

- Common in India, Sri Lanka, South Asia, parts of Africa.
- Occurs in all age groups but most commonly in 20–50 years.
- Male preponderance (3–4:1).
- Associated with bathing in ponds, stagnant water, unhygienic conditions.



## CLINICAL FEATURES

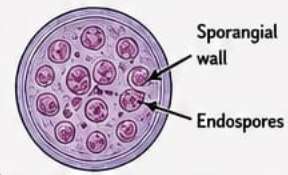
- Nasal obstruction
- Recurrent **epistaxis** (most common symptom)
- Nasal mass – pinkish, red, polypoidal, friable lesion
- Rhinorrhea, nasal discharge
- Sneezing
- Mass may extend to nasopharynx, oropharynx, larynx, conjunctiva, skin, urethra and other mucosal sites (rare).



Classic "strawberry" appearance with white dots (sporangia)

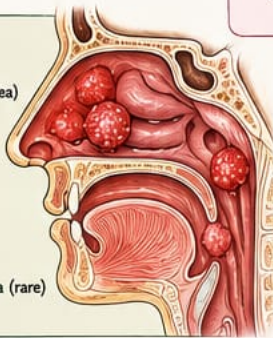
## ETIOLOGICAL AGENT

- Caused by *Rhinosporidium seeberi*
- Now classified among aquatic protistan organisms.
- A large (spore forming) micro-organism.
- Mature sporangia contain numerous endospores.



## SITE

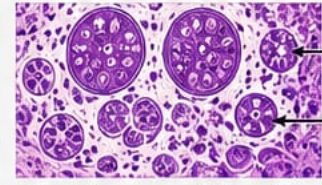
- Nose – most common
  - Septum (Kieselbach's area)
  - Inferior turbinate
  - Lateral wall
- Nasopharynx
- Oropharynx
- Larynx
- Conjunctiva, skin, urethra (rare)



## CHARACTERISTICS OF LESION

- Polypoidal, smooth or lobulated mass
- Pink to red, highly vascular
- Friable – bleeds easily on touch
- Surface studded with tiny white dots (mature sporangia)
- Stalk or sessile
- Size varies from a few mm to several cm

## HISTOPATHOLOGY (Diagnostic)



- Stratified squamous epithelium with underlying stroma.
- Thick-walled sporangia of varying sizes in the stroma.
- Each sporangium contains numerous endospores.
- Surrounding inflammatory infiltrate with plasma cells, lymphocytes, eosinophils, giant cells.

## DIAGNOSIS

- Clinical appearance + history
- Diagnostic nasal endoscopy
- Histopathological examination confirms the diagnosis.
- Biopsy is safe and diagnostic.

## NASAL ENDOSCOPIC APPEARANCE



Polypoidal red mass in nasal cavity



Surface showing white dots (sporangia)

## DIFFERENTIAL DIAGNOSIS

- Lobular capillary hemangioma
- Inverted papilloma
- Nasopharyngeal angiofibroma
- Antrochoanal polyp
- Hemangioma
- Granulomatous lesions (TB, Wegener's granulomatosis)
- Malignancy

## INVESTIGATIONS

- Diagnostic nasal endoscopy – to assess site, extent and attachment.
- Biopsy for histopathology – confirms diagnosis.
- Imaging (CT/MRI) – for large lesions or suspected extension.
- Routine blood tests.

## COMPLICATIONS

- Recurrence (5–15%) if base not adequately cauterized.
- Secondary infection
- Anemia (due to recurrent bleeding)
- Septal perforation (rare)
- Extension to nasopharynx, oropharynx or other sites (rare)



## PROGNOSIS

- Excellent after complete excision with cauterization.
- Recurrence is uncommon if the base is adequately cauterized.
- Malignant transformation – not reported.



## TREATMENT (Choice)

- Surgical excision of the lesion with cauterization of the base.
- Methods:
  - Endoscopic excision ± cauterization
  - External approach (rarely needed)
- Electrocautery/diathermy at the base to destroy residual spores and reduce recurrence.
- Large nasopharyngeal lesions – may require staged excision.



Excision of lesion

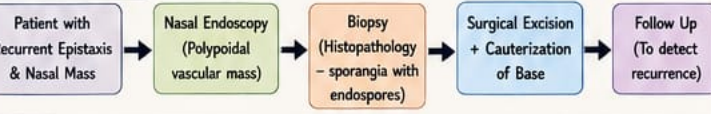


Cauterization of base

## KEY POINTS

- ✓ Chronic granulomatous disease caused by *Rhinosporidium seeberi*.
- ✓ Common in India and South Asia; associated with pond bathing.
- ✓ Presents with recurrent epistaxis and polypoidal pink/red mass.
- ✓ Classic strawberry appearance with white dots (sporangia).
- ✓ Diagnosis confirmed by histopathology (sporangia with endospores).
- ✓ Treatment – complete excision with cauterization of base.
- ✓ Good prognosis; recurrence if cauterization is inadequate.

## FLOW CHART



## PREVENTION

- Avoid bathing in stagnant ponds and contaminated water.
- Maintain personal and environmental hygiene.
- Early treatment to prevent recurrence.



By: Dr Ashik SureshKumar

# ANTROCHOANAL POLYP ( MAXILLARY SINUS CHOANAL POLYP)

## A COMMON CAUSE OF UNILATERAL NASAL OBSTRUCTION

Antrochoanal polyp is a **benign, non-neoplastic, edematous** polyp arising from the maxillary sinus and extending into the choana.

### EPIDEMIOLOGY

- Can occur at any age (commonly 10–30 years)
- Slight male predominance
- Unilateral in > 90% cases
- Rarely bilateral (cystic fibrosis, Kartagener syndrome)

### ETIOPATHOGENESIS

- Arises from the mucosa of the maxillary sinus
- Inflammatory in origin
- Due to chronic irritation and inflammation → polypoid degeneration
- Allergic factors may play a role

### CLINICAL FEATURES

#### Symptoms

- Unilateral nasal obstruction – most common
- Mouth breathing
- Rhinorrhea (mucoid)
- Post nasal drip
- Hyposmia
- Snoring, disturbed sleep
- Headache or facial heaviness
- Epistaxis – rare (unlike vascular lesions)

#### Signs

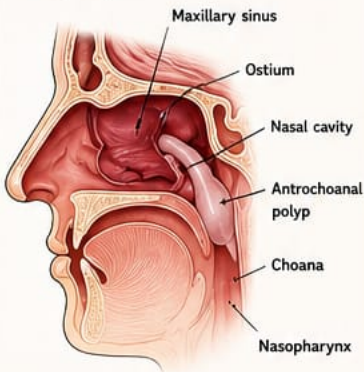
- Pale, greyish-white, glistening polyp seen in choana on anterior rhinoscopy / nasal endoscopy
- Smooth surface, non-tender
- Arises from middle meatus area and extends posteriorly into nasopharynx

### DIFFERENTIAL DIAGNOSIS

- Nasopharyngeal angiofibroma
- Rhinosporidiosis
- Inverted papilloma
- Juvenile nasopharyngeal angiofibroma
- Hemangioma
- Nasal glioma

### ORIGIN AND PATHWAY

- Arises from the mucosa of maxillary sinus (usually through ostium)
- Passes through the natural ostium → into nasal cavity → choana → nasopharynx



### INVESTIGATIONS

#### 1. NASAL ENDOSCOPY



Pale, smooth, glistening polyp arising from middle meatus and extending to choana

#### 2. CT PARANASAL SINUSES (CORONAL VIEW)



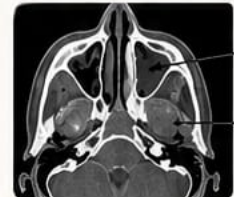
Opacified maxillary sinus  
Polyp extending into choana

#### IMPORTANT POINTS

- ✓ Usually non-vascular – bleeding is rare
- ✓ No bone destruction
- ✓ Origin always from maxillary sinus

### RADIOLOGICAL FEATURES (CT PNS)

- Opacification / soft tissue density in maxillary sinus
- Polypoid soft tissue mass arising from maxillary sinus and extending through ostium into nasal cavity and choana
- May occupy nasopharynx
- No bone erosion
- May cause medial bowing of medial wall of maxillary sinus (pressure effect), but no aggressive destruction



Polyp in choana  
Opacified maxillary sinus

### MANAGEMENT – SURGICAL

#### 1. PRE-OPERATIVE ASSESSMENT

- History and clinical examination
- Diagnostic nasal endoscopy
- CT PNS – to confirm origin
- Treat associated sinusitis (if present)



#### 2. SURGICAL APPROACH (FUNCTIONAL ENDOSCOPIC)

- Endoscopic removal is the treatment of choice
- Performed under general anesthesia



#### 3. KEY STEPS

- Identify the polyp origin in middle meatus
- Remove the polyp completely through the nasal cavity
- Widen the natural ostium of maxillary sinus
- Remove any diseased mucosa around the ostium



Polyp removed and maxillary ostium opened

#### 4. POST-OPERATIVE CARE

- Nasal decongestion
- Saline nasal douching
- Antibiotics (if indicated)
- Treat associated sinusitis / allergy
- Regular follow up



#### 5. COMPLICATIONS (RARE)

- Recurrence (if ostium not adequately opened)
- Infection
- Synechiae formation



### HISTOPATHOLOGY

- Edematous stroma
- Loose connective tissue
- Respiratory epithelium
- Chronic inflammatory cells
- No atypia or malignancy



### COMPLICATIONS (IF UNTREATED)

- Chronic sinusitis
- Nasal obstruction
- Sleep disturbance
- Malocclusion (in children)
- Middle ear problems due to Eustachian tube dysfunction

### PROGNOSIS

- Excellent after complete removal of polyp and widening of the sinus ostium
- Recurrence is rare if the ostium is adequately opened

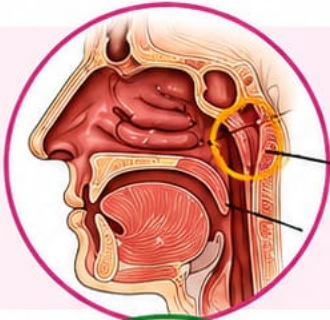
### KEY POINTS TO REMEMBER

- ✓ Always arises from maxillary sinus
- ✓ Pale, non-vascular polyp
- ✓ Causes unilateral nasal obstruction
- ✓ CT confirms origin from maxillary sinus
- ✓ Endoscopic removal with widening of ostium is the treatment of choice

"Think of Antrochoanal Polyp in any patient with unilateral nasal obstruction and a pale polypoid mass extending from the maxillary sinus into the choana."

# NASOPHARYNGEAL CARCINOMA (NPC)

## • KEY HIGH-YIELD POINTS •

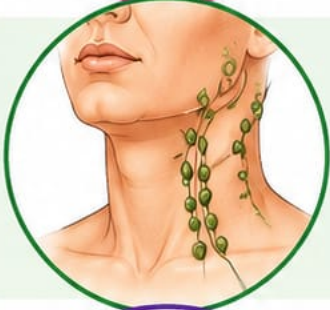


Fossa of  
Rosenmüller



### MOST COMMON SITE

**Fossa of Rosenmüller**  
(pharyngeal recess)



### MOST COMMON PRESENTATION

**Cervical lymphadenopathy**  
(Usually bilateral, upper deep cervical nodes)



### STRONG ASSOCIATION

**Epstein-Barr Virus (EBV)**  
(Especially with undifferentiated non-keratinizing carcinoma)



### INVESTIGATION OF CHOICE

**Nasal endoscopy with biopsy**  
(Gold standard for diagnosis)



### TREATMENT OF CHOICE

**Radiotherapy**  
(Mainstay of treatment; highly radiosensitive tumor)

• ————— By: Ashik SureshKumar ————— •

# NASOPHARYNGEAL CARCINOMA (NPC)

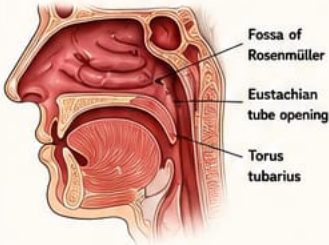
## A MALIGNANT EPITHELIAL TUMOR OF NASOPHARYNX

- Arises from mucosa of nasopharynx, most commonly from the fossa of Rosenmüller (pharyngeal recess).
- Deep-seated, early lymphatic spread, associated with Epstein-Barr virus (EBV) and highly radiosensitive.

**NASOPHARYNX IS A "SILENT AREA" – TUMORS GROW SILENTLY BEFORE SYMPTOMS APPEAR.**

Endoscopic view showing lesion in fossa of Rosenmüller

### ANATOMY OF NASOPHARYNX



Most common site of origin –  
**FOSSA OF ROSENMÜLLER**

### ETIOLOGY & RISK FACTORS

- Epstein-Barr Virus (EBV)
  - Most important etiological factor.
  - Strongly associated with undifferentiated non-keratinizing carcinoma (WHO Type III).
- Genetic predisposition (HLA association, familial tendency)
- Dietary factors – salted fish, nitrosamines, preserved/smoked foods
- Smoking and alcohol
- Occupational exposure – wood dust, formaldehyde, smoke



EBV DNA in tumor cells

### EPIDEMIOLOGY

- Common in
  - Southern China
  - Southeast Asia
  - North Africa
- Less common in India but still encountered.

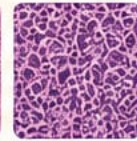


### HISTOPATHOLOGICAL CLASSIFICATION (WHO)

- Type I** Keratinizing squamous cell carcinoma
- Type II** Non-keratinizing differentiated carcinoma
- Type III** Undifferentiated carcinoma (lymphoepithelioma)
  - Most strongly associated with EBV.



Type I



Type II



Type III

### CLINICAL FEATURES

#### A. NASAL SYMPTOMS

- Nasal obstruction
- Epistaxis
- Blood-stained nasal discharge

#### B. OTOLOGICAL SYMPTOMS

- Conductive hearing loss
- Ear fullness, tinnitus
- Serous otitis media
  - Unilateral serous otitis media in an adult should be considered NPC until proved otherwise.

#### C. NECK SYMPTOMS

- Neck swelling
- Multiple cervical nodes
- Bilateral nodal enlargement (Most common presenting feature)

#### D. NEUROLOGICAL SYMPTOMS

- Due to skull base & cranial nerve involvement
- Commonly affected: V, VI nerves
- Advanced disease: IX, X, XI, XII nerves
- Symptoms: facial pain, diplopia, dysphagia, palatal palsy

#### TROTTER'S TRIAD

- 1 Unilateral conductive deafness
  - 2 Ipsilateral palatal palsy
  - 3 Facial pain (trigeminal involvement)
- Occurs due to lateral extension into parapharyngeal space.

#### E. CONSTITUTIONAL SYMPTOMS

- Weight loss
- Malaise
- Anorexia

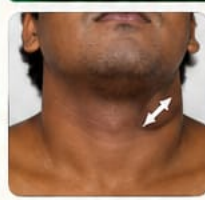
### SIGNS

#### 1. DIAGNOSTIC NASAL ENDOSCOPY



- Ulcerative/proliferative growth
  - Friable mass
  - Irregular lesion
- Arising usually from fossa of Rosenmüller.

#### 2. NECK EXAMINATION



- Enlarged cervical nodes
- Hard nodes
- Fixed nodes in advanced disease

### INVESTIGATIONS

#### 1. Diagnostic nasal endoscopy

- Visualization + biopsy

#### 2. Biopsy – Gold standard for diagnosis

#### 3. FNAC of neck node – Useful in cervical lymphadenopathy

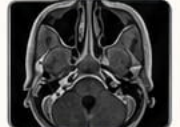
#### 4. Imaging

- CECT – Primary tumor extent, bone erosion, parapharyngeal spread
  - MRI – Superior for skull base invasion, intracranial extension, perineural spread, marrow infiltration
  - PET-CT – For distant metastasis, staging, recurrence evaluation
- #### 5. EBV markers – EBV DNA, IgA antibody to viral capsid antigen (Useful prognostically)

CECT



MRI



PET-CT



### STAGING (TNM)

| T – Primary Tumor                                       | N – Regional Nodes                            | M – Distant Metastasis         |
|---------------------------------------------------------|-----------------------------------------------|--------------------------------|
| T1: Confined to nasopharynx                             | N0: No regional node                          | M0: No distant metastasis      |
| T2: Extension to soft tissue                            | N1: Unilateral lymph node ≤ 6 cm              | M1: Distant metastasis present |
| T3: Bone/paranasal sinus involvement                    | N2: Bilateral lymph nodes ≤ 6 cm              |                                |
| T4: Intracranial extension or cranial nerve involvement | N3: Lymph node > 6 cm or supraclavicular node |                                |

### IMPORTANT POINTS

- ✓ NPC spreads early to cervical nodes.
- ✓ Cervical lymphadenopathy is the most common presenting feature.
- ✓ Adult unilateral serous otitis media = suspect NPC.

### TREATMENT

#### 1. Radiotherapy – Mainstay (Highly radiosensitive)

- Early stage – Radiotherapy alone
- Preferred technique – IMRT (Intensity-Modulated Radiotherapy)
- Advantages – Better tumor targeting, reduced xerostomia, less normal tissue injury

#### 2. Chemotherapy – Used in advanced disease

- Concurrent chemoradiotherapy
- Common drugs: Cisplatin, 5-FU

#### 3. Surgery – Limited role

- Indications: Residual neck disease, recurrent disease, salvage nasopharyngectomy

#### 4. Neck Dissection – For persistent cervical nodal disease after chemoradiotherapy.

### SPREAD OF TUMOR

#### Local Spread

- Nasal cavity
- Oropharynx
- Skull base
- Parapharyngeal space
- Cranial cavity

#### Lymphatic Spread (Very common)

- Rich lymphatics in nasopharynx
- Common nodes: Retropharyngeal, Jugulodigastric, Posterior cervical nodes
- Often bilateral

Distant Metastasis

- Liver
- Lung

### COMPLICATIONS OF DISEASE

- Skull base erosion
- Cranial nerve palsy
- Intracranial extension
- Cachexia
- Distant metastasis



### COMPLICATIONS OF RADIOTHERAPY

- Xerostomia
- Mucositis
- Osteoradionecrosis
- Hearing loss
- Hypothyroidism



### PROGNOSTIC FACTORS

- TNM stage
- Cranial nerve involvement
- Distant metastasis
- EBV DNA load
- Response to therapy



### PROGNOSIS

Early-stage disease has good prognosis with modern chemoradiotherapy. Advanced disease has variable outcome.



### DIFFERENTIAL DIAGNOSIS

- Adenoid hypertrophy
- Lymphoma
- Tuberculosis
- Thornwaldt cyst
- Angioblastoma
- Skull base lesions



### DIAGNOSTIC & TREATMENT FLOWCHART



### KEY TAKE HOME MESSAGES

- ✓ Fossa of Rosenmüller is the most common site.
- ✓ Cervical lymphadenopathy is the most common presentation.
- ✓ Adult unilateral serous otitis media should raise suspicion.
- ✓ Epstein-Barr virus is strongly associated.
- ✓ Radiotherapy is the treatment of choice.



## INTRODUCTION

Otosclerosis is a localized hereditary disorder of the bony otic capsule characterized by abnormal bone remodeling involving the stapes footplate, leading to progressive hearing loss.

- Commonly affects young adults
- Females > Males
- Primarily involves fissula ante fenestram near oval window.

# OTOSCLEROSIS

## A PRIMARY OSTEODYSTROPHY OF OTIC CAPSULE

## DEFINITION

A primary disease of the labyrinthine capsule characterized by replacement of normal dense endochondral bone by spongy vascular bone causing stapes fixation.

## MOST COMMON SITE

## FISSULA ANTE FENESTRAM (anterior to oval window)



## PREDISPOSING FACTORS

### 1. HEREDITARY

- Autosomal dominant
- Variable penetrance
- Positive family history common

### 2. HORMONAL FACTORS

- More common in females
- Worsens during pregnancy and puberty

### 3. VIRAL THEORY

- Associated with measles virus infection

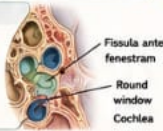
### 4. RACIAL PREDISPOSITION

- More common in Caucasians
- Less common in Asians and Africans

## PATHOLOGY

### SITES OF INVOLVEMENT

- Fissula ante fenestram
- Round window
- Cochlea
- Internal auditory canal



### PATHOLOGICAL PHASES

#### 1. OTOSPONGIOSIS PHASE

- Active vascular spongy bone formation
- Hypervascularity



#### 2. SCLEROTIC PHASE

- Dense sclerotic bone deposition
- Stapes fixation



### HISTOLOGICAL vs CLINICAL OTOSCLEROSIS

#### HISTOLOGICAL OTOSCLEROSIS

- Microscopic lesion only
- Asymptomatic

#### CLINICAL OTOSCLEROSIS

- Hearing loss present
- Symptomatic disease

## TYPES OF OTOSCLEROSIS

### 1. FENESTRAL OTOSCLEROSIS (Most common)

Involves oval window / stapes footplate  
→ Conductive hearing loss



### 2. COCHLEAR (RETROFENESTRAL) OTOSCLEROSIS

Involves cochlear capsule  
→ Sensorineural hearing loss



### 3. MIXED OTOSCLEROSIS

Both conductive and sensorineural components



### 4. OBLITERATIVE OTOSCLEROSIS

Dense bone around footplate causing difficult surgery and more complications



## CLINICAL FEATURES

### SYMPTOMS

#### 1. Progressive Hearing Loss

- Bilateral
- Conductive
- Slowly progressive

#### 2. Paracusis Willisii

- Hears better in noisy surroundings (others speak louder)

#### 3. Tinnitus

- Low-pitched humming sound

#### 4. Vertigo

- Occasional

## SIGNS

- Otoscopy – Usually normal tympanic membrane

- Schwartz Sign – Flamingo pink blush over promontory



### TUNING FORK TESTS

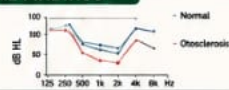
- Rinne Test – Negative (BC > AC)
- Weber Test – Lateralized to affected ear
- Absolute Bone Conduction – Normal or prolonged
- Gelle Test – Negative (Increased pressure in EAC does not reduce BC because stapes is fixed)



## AUDIOLOGICAL FINDINGS

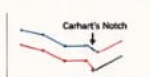
### 1. Pure Tone Audiometry (PTA)

- Conductive hearing loss
- Air-bone gap



### 2. Carhart's Notch

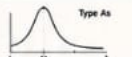
- Dip in bone conduction at 2000 Hz
- Mechanical artifact due to stapes fixation, not true SNHL



### 3. Speech Audiometry – Usually preserved

### 4. Impedance Audiometry

- Type As (shallow compliance) tympanogram
- Absent stapedial reflex



## INVESTIGATIONS

### 1. Pure Tone Audiometry – Most important investigation

### 2. Tympanometry – Type As (shallow compliance curve)

### 3. HRCT Temporal Bone

- Lucent focus anterior to oval window
- Double ring sign in cochlear disease
- Useful in surgical planning and cochlear otosclerosis



Lucent focus anterior to oval window

## DIFFERENTIAL DIAGNOSIS

- Secretory otitis media
- Congenital stapes fixation
- Tympanosclerosis
- Ossicular fixation
- Ossicular discontinuity
- Chronic otitis media
- Superior semicircular canal dehiscence



## TREATMENT

### A. MEDICAL TREATMENT (Limited role)

- Sodium Fluoride – May slow progression of cochlear otosclerosis
- Bisphosphonates – Sometimes useful
- Hearing Aid – Preferred in:
  - Elderly
  - Poor surgical candidates
  - Patients unwilling for surgery
  - Severe cochlear disease



### B. SURGICAL TREATMENT

#### 1. STAPEDECTOMY (Treatment of choice)

- Small fenestra in footplate and piston prosthesis inserted
- Advantages – Better hearing improvement and fewer complications



#### 2. STAPEDECTOMY (Older procedure)

- Entire stapes removed and replaced with prosthesis



#### 3. FENESTRATION SURGERY (Historical)

- Used before modern stapes surgery era



## SURGICAL STEPS OF STAPEDECTOMY

1. Elevation of tympanomastoid flap
2. Exposure of middle ear
3. Disarticulation of incudostapedial joint
4. Removal of stapes superstructure
5. Fenestration of footplate
6. Insertion of piston prosthesis
7. Closure of flap



## INDICATIONS FOR SURGERY

- ✓ Conductive hearing loss
- ✓ Air-bone gap >20-25 dB
- ✓ Good cochlear reserve
- ✓ Medically fit patient

### CONTRAINDICATIONS

- ✗ Only hearing ear
- ✗ Active infection
- ✗ Poor cochlear reserve
- ✗ Ménière disease / vertigo disorders
- ✗ Poor general condition

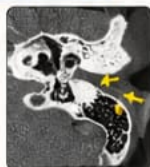
## COMPLICATIONS OF SURGERY

- Sensorineural hearing loss
- Vertigo
- Facial nerve injury
- Perilymph fistula
- Tympanic membrane perforation
- Taste disturbance (chorda tympani injury)

**DEAD EAR** (Most feared complication)  
→ Profound postoperative SNHL

## HRCT TEMPORAL BONE FINDINGS

- Lucent/hypodense focus anterior to oval window
- Double ring sign in cochlear otosclerosis
- Cochlear capsule involvement



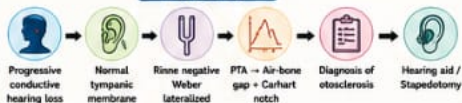
## IMPORTANT VIVA POINTS

- Most common site – Fissula ante fenestram
- Most common symptom – Progressive CHL
- Characteristic symptom – Paracusis Willisii
- Characteristic sign – Schwartz sign
- Characteristic audiological finding – Carhart's notch at 2000 Hz
- Tympanometry – Type As curve
- Gelle test – Negative
- Worsens during pregnancy
- Treatment of choice – Stapedotomy
- Most feared complication – Dead ear

## PROGNOSIS

- Excellent after surgery.
- Most patients show:
  - Closure of air-bone gap
  - Significant hearing improvement
  - Good long-term results

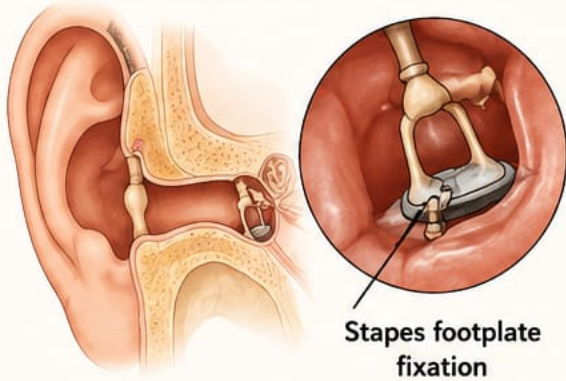
## FLOWCHART



# OTOSCLEROSIS – KEY FEATURES AT A GLANCE

THE PATIENT HAS  
CLASSICAL FEATURES OF:

## OTOSCLEROSIS



### SUMMARY

- Otosclerosis is a primary disease of the otic capsule causing stapes fixation.
- Commonly affects young females.
- Leads to progressive conductive hearing loss.
- Paracusis Willisii is characteristic.
- Tympanic membrane is usually normal.
- Carhart's notch is the hallmark audiological finding.



### KEY CLUES



Young female



Progressive conductive hearing loss



**Paracusis Willisii**  
(Hears better in noisy surroundings)



Normal tympanic membrane



Stapes fixation



### REMEMBER!

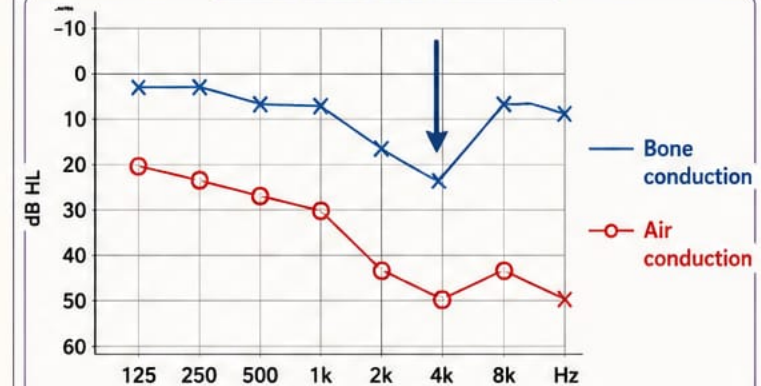
“YOUNG FEMALE – CONDUCTIVE LOSS – HEARS BETTER IN NOISE –  
NORMAL TM – STAPES FIXATION – CARHART'S NOTCH (2 kHz)”

### CARHART'S NOTCH

Dip in bone conduction at:

**2000 Hz**

### AUDIOGRAM



### OCCURS DUE TO:

Mechanical effect of stapes fixation.



### HIGH YIELD PEARLS

- Most common site: Fissula ante fenestram
- Tympanogram: Type As
- Treatment of choice: Stapedotomy

# MALIGNANT (NECROTIZING) OTITIS EXTERNA

A SERIOUS INFECTION OF THE EXTERNAL AUDITORY CANAL AND BASE OF SKULL, OCCURRING MOSTLY IN ELDERLY DIABETIC OR IMMUNOCOMPROMISED PATIENTS

## DEFINITION

A severe, invasive infection of the external auditory canal that spreads to the skull base, especially the temporomandibular joint, mastoid, and can progress to the petrous bone.

Occurs mainly in elderly diabetics or immunosuppressed patients.



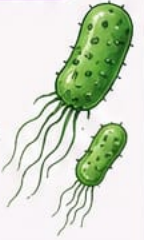
## ETIOLOGY / RISK FACTORS

- Elderly diabetic patients
- Immunosuppression (steroids, malignancy, HIV, chemo)
- Poor hygiene
- Trauma to ear canal
- Use of cotton buds / instrumentation
- Chronic otitis externa



## CAUSATIVE ORGANISM

- *Pseudomonas aeruginosa* (Most common)
- Occasionally other organisms like *Staphylococcus aureus*, *Proteus*, *Aspergillus* species may be involved.



## PATHOGENESIS

Minor trauma or infection of ear canal  
↓  
Invasion of *Pseudomonas aeruginosa* into soft tissue  
↓  
Spread to cartilage, bone and skull base (via fissures of Santorini)  
↓  
Thrombosis of small vessels → Ischemia → Necrosis  
↓  
Granulation tissue and sequestrum formation  
↓  
Extension to cranial nerves and adjacent structures



## CLINICAL FEATURES

- Severe otalgia, disproportionate to clinical findings
- Persistent otorrhea
- Itching in ear
- Granulation tissue in the ear canal
- Facial nerve palsy (common)
- Headache
- Trismus (involvement of temporomandibular joint)
- Lower cranial nerve palsies in advanced cases
- Fever, malaise, weight loss
- Raised ESR and blood sugar



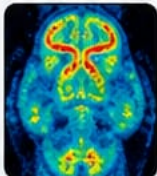
## EXAMINATION FINDINGS

- Edema and erythema of external auditory canal
- Granulation tissue at bony-cartilaginous junction
- Foul-smelling otorrhea
- Otoscopy: Granulation tissue which bleeds easily
- Tenderness over:
  - Tragus
  - Temporomandibular joint
- Cranial nerve involvement in advanced disease



## DIAGNOSIS

- Based on clinical features
- High ESR, leukocytosis, and poor glycemic control
- CT scan temporal bone: Bony erosion, soft tissue infiltration
- MRI: Extent of soft tissue involvement
- Radionuclide scan (Tc-99): Useful for diagnosis and follow-up
- Culture and sensitivity of ear discharge



## COMPLICATIONS

- Cranial nerve palsies (VII most common)
- Dural sinus thrombosis
- Meningitis
- Brain abscess
- Labyrinthitis
- Septicemia
- Death (if untreated)



## TREATMENT

### 1. CONTROL OF DIABETES

Strict control of blood sugar is essential.



### 2. AURAL TOILET

Careful cleaning and suction of ear canal.



### 3. ANTIBIOTIC THERAPY

Prolonged high-dose IV antipseudomonal antibiotics for at least 6–8 weeks.

- Ciprofloxacin IV / Oral (preferred)
- Ceftazidime, Piperacillin-Tazobactam, or Carbapenems (in severe cases)



### 4. SURGERY (Rarely needed)

Sequestrectomy or debridement for persistent granulation tissue or dead bone.



## PREVENTION



Avoid unnecessary ear drops



Avoid instrumentation or trauma



Keep ears dry after swimming/bathing

## IMPORTANT VIVA POINTS

- ★ Most common organism → *Pseudomonas aeruginosa*
- ★ Occurs mainly in elderly diabetic or immunocompromised patients
- ★ Facial nerve palsy is the most common cranial nerve involved
- ★ Prolonged antibiotics (6–8 weeks) are required
- ★ Radionuclide (Tc-99) scan is useful for diagnosis and follow-up



# ⇒ DIFFUSE OTITIS EXTERNA ⇒

## (ACUTE DIFFUSE OTITIS EXTERNA)

### DEFINITION

Diffuse inflammation of the skin and subcutaneous tissue of the external auditory canal, commonly called "swimmer's ear."



### ETIOLOGY / PREDISPOSING FACTORS

• Excessive moisture and humidity

• Use of topical ear drops

• Trauma from:

- Ear buds
- Matchsticks
- Hairpins
- Scratching

• Diabetes mellitus

• Swimming

Immunocompromised state

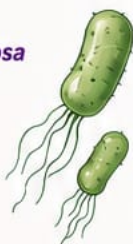
### CAUSATIVE ORGANISMS

• Most common:

*Pseudomonas aeruginosa*

• Others:

- *Staphylococcus aureus*
- *Proteus*
- *E. coli*
- Fungal infection occasionally



### PATHOGENESIS

Loss of protective cerumen and maceration of canal skin



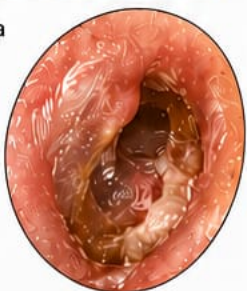
bacterial invasion



edema and inflammation of external auditory canal

### EXAMINATION FINDINGS

- Diffuse edema of EAC
- Congested canal skin
- Debris/discharge
- Narrowed canal lumen



### COMPLICATIONS

- Furunculosis
- Perichondritis
- Cellulitis
- Malignant otitis externa in diabetics



### CLINICAL FEATURES

- Severe otalgia
- Ear fullness
- Itching initially
- Purulent ear discharge
- Tenderness on:
  - Tragal pressure
  - Pulling pinna
- Conductive hearing loss due to edema/debris
- Swollen erythematous canal



### TREATMENT

#### AURAL TOILET



- Cleaning of discharge and debris
- Suction/mopping

#### TOPICAL THERAPY



- Antibiotic ear drops:
- Ciprofloxacin
  - Ofloxacin
- Antibiotic + steroid combinations

#### EAR WICK



Used if canal edema is severe

#### SYSTEMIC ANTIBIOTICS

Indications:

- Cellulitis
- Fever
- Lymphadenitis
- Diabetes/immunocompromised patients



#### ANALGESICS



For pain relief.

### ADVICE



- Keep ear dry



- Avoid trauma/instrumentation



# TUBERCULOUS OTITIS MEDIA

A 30-year-old male presents with painless foul-smelling ear discharge, severe hearing loss out of proportion to symptoms for the last one year. Otoscopy revealed multiple perforations in pars tensa.

## MOST LIKELY DIAGNOSIS: TUBERCULOUS OTITIS MEDIA (TBOM)

*Differential Diagnosis: Unsafe CSOM with Cholesteatoma*

### 1. INTRODUCTION

Tuberculous otitis media is a chronic granulomatous infection of the middle ear caused by *Mycobacterium tuberculosis*. It is a rare form of chronic suppurative otitis media and usually occurs secondary to pulmonary tuberculosis.

### 2. CLINICAL FEATURES

#### CLASSICAL TRIAD

- Painless otorrhea
- Multiple tympanic membrane perforations
- Severe hearing loss disproportionate to clinical findings

#### Other Features

- Pale granulation tissue
- Profuse ear discharge
- Ossicular necrosis
- Facial nerve palsy
- Postaural fistula



### 3. PATHOPHYSIOLOGY

#### ROUTES OF INFECTION

1. Through Eustachian tube
  - From nasopharynx or pulmonary TB
  - Most common route
2. Hematogenous spread
  - Via bloodstream from distant focus
3. Direct implantation
  - Through perforated tympanic membrane

#### PATHOLOGICAL CHANGES

- Tubercle bacilli infect middle ear mucosa
- Granulomatous inflammation develops
- Formation of epithelioid granulomas, Langhans giant cells and caseous necrosis

#### TYMPANIC MEMBRANE CHANGES

- Multiple small perforations develop
- These later coalesce into large perforation

#### OSSICULAR NECROSIS

- Due to caseation and osteitis
- Incus commonly affected

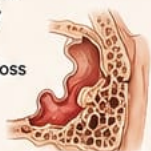
#### HEARING LOSS

- Conductive loss due to ossicular destruction
- Sensorineural component may occur due to labyrinth involvement
- Hearing loss is often severe and disproportionate

### 4. COMPLICATIONS IF UNTREATED

#### INTRATEMPORAL COMPLICATIONS

- Facial nerve palsy
- Mastoiditis
- Labyrinthitis
- Ossicular destruction
- Postaural abscess/fistula
- Profound hearing loss



#### INTRACRANIAL COMPLICATIONS

- Meningitis
- Brain abscess
- Extradural abscess
- Lateral sinus thrombosis
- Otitic hydrocephalus



### 5. INVESTIGATIONS WITH EXPECTED FINDINGS



#### 1. OTOSCOPY / MICROSCOPY

- Multiple perforations in pars tensa
- Pale granulation tissue
- Purulent discharge
- Large central perforation formed by coalescence



#### 2. PURE TONE AUDIOGRAM

- Severe conductive hearing loss
- Mixed hearing loss possible



#### 3. TUNING FORK TESTS

- Rinne – Negative (affected ear)
- Weber – Lateralizes to affected ear



#### 4. EAR DISCHARGE EXAMINATION

- Ziehl-Neelsen stain – AFB may be seen
- Culture – *Mycobacterium tuberculosis*
- CBNAAT / GeneXpert – Detects TB bacilli rapidly



#### 5. HISTOPATHOLOGY

- Granulomatous inflammation
- Caseous necrosis
- Langhans giant cells



#### 6. CHEST X-RAY

- May show evidence of pulmonary tuberculosis



#### 7. ESR & MANTOUX TEST

- ESR raised
- Mantoux test may be positive



#### 8. HRCT TEMPORAL BONE

- Middle ear and mastoid opacification
- Ossicular erosion
- Bone destruction
- Mastoid involvement

### 6. TREATMENT

#### A. MEDICAL TREATMENT

##### 1. ANTI-TUBERCULAR THERAPY (ATT)

- Mainstay of treatment

Standard Regimen (2HRZE + 4HR)

##### INTENSIVE PHASE (2 MONTHS)

- H – Isoniazid
- R – Rifampicin
- Z – Pyrazinamide
- E – Ethambutol

##### CONTINUATION PHASE (4 MONTHS)

- H – Isoniazid
- R – Rifampicin

##### 2. AURAL TOILET

- Suction clearance
- Dry mopping



##### 3. ANTIBIOTICS

- For secondary bacterial infection



#### B. SURGICAL TREATMENT

##### INDICATIONS

- Persistent disease
- Complications
- Facial palsy
- Mastoid abscess
- Cholesteatoma suspicion

##### PROCEDURES

- Mastoidectomy
- Tympanoplasty
- Abscess drainage



### 7. CONCLUSION

Tuberculous otitis media is a rare but important cause of chronic painless otorrhea with multiple tympanic membrane perforations and severe hearing loss. Early diagnosis with microbiological confirmation and prompt initiation of anti-tubercular therapy are essential to prevent irreversible complications and hearing loss.

Dr Ashik Sureshkumar

# TUBOTYMPANIC DISEASE (SAFE CSOM)

## SAFE CHRONIC SUPPURATIVE OTITIS MEDIA

### LONG ESSAY QUESTION

A 24-year-old female presents with recurrent mucoid ear discharge from the left ear associated with decreased hearing for the past 1 year. The discharge is non-foul smelling and increases during upper respiratory tract infections. On otoscopic examination, a central perforation is seen in the pars tensa with no evidence of granulation tissue or cholesteatoma.

- What is the likely diagnosis?
- Describe the pathophysiology of this condition.
- Enumerate the complications if left untreated.
- Mention the relevant investigations with expected findings.
- Discuss the treatment of this condition.



Central perforation in pars tensa

### 1. LIKELY DIAGNOSIS

#### Safe CSOM (Tubotympanic Disease)

##### Differential Diagnoses

- Tuberculous otitis media
- Traumatic perforation
- Early cholesteatoma
- Healed perforation

### 3. WHY IT IS CALLED "SAFE"

- Cholesteatoma is absent
- Bone erosion is absent
- Serious intracranial complications are uncommon



### 4. DEFINITION OF CENTRAL PERFORATION

A central perforation is one surrounded by remnant tympanic membrane on all sides without involvement of annulus.



### 5. STAGES OF TUBOTYMPANIC DISEASE

- Active Stage – Ear discharge present
- Quiescent Stage – Intermittent discharge
- Inactive Stage – Dry perforation without discharge
- Healed Stage – Perforation healed completely

### 6. ETIOLOGY / PREDISPOSING FACTORS

- Recurrent URTI
- Eustachian tube dysfunction
- Adenoid hypertrophy
- Allergic rhinitis
- Sinusitis
- Deviated nasal septum
- Poor socioeconomic conditions
- Repeated acute otitis media



Adenoid hypertrophy

### 7. CLINICAL FEATURES

#### SYMPTOMS

- Recurrent mucoid or mucopurulent ear discharge
- Usually non-foul smelling
- Decreased hearing
- Ear blockage

#### SIGNS (OTOSCOPY)

- Central perforation in pars tensa
- Middle ear mucosal edema
- Mucoid discharge
- Congested middle ear mucosa
- No cholesteatoma
- No granulation tissue



### 8. EXAMINATION OF NOSE & THROAT

Important to identify cause of Eustachian tube dysfunction.

Examine for:

- Adenoid hypertrophy
- Allergic rhinitis
- Sinusitis
- Deviated nasal septum
- Nasopharyngeal infection



### 9. PATHOPHYSIOLOGY

- Eustachian Tube Dysfunction** – Causes impaired ventilation and negative middle ear pressure.
- Recurrent Infection** – Organisms enter middle ear through ET during URTI.
- Tympanic Membrane Perforation** – Acute otitis media leads to perforation of pars tensa. Persistent infection prevents healing.
- Mucosal Changes** – Middle ear mucosa becomes hyperemic, edematous and thickened. Mucosal glands become hypersecretory causing mucoid discharge.
- Conductive Hearing Loss** – Due to:
  - Reduced vibrating area of tympanic membrane
  - Ossicular conduction impairment
  - Round window phase cancellation
 Usually mild to moderate.



Reduced vibrating area of TM

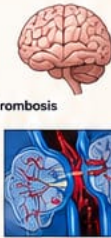
### 10. COMPLICATIONS IF UNTREATED

#### A. EXTRACRANIAL COMPLICATIONS

- Mastoiditis
- Tympanosclerosis
- Aural polyp
- Ossicular fixation
- Persistent conductive hearing loss

#### B. INTRACRANIAL COMPLICATIONS (RARE)

- Meningitis
- Brain abscess
- Lateral sinus thrombosis



Intracranial complications are uncommon because cholesteatoma and bone erosion are absent.

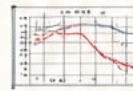
### 11. RELEVANT INVESTIGATIONS WITH EXPECTED FINDINGS

#### 1 OTOSCOPY / MICROSCOPY



Central perforation, healthy or edematous mucosa, mucoid discharge.

#### 2 PURE TONE AUDIOGRAM



Conductive hearing loss with mild to moderate air-bone gap.

#### 3 TUNING FORK TESTS

**RINNE TEST**

- Negative on affected side

**WEBER TEST**

- Lateralized to affected ear



#### 4 ET FUNCTION TESTS

Examples:

- Valsalva maneuver
- Toynbee test

May show poor ET function.



#### 5 EAR SWAB CULTURE



Common organisms:

- Pseudomonas
- Staphylococcus aureus
- Proteus

#### 6 X-RAY MASTOID



May show sclerosed mastoid air cells.

#### 7 HRCT TEMPORAL BONE



Usually not routinely required. May show soft tissue in middle ear, intact ossicles, no bone erosion.

### 12. TREATMENT

#### A. MEDICAL TREATMENT (TO CONTROL INFECTION)

##### 1. AURAL TOILET

- Dry mopping
- Suction clearance

##### 2. TOPICAL ANTIBIOTICS

Preferred:

- Ciprofloxacin ear drops
- Ofloxacin ear drops



##### 3. SYSTEMIC ANTIBIOTICS

Used during acute exacerbation.



##### 4. TREATMENT OF PREDISPOSING FACTORS

- Adenoid hypertrophy
- Sinusitis
- Allergic rhinitis
- URT



##### 5. WATER PRECAUTIONS

Avoid water entry into ear.



#### B. SURGICAL TREATMENT (DEFINITIVE)

Surgery is preferably done when ear is dry for 6–12 weeks.

##### 1 MYRINGOPLASTY (Repair of TM perforation)

- Indications:
- Dry ear
  - Persistent perforation
  - Conductive hearing loss

##### 2 GRAFT MATERIALS

- Temporalis fascia (most common)
- Tragal perichondrium
- Cartilage



##### 3 TECHNIQUES

- Underlay technique (most commonly used)
- Overlay technique



##### 4 TYMPANOPLASTY (Reconstruction of TM with or without ossicular repair)

**WULLSTEIN CLASSIFICATION:**  
Type I, Type II, Type III, Type IV, Type V

##### 5 CONTRAINDICATIONS TO SURGERY

- Active infection
- Poor ET function
- Uncontrolled URT



### 13. PROGNOSTIC FACTORS

Better outcome with:

- Dry ear
- Small perforation
- Healthy middle ear mucosa
- Good ET function



### 14. PROGNOSIS

- Generally good
- Hearing improves after surgery
- Recurrence uncommon



### 15. KEY POINTS (HIGH YIELD)

- Tubotympanic disease is a safe type of CSOM.
- Central perforation involves pars tensa and is surrounded by TM on all sides.
- Discharge is mucoid, non-foul smelling and increases in URTI.
- Complications are rare compared to unsafe CSOM.
- Medical treatment controls infection; surgery restores hearing.

### 16. DIFFERENTIAL DIAGNOSIS

- Tuberculous otitis media
- Traumatic perforation
- Early cholesteatoma
- Healed perforation



# UNSAFE CSOM (ATTICOANTRAL DISEASE WITH CHOLESTEATOMA)

## LONG ESSAY

A 28-year-old male presents with recurrent foul-smelling purulent ear discharge from the right ear associated with progressive hearing loss for the past 2 years. He also complains of intermittent earache and giddiness. On otoscopic examination, a retraction pocket with pearly white flakes is seen in the attic region with granulation tissue and marginal perforation.

- What is the likely diagnosis?
- Describe the pathophysiology of this condition.
- Write the complications if treatment is not taken.
- Mention the relevant investigations with expected findings.
- Discuss the treatment of this condition.



Attic retraction pocket with pearly white flakes

### 1. LIKELY DIAGNOSIS

#### UNSAFE CSOM (Atticoantral Disease with Cholesteatoma)

##### Differential Diagnosis

- Tuberculous otitis media
- Malignant otitis externa
- Chronic mastoiditis

### 2. DEFINITION

Unsafe ear is one associated with cholesteatoma or bone-eroding disease having potential to produce serious extracranial and intracranial complications.

### 3. CLASSIFICATION OF CSOM

#### 1. SAFE CSOM

(Tubotympanic Disease)

- Central perforation
- Usually does not cause bone erosion
- Less dangerous



#### 2. UNSAFE CSOM (Atticoantral Disease)

- Marginal or attic perforation
- Associated with cholesteatoma
- Causes bone destruction and intracranial complications



### 4. TYPES OF CHOLESTEATOMA

#### 1. CONGENITAL CHOLESTEATOMA

Occurs behind intact tympanic membrane.



#### 2. ACQUIRED CHOLESTEATOMA

##### a) PRIMARY ACQUIRED

Due to retraction pocket formation.



##### b) SECONDARY ACQUIRED

Due to migration of squamous epithelium through perforation.



### 5. CLINICAL FEATURES

#### SYMPTOMS

- Foul-smelling scanty ear discharge
- Progressive hearing loss
- Earache
- Giddiness
- Tinnitus
- Occasionally facial weakness

Reason for foul smell: Due to decomposition of retained keratin debris with anaerobic infection.

#### SIGNS (OTOSCOPY)

- Attic perforation
- Marginal perforation
- Retraction pocket
- Pearly white keratin flakes
- Granulation tissue
- Sagging posterior canal wall

Common sites of retraction pocket: Pars flaccida, Posterosuperior pars tensa.

### 6. PATHOPHYSIOLOGY

#### 1. EUSTACHIAN TUBE DYSFUNCTION

Chronic ET dysfunction → negative middle ear pressure → retraction of tympanic membrane.

#### 2. RETRACTION POCKET FORMATION

Retraction pocket forms in pars flaccida or posterosuperior pars tensa. Keratin debris accumulates within the pocket.

#### 3. CHOLESTEATOMA FORMATION

- Retraction pocket theory (Most accepted): Invagination of TM traps squamous epithelium.
- Migration theory: Squamous epithelium migrates through marginal perforation.
- Metaplasia theory: Middle ear mucosa undergoes squamous metaplasia.

#### 4. BONE EROSION

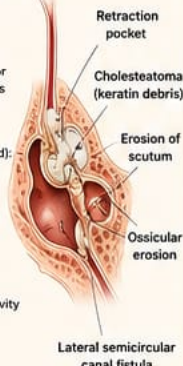
Due to pressure necrosis, osteoclastic activity and enzymatic destruction (collagenase, cytokines, TNF- $\alpha$ ).

#### 5. OSSICULAR DESTRUCTION

Most commonly eroded ossicle – Incus long process → then stapes suprastructure, malleus → severe conductive hearing loss.

#### 6. LABYRINTHINE INVOLVEMENT

Erosion of lateral semicircular canal produces vertigo and nystagmus. Most common fistula site – Lateral semicircular canal.



### 7. COMPLICATIONS IF UNTREATED

#### A. EXTRACRANIAL (INTRATEMPORAL) COMPLICATIONS



- Acute mastoiditis
- Facial nerve palsy (Horizontal segment commonly involved)
- Labyrinthitis
- Labyrinthine fistula
- Petrositis
- Ossicular necrosis
- Profound hearing loss
- Postaural abscess

#### B. INTRACRANIAL COMPLICATIONS



- Meningitis
- Brain abscess (Temporal lobe abscess, Cerebellar abscess)
- Extradural abscess
- Subdural empyema
- Lateral sinus thrombosis
- Otitic hydrocephalus

### 8. RELEVANT INVESTIGATIONS WITH EXPECTED FINDINGS

#### 1. OTOSCOPY / MICROSCOPY

Attic or marginal perforation, retraction pocket, cholesteatoma flakes, granulations, foul-smelling discharge.

#### 2. PURE TONE AUDIOGRAM

Conductive hearing loss (large air-bone gap); mixed loss if labyrinth involved.

#### 3. TUNING FORK TESTS

- Rinne test: Negative on affected side
- Weber test: Lateralized to diseased ear

#### 4. FISTULA TEST

Pressure over tragus produces vertigo/nystagmus. Suggests labyrinthine fistula (lateral semicircular canal).

#### 5. HRCT TEMPORAL BONE (INVESTIGATION OF CHOICE)

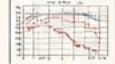
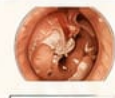
Soft tissue opacity in middle ear/mastoid, scutum blunting & erosion, ossicular erosion, tegmen tympani erosion, facial canal erosion, sigmoid sinus plate erosion, mastoid destruction, labyrinthine fistula, automastoidectomy.

#### 6. EAR SWAB CULTURE

Common organisms: *Pseudomonas aeruginosa*, *Proteus*, Anaerobes.

#### 7. X-RAY MASTOID (OLDER INVESTIGATION)

May show sclerosed mastoid, bone destruction.



### 9. TREATMENT

#### A. MEDICAL TREATMENT (TEMPORARY – TO CONTROL INFECTION)

##### 1. AURAL TOILET

- Suction clearance
- Dry mopping



##### 2. ANTIBIOTICS

- Topical quinolone ear drops (Ciprofloxacin / Ofloxacin)
- Systemic antibiotics during acute exacerbation.



##### 3. CONTROL OF GRANULATIONS

Chemical cautery if required.



Medical treatment is temporary and aims to reduce discharge and infection.

**All cholesteatomas require surgical removal.**

#### B. DEFINITIVE TREATMENT = SURGERY

##### GOALS OF SURGERY



- Eradicate disease
- Create safe dry ear
- Preserve / reconstruct hearing

##### 2. OTHER SURGICAL PROCEDURES

- Canal Wall Up Mastoidectomy
- Canal Wall Down Mastoidectomy
- Tympanoplasty (Wullstein Classification: Type I to V)
- Ossiculoplasty

##### INDICATIONS FOR EMERGENCY SURGERY

- Facial palsy
- Intracranial complications
- Mastoid abscess
- Labyrinthine fistula

##### 1. MODIFIED RADICAL MASTOIDECTOMY (MRM)

Most commonly performed surgery.

Indications: Cholesteatoma, persistent discharge, bone erosion, complications.

Procedure: Removal of cholesteatoma, exteriorization of mastoid and middle ear disease.



### 10. KEY POINTS (HIGH YIELD)

- Unsafe ear = Cholesteatoma until proved otherwise.
- Foul smell due to anaerobic decomposition of keratin debris.
- Incus long process most commonly eroded.
- Lateral semicircular canal fistula most common.
- HRCT temporal bone is investigation of choice.
- All cholesteatomas need surgical removal.



### 11. DIFFERENTIAL DIAGNOSIS

- Tuberculous otitis media
- Malignant otitis externa
- Chronic mastoiditis
- Congenital cholesteatoma



### 12. CONCLUSION

Unsafe CSOM with cholesteatoma is a dangerous chronic ear disease characterized by foul-smelling ear discharge, hearing loss, and progressive bone destruction. Early diagnosis using otoscopy and HRCT followed by definitive surgical management is essential to prevent irreversible hearing loss and life-threatening intracranial complications.





# COMPLICATIONS OF CSOM



Chronic Suppurative Otitis Media (CSOM) is a persistent infection of the middle ear cleft with perforation of tympanic membrane and ear discharge for more than 6 weeks. If left untreated, it may lead to a variety of complications which are broadly classified into Intratemporal (Extracranial) and Intracranial complications.

## CLASSIFICATION OF CSOM

### 1. SAFE CSOM (Tubotympanic Disease)

- Central perforation
- No cholesteatoma
- No bone erosion
- Complications are rare

### 2. UNSAFE CSOM (Atticoantral Disease)

- Marginal/attic perforation
- Associated with cholesteatoma
- Bone erosion present
- Complications are common and may be life-threatening

## TYPES OF COMPLICATIONS

1. INTRATEMPORAL (EXTRACRANIAL) COMPLICATIONS – Confined to temporal bone
2. INTRACRANIAL COMPLICATIONS – Spread beyond the temporal bone to cranial cavity

## I. INTRATEMPORAL (EXTRACRANIAL) COMPLICATIONS

These complications remain confined to the temporal bone and its related structures.

### 1. ACUTE MASTOIDITIS



- Infection spreads from middle ear to mastoid air cells.
- Pain, tenderness and swelling in postaural region.
- Pinna pushed forward and downward.
- X-ray/HRCT: hazy or sclerosed mastoid air cells.

### 2. SUBPERIOSTEAL (POSTAURAL) ABSCESS



- Pus collects between periosteum and cortex in mastoid area.
- Fluctuant, tender swelling behind the ear.
- May point and discharge externally.

### 3. FACIAL NERVE PALSY



- Due to inflammation or erosion of facial canal (horizontal segment most commonly involved).
- Presents as weakness or paralysis of muscles of facial expression.

### 4. LABYRINTHITIS



- Infection spreads to inner ear.
- Causes vertigo, nystagmus, nausea and vomiting.
- Sensorineural hearing loss may be present.

### 5. LABYRINTHINE FISTULA



- Bony defect in lateral (most common), superior or posterior semicircular canal.
- Pressure over tragus/positive fistula test causes vertigo and nystagmus.

### 6. PETROSITIS



- Infection involves apex of petrous bone (Gradenigo's syndrome).
- Severe deep ear pain, retro-orbital pain, diplopia (abducens nerve palsy), otorrhoea.

### 7. OSSICULAR DAMAGE



- Erosion or necrosis of ossicles (incus most commonly).
- Results in persistent conductive hearing loss.

## II. INTRACRANIAL COMPLICATIONS

These are serious and life-threatening complications due to spread of infection beyond the temporal bone.

### 1. MENINGITIS



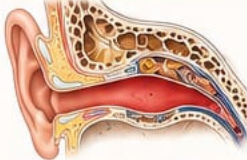
- Infection spreads through tegmen tympani or via venous channels.
- Presents with headache, fever, neck stiffness, vomiting and photophobia.
- CSF shows pleocytosis, raised proteins and low sugar.

### 2. BRAIN ABSCESS



- a) **TEMPORAL LOBE ABSCESS**
  - Due to erosion of tegmen tympani.
  - Headache, vomiting, fever, focal neurological signs, fits.
- b) **CEREBELLAR ABSCESS**
  - Due to erosion of sinus plate or posterior fossa structures.
  - Occipital headache, vomiting, cerebellar signs, ataxia.

### 3. EXTRADURAL (EPIDURAL) ABSCESS



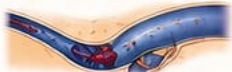
- Pus collects between dura mater and inner surface of skull.
- Commonly in middle cranial fossa.
- Presents with headache, vomiting, fever, signs of raised intracranial tension.
- Surgical emergency.

### 4. SUBDURAL EMPYEMA



- Pus collects between dura mater and arachnoid mater.
- Presents with headache, vomiting, fever, drowsiness, focal neurological deficits, fits.
- Mortality is high if not treated early.

### 5. LATERAL (SIGMOID) SINUS THROMBOSIS



- Infection spreads from mastoid emissary veins or by direct erosion.
- Presents with headache, fever with chills, neck pain and swelling, papilledema.
- May lead to septicemia and metastatic abscesses.

### 6. OTITIC HYDROCEPHALUS



- Due to blockage of CSF pathways by meningitis or fibrosis.
- Presents with headache, vomiting, drowsiness, papilledema.
- Ventriculomegaly on imaging.

### 7. BRAIN SINUS PERIPHLEBITIS



- Inflammation of walls of dural venous sinuses without thrombosis.
- Presents with headache, fever, vomiting.
- May progress to lateral sinus thrombosis.

### 8. PETROUS APICITIS



- Severe infection of petrous apex.
- Causes deep persistent ear pain, headache, vertigo, cranial nerve palsies (V, VI, VII, VIII).

### 9. CEREBELLAR EMPYEMA



- Collection of pus in cerebellum.
- Presents with occipital headache, vomiting, vertigo, ataxia, cerebellar signs.

### 10. SEPTICEMIA



- Bacteremia due to spread through venous channels.
- Presents with high fever, chills, toxic appearance, septic shock.

### 11. CERVICAL EPIDURAL ABSCESS



- Infection spreads to cervical epidural space.
- Back pain, neck stiffness, fever, neurological deficits (motor weakness, sensory changes), bladder involvement.

### 12. ANEURYSM OF SIGMOID SINUS



- Rare complication.
- Presents with swelling in the neck, bruit, pulsatile tinnitus, risk of rupture and hemorrhage.

## GENERAL FEATURES OF COMPLICATIONS

- More common in unsafe CSOM (atticoantral disease).
- Result of infection, bone erosion, or thrombophlebitis.
- May be acute or chronic.
- Early diagnosis and treatment are essential to prevent morbidity and mortality.

## IMPORTANT INVESTIGATIONS

- Otoscopy, aural swab culture
- Complete blood count
- HRCT temporal bone
- X-ray mastoid (Schüller's, Stenvers view)
- MRI brain (for intracranial complications)
- Lumbar puncture (if meningitis suspected)

## PRINCIPLES OF MANAGEMENT

- Control infection with appropriate antibiotics
- Aural toilet and local care
- Treat complications accordingly (medical/surgical)
- Surgical management of CSOM (mastoid surgery)
- Early recognition and intervention prevent serious outcomes

# McEWEN'S TRIANGLE

## (SUPRAMEATAL TRIANGLE)

McEwen's triangle is an important surface landmark on the lateral surface of the temporal bone. It overlies the **mastoid antrum**.

### BOUNDARIES

#### 1 SUPERIORLY

Posterior root of zygoma  
(supramastoid crest)

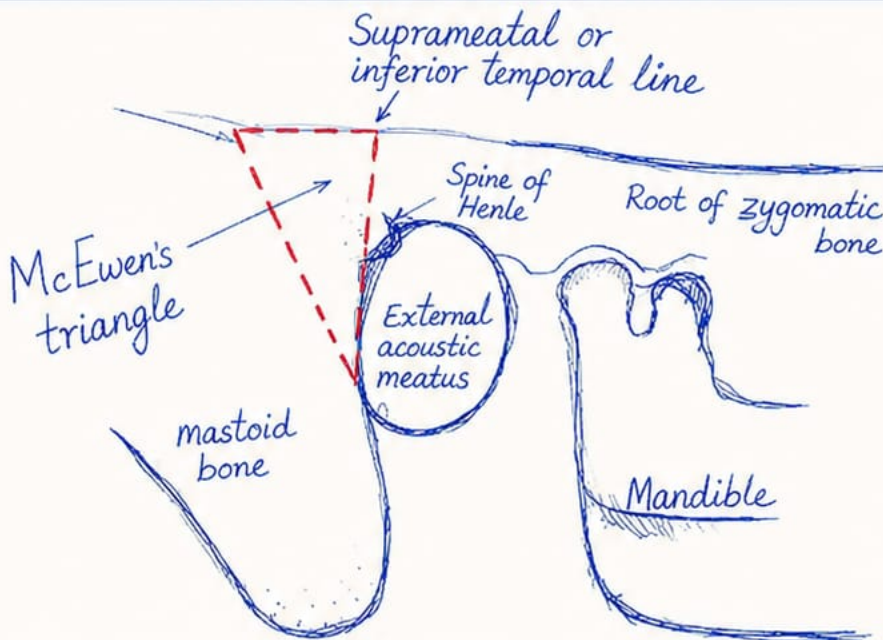
#### 2 ANTERIORLY

Posterosuperior wall of  
external auditory canal

#### 3 POSTERIORLY

Imaginary tangent line from  
posterior canal wall

### ANATOMICAL DIAGRAM (RIGHT SIDE)



### IT OVERLIES

**MASTOID ANTRUM**

### SIGNIFICANCE

Tenderness over McEwen's triangle is one of the earliest and most reliable signs of **acute mastoiditis**.

### CLINICAL IMPORTANCE

- Serves as an important surface landmark for diagnosing mastoiditis.
- Guides the site of cortical mastoidectomy (incision placed just behind the postauricular sulcus and centered over this triangle).
- Helps in locating the mastoid antrum during surgery.
- Anatomically important in avoiding injury to surrounding structures.

### KEY POINTS TO REMEMBER

- ✓ **Boundaries:** superior – posterior root of zygoma (supramastoid crest), anterior – posterosuperior wall of external auditory canal, posterior – tangent from posterior canal wall.
- ✓ It overlies the **mastoid antrum**.
- ✓ Tenderness over this triangle suggests **mastoiditis**.
- ✓ Mastoid antrum is more superficial in children.





# ACUTE MASTOIDITIS

## LONG ESSAY QUESTION & COMPLETE ANSWER



Otoscopy showing congested Tympanic membrane with perforation and purulent discharge

### LONG ESSAY QUESTION

A 12-year-old boy presents with severe ear pain, fever, persistent purulent ear discharge and swelling behind the right ear for the past 5 days. On examination, the postauricular region is tender, erythematous and swollen with forward and downward displacement of the pinna. Otoscopy reveals congested tympanic membrane with central perforation and purulent discharge.

- What is the likely diagnosis?
- Describe the pathophysiology of this condition.
- Enumerate the complications of this condition.
- Mention the relevant investigations with expected findings.
- Discuss the treatment of this condition.

### a) LIKELY DIAGNOSIS

#### ACUTE MASTOIDITIS

Acute suppurative infection of mastoid air cells occurring as a complication of acute otitis media.

### ETIOLOGY

#### Common Organisms

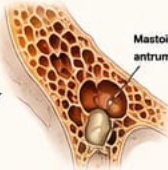
- Streptococcus pneumoniae
- Streptococcus pyogenes
- Staphylococcus aureus
- Haemophilus influenzae
- Pseudomonas aeruginosa

### PREDISPOSING FACTORS

- Acute otitis media
- Recurrent URTI
- Poor antibiotic compliance
- Immunocompromised state
- Malnutrition

### ANATOMY RELEVANT TO MASTOIDITIS

- Mastoid process contains
  - Mastoid antrum
  - Mastoid air cells
- Communicate with middle ear through aditus ad antrum



### MAC EWEN'S TRIANGLE

Important surface landmark over mastoid antrum.

Boundaries:

- Posterior root of zygoma
- Posterior bony external auditory canal
- Temporal line

Tenderness is maximal over this area.



### TYPES OF MASTOIDITIS

- Acute Mastoiditis
- Masked Mastoiditis
  - Occurs after incomplete antibiotic therapy
- Chronic Mastoiditis

### STAGES OF ACUTE MASTOIDITIS

#### 1. ACUTE OTITIS MEDIA WITH PERIOSTITIS

- Mucosal edema and inflammation.



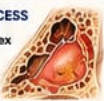
#### 2. COALESCENT MASTOIDITIS

- Destruction of bony septae between air cells.



#### 3. SUBPERIOSTEAL ABSCESS

- Pus erodes mastoid cortex and collects beneath periosteum.



### CLINICAL FEATURES

#### SYMPTOMS

- Fever
- Severe throbbing ear pain
- Purulent ear discharge
- Hearing loss
- Irritability (in children)



#### SIGNS - LOCAL EXAMINATION

- Postauricular swelling, tenderness, erythema
- Obiteration of postauricular sulcus
- Pinna displaced forward and downward
- Tenderness maximal over MacEwen's triangle
- Otoscopy: congested TM, central perforation, purulent discharge, sagging posterosuperior canal wall



#### LUC'S SIGN

Sagging of posterosuperior meatal wall. Strongly suggests mastoiditis.



#### WHY POSTERIOR CANAL WALL SAGS?

Due to periostitis and pressure from pus within mastoid air cells causing downward bulging of posterosuperior meatal wall.

### TYPES OF MASTOID ABSCESSSES

#### 1. Postauricular Abscess - Most common

2. Bezold Abscess - Pus escapes through medial mastoid tip and tracks deep to sternocleidomastoid muscle

3. Luc Abscess - Pus tracks into external auditory canal

4. Zygomatic Abscess - Spread toward root of zygoma

5. Citelli Abscess - Pus tracks posteriorly into occipital region



### COMPLICATIONS

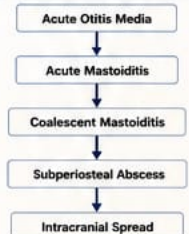
#### A. INTRATEMPORAL (EXTRACRANIAL) COMPLICATIONS

- Subperiosteal Abscess
- Facial Nerve Palsy
- Labyrinthitis
- Petrositis
- Gradenigo Syndrome Triad:
  - Persistent otorrhea
  - Retro-orbital pain
  - Abducens nerve palsy
- Ossicular Necrosis
- Profound Hearing Loss

#### B. INTRACRANIAL COMPLICATIONS

- Meningitis
- Brain Abscess
  - a) Temporal Lobe Abscess
  - b) Cerebellar Abscess
- Extradural Abscess
- Subdural Empyema
- Lateral Sinus Thrombosis
- Otitic Hydrocephalus

### SEQUENCE OF DISEASE PROGRESSION



### RELEVANT INVESTIGATIONS

- Otoscopy
  - Congested TM
  - Perforation
  - Purulent discharge
  - Sagging posterosuperior canal wall
- Pure Tone Audiometry
  - Conductive hearing loss
- Blood Investigations
  - CBC - Leukocytosis
  - ESR / CRP - Elevated
- Ear Swab Culture
  - Organism identification
  - Antibiotic sensitivity
- X-ray Mastoid (Schüller View)
  - Clouding of mastoid air cells
  - Loss of air cell pattern
  - Coalescence
- HRCT Temporal Bone (Investigation of choice)
  - Opacified mastoid air cells
  - Coalescent mastoiditis
  - Loss of bony septae
  - Cortical destruction
  - Subperiosteal abscess
  - Epidual abscess
  - Intracranial extension

### TREATMENT

#### 1. MEDICAL TREATMENT

- Hospital Admission (All cases)
- IV Antibiotics
  - Broad spectrum (Ceftriaxone, Cefotaxime, Piperacillin-Tazobactam)
- Analgesics & Antipyretics
- Aural Toilet
  - Section clearance
  - Dry mopping
- Myringotomy
  - Indications: Intact bulging TM, poor drainage, severe pain
  - Incision site: Posteroinferior quadrant (Avoids ossicles & chorda tympani)
  - Purpose: Drain pus, relieve pressure, improve ventilation

#### 2. SURGICAL TREATMENT

##### Cortical (Simple) Mastoidectomy

- Indications:
- No improvement in 24-48 hrs
  - Coalescent mastoiditis
  - Subperiosteal abscess
  - Complications

Procedure: Removal of infected mastoid air cells and establish adequate drainage.

Drainage of Abscess  
Incision and drainage if abscess present.



### INDICATIONS FOR MASTOIDECTOMY

- Coalescent mastoiditis
- Facial palsy
- Intracranial complications
- Persistent fever/toxemia
- Subperiosteal abscess

### DIFFERENTIAL DIAGNOSIS

- Postauricular lymphadenitis
- Infected sebaceous cyst
- Cellulitis
- Chronic mastoiditis

### PROGNOSIS

Excellent with early diagnosis and appropriate treatment.



### POOR PROGNOSTIC FACTORS

- Delayed treatment
- Intracranial spread
- Immunocompromised state



### KEY POINTS

- Most common complication of Acute Otitis Media.
- Look for postauricular swelling, Luc's sign, and tenderness over MacEwen's triangle.
- Early antibiotics and timely surgery prevent serious intracranial complications.



### NOTE

Early recognition, adequate antibiotics, followed by timely mastoidectomy when indicated, are essential to prevent life-threatening complications.





# LATERAL SINUS THROMBOPHLEBITIS (SIGMOID SINUS THROMBOSIS)



## QUESTION

A 22-year-old male with a history of unsafe chronic suppurative otitis media presents with high-grade intermittent fever associated with chills and rigors, severe headache, vomiting, and persistent foul-smelling ear discharge. On examination, he has tenderness over the mastoid region with edema over the posterior mastoid area. Fundus examination reveals papilloedema.

- What is the most likely diagnosis?
- Describe the pathology of this condition.
- Enumerate the clinical features of this condition.
- Mention the relevant investigations with expected findings.
- Discuss the treatment of this condition.

## ANSWER

### a) MOST LIKELY DIAGNOSIS

Lateral sinus thrombophlebitis (sigmoid sinus thrombosis).

### b) PATHOLOGY

The pathological process occurs in stages:

- Formation of Perisinus Abscess**
  - Abscess forms adjacent to outer dural wall of sinus. Overlying sinus plate may be destroyed by coalescent osteitis or cholesteatoma.
- Endophlebitis and Mural Thrombus Formation**
  - Inflammation spreads to inner endothelial wall of sinus. Fibrin, platelets and blood cells deposit within lumen forming mural thrombus.
- Obliteration of Sinus Lumen and Intrasinus Abscess**
  - Thrombus enlarges and occludes the lumen. Organisms invade thrombus producing intrasinus abscess. Fragments may break off as septic emboli causing pyemia and metastatic abscesses.
- Extension of Thrombus**
  - Proximally – to confluence of sinuses, superior sagittal sinus, cavernous sinus.
  - Distally – mastoid emissary vein, jugular bulb, internal jugular vein.

### ETIOLOGY

- Acute coalescent mastoiditis
- Masked mastoiditis
- Chronic suppurative otitis media with cholesteatoma (most common)



### ANATOMICAL RELATION

- Sigmoid sinus lies adjacent to mastoid air cells and is separated by a thin bony plate.
- It continues inferiorly as internal jugular vein – hence thrombus may extend downward.

### BACTERIOLOGY

#### Acute infections

- Hemolytic streptococcus
- Pneumococcus
- Staphylococcus aureus



#### Chronic infections with cholesteatoma

- Proteus
- Pseudomonas pyocyanus
- Escherichia coli
- Staphylococci

### c) CLINICAL FEATURES

- Hectic "Picket-Fence" Fever with Rigors**
  - Due to septicemia and repeated release of septic emboli.
  - Irregular fever with one or more peaks daily, associated with chills, rigors and profuse sweating.
- Headache**
  - Early – mild (perisinus abscess)
  - Later – severe (raised intracranial pressure)
- Progressive Anaemia and Emaciation**
  - Due to chronic septicemia.
- Griesinger Sign**
  - Due to thrombosis of mastoid emissary vein.
  - Edema over posterior part of mastoid.
- Papilloedema**
  - Due to raised intracranial venous pressure and impaired CSF absorption.
  - More common with right sigmoid sinus involvement or extension to superior sagittal sinus.
  - Fundus: blurring of disc margins, dilated veins, retinal hemorrhages.
- Tobey–Ayer Test**
  - Compression of jugular vein on thrombosed side – no rise in CSF pressure.
  - Compression on healthy side – rapid rise in CSF pressure.
- Crowe–Beck Test**
  - Compression of jugular vein on healthy side – engorgement of retinal veins and supraorbital veins, subsides after release of pressure.
- Tenderness Along Jugular Vein**
  - Due to extension of thrombus into IJV.
  - Tender, cord-like jugular vein, neck pain, torticollis, enlarged jugular lymph nodes.

### d) INVESTIGATIONS

- Hemogram** – Anaemia, raised leukocyte count.
- Blood Smear** – To rule out malaria.
- Blood Culture** – Done during chill phase; identifies causative organism; repeated cultures may be required.
- CSF Examination** – Usually normal except raised pressure; helps to exclude meningitis.
- Imaging Studies**
  - HRCT Temporal Bone** – Clouding of mastoid air cells, bone erosion, cholesteatoma.
  - Contrast-enhanced CT Scan** – Shows Empty Delta Sign: peripheral triangular enhancement of dura with central non-enhancing thrombus.
  - MRI with MR Venography** – More sensitive than CT; shows extent of thrombus and venous flow obstruction. Useful for follow up.
- Culture and Sensitivity of Ear Discharge** – Guides antibiotic therapy.



CT – Empty Delta Sign (axial view)



MR Venography

### DIFFERENTIAL DIAGNOSIS

- Malaria
- Septicemia
- Meningitis
- Brain abscess
- Enteric fever

### COMPLICATIONS

- Septicemia
- Pyemic abscesses in lungs, joints, subcutaneous tissue
- Meningitis
- Subdural abscess
- Cerebellar abscess
- Otitic hydrocephalus
- Jugular bulb thrombosis
- Involvement of IX, X and XI cranial nerves



### e) TREATMENT

- Intravenous Antibiotic Therapy**
  - High dose broad-spectrum IV antibiotics started immediately and modified according to culture sensitivity. Continued at least 1 week after surgery.
- Mastoidectomy and Exposure of Sinus**
  - Cortical or modified radical mastoidectomy as per pathology.
  - Remove diseased mastoid, expose sinus, drain perisinus abscess.
- Management of Sinus Thrombus**
  - If infected clot or intrasinus abscess present – incise sinus wall, evacuate clot and abscess.
  - Healthy clot beyond diseased area should not be disturbed.
  - Routine sinus exploration and clot evacuation are controversial now; many cases respond to mastoidectomy and antibiotics alone.
- Internal Jugular Vein Ligation (Rare)**
  - Indications: persistent septicemia, recurrent septic embolization, failure of antibiotics and surgery or extension into IJV.
- Anticoagulant Therapy (Controversial)**
  - Not routinely recommended.
  - May be used when thrombus extends to cavernous sinus.
- Supportive Treatment**
  - Blood transfusion for anaemia, nutritional support, antipyretics and general supportive care.

### KEY POINTS (SUMMARY)

- Septic thrombosis of sigmoid sinus due to spread of infection from mastoid through perisinus abscess.
- Classical features: picket-fence fever, Griesinger sign, papilloedema.
- Empty Delta Sign on contrast CT is highly suggestive.
- MRI/MRV is better than CT for diagnosis and follow up.
- Early diagnosis and treatment prevent serious complications.

### PROGNOSIS

With early diagnosis, antibiotics and surgery the prognosis is good. Delay in treatment may lead to septicemia, intracranial abscess and death.

*"Early Diagnosis and Aggressive Management Save Lives."*



BY – DR ASHIK SURESHKUMAR



## c) CLINICAL FEATURES

### 1. Hectic "Picket-Fence" Fever with Rigors

- Due to septicemia and repeated release of septic emboli.
- Irregular fever with one or more peaks daily, associated with chills, rigors and profuse sweating.

### 2. Headache

- Early – mild (perisinus abscess)
- Later – severe (raised intracranial pressure)

### 3. Progressive Anaemia and Emaciation

- Due to chronic septicemia.

### 4. Griesinger Sign

- Due to thrombosis of mastoid emissary vein.
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### 5. Papilloedema

- Due to raised intracranial venous pressure and impaired CSF absorption.
- More common with right sigmoid sinus involvement or extension to superior sagittal sinus.
- Fundus: blurring of disc margins, dilated veins, retinal hemorrhages.

### 6. Tobey-Ayer Test

- Compression of jugular vein on thrombosed side – no rise in CSF pressure.
- Compression on healthy side – rapid rise in CSF pressure.

### 7. Crowe-Beck Test

- Compression of jugular vein on healthy side – engorgement of retinal veins and supraorbital veins, subsides after release of pressure.

### 8. Tenderness Along Jugular Vein

- Due to extension of thrombus into IJV.
- Tender, cord-like jugular vein, neck pain, torticollis, enlarged jugular lymph nodes.



# LATERAL SINUS THROMBOPHLEBITIS

## (SIGMOID SINUS THROMBOSIS)



### TOP 10 POINTS

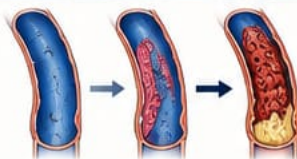
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#### DEFINITION & ETIOLOGY

- Septic thrombosis of the sigmoid (lateral) sinus secondary to middle ear or mastoid infection.
- Most commonly due to cholesteatomatous unsafe CSOM or acute coalescent mastoiditis.

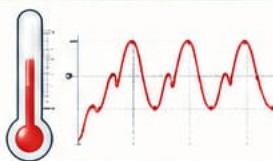
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#### PATHOLOGY (STAGES)

- Perisinus abscess → Endophlebitis & mural thrombus → Obliteration of sinus & intrasinus abscess.
- Thrombus may extend proximally (SSS, cavernous sinus) and distally (jugular bulb, IJV). Septic emboli may cause pyemia.

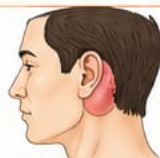
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#### CLASSIC CLINICAL FEATURE

- Hectic "Picket-Fence" fever with chills and rigors due to septicemia and septic emboli.
- Associated with headache, vomiting, progressive anemia, emaciation and features of raised ICP.

4



#### IMPORTANT SIGNS

- Griesinger sign – Edema over posterior mastoid due to thrombosis of mastoid emissary vein.
- Papilloedema – Due to raised intracranial venous pressure.

5



Tobey-Ayer Test



Crowe-Beck Test

#### SPECIAL TESTS

- Tobey-Ayer test – Compression of jugular vein on affected side → no rise in CSF pressure; on healthy side → rapid rise.
- Crowe-Beck test – Compression on healthy side → engorgement of retinal & supraorbital veins.

6



CT – Empty Delta Sign



MR Venography

#### INVESTIGATIONS (KEY)

- CT with contrast – Empty Delta Sign (enhancing triangular rim with central non-enhancing thrombus).
- MRI / MR Venography – More sensitive; shows extent of thrombus.
- Blood culture during chill, hemogram, CSF (usually normal except ↑ pressure), culture of ear discharge.

7



#### COMPLICATIONS

- Septicemia, pyemic abscesses (lungs, joints, subcutaneous tissue).
- Meningitis, subdural abscess, cerebellar abscess, otitic hydrocephalus.
- Jugular bulb thrombosis, involvement of IX, X & XI cranial nerves.

8



#### TREATMENT – SURGERY

- Mastoidectomy with exposure of sinus; drain perisinus abscess.
- If infected clot/intrasinus abscess present – incise sinus, evacuate clot and drain abscess.
- Routine sinus exploration & clot evacuation are controversial now.

9



#### TREATMENT – MEDICAL & ADJUNCTS

- High-dose IV antibiotics (modify as per culture); continue ≥1 week after surgery.
- IJV ligation (rare) – for persistent septicemia/embolization or extension into IJV.
- Anticoagulants – controversial; not routinely recommended.

10



#### PROGNOSIS & KEY POINTS

- Prognosis good with early diagnosis, antibiotics & surgery.
- Delay may lead to septicemia, intracranial abscess & death.
- Classical triad: otorrhea, picket-fence fever, signs of raised ICP.



# ACUTE MASTOIDITIS

## TOP 10 POINTS

1

### DEFINITION & ETIOLOGY

- Acute suppurative infection of mastoid air cells, usually as a complication of acute otitis media.
- Common organisms: *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Streptococcus pyogenes*, *Haemophilus influenzae*.

#### PREDISPOSING FACTORS

- Children < 2 years
- Poor immunity, malnutrition
- Delay or inadequate treatment of AOM

2

### PATHOPHYSIOLOGY (SEQUENCE)

Acute otitis media → Spread via aditus ad antrum → Mucosal edema & pus accumulation  
→ Osteitis & destruction of bony septae → Coalescent mastoiditis  
→ Subperiosteal abscess → Cortical erosion → Intracranial spread.

3

### CLINICAL FEATURES

- Fever, severe earache, throbbing pain over mastoid.
- Postauricular swelling, redness, tenderness, fluctuation (subperiosteal abscess).
- Protrusion of auricle, obliteration of postauricular sulcus.
- Otoscopy: congested TM, bulging, perforation, purulent discharge.
- May have headache, irritability, vomiting (raised ICP if complications).

#### LUC'S SIGN

Sagging of posterosuperior canal wall due to erosion.

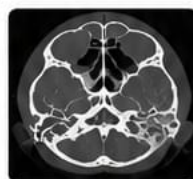
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### INVESTIGATIONS

- CBC: Leukocytosis, ↑ ESR/CRP.
- Ear swab culture & sensitivity.
- X-ray mastoid (Schüller view): clouding, loss of air cell pattern.
- HRCT temporal bone: opacified air cells, coalescence, cortical destruction.



X-ray Mastoid (Schüller view)



HRCT Temporal Bone

- Blood culture (if severe).
- Hearing assessment.

5

### DIAGNOSIS

Based on history of AOM, clinical features (mastoid tenderness, postauricular swelling, otoscopic findings) and supported by investigations.

6

### COMPLICATIONS

- Intratemporal: Subperiosteal abscess, facial palsy, labyrinthitis.
- Intracranial: Meningitis, brain abscess, lateral sinus thrombophlebitis, extradural abscess, subdural empyema, otitic hydrocephalus.

#### RED FLAG SIGNS

- Severe headache, vomiting
- Neck stiffness
- Neurological deficits
- Persistent high fever despite treatment

7

### TREATMENT – MEDICAL

- Hospital admission.
- IV broad spectrum antibiotics (e.g., Ceftriaxone + Metronidazole or Cefotaxime + Metronidazole).
- Analgesics, antipyretics.
- Aural toilet and treatment of associated otitis media.

#### DURATION

At least 10–14 days IV antibiotics; switch to oral as per response.

8

### TREATMENT – SURGICAL

- Indications: Failure of medical treatment, subperiosteal abscess, coalescent mastoiditis, intracranial complications.
- Procedures: Cortical (simple) mastoidectomy — treatment of choice. Radical mastoidectomy if extensive disease.

9

### POST-OPERATIVE CARE

- Continue IV antibiotics as required.
- Wound care and regular dressing.
- Monitor for complications.
- Audiological evaluation after recovery.

#### MONITORING

- Temperature chart
- WBC/CRP trends
- Clinical improvement

10

### KEY CLINICAL PEARLS

- Luc's sign (sagging posterosuperior canal wall) is a strong indicator.
- Early diagnosis, adequate antibiotics & timely surgery prevent complications.
- Pain, tenderness, swelling over mastoid with AOM should raise suspicion.





# OTOGENIC BRAIN ABSCESS

(BRAIN ABSCESS SECONDARY TO CSOM)



LIFE-THREATENING INTRACRANIAL COMPLICATION OF UNSAFE CSOM

## DEFINITION

A localized collection of pus within the brain parenchyma resulting from intracranial spread of infection from middle ear or mastoid.

## ETIOLOGY

- Unsafe CSOM with cholesteatoma
- Acute coalescent mastoiditis

## COMMON ORGANISMS

- Streptococcus species
- Staphylococcus aureus
- Proteus
- Pseudomonas
- Anaerobes
- Mixed infection common



## COMMON SITES

### 1. TEMPORAL LOBE ABSCESS

(Most common)

Spread through:

- Tegmen tympani
- Tegmen antri



### 2. CEREBELLAR ABSCESS

(Second most common)

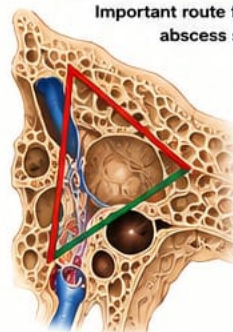
Spread through:

- Posterior cranial fossa plate
- Trautmann's triangle



## TRAUTMANN'S TRIANGLE

Important route for cerebellar abscess spread.



- Sigmoid sinus
- Superior petrosal sinus
- Bony labyrinth

## PATHOGENESIS

- Primary ear infection in middle ear & mastoid.
- Bone erosion by cholesteatoma/osteitis (Tegmen tympani, tegmen antri, PF plate).
- Spread of infection – direct erosion, thrombophlebitis, preformed pathways.
- Cerebritis stage – localized inflammatory edema in brain tissue.
- Necrosis & pus formation – central necrosis with accumulation of pus.
- Capsule formation – fibrous vascular capsule develops around abscess (after 10–14 days).

## STAGES OF BRAIN ABSCESS

### 1. EARLY CEREBRITIS



Localized inflammatory edema.

### 2. LATE CEREBRITIS



More marked edema & early necrosis.

### 3. EARLY CAPSULE FORMATION



Thin capsule begins to form.

### 4. LATE CAPSULE FORMATION



Well formed capsule with pus in center.

## CLINICAL FEATURES

### CLASSICAL TRIAD

- Headache
- Vomiting
- Papilloedema with unsafe CSOM



### OTHER SYMPTOMS

- Fever – mild, intermittent or absent
- Foul smelling ear discharge, hearing loss
- Seizures (common in temporal lobe abscess)
- Features of raised ICP – headache, vomiting, drowsiness, altered sensorium

## SIGNS

### GENERAL

- Toxic appearance
- Bradycardia (raised ICP)
- Papilloedema

### FALSE LOCALIZING SIGN

- VI nerve palsy may occur due to raised ICP.



### TEMPORAL LOBE ABSCESS

- Contralateral hemiparesis
- Aphasia (dominant hemisphere)
- Nominal aphasia
- Contralateral superior quadrantanopia
- Seizures

### CEREBELLAR ABSCESS

- Ataxia
- Nystagmus
- Dysidiadochokinesia
- Intention tremor
- Past pointing
- Hypotonia
- Broad-based gait
- Falling toward affected side

### VENTRICULAR RUPTURE

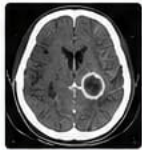


Sudden deterioration in sensorium may indicate rupture into ventricle. **Often fatal.**

## INVESTIGATIONS

### 1. CONTRAST-ENHANCED CT (INVESTIGATION OF CHOICE)

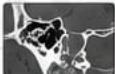
- Ring-enhancing lesion
- Surrounding edema
- Mass effect, midline shift
- Ring enhancement due to vascular capsule around necrotic center
- May show mastoid disease & bone erosion



### 2. MRI WITH CONTRAST – More sensitive; shows early cerebritis, exact size, multiple abscesses, posterior fossa lesions.



### 3. HRCT TEMPORAL BONE – Cholesteatoma, bone erosion, mastoid destruction.



### 4. BLOOD INVESTIGATIONS – Leukocytosis, ↑ ESR/CRP.

### 5. EAR SWAB CULTURE – For organism & sensitivity.

### 6. LUMBAR PUNCTURE – CONTRAINDICATED (Risk of tentorial herniation / coning)

If done cautiously: ↑ CSF pressure, mild ↑ protein.

## DIFFERENTIAL DIAGNOSIS

- Brain tumor
- Glioma
- Metastasis
- Tuberculoma
- Neurocysticercosis
- Fungal abscess
- Subdural empyema
- Meningitis

## MULTIPLE ABSCESSES

Usually due to hematogenous spread.

Otogenic abscesses are usually **SOLITARY.**

## TREATMENT

### 1. MEDICAL TREATMENT

- High dose broad spectrum IV antibiotics (e.g. Third generation cephalosporins + Metronidazole ± Vancomycin)
- Modify according to culture sensitivity
- Measures to reduce ICP – Mannitol, Dexamethasone, Head elevation
- Anticonvulsants for seizure control



### 2. NEUROSURGICAL TREATMENT

- Stereotactic aspiration – Preferred modern approach (Precise localization, decompression & pus culture)
- Burr hole aspiration – Common emergency procedure
- Excision of abscess – Indications:
  - Large abscess
  - Recurrent abscess
  - Failure of aspiration
  - Thick capsule



### 3. OTOLOGIC SURGERY (After stabilization)

- Acute ear disease – Mastoid drainage
- Unsafe CSOM – Modified radical mastoidectomy
- Purpose – Eradicate primary source of infection



## COMPLICATIONS

- Meningitis
- Ventriculitis
- Brain herniation
- Septicemia
- Lateral sinus thrombosis
- Rupture into ventricle
- Persistent neurological deficit
- Death

## PROGNOSTIC FACTORS (POOR PROGNOSIS)

- Delayed diagnosis
- Low GCS
- Ventricular rupture
- Multiple abscesses
- Deep-seated abscesses



## PROGNOSIS

Before antibiotics – Mortality extremely high. Now – Mortality has reduced significantly with CT/MRI, broad spectrum antibiotics, neurosurgery & intensive care support. Early diagnosis and timely treatment improve outcome.



## ★ KEY POINTS

Think brain abscess in any patient with unsafe CSOM + features of raised ICP or focal neurological signs. Early imaging, aggressive antibiotics, neurosurgical drainage and definitive ear surgery save lives.



# TRIADS IN ENT



★ IMPORTANT CLASSICAL TRIADS EVERY ENT STUDENT MUST KNOW ★

## 1. MÉNIÈRE'S DISEASE TRIAD

1. Episodic vertigo
2. Sensorineural hearing loss
3. Tinnitus

(+ ear fullness often added)



## 2. GRADENIGO SYNDROME TRIAD

1. Persistent otorrhea
2. Deep retro-orbital pain (trigeminal involvement)
3. Abducens nerve palsy (VI nerve)

Due to: Petrositis



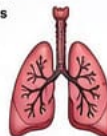
## 3. SAMTER'S TRIAD

1. Bronchial asthma
2. Nasal polyposis
3. Aspirin sensitivity (AERD)



## 4. KARTAGENER SYNDROME TRIAD

1. Chronic sinusitis
2. Bronchiectasis
3. Situs inversus



## 5. EAGLE SYNDROME TRIAD

1. Throat pain
  2. Dysphagia
  3. Referred otalgia
- Due to: Elongated styloid process



## 6. BEZOLD ABSCESS FEATURES (NOT STRICT TRIAD)

- Neck swelling
- Otorrhea
- Mastoid tenderness

Due to: Bezold abscess



## 7. OTOGENIC BRAIN ABSCESS TRIAD

1. Headache
2. Vomiting
3. Papilloedema

Associated with:  
Unsafe CSOM



## 8. ACOUSTIC NEUROMA TRIAD (VESTIBULAR SCHWANNOMA)

1. Unilateral SNHL
2. Tinnitus
3. Imbalance/Unsteadiness



## 9. NASOPHARYNGEAL CARCINOMA TRIAD

1. Cervical lymphadenopathy
2. Nasal obstruction/epistaxis
3. Conductive hearing loss (OME)



## 10. MALIGNANT OTITIS EXTERNA TRIAD

1. Severe otalgia
  2. Otorrhea
  3. Granulation tissue at bony-cartilaginous junction of EAC
- Usually in: Elderly diabetics



## 11. POTT'S PUFFY TUMOR TRIAD

1. Frontal swelling
2. Frontal sinusitis
3. Osteomyelitis of frontal bone



## 12. TREACHER COLLINS SYNDROME TRIAD

1. Mandibular hypoplasia
2. Ear deformity
3. Down-slanting palpebral fissures



## 13. PIERRE ROBIN SEQUENCE TRIAD

1. Micrognathia
2. Glossoptosis
3. Cleft palate



## 14. RAMSAY HUNT SYNDROME TRIAD

1. Facial palsy
  2. Ear vesicles
  3. Otagia
- Due to: Herpes zoster oticus



## 15. LATERAL SINUS THROMBOSIS CLASSICAL TRIAD

1. Otorrhea
2. Picket-fence fever
3. Features of raised ICP



## 16. CPA (ACOUSTIC NEUROMA / CPA SYNDROME) TRIAD

1. Hearing loss
2. Facial numbness
3. Cerebellar signs



## 17. OBSTRUCTIVE SLEEP APNEA TRIAD (ADULT)

1. Snoring
2. Daytime somnolence
3. Witnessed apneas



## 18. LEMIERRE SYNDROME TRIAD

1. Oropharyngeal infection
2. Internal jugular thrombophlebitis
3. Septic emboli



## 19. ALLERGIC RHINITIS TRIAD

1. Sneezing
2. Rhinorrhea
3. Nasal obstruction



## 20. ACUTE EPIGLOTTITIS TRIAD

1. Fever
2. Dysphagia/drooling
3. Respiratory distress/stridor



## 21. COSTEN SYNDROME TRIAD (TM JOINT DYSFUNCTION)

1. Ear pain
2. Tinnitus
3. Vertigo



## 22. FREY SYNDROME TRIAD

1. Gustatory sweating
2. Flushing over parotid region
3. Warmth during eating

Occurs after:  
Parotid surgery



## 23. VERNET SYNDROME TRIAD (JUGULAR FORAMEN SYNDROME)

1. IX nerve palsy
2. X nerve palsy
3. XI nerve palsy



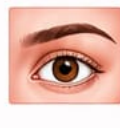
## 24. TROTTER'S TRIAD (IMPORTANT IN NPC)

1. Conductive deafness
2. Ipsilateral palatal palsy
3. Trigeminal neuralgia-1st-facial pain



## 25. HORNER SYNDROME TRIAD

1. Ptosis
2. Miosis
3. Anhidrosis



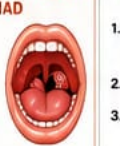
## 26. BRANCHIAL CYST CLASSICAL TRIAD

1. Young adult
2. Fluctuant lateral neck swelling
3. Swelling anterior to SCM



## 27. QUINSY (PERITONSILLAR ABSCESS) TRIAD

1. Fever
2. Trismus
3. Hot potato voice



## 28. LUDWIG ANGINA TRIAD

1. Bilateral submandibular swelling
2. Tongue elevation
3. Airway compromise



## 29. CHOANAL ATRESIA TRIAD (NEONATE)

1. Cyclical cyanosis
2. Relieved by crying
3. Feeding difficulty



## 30. PLUMMER-VINSON SYNDROME TRIAD

1. Dysphagia
2. Iron deficiency anemia
3. Esophageal web

Associated with:  
Postcricoid carcinoma risk



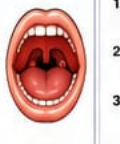
## 31. SINUS BAROTRAUMA TRIAD

1. Frontal headache
2. Nasal obstruction
3. Pain during altitude change



## 32. PEDIATRIC OSA TRIAD

1. Snoring
2. Mouth breathing
3. Adenotonsillar hypertrophy



## 33. CSF RHINORRHEA TRIAD

1. Clear unilateral nasal discharge
2. Positional increase in leak
3. Halo sign / glucose-positive fluid



## 34. ORBITAL COMPLICATION OF SINUSITIS TRIAD

1. Proptosis
2. Ophthalmoplegia
3. Visual impairment



## 35. CAVERNOUS SINUS THROMBOSIS TRIAD

1. Fever
2. Proptosis
3. Ophthalmoplegia



## HIGH-YIELD TRIADS TO REMEMBER FOR EXAMS

- Ménière's disease
- Gradenigo syndrome
- Samter's triad
- Kartagener syndrome
- Eagle syndrome

- Ramsay Hunt syndrome
- Bezold abscess (features)
- Orogenic brain abscess triad
- Acoustic neuroma triad
- Nasopharyngeal carcinoma triad

- Malignant otitis externa triad
- Lateral sinus thrombosis triad
- CPA syndrome triad
- Lemierre syndrome triad
- Quinsy triad

- Ludwig angina triad
- Horner syndrome triad
- Trotter's triad
- Plummer-Vinson syndrome triad
- Cavernous sinus thrombosis triad

- Costen syndrome triad
- Vernet syndrome triad
- Branchial cyst triad
- CSF rhinorrhea triad
- Orbital complication triad

## REMEMBER

Triads are memory aids, not diagnostic criteria. Always correlate clinically and with investigations.



\*AERD: Aspirin-Exacerbated Respiratory Disease

★ Compiled by: **Dr. Ashik Sureshkumar** ★

ENT: EAR, NOSE & THROAT

# SWIMMER'S NOSE vs CHLORINE RHINITIS

## UNDERSTAND THE DIFFERENCE

### SWIMMER'S NOSE (RHINOSPORIDIOSIS) AN INFECTIOUS GRANULOMATOUS DISEASE

#### DEFINITION

A chronic granulomatous disease caused by the aquatic protistan organism *Rhinosporidium seeberi*.



Strawberry-like nasal mass with white dots (sporangia)

|  |                          |                                                                                                                                                                                                                                                                                      |
|--|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>CAUSE</b>             | <i>Rhinosporidium seeberi</i><br>(an aquatic protistan organism)                                                                                                                                                                                                                     |
|  | <b>TRANSMISSION</b>      | Entry through traumatized nasal mucosa while bathing/swimming in ponds, lakes, stagnant water.                                                                                                                                                                                       |
|  | <b>COMMON SITES</b>      | Nose (most common), nasopharynx, conjunctiva, rarely other sites.                                                                                                                                                                                                                    |
|  | <b>CLINICAL FEATURES</b> | <ul style="list-style-type: none"><li>Red, friable, polypoidal nasal mass</li><li>Multiple white dots on surface (sporangia)</li><li>Bleeds easily on touch</li><li>Nasal obstruction</li><li>Watery or blood-stained nasal discharge</li><li>Sneezing, anosmia (if large)</li></ul> |
|  | <b>INVESTIGATION</b>     | <b>Histopathology:</b> <ul style="list-style-type: none"><li>Thick-walled sporangia with numerous endospores</li><li>PAS positive</li><li>Cyst wall with endosporeogenesis</li></ul>                                                                                                 |
|  | <b>TREATMENT</b>         | <ul style="list-style-type: none"><li>Endoscopic excision of the mass</li><li>Wide cauterization/electrocautery of base</li><li>Dapsone (100 mg daily) may reduce recurrences</li><li>Long-term follow up (recurrence common)</li></ul>                                              |
|  | <b>KEY POINTS</b>        | <ul style="list-style-type: none"><li>Infectious disease, not just irritation</li><li>Common in India &amp; Sri Lanka</li><li>Nicknamed "Swimmer's Nose" because of association with pond bathing/swimming</li></ul>                                                                 |

**Remember:** All cases called "Swimmer's Nose" are usually rhinosporidiosis, but the term is only a nickname, not the actual disease name.

### CHLORINE RHINITIS (CHEMICAL RHINITIS)

A NON-INFECTIOUS INFLAMMATORY CONDITION

#### DEFINITION

Inflammation and irritation of the nasal mucosa due to prolonged exposure to chlorinated water or chlorine fumes.



Inflamed nasal mucosa due to chemical irritation

|  |                          |                                                                                                                                                                                                                                                           |
|--|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>CAUSE</b>             | Chlorine (from swimming pool water or chlorine fumes) causing chemical irritation.                                                                                                                                                                        |
|  | <b>RISK GROUP</b>        | Swimmers, lifeguards, pool workers, people frequently exposed to chlorinated water.                                                                                                                                                                       |
|  | <b>COMMON SITES</b>      | Nasal mucosa throughout the nasal cavity.                                                                                                                                                                                                                 |
|  | <b>CLINICAL FEATURES</b> | <ul style="list-style-type: none"><li>Nasal irritation</li><li>Burning sensation</li><li>Rhinorrhea (watery discharge)</li><li>Sneezing</li><li>Nasal blockage</li><li>Dryness, crusting</li><li>Itching</li><li>Epistaxis (occasionally)</li></ul>       |
|  | <b>PATHOPHYSIOLOGY</b>   | Chlorine causes: <ul style="list-style-type: none"><li>Chemical irritation and mucosal edema</li><li>Loss of mucociliary function</li><li>Chronic inflammatory changes</li></ul>                                                                          |
|  | <b>INVESTIGATION</b>     | <ul style="list-style-type: none"><li>Clinical diagnosis (history of exposure)</li><li>Nasal endoscopy: congested mucosa</li><li>No specific organism</li></ul>                                                                                           |
|  | <b>MANAGEMENT</b>        | <ul style="list-style-type: none"><li>Avoid prolonged chlorine exposure</li><li>Nasal saline irrigation</li><li>Antihistamines for symptoms</li><li>Intranasal steroid sprays in chronic cases</li><li>Proper pool chlorination and ventilation</li></ul> |
|  | <b>KEY POINTS</b>        | <ul style="list-style-type: none"><li>Non-infectious, chemical irritation</li><li>Not caused by any organism</li><li>Improves with avoidance and medical management</li></ul>                                                                             |

### QUICK COMPARISON

| FEATURE      | SWIMMER'S NOSE (RHINOSPORIDIOSIS)                          | CHLORINE RHINITIS (CHEMICAL RHINITIS)         |
|--------------|------------------------------------------------------------|-----------------------------------------------|
| Nature       | Infectious granulomatous disease                           | Non-infectious inflammatory condition         |
| Cause        | <i>Rhinosporidium seeberi</i> (aquatic protistan organism) | Chlorine - chemical irritation                |
| Transmission | Pond bathing, contaminated stagnant water                  | Prolonged exposure to chlorinated water/fumes |
| Lesion       | Polypoidal mass with white dots (sporangia)                | Diffuse mucosal inflammation, no mass         |
| Bleeding     | Bleeds easily                                              | May bleed occasionally                        |
| Treatment    | Excision + cauterization ± Dapsone                         | Avoid exposure + symptomatic treatment        |
| Recurrence   | Common                                                     | Not applicable (resolves with treatment)      |

### HIGH-YIELD PEARLS

- ✓ Swimmer's nose = Rhinosporidiosis (infectious).
- ✓ Chlorine rhinitis = Chemical irritation (non-infectious).
- ✓ Strawberry-like mass with white dots → Think Rhinosporidiosis.
- ✓ Burning, irritation in swimmers without mass → Think Chlorine rhinitis.
- ✓ Histopathology is diagnostic for rhinosporidiosis.

**In short:** Rhinosporidiosis (Swimmer's Nose) is an infectious disease caused by *Rhinosporidium seeberi*, while Chlorine Rhinitis is an inflammatory response due to chemical irritation from chlorine.



# CARCINOMA LARYNX

## (SQUAMOUS CELL CARCINOMA)



### DEFINITION

Carcinoma larynx is a malignant tumour arising from the epithelial lining of the larynx, most commonly a squamous cell carcinoma.

### ANATOMY OF LARYNX



#### Supraglottis

- Epiglottis
- Aryepiglottic folds
- False vocal cords
- Ventricle

#### Glottis

- True vocal cords
- Anterior & posterior commissures

#### Subglottis

- Below the vocal cords to lower border of cricoid cartilage

### ETIOLOGY / RISK FACTORS

- Smoking (most important)
- Alcohol
- Voice abuse
- HPV infection
- Occupational exposure : Nickel, Asbestos, Wood dust
- Chronic laryngitis
- Radiation exposure

### PRECANCEROUS LESIONS

- Leukoplakia
- Erythroplakia
- Keratosis
- Papillomatosis
- Chronic laryngitis

### PATHOLOGY

#### Histological Types

- Squamous cell carcinoma (95%)
- Verrucous carcinoma
- Adenocarcinoma (rare)

#### Spread

- Local spread** : Adjacent laryngeal structures
- Lymphatic spread** :
  - Supraglottic cancers → early nodal spread
  - Glottic cancers → late nodal spread
- Distant metastasis** : Lung, Liver, Bone

### SYMPTOMS ACCORDING TO SITE

| Site         | Earliest Symptom      | Other Features                                              |
|--------------|-----------------------|-------------------------------------------------------------|
| Supraglottic | Dysphagia             | Odynophagia, referred otalgia, neck node, muffling of voice |
| Glottic      | Hoarseness (of voice) | Change in voice, stridor (late)                             |
| Subglottic   | Dyspnea / Stridor     | Airway obstruction, stridor                                 |

#### Advanced / Late Features

Hemoptysis, weight loss, neck swelling, respiratory distress, aspiration

### MODES OF SPREAD

#### Local Spread

- Pre-epiglottic space
- Paraglottic space
- Thyroid cartilage, cricoid cartilage
- Soft tissues of neck

#### Lymphatic Spread

- Supraglottic → Rich lymphatics → Early nodal spread
- Glottic → Poor lymphatics → Late nodal spread
- Common nodal levels: Level II, III, IV

#### Hematogenous Spread

- Lung (most common), liver, bone

### INVESTIGATIONS

- Indirect / Flexible laryngoscopy : For initial assessment
- Direct laryngoscopy with biopsy : Gold standard
- FNAC of neck node : To detect metastasis
- Imaging :
  - CT scan larynx
  - MRI for soft tissue & cartilage invasion
- Panendoscopy : To evaluate extent
- Chest X-ray / CT thorax : To detect lung metastasis
- PET-CT : In advanced / recurrent disease

### TNM STAGING (8<sup>th</sup> EDITION) – SUMMARY

| T Stage | Definition                                                                                                                   |
|---------|------------------------------------------------------------------------------------------------------------------------------|
| T1      | Tumour limited to one subsite, vocal cord mobility normal                                                                    |
| T2      | Tumour extends to adjacent subsite(s) or supraglottis / subglottis, mobility normal                                          |
| T3      | Tumour limited to larynx with vocal cord fixation and / or invasion of paraglottic space / inner cortex of thyroid cartilage |
| T4a     | Tumour invades through thyroid cartilage and/or invades tissues beyond larynx (e.g. strap muscles, trachea, soft tissues)    |
| T4b     | Very advanced disease (e.g. prevertebral space, encases carotid artery)                                                      |

### TREATMENT

#### Early Stage (T1-T2)

- Radiotherapy (preferred for early glottic cancers)
- OR
- Conservative laryngeal surgery (cordectomy, partial laryngectomy)
- Good voice preservation

#### Advanced Stage (T3-T4)

- Total laryngectomy
- Neck dissection
- Postoperative radiotherapy / chemoradiotherapy

Indicated in extensive disease or cartilage invasion

#### Chemotherapy / Organ Preservation

- Cisplatin-based chemotherapy
- Concurrent chemoradiotherapy
- Used in selected cases to preserve larynx

### SURGICAL OPTIONS

- Endoscopic cordectomy (very early)
- Vertical partial laryngectomy
- Hemilaryngectomy
- Subglottic laryngectomy
- Frontolateral laryngectomy
- Total laryngectomy (most common for advanced disease)

### COMPLICATIONS

- Airway obstruction
- Aspiration
- Pharyngocutaneous fistula (after surgery)
- Stomal complications
- Recurrence
- Distant metastasis

### REHABILITATION AFTER LARYNGECTOMY

#### Voice Rehabilitation

Esophageal Speech

Air swallowed and released into esophagus to produce sound.

#### Electrolarynx

External device produces vibrations for speech.

#### Tracheoesophageal Puncture (TEP)

Voice prosthesis placed between trachea and esophagus.

Other Aspects: Nutritional support • Psychological support • Stoma care

### PROGNOSIS

- Depends on :
- Stage of tumour
  - Site and extent
  - Vocal cord mobility
  - Nodal metastasis
  - Cartilage invasion
  - Histological grade

Best Prognosis : Glottic carcinoma  
Worst Prognosis : Subglottic carcinoma

### PROGNOSTIC FACTORS

- Early stage (T1-T2) – Better outcome
- Normal vocal cord mobility – Good prognosis
- Absence of nodal metastasis – Better survival
- Extracapsular spread – Poor prognosis
- Smilglottic extension – Poor prognosis

### DIFFERENTIAL DIAGNOSIS

- Chronic laryngitis
- Vocal cord polyp
- Laryngeal tuberculosis
- Papilloma larynx
- Reinke's edema
- Granuloma larynx

### VERY IMPORTANT EXAM PEARLS

- Most common carcinoma
  - Most common site
  - Earliest symptom
  - Investigation of choice
  - Best prognosis
  - Common neck node level
  - High-risk factors
- Squamous cell carcinoma  
Glottis  
Hoarseness of voice  
Direct laryngoscopy + biopsy  
Glottic carcinoma  
Level II, III  
Smoking, Alcohol

### KEY POINTS

- ✓ Hoarseness of voice in adult > 3 weeks is a red flag.
- ✓ All laryngeal growths must be biopsied.
- ✓ Early detection → better voice preservation & survival.
- ✓ Always evaluate neck nodes.
- ✓ Smoking and alcohol cessation is important.



# VESTIBULAR SCHWANNOMA

## (AUDITORY NEUROMA)



### ★ TOP 10 HIGH-YIELD POINTS TO REMEMBER ★

#### 1 MOST COMMON CPA TUMOR

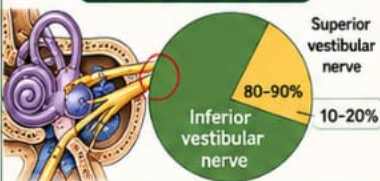
Vestibular schwannoma is the most common tumor of the cerebellopontine angle.



#### 2 ARISES FROM INFERIOR VESTIBULAR NERVE

NOT from cochlear nerve.  
Hence "Auditory neuroma" is a **misnomer**.

##### ORIGIN (IMPORTANT)



Most vestibular schwannomas arise from the inferior vestibular division within the internal auditory canal.

#### 3 MOST COMMON SYMPTOM

Progressive unilateral sensorineural hearing loss (SNHL)

- High-frequency loss
- Asymmetrical



#### 4 ANY UNILATERAL / ASYMMETRICAL SNHL = RULE OUT VESTIBULAR SCHWANNOMA

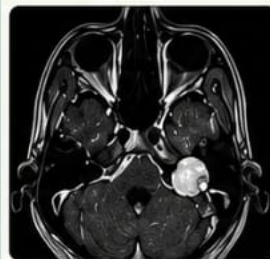


##### Important clinical rule:

Any unilateral or asymmetrical SNHL should be evaluated for vestibular schwannoma.

#### 5 INVESTIGATION OF CHOICE

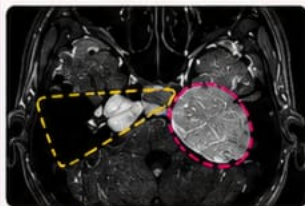
MRI with gadolinium contrast



Can detect tumors < 2 mm.

#### 6 CLASSICAL MRI APPEARANCE

##### ICE CREAM CONE APPEARANCE

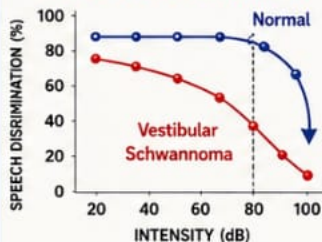


Cone  
Internal auditory canal component

Ice cream  
CPA component

#### 7 CHARACTERISTIC AUDIOLOGICAL FINDING

##### ROLL-OVER PHENOMENON



Speech discrimination decreases disproportionately at high intensity.

#### 8 BILATERAL TUMORS SUGGEST

NEUROFIBROMATOSIS TYPE 2 (NF2)



Bilateral vestibular schwannomas are diagnostic of NF2 until proved otherwise.

#### 9 HISTOPATHOLOGY

Two patterns:

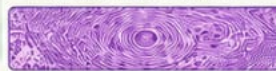
##### ANTONI A AREAS

- Dense cellular arrangement
- Nuclear palisading
- Verocay bodies present



##### ANTONI B AREAS

- Loose, hypocellular areas



#### 10 TREATMENT GOALS



Tumor control / removal



Facial nerve preservation



Hearing preservation whenever possible

##### Treatment options:

- Observation (Wait & Scan)
- Microsurgical excision
- Stereotactic radiosurgery (Gamma Knife)



**RAPID REVISION:** Unilateral SNHL + tinnitus + poor speech discrimination + MRI ice cream cone lesion = **Vestibular Schwannoma**



*Dr Ashik SureshKumar*





# VOCAL CORD PARALYSIS

ANATOMY • CLASSIFICATION • POSITIONS • ETIOLOGY • CLINICAL FEATURES • MANAGEMENT



## APPLIED ANATOMY

### 1. NERVE SUPPLY OF LARYNX

#### A. RECURRENT LARYNGEAL NERVE (RLN)

Supplies all intrinsic muscles of larynx except cricothyroid.

##### Motor to:

- Posterior cricoarytenoid (only abductor)
- Lateral cricoarytenoid
- Thyroarytenoid
- Interarytenoid muscles

#### B. EXTERNAL LARYNGEAL NERVE

Supplies cricothyroid muscle.

### IMPORTANT MUSCLE POSTERIOR CRICOARYTENOID

- Only abductor of vocal cords
- Called "SAFETY MUSCLE OF LARYNX"

### COURSE OF RECURRENT LARYNGEAL NERVE

#### LEFT RLN (Longer)

Loops around arch of aorta in the thorax and ascends in tracheo-esophageal groove.



#### RIGHT RLN (Shorter)

Loops around subclavian artery in the thorax and ascends in tracheo-esophageal groove.



### SEMON'S LAW

In all progressive organic lesions:

- Abductor fibres of the nerve are affected first
- Adductor fibres are affected later



Early (abductor fibres affected) → Paramedian position

Hence cords lie in **PARAMEDIAN** position initially (abductors weak).



Late (adductor fibres involved) → More lateral (intermediate)

Does **NOT** apply in sudden traumatic transection.

## CLASSIFICATION

### A. ACCORDING TO SIDE

- Unilateral vocal cord paralysis
- Bilateral vocal cord paralysis

### B. ACCORDING TO NERVE INVOLVED

- Recurrent laryngeal nerve palsy (RLN palsy)
- Superior laryngeal nerve palsy (SLN palsy)
- Combined paralysis (Vagus nerve lesion)
  - RLN + SLN involvement

### C. ACCORDING TO TYPE OF PALSY

- Complete paralysis
- Incomplete (partial) paralysis

## ETIOLOGY

### 1. SURGICAL TRAUMA (Most common)

- Thyroid surgery
- Parathyroid surgery
- Carotid surgery
- Cervical spine surgery

## QUESTION (OTALGIA)

An adult male 40 yrs of age presented with right sided severe throat pain radiating to the ipsilateral ear associated with high grade fever and difficulty in mouth opening. Patient also had a prior history of recurrent sore throat.

- What is the most likely diagnosis of this condition?
- What are the other clinical signs seen in this condition?
- Discuss its treatment.



# PERITONSILLAR ABSCESS (QUINSY)

*The commonest deep neck space infection*

## DEFINITION

A collection of pus between the capsule of the palatine tonsil and the superior constrictor muscle.



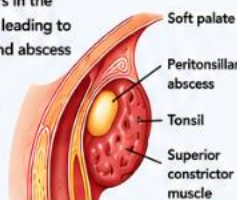
## ETIOLOGY

- Usually occurs as a complication of :
  - Acute tonsillitis
  - Recurrent tonsillitis
  - Infection of Weber's glands
- Common organisms :
  - Streptococcus pyogenes*
  - Staphylococcus aureus*
  - Anaerobes

## PATHOLOGY

Suppuration occurs in the peritonsillar space leading to edema, cellulitis and abscess formation.

Usually unilateral.



## CLINICAL FEATURES (Symptoms)



- Severe sore throat (unilateral)



- Referred otalgia (ipsilateral ear pain)



- High grade fever with toxicity



- Dysphagia and odynophagia



- Trismus (difficulty in mouth opening)



- Muffled "hot potato" voice



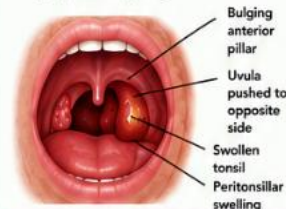
- Drooling of saliva



- Foul breath (halitosis)

## CLINICAL SIGNS (Local Examination)

- ✓ Congested swollen tonsil
- ✓ Bulging of anterior pillar and soft palate
- ✓ Uvula pushed to opposite side
- ✓ Fluctuant peritonsillar swelling
- ✓ Trismus present
- ✓ Tender jugulodigastric lymphadenopathy



## DIFFERENTIAL DIAGNOSIS

- Acute tonsillitis
- Parapharyngeal abscess
- Retropharyngeal abscess
- Tonsillar malignancy



## INVESTIGATIONS

- Diagnosis is usually clinical.
- Supportive :
  - CBC – leukocytosis
  - Throat swab culture
  - Pus culture & sensitivity



## TREATMENT

### 1. GENERAL MANAGEMENT

- Hospitalization (if toxic, dehydrated or airway compromise)
- Rest
- Adequate hydration and nutrition

### 2. MEDICAL TREATMENT

- IV Antibiotics (broad spectrum)
  - Inj. Amoxicillin-Clavulanate or
  - Inj. Ceftriaxone + Metronidazole
- Analgesics and antipyretics
- IV fluids
- Oral hygiene and mouth gargles

### 3. SURGICAL TREATMENT (To drain the abscess and relieve symptoms)

#### A. NEEDLE ASPIRATION

- Simple, diagnostic and therapeutic.



#### B. INCISION AND DRAINAGE (Most commonly performed)

- Site: maximum bulge above upper pole of tonsil.
- Procedure :
  - Under local anesthesia
  - Horizontal incision
  - Pus drained



#### C. INTERVAL TONSILLECTOMY (4-6 weeks after infection subsides)

- Performed after the acute infection has resolved.
- Indications :
  - Recurrent tonsillitis
  - Recurrent peritonsillar abscess
  - Chronic tonsillitis



#### D. IMMEDIATE (QUINSY) TONSILLECTOMY (Performed during acute stage)

- Rarely needed. Reserved for :
  - Bilateral abscess
  - Failure of drainage
  - Suspicion of malignancy
  - Airway obstruction



Note: Choice of surgical procedure depends on severity, recurrence and patient condition.

## COMPLICATIONS



- Airway obstruction
- Aspiration of pus
- Parapharyngeal abscess
- Septicemia
- Recurrence

## KEY POINTS

- Peritonsillar abscess is a complication of tonsillitis.
- Presents with unilateral throat pain, referred otalgia, fever and trismus.
- Early diagnosis, drainage and antibiotics prevent serious deep neck space complications.



## ANSWER SUMMARY

- Most likely diagnosis : **PERITONSILLAR ABSCESS (QUINSY)**
- Other clinical signs : See "Clinical Signs" and "Clinical Features".
- Treatment : Medical management with antibiotics + Surgical drainage (needle aspiration / I&D) or tonsillectomy as indicated.

# LEFT VOCAL CORD PARALYSIS

## Aetiology, Clinical Features, Investigations and Management

### ESSAY CASE SCENARIO

A 52-year-old male presents with progressive hoarseness of voice for 3 months associated with weak breathy voice and occasional choking while drinking liquids. He is a chronic smoker and recently underwent thyroid surgery. On indirect laryngoscopy, the left vocal cord is found to be immobile in paramedian position.



### ESSAY QUESTIONS

- What is the most likely diagnosis?
- Discuss the etiology of this condition.
- Describe the clinical features and investigations.
- Discuss the management of left vocal cord paralysis.

### MOST LIKELY DIAGNOSIS

**LEFT VOCAL CORD PARALYSIS**  
(Due to left recurrent laryngeal nerve palsy)

#### WHY LEFT SIDE IS COMMONLY AFFECTED?

- Left recurrent laryngeal nerve has:
  - Longer intrathoracic course
  - Loops around arch of aorta
  - More prone for compression / injury



### ETIOLOGY

#### 1. SURGICAL CAUSES (Most Common)

- Thyroid surgery (most common)
- Parathyroid surgery
- Carotid surgery
- Cervical spine surgery
- Cardiac surgery



#### 2. MALIGNANCY

- Bronchogenic carcinoma
- Thyroid carcinoma
- Esophageal carcinoma
- Mediastinal tumors
- Apical lung tumor



#### 3. NEUROLOGICAL CAUSES

- Stroke
- Brainstem lesions
- Multiple sclerosis
- Motor neuron disease



#### 4. INFLAMMATORY / INFECTIVE

- Tuberculosis
- Viral neuritis
- Mediastinitis



#### 5. TRAUMATIC CAUSES

- Neck trauma
- Intubation injury



#### 6. OTHERS

- Aortic aneurysm
- Left atrial enlargement (Ortner syndrome)
- Idiopathic (no identifiable cause)

Because left RLN loops around the aortic arch, always rule out: bronchogenic carcinoma, aortic aneurysm, mediastinal lymphadenopathy, left atrial enlargement (Ortner syndrome).

### NERVE SUPPLY OF LARYNX

#### 1. RECURRENT LARYNGEAL NERVE

**Motor:** All intrinsic muscles of larynx except cricothyroid

**Sensory:** Below vocal cords



#### 2. SUPERIOR LARYNGEAL NERVE

**External branch:**  
Motor to cricothyroid muscle

**Internal branch:**  
Sensory above vocal cords



### POSITION OF VOCAL CORD IN PARALYSIS

#### 1. Recurrent laryngeal nerve palsy

- Cord lies in **PARAMEDIAN** position



#### 2. Vagal palsy

- Cord lies in **INTERMEDIATE / CADAVERIC** position



### CLINICAL FEATURES

#### A. VOICE SYMPTOMS

- Hoarseness
- Breathy voice
- Weak voice
- Vocal fatigue
- Inability to speak loudly



#### B. SWALLOWING SYMPTOMS

- Choking while drinking liquids
- Aspiration
- Cough after swallowing



#### C. RESPIRATORY SYMPTOMS

- Usually mild in unilateral palsy
- Dyspnea on exertion



### EXAMINATION (LARYNGOSCOPY)

Indirect / Flexible laryngoscopy shows:

- ✓ Left vocal cord immobile
- ✓ Cord lies in paramedian position
- ✓ Incomplete glottic closure
- ✓ Phonation gap present
- ✓ Contralateral cord shows compensatory movement



### INVESTIGATIONS

#### 1. Flexible laryngoscopy

- Confirms cord immobility

#### 2. Stroboscopy

- Assesses mucosal wave and vibration

#### 3. Imaging

- CT neck and thorax: To detect lung malignancy, mediastinal lesions, thyroid pathology
- MRI brain/skull base: If central lesion suspected



#### 4. Chest X-ray

- Detects bronchogenic carcinoma, mediastinal widening



#### 5. Laryngeal Electromyography (EMG)

- Assesses nerve and muscle function



### DIFFERENTIAL DIAGNOSIS

- Functional (psychogenic) dysphonia
- Nodules / polyps of vocal cord
- Laryngitis
- Early glottic carcinoma
- Bilateral vocal cord paralysis



### COMMON PRESENTING CONDITIONS TO RULE OUT (LEFT SIDE)

- Bronchogenic carcinoma
- Aortic aneurysm
- Mediastinal lymphadenopathy
- Left atrial enlargement (Ortner syndrome)
- Thyroid malignancy



### MANAGEMENT

#### A. CONSERVATIVE (NON-SURGICAL) TREATMENT

|                                |                        |            |                                                |
|--------------------------------|------------------------|------------|------------------------------------------------|
|                                |                        |            |                                                |
| Voice therapy / Speech therapy | Treat underlying cause | Voice rest | Observation (Some cases recover spontaneously) |

#### B. SURGICAL TREATMENT

##### 1. INJECTION LARYNGOPLASTY

Temporary medialization using materials like fat, collagen, hyaluronic acid. Improves voice and aspiration.



##### 2. MEDIALIZATION THYROIDECTOMY (TYPE I)

Permanent medialization procedure

Most commonly done surgery



##### 3. ARYTENOID ADDUCTION

Used in selected cases with large posterior glottic gap



##### 4. REINNERVATION PROCEDURES

Useful in younger patients



Note: Choice of surgical procedure depends on severity, duration, patient's age, voice demand and cause.

### UNILATERAL VS BILATERAL VOCAL CORD PARALYSIS

| Feature      | Unilateral Paralysis | Bilateral Paralysis               |
|--------------|----------------------|-----------------------------------|
| Voice        | Hoarse / breathy     | Near normal sometimes             |
| Airway       | Usually adequate     | Severe stridor, airway compromise |
| Aspiration   | Common               | Less common                       |
| Main problem | Voice                | Airway obstruction                |

### COMPLICATIONS

- Aspiration pneumonia
- Persistent dysphonia
- Social / psychological disability
- Airway compromise (rare in unilateral palsy)



### KEY POINTS

- ✓ Left vocal cord paralysis is usually due to left recurrent laryngeal nerve palsy.
- ✓ Left side is more commonly affected.
- ✓ Always search for underlying cause from skull base to mediastinum.
- ✓ Early voice rehabilitation and medialization procedures provide excellent functional outcome.

“Left vocal cord paralysis commonly presents with hoarseness and aspiration due to recurrent laryngeal nerve involvement. Careful evaluation is required to identify underlying causes, especially thoracic malignancy.”

”

# RETROPHARYNGEAL ABSCESS

A Deep Neck Space Infection – Early Diagnosis and Airway Management Save Lives

## ESSAY CASE SCENARIO

A 5-year-old child presented with:

- High-grade fever
- Difficulty in swallowing
- Neck pain and stiffness
- Drooling of saliva
- Noisy breathing and respiratory distress

On examination:

- Child appeared toxic
- Neck held in extension
- Bulge seen in posterior pharyngeal wall



**MOST LIKELY DIAGNOSIS**  
**RETROPHARYNGEAL ABSCESS**

## DEFINITION

Retropharyngeal abscess is a collection of pus in the retropharyngeal space between the buccopharyngeal fascia and prevertebral fascia.

Common in children below 5 years.

## TYPES

### 1. Acute Retropharyngeal Abscess

- Common in children
- Pyogenic infection
- Due to suppurative of retropharyngeal lymph nodes

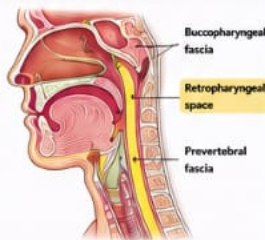
### 2. Chronic Retropharyngeal Abscess

- Usually in adults
- Associated with tuberculosis of cervical spine (Pott's spine)
- Also called "Cold abscess"

## ANATOMY OF RETROPHARYNGEAL SPACE

### Boundaries

- Anterior : Buccopharyngeal fascia  
Posterior : Prevertebral fascia  
Lateral : Parapharyngeal space and carotid sheath  
Superior : Base of skull  
Inferior : Extends into superior mediastinum



### IMPORTANT ANATOMY POINT

Behind the retropharyngeal space lies the **"DANGER SPACE"**. It extends from base of skull to diaphragm. Hence infection can spread rapidly causing mediastinitis.

## ETIOLOGY

### A. In Children (Most Common)

- Adenoiditis
- Tonsillitis
- Sinusitis
- Otitis media
- Upper respiratory infection

Due to suppurative of retropharyngeal lymph nodes

### B. In Adults

- Fish bone injury / Foreign body
- Instrumentation / Trauma
- Tuberculosis of cervical spine
- Immunocompromised states

### COMMON ORGANISMS



## CLINICAL FEATURES

### A. Symptoms

- High-grade fever
- Severe sore throat
- Dysphagia and odynophagia
- Drooling of saliva
- Neck pain and stiffness
- Respiratory distress (stridor, noisy breathing)
- Muffled "hot potato" voice
- Torticollis (neck held in extension)

### B. Signs

#### General Examination

- Toxic child
- Dehydration
- Respiratory distress

#### Local Examination

- Oropharyngeal examination
  - Bulge in posterior pharyngeal wall
  - Congestion and edema
- Neck examination
  - Cervical lymphadenopathy
  - Neck stiffness



## INVESTIGATIONS

### 1. CBC

- Leukocytosis

### 2. X-ray Soft Tissue Neck (Lateral View)

- Widened prevertebral shadow
- Air-fluid level

### Normal Prevertebral Soft Tissue Width

- Adults : < 7 mm at C2
- < 22 mm at C6
- Increase suggests abscess.



### 3. CT Neck with Contrast – Investigation of Choice

- Shows extent of abscess
- Airway compromise
- Deep neck space involvement

### 4. Pus Culture and Sensitivity



## DIFFERENTIAL DIAGNOSIS

- Peritonsillar abscess
- Parapharyngeal abscess
- Acute epiglottitis
- Diphtheria
- Foreign body airway



## DIFFERENCE BETWEEN RETROPHARYNGEAL & PERITONSILLAR ABSCESS

| Feature         | Retropharyngeal Abscess   | Peritonsillar Abscess |
|-----------------|---------------------------|-----------------------|
| Age             | Children                  | Adults                |
| Site            | Posterior pharyngeal wall | Peritonsillar region  |
| Trismus         | Mild / Absent             | Marked                |
| Torticollis     | Common                    | Rare                  |
| Uvula deviation | Absent                    | Present               |
| Neck stiffness  | Common                    | Rare                  |

## MANAGEMENT

### 1. HOSPITALIZATION

All patients require admission.



### 2. AIRWAY MANAGEMENT

Most important step

- If severe obstruction:
- Endotracheal intubation
- OR
- Emergency tracheostomy



### 3. MEDICAL TREATMENT

- IV antibiotics (Broad spectrum)
  - Ceftriaxone
  - Amoxicillin-clavulanate
  - Metronidazole
- IV fluids
- Analgesics and antipyretics



### 4. SURGICAL TREATMENT INCISION AND DRAINAGE

(Gold Standard when indicated)

- Procedure:
- Done under general anesthesia
  - Most common route:

#### TRANSORAL DRAINAGE



Technique:

- Mouth gag inserted
- Bulge in posterior pharyngeal wall incised
- Pus aspirated / drained
- Thorough irrigation done

Important Precautions:

- Head kept low and turned sideways
- Prevent aspiration of pus

### TUBERCULOUS RETROPHARYNGEAL ABSCESS

Cause: Cervical spine tuberculosis

Treatment:

- Aspiration
- Antitubercular therapy

Incision usually avoided because of sinus formation.



### WHY COMMON IN CHILDREN?

Retropharyngeal lymph nodes are prominent in children and regress after 4–5 years of age. Hence retropharyngeal abscess is rare in adults.

### INDICATIONS FOR TRACHEOSTOMY

- ✓ Severe airway obstruction
- ✓ Stridor
- ✓ Failed intubation
- ✓ Massive abscess



### PROGNOSIS

Excellent with early diagnosis and prompt drainage. Delay may lead to fatal airway obstruction or mediastinitis.

## RADIOLOGICAL CRITERIA (Prevertebral Soft Tissue Width)



Normal width:

- Adults : < 7 mm at C2
- < 22 mm at C6

Increase in width indicates retropharyngeal abscess.

- ★ Commonest deep neck space infection in children
- ★ Investigation of choice – CT neck with contrast
- ★ Most dangerous complication – Mediastinitis / Airway obstruction
- ★ Most important step in management – Airway maintenance
- ★ Why rare in adults? – Regression of retropharyngeal lymph nodes



## ONE-LINE CONCLUSION

“Retropharyngeal abscess is a potentially life-threatening deep neck space infection predominantly affecting children. Early diagnosis, prompt airway management, intravenous antibiotics, and surgical drainage are essential to prevent fatal complications like airway obstruction and mediastinitis.”

Dr Ashik SureshKumar



# AJCC STAGING IN DIFFERENTIATED THYROID CARCINOMA



This staging system applies to patients **<55 years** of age with differentiated thyroid carcinoma.

## STAGING FOR PATIENTS <55 YEARS (DIFFERENTIATED THYROID CARCINOMA)

| STAGE           | DEFINITION              | EXPLANATION                                                                                                                                                |
|-----------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STAGE I</b>  | Any T, Any N, <b>M0</b> | <ul style="list-style-type: none"><li>● No distant metastasis (<b>M0</b>) → Stage I, regardless of tumor size (T) or nodal status (N).</li></ul>           |
| <b>STAGE II</b> | Any T, Any N, <b>M1</b> | <ul style="list-style-type: none"><li>● Presence of distant metastasis (<b>M1</b>) → Stage II, regardless of tumor size (T) or nodal status (N).</li></ul> |

### GIVEN CASE



Age = 42 years  
(**<55 years**)



T2/T3 disease  
(Tumor size)



Nodal metastasis  
present



No distant metastasis  
(**M0**)



### FINAL STAGE

# STAGE I



Age <55 years with any T, any N, and M0 disease is classified as **STAGE I**.

### WHAT THIS MEANS?

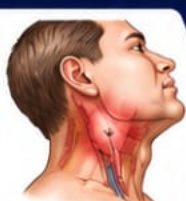
- ✓ The presence of nodal metastasis (N1) does not upstage the disease in patients <55 years if there is no distant metastasis.
- ✓ Distant metastasis (M1) is the only factor that upstages the disease to Stage II in patients <55 years.



### KEY POINTS TO REMEMBER



- Differentiated thyroid carcinoma in patients <55 years has only two stages: I and II.
- **Stage I** → Any T, Any N, **M0**
- **Stage II** → Any T, Any N, **M1**
- Nodal disease does not affect the stage in patients <55 years unless M1 is present.



# DIFFERENTIAL DIAGNOSIS OF NECK ABSCESS

Approach to a patient with neck swelling, pain, fever and signs of inflammation

## I. INFECTIVE / INFLAMMATORY CAUSES

### 1. PERITONSILLAR ABSCESS (QUINSY)

- Most common cause of sore throat with abscess.
- Trismus prominent.
- Uvular deviation to opposite side.
- Bulge in tonsillar fossa.
- History of acute tonsillitis.



### 2. PARAPHARYNGEAL ABSCESS

- Deep neck space infection.
- Swelling near angle of mandible.
- Medial bulging of pharyngeal wall.
- Trismus may be less.
- Cranial nerve palsy (IX, X, XII) may occur.



### 3. RETROPHARYNGEAL ABSCESS

- Common in children.
- Fever, dysphagia, odynophagia.
- Bulge in posterior pharyngeal wall.
- Neck stiffness/torticollis.
- Stridor in severe cases.



### 4. ACUTE TONSILLITIS / SEVERE PHARYNGITIS

- Fever, sore throat, odynophagia.
- No abscess or bulge.
- Uvula central.
- Exudates on tonsils.



### 5. CERVICAL LYMPHADENITIS

- Enlarged, tender cervical lymph nodes.
- Overlying skin red and warm.
- No bulge in pharyngeal wall.
- History of upper respiratory infection.



### 6. EPIGLOTTITIS

- Acute onset, high fever.
- Severe sore throat, drooling, stridor.
- Toxic appearance.
- Cherry-red, swollen epiglottis.



## II. AIRWAY AND NECK SPACE CONDITIONS

### 7. LUDWIG ANGINA

- Bilateral cellulitis of submandibular space.
- Swelling of floor of mouth.
- Tongue elevated and pushed upwards.
- Difficulty in to breathing, drooling.



### 8. FOREIGN BODY (Pharynx/Esophagus)

- Sudden onset dysphagia.
- History of foreign body ingestion.
- Pain on swallowing.
- No fever in most cases.



### 9. MENINGITIS

- High fever, headache, vomiting.
- Neck rigidity present.
- Kernig's and Brudzinski's signs positive.
- No local swelling or bulge.



### 10. VERTEBRAL OSTEOMYELITIS / TUBERCULOUS COLD ABSCESS

- Insidious onset.
- Neck pain, stiffness.
- Constitutional symptoms.
- Pus may track along prevertebral space.



## III. NEOPLASTIC CONDITIONS

### 11. LYMPHOMA

- Painless, firm neck mass.
- May be associated with fever, night sweats, weight loss.
- Multiple nodes may be present.



### 12. NASOPHARYNGEAL CARCINOMA

- Unilateral neck node metastasis.
- Nasal obstruction, epistaxis, otitis media.
- Often in adults from endemic areas.



### 13. RETROPHARYNGEAL TUMORS / CYSTS

- Slow progressive dysphagia.
- Usually afebrile.
- No acute inflammatory signs.



### 14. OTHER CYSTIC LESIONS

- Branchial cyst – lateral neck swelling.
- Thyroglossal cyst – midline swelling that moves with deglutition.



## IV. TRAUMA / MISCELLANEOUS

### 15. HEMATOMA OF NECK (Trauma)

- History of trauma.
- Rapid onset swelling.
- Bruising of overlying skin.
- May cause airway obstruction.



### 16. CONGENITAL ANOMALIES

- Dermoid / Epidermoid cyst.
- Lymphangioma.
- Usually non-tender unless infected.
- Long-standing swelling.



## CLINICAL CLUES SUGGESTIVE OF NECK ABSCESS

- ★ Fever, malaise
- ★ Pain in neck
- ★ Dysphagia / Odynophagia
- ★ Neck swelling – tender, fluctuant
- ★ Redness, warmth of overlying skin
- ★ Limited neck movements
- ★ Trismus (in deep neck space infection)
- ★ Toxic appearance in severe infections
- ★ Raised WBC count, elevated ESR / CRP



## INVESTIGATIONS HELPFUL IN DIFFERENTIATION

- CBC, ESR, CRP
- Blood culture
- Plain X-ray neck – soft tissue swelling, gas shadow, foreign body
- Ultrasound neck – abscess vs solid mass, node vs cyst
- Contrast CT / MRI neck – extent, deep space involvement
- FNAC / Biopsy – in suspected neoplastic lesions
- Laryngoscopy / Nasopharyngoscopy – airway assessment



## SUMMARY TABLE

| Condition               | Onset   | Fever | Pain | Neck Swelling         | Trismus | Pharyngeal Wall Bulge | Systemic Features  | Key Differentiating Points               |
|-------------------------|---------|-------|------|-----------------------|---------|-----------------------|--------------------|------------------------------------------|
| Peritonsillar abscess   | Acute   | ++    | ++   | + (lateral)           | ++      | No                    | Mild               | Tonsillar bulge, uvular deviation        |
| Parapharyngeal abscess  | Acute   | ++    | ++   | + (angle of mandible) | +/-     | Yes (medial)          | Moderate           | Medial bulge, possible CN palsy          |
| Retropharyngeal abscess | Acute   | ++    | ++   | +/-                   | +/-     | Yes (posterior)       | Moderate to severe | Posterior pharyngeal wall bulge          |
| Epiglottitis            | Acute   | +++   | ++   | No                    | No      | No                    | Severe toxic       | Drooling, stridor, cherry-red epiglottis |
| Ludwig angina           | Acute   | +++   | ++   | ++ (submental)        | +/-     | No                    | Severe             | Floor of mouth swelling, airway distress |
| Lymphadenitis           | Acute   | +     | +    | + (nodes)             | No      | No                    | Mild               | Tender nodes, no pharyngeal bulge        |
| Neoplastic lesions      | Chronic | +/-   | +/-  | +                     | No      | +/-                   | Variable           | Painless, progressive, long duration     |





# PARAPHARYNGEAL ABSCESS

## DEEP NECK SPACE INFECTION

Parapharyngeal abscess is a deep neck space infection involving the parapharyngeal space lateral to the pharynx. It is a potentially life-threatening condition due to the proximity to major neurovascular structures and airway.



CT Neck (contrast) showing parapharyngeal abscess

### CLINICAL CASE

A 25-year-old male presents with:

- Fever
- Severe throat pain
- Dysphagia
- Odynophagia
- Difficulty in opening mouth
- Swelling below the angle of mandible
- Muffled voice

On examination:

- Patient appears toxic
- Tender upper cervical swelling
- Medial bulging of lateral pharyngeal wall
- Tonsil displaced medially
- Trismus present

**PROBABLE DIAGNOSIS:**  
**PARAPHARYNGEAL ABSCESS**

### ETIOLOGY

#### COMMON CAUSES

- Tonsillitis
- Peritonsillar abscess
- Dental infections
- Pharyngitis
- Adenoid infection
- Foreign body trauma
- Suppurative lymphadenitis

#### COMMON ORGANISMS

- *Streptococcus pyogenes*
- *Staphylococcus aureus*
- Anaerobes
- *Bacteroides*
- *Fusobacterium*

(Polymicrobial flora is common)



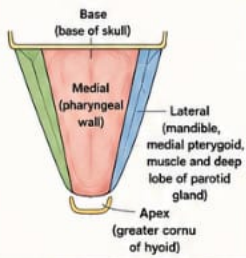
### DIFFERENTIAL DIAGNOSIS

| CONDITION                | DIFFERENTIATING FEATURE                        |
|--------------------------|------------------------------------------------|
| Peritonsillar abscess    | Uvula deviation with peritonsillar swelling    |
| Retropharyngeal abscess  | Posterior pharyngeal wall bulge                |
| Ludwig's angina          | Woody induration of floor of mouth             |
| Parotid abscess          | Swelling over parotid region                   |
| Cervical lymphadenitis   | Isolated lymph node enlargement                |
| Deep lobe parotid tumour | Slow-growing, painless swelling                |
| Schwannoma               | Slow-growing, may cause cranial nerve deficits |
| Paraganglioma            | Pulsatile swelling, may have bruit             |

### APPLIED ANATOMY OF PARAPHARYNGEAL SPACE

#### SHAPE

Inverted pyramid-shaped space.



#### BOUNDARIES

|           |                                                                  |
|-----------|------------------------------------------------------------------|
| Base      | Base of skull                                                    |
| Apex      | Greater cornu of hyoid                                           |
| Medial    | Pharyngeal wall                                                  |
| Lateral   | Mandible, medial pterygoid muscle and deep lobe of parotid gland |
| Posterior | Prevertebral fascia                                              |
| Anterior  | Pterygomandibular raphe                                          |

The styloid process divides the space into PRESTYLOID and POSTSTYLOID compartments.

#### COMPARTMENTS AND CONTENTS

##### PRESTYLOID COMPARTMENT

- Fat
- Lymph nodes
- Deep lobe of parotid gland

##### POSTSTYLOID COMPARTMENT

- Internal carotid artery
- Internal jugular vein
- Cranial nerves IX, X, XI, XII
- Sympathetic chain

### PATHOGENESIS

- Infection spreads from tonsil, teeth, or pharynx
- Suppuration develops in parapharyngeal space
- Oedema and inflammation compress adjacent structures
- Infection may spread into carotid sheath, retropharyngeal space or mediastinum

### CLINICAL FEATURES

#### SYMPTOMS

- Fever
- Severe throat pain
- Dysphagia
- Odynophagia
- Trismus
- Neck swelling
- Muffled "hot potato" voice
- Respiratory distress

#### SIGNS

- Toxic appearance
- Tender swelling below angle of mandible
- Medial bulging of lateral pharyngeal wall
- Medial displacement of tonsil
- Cervical lymphadenopathy
- Torticollis
- Trismus due to irritation of medial pterygoid muscle



Trismus occurs due to inflammation and irritation of medial pterygoid muscle.

### COMPLICATIONS

#### AIRWAY COMPLICATIONS

- Airway obstruction
- Laryngeal oedema

#### VASCULAR COMPLICATIONS

- Internal jugular vein thrombosis
- Carotid artery erosion
- Septic emboli

#### SPREAD OF INFECTION

- Retropharyngeal abscess
- Mediastinitis
- Aspiration pneumonia
- Septicaemia

#### NEUROLOGICAL COMPLICATIONS

- Cranial nerve palsies
- Sympathetic chain involvement

#### LEMIERRE SYNDROME

Septic thrombophlebitis of the internal jugular vein caused by deep neck infection.

### INVESTIGATIONS

#### BLOOD TESTS

- Leukocytosis
- Raised ESR/CRP

#### IMAGING (INVESTIGATION OF CHOICE)

##### 1. CONTRAST-ENHANCED CT NECK

Shows:

- Extent of abscess
- Air-fluid level
- Vascular involvement

##### 2. MRI NECK

Useful for:

- Soft tissue delineation
- Intracranial extension



### IMPORTANT POINT

Examination under sedation should be avoided in a patient with airway compromise as sudden obstruction may occur.

### MANAGEMENT

#### 1. AIRWAY MANAGEMENT (FIRST PRIORITY)

- Assess airway early
- Oxygen supplementation
- Intubation if required
- Tracheostomy in severe airway compromise



#### 2. MEDICAL MANAGEMENT

##### INTRAVENOUS ANTIBIOTICS

Broad-spectrum antibiotics covering streptococci, staphylococci and anaerobes.

Examples:

- Piperacillin-tazobactam
- Ceftriaxone + Metronidazole
- Clindamycin

##### SUPPORTIVE CARE

- IV fluids
- Analgesics
- Antipyretics

#### 3. SURGICAL MANAGEMENT

##### INDICATIONS

- Established abscess
- Airway compromise
- Failure of conservative treatment
- Large collection on imaging

##### PROCEDURE

- External cervical drainage preferred
- Incision below angle of mandible
- Blunt dissection into abscess cavity
- Drain placement



### PROGNOSIS



Good prognosis with early diagnosis and appropriate management. Delay in treatment may lead to severe or fatal complications.

### IMPORTANT VIVA POINTS

- ✓ Contrast-enhanced CT neck is the investigation of choice.
- ✓ Trismus occurs due to irritation of medial pterygoid muscle.
- ✓ "Hot potato voice" is characteristic.
- ✓ Airway management is the first priority.
- ✓ External drainage is preferred over intraoral drainage.
- ✓ Mediastinitis is the most dangerous complication.

# REFERRED OTALGIA ⚡

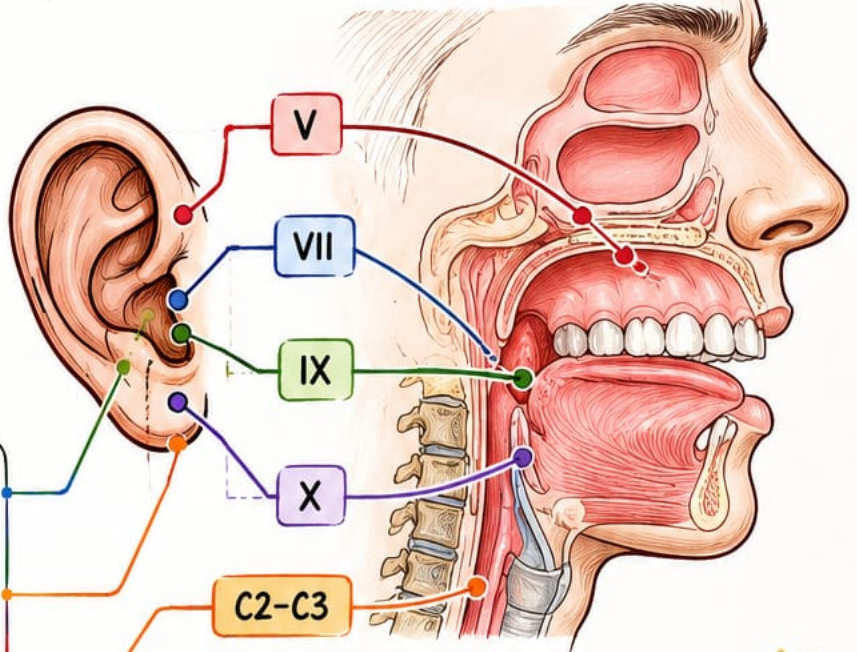
"Ear pain from a site other than the ear"

## WHAT IS IT?

Pain felt in the ear but originating from other structures due to shared sensory nerve supply.

## NERVE SUPPLY OF EAR

- **V Trigeminal**  
Teeth, TMJ, oral cavity, sinuses
- **VII Facial**  
Geniculate ganglion
- **IX Glossopharyngeal**  
Tonsil, oropharynx, posterior tongue
- **X Vagus**  
Larynx, hypopharynx, upper esophagus
- **C2-C3**  
Cervical spine, neck muscles



## IMPORTANT POINT

Persistent unilateral otalgia with normal ear examination in adults  
→ think of **malignancy**

## CAUSES

- Oropharyngeal**
  - Tonsillitis
  - Peritonsillar abscess
- Dental**
  - Caries
  - Impacted tooth
- TMJ disorders**
  - TMJ arthritis
- Sinus/Nasal**
  - Maxillary sinusitis
  - Nasopharyngeal lesions
- Laryngeal/Hypopharyngeal**
  - Laryngeal carcinoma
  - Hypopharyngeal carcinoma
- Cervical**
  - Cervical spondylosis
  - Cervical lymphadenitis

## CLINICAL FEATURES



- Ear pain
- Normal otoscopic examination
- Associated symptoms depend on primary cause



Sore throat



Tooth ache



Hoarseness



Neck pain

## INVESTIGATIONS

- ENT examination
- Oral & dental exam
- Indirect/Flexible laryngoscopy
- Imaging - CT/MRI (if malignancy suspected)
- Panendoscopy (if required)



## MANAGEMENT

Treat the primary cause



Dr Ashik Suresh Kumar

# GLOMUS TUMOUR (PARAGANGLIOMA) OF MIDDLE EAR

## DEFINITION

Glomus tumour (paraganglioma) is the most common benign tumour of the middle ear. It arises from paraganglionic tissue (glomus bodies) and is a highly vascular, non-encapsulated neoplasm.



## CLASSIFICATION

Glomus tumours of middle ear and mastoid are divided into:

### 1. PRIMARY TUMOURS

#### a. Benign

- Neoplastic: Paraganglioma, schwannoma of facial nerve, haemangioma, carcinoid, adenoma.
- Non-neoplastic: Congenital cholesteatoma, choristoma, aberrant internal carotid artery, high jugular bulb.
- Differential diagnosis of glomus tumour.

#### b. Malignant: Carcinoma of middle ear; sarcoma (rhabdomyosarcoma).

### 2. SECONDARY TUMOURS

- From adjacent areas: External ear canal, parotid gland or nasopharynx.
- Metastatic: From carcinoma of breast, bronchus, kidney, thyroid, prostate and gastrointestinal tract.

## ETIOLOGY & PATHOLOGY

- Seen in middle age (40–50 years).
- Females are affected five times more.
- Benign, non-encapsulated but extremely vascular neoplasm.
- Locally invasive.
- Abundance of thin-walled blood sinusoids with no contractile muscle coat → profuse bleeding from the tumour.
- Two types: Glomus jugulare & Glomus tympanicum.



## TYPES

### 1. GLOMUS JUGULARE

- Arises from dome of jugular bulb.
- Invades hypotympanum & jugular foramen.
- Neurological signs of IX–XII cranial nerve involvement.
- May compress jugular vein or invade its lumen.



### 2. GLOMUS TYMPANICUM

- Arises from promontory.
- Causes aural symptoms.
- Sometimes associated with facial paralysis.



## CLINICAL FEATURES

Symptoms in 90% of cases, related to ear.

### 1. When tumour is intratympanic

- Hearing loss & tinnitus (conductive, slowly progressive).
- Tinnitus pulsatile; synchronous with pulse.
- Otoscopy: Red reflex through tympanic membrane.
- Rising sun appearance.
- Pulsation sign (Brown sign): Positive.
- Siegel's speculum sign: Positive.

### 2. When tumour presents as a polyp

- Hearing loss, tinnitus, profuse bleeding.
- Dizziness/vertigo; facial paralysis may appear.
- Otorrhoea (less common; secondary infection).
- Red, vascular polyp. Bleeds on manipulation or biopsy.

## SPREAD OF GLOMUS TUMOUR

- Fills middle ear, perforates tympanic membrane → vascular polyp in external ear canal.
- Invades labyrinth, petrous pyramid & mastoid.
- Invades jugular foramen & base of skull → IX–XII nerve palsies.
- Through eustachian tube → nasopharynx.
- Intracranial spread → posterior & middle cranial fossa.
- Metastasis to lungs & bones rare (4%); lymph node enlargement may occur.



## AUDIBLE BRUIT

- Auscultation with stethoscope over mastoid may reveal systolic bruit at all stages.
- Some tumours secrete catecholamines → headaches, sweating, palpitations, hypertension, anxiety.
- Rule of 10s
  - ✓ 10% familial
  - ✓ 10% multicentric (multiple)
  - ✓ 3% functional (secrete catecholamines)



## DIAGNOSIS

Based on history, examination and investigations.

- CT Head (bone window):** 1 mm thin sections to distinguish glomus tympanicum (from glomus jugulare), identify caroticojugular spine erosion, differentiate from aberrant carotid artery, high/dehiscent jugular bulb.
- MRI:** Shows soft tissue extent. MR angiography & venography delineate invasion of jugular bulb & vein or compression of carotid.
- CT + MRI Together:** Excellent preoperative guidance in diagnosis of petrous apex lesions.
- Four-vessel Angiography:** Necessary when CT shows jugular bulb, carotid artery or intradural extension or when tumours are multiple; helps in embolization if required.
- Brain Perfusion & Flow Studies:** Required when tumour is pressing on ICA. If elective surgery, assess perfusion & adequacy of collateral circulation (circle of Willis). If needed, xenon blood flow & isotope studies done. Also assesses stroke risk & need for replacement of ICA.
- Embolization:** In large tumours, embolization of feeding vessels 1–2 days before surgery helps to reduce blood loss.
- Biopsy:** Preoperative biopsy is never done. Very vascular lesion → high risk of injury & bleeding.



## SURGICAL APPROACHES

- Transcanal Approach**  
For limited glomus tympanicum (tumour visible). Only tympanotomy sufficient.
- Hypotympanic Approach**  
For tumours limited to promontory; extension to hypotympanum but not into mastoid. Postauricular: superiorly based tympanomeatal flap; bony inferior tympanic ring drilled.
- Extended Facial Recess Approach**  
For small tumours extending into mastoid but not into jugular bulb. Modified radical operation if extensive.
- Mastoid–Neck Approach**  
For glomus jugulare tumours not extending to ICA, posterior cranial fossa or neck.
- Infratemporal Fossa Approach (Fisch)**  
For large glomus jugulare tumours.
- Transcondylar Approach**  
For tumours extending towards foramen magnum (recurrent glomus jugulare). Provides access to craniocervical junction with exposure of occipital condyle & jugular tubercle.



Radiation does not cure but may reduce vascularity & arrest growth. Embolization is used to reduce vascularity before surgery or as the sole treatment in inoperable patients previously irradiated.

## DIFFERENTIAL DIAGNOSIS

Early glomus tympanicum tumour should be differentiated from:

- Congenital cholesteatoma
- Adenoma
- Schwannoma of facial nerve
- Haemangioma of facial nerve
- Aberrant internal carotid artery
- High jugular bulb (also consider other vascular tumours)

## TREATMENT

- Surgical removal
- Radiation
- Embolization
- Combination of the above techniques



## KEY POINTS

- ✓ Glomus tumours are highly vascular → profuse bleeding risk.
- ✓ Pulsatile tinnitus & Brown's sign are characteristic.
- ✓ Thorough radiological evaluation & preoperative embolization minimize morbidity.
- ✓ Facial nerve palsy may be early or late due to involvement.
- ✓ Most are benign but locally aggressive.

## Disease

Defn

Etiology

Pathology

Clinical feature

Symptoms:

Signs

## Management

Investigation

↳ ~~Systematic~~ Routine

↳ Imaging

↳ Invasive

↳ Definite

Treatment

↳ Lifestyle modification -

↳ Medical

↳ Surgical

↳ Advanced

# Complication of Surgery

## Intra operative

↳ vessel injury → Bleeding

↳ nerve injury

↳ surrounding structure injury

## Early Post-op

↳ reactionary hemorrhage (slippage)

↳ seroma

↳ flap necrosis

↳ nerve palsy

## Late Post op

↳ Infection

↳ Abscess

↳ necrosis of wound

↳ nerve palsy

# Surgery

① Defn →

② Indication →

⇒

③ Contraindication →

⇒

④ Anaesthesia → GA / LA

⑤ Position

⑥ Technique / steps — ①  
②  
③  
④

⑦ Post op care

↳ NPO

↳ IV fluid

↳ Pain medicine

⑧ Complications

↳ Intra op — Bleeding, nerve injury

↳ Early post op — Bleeding, sepsis,

↳ Late — Infection, Failure



# — INFORMED CONSENT —



## INFORMED CONSENT FOR TONSILLECTOMY



### PROCEDURE

Removal of palatine tonsils under general anesthesia.



### INDICATIONS

- Recurrent tonsillitis
- Chronic tonsillitis
- Peritonsillar abscess
- Obstructive sleep apnea
- Tonsillar hypertrophy
- Suspicion of malignancy



### BENEFITS EXPLAINED TO PATIENT

- Reduction in throat infections
- Relief of airway obstruction
- Improved swallowing / sleep
- Prevention of complications



### RISKS AND COMPLICATIONS EXPLAINED

#### COMMON

- Pain
- Fever
- Odynophagia
- Earache
- Temporary voice change

#### IMPORTANT RISKS

- Primary hemorrhage (<24 h)
- Secondary hemorrhage (5–10 days)
- Reactionary bleeding
- Infection
- Dehydration

#### RARE BUT SERIOUS

- Airway compromise
- Aspiration
- Velopharyngeal insufficiency
- Injury to teeth / lips / tongue
- Anesthetic complications



### ALTERNATIVES

- Medical management
- Observation



### POSTOPERATIVE INSTRUCTIONS

- Soft / cold diet
- Adequate hydration
- Analgesics
- Avoid hot / spicy food
- Return immediately if bleeding occurs



### SPECIFIC CONSENT POINTS

- Need for blood transfusion in severe bleeding
- Possibility of emergency re-exploration
- Histopathological examination if indicated



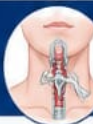
I have been explained about the procedure, benefits, risks, complications and alternatives. I understand and voluntarily give my consent.

Patient / Guardian Signature .....

Date / Time .....

Doctor Signature .....

## INFORMED CONSENT FOR TRACHEOSTOMY



### PROCEDURE

Creation of a surgical opening in trachea with insertion of tracheostomy tube.



### INDICATIONS

- Upper airway obstruction
- Prolonged ventilation
- Airway protection
- Head and neck malignancy
- Neurological disorders



### BENEFITS EXPLAINED TO PATIENT

- Secures airway
- Improves ventilation
- Facilitates suction clearance
- Reduces dead space
- Improves comfort in selected cases



### RISKS AND COMPLICATIONS EXPLAINED

#### IMMEDIATE

- Bleeding
- Pneumothorax
- Surgical emphysema
- Tube misplacement
- Hypoxia
- Cardiac arrest

#### INTERMEDIATE

- Tube blockage
- Infection
- Tube displacement
- Aspiration

#### LATE

- Tracheal stenosis
- Tracheomalacia
- Tracheoesophageal fistula
- Unsightly scar
- Persistent tracheocutaneous fistula



### SPECIAL CONSENT POINTS

- Need for ICU care
- Ventilator support may continue
- Speech difficulty
- Need for humidification and suctioning
- Possibility of permanent tracheostomy



### ALTERNATIVES

- Endotracheal intubation
- Conservative management where feasible



### POSTOPERATIVE ADVICE

- Tracheostomy care training
- Suctioning instructions
- Emergency management of tube blockage / displacement



I have been explained about the procedure, benefits, risks, complications and alternatives. I understand and voluntarily give my consent.

Patient / Guardian Signature .....

Date / Time .....

Doctor Signature .....

## INFORMED CONSENT FOR STAPEDECTOMY



### PROCEDURE

Removal of stapes and replacement with prosthesis to improve hearing in otosclerosis.



### INDICATIONS

- Conductive hearing loss due to otosclerosis
- Adequate cochlear reserve



### BENEFITS EXPLAINED TO PATIENT

- Hearing improvement
- Better speech discrimination
- Reduced air-bone gap



### RISKS AND COMPLICATIONS EXPLAINED

#### COMMON

- Vertigo
- Nausea
- Taste disturbance (chorda tympani injury)
- Tinnitus

#### SERIOUS RISKS

- Sensorineural hearing loss ("dead ear")
- Facial nerve injury
- Persistent vertigo
- Prosthesis displacement
- Tympanic membrane perforation
- Perilymph fistula

#### RARE COMPLICATIONS

- Total deafness
- Persistent imbalance
- CSF leak



### ALTERNATIVES

- Hearing aid
- Observation



### POSTOPERATIVE INSTRUCTIONS

- Avoid straining / coughing / sneezing
- Avoid air travel initially
- Keep ear dry
- Avoid heavy lifting



### SPECIFIC CONSENT POINTS

- Hearing improvement not guaranteed
- Revision surgery may be required
- Residual hearing loss may persist
- Small risk of permanent deafness must be explicitly discussed

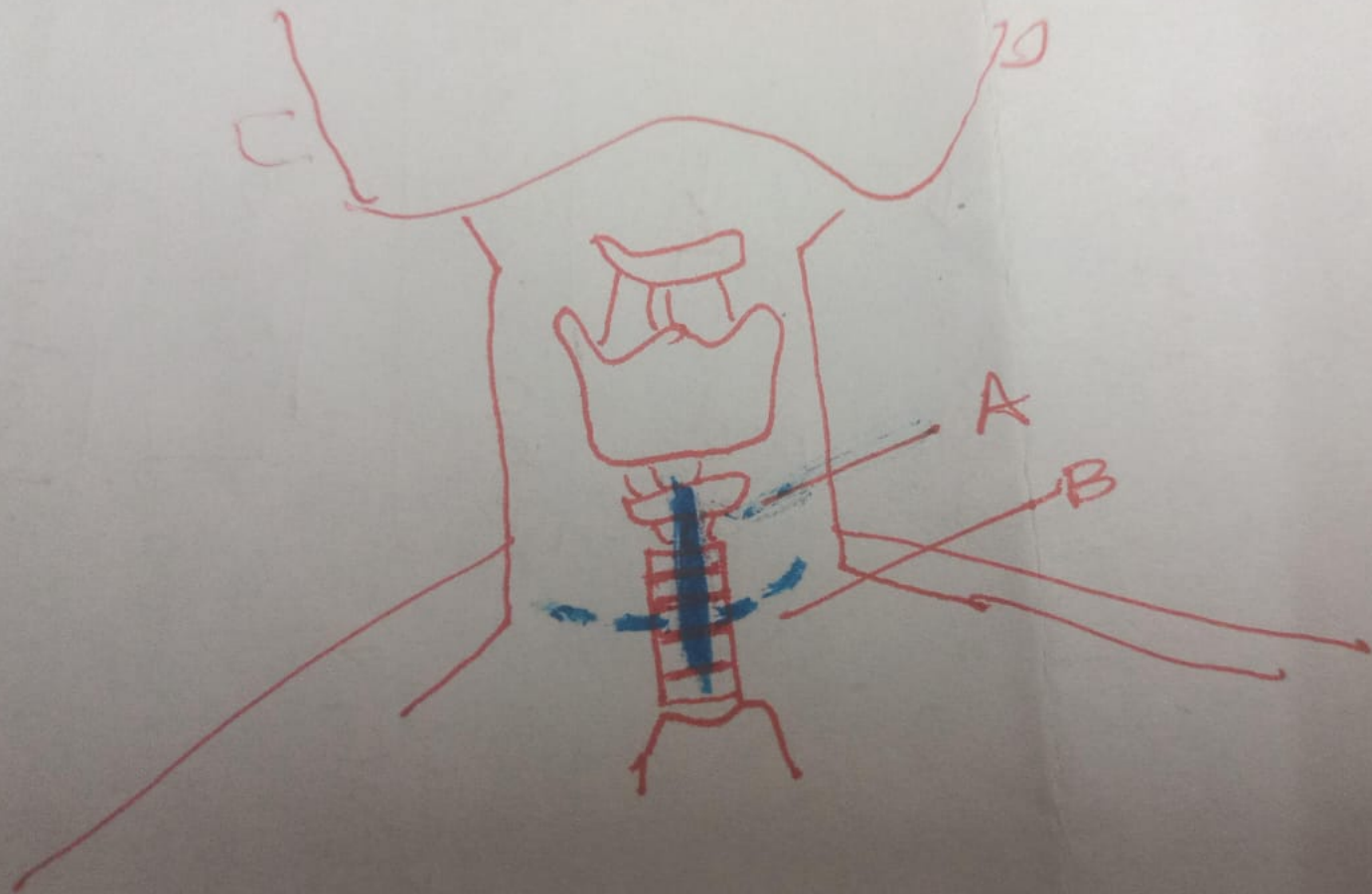


I have been explained about the procedure, benefits, risks, complications and alternatives. I understand and voluntarily give my consent.

Patient / Guardian Signature .....

Date / Time .....

Doctor Signature .....



## INDICATIONS FOR THE

CLINICAL

• Congenital

• Inflammatory

• Infections

• Insufficiency  
of normal  
body  
function

• Inability to do  
certain activity

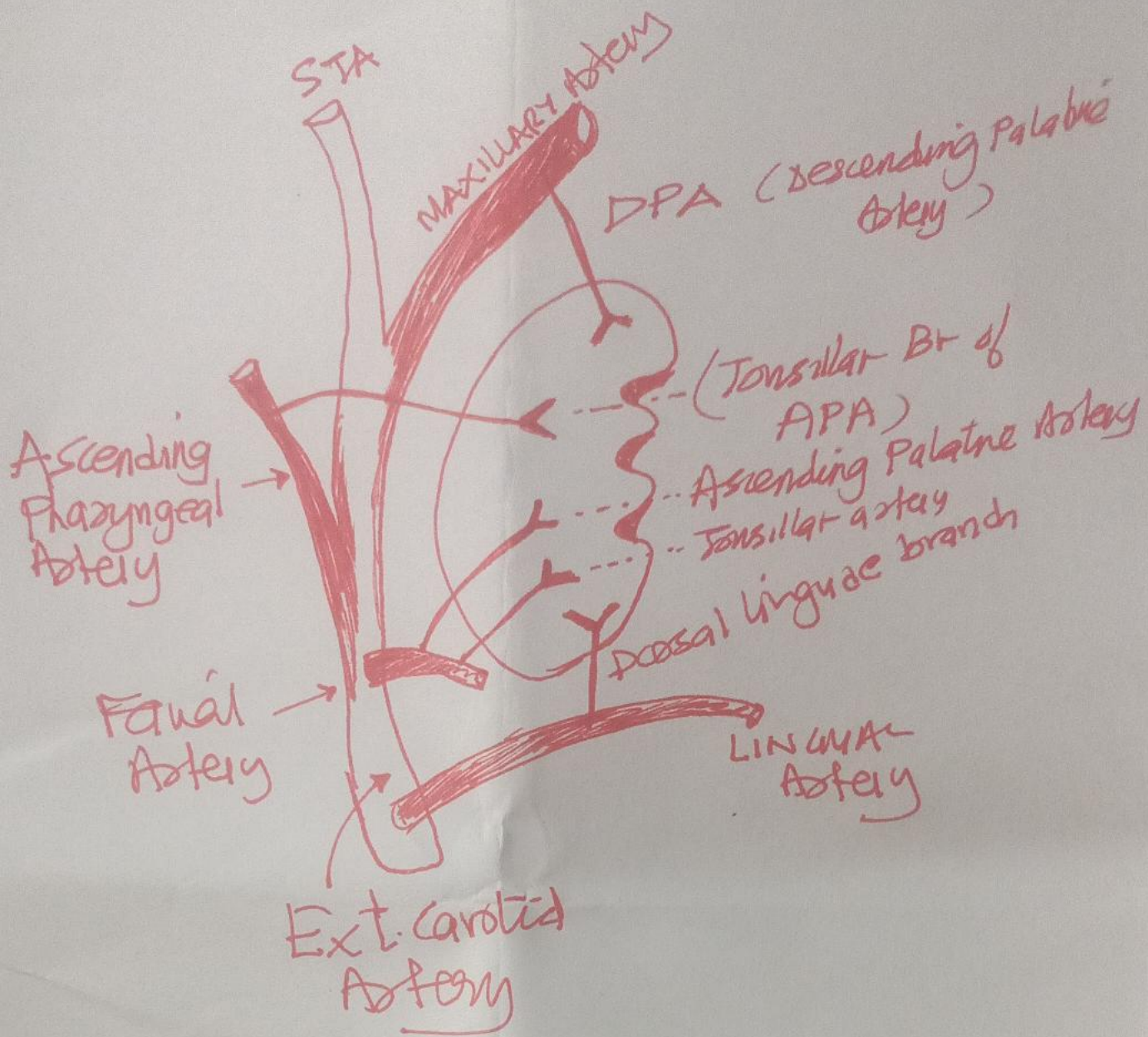
• Neoplastic

• Neuropathy

• ? Toxin  
• Trauma

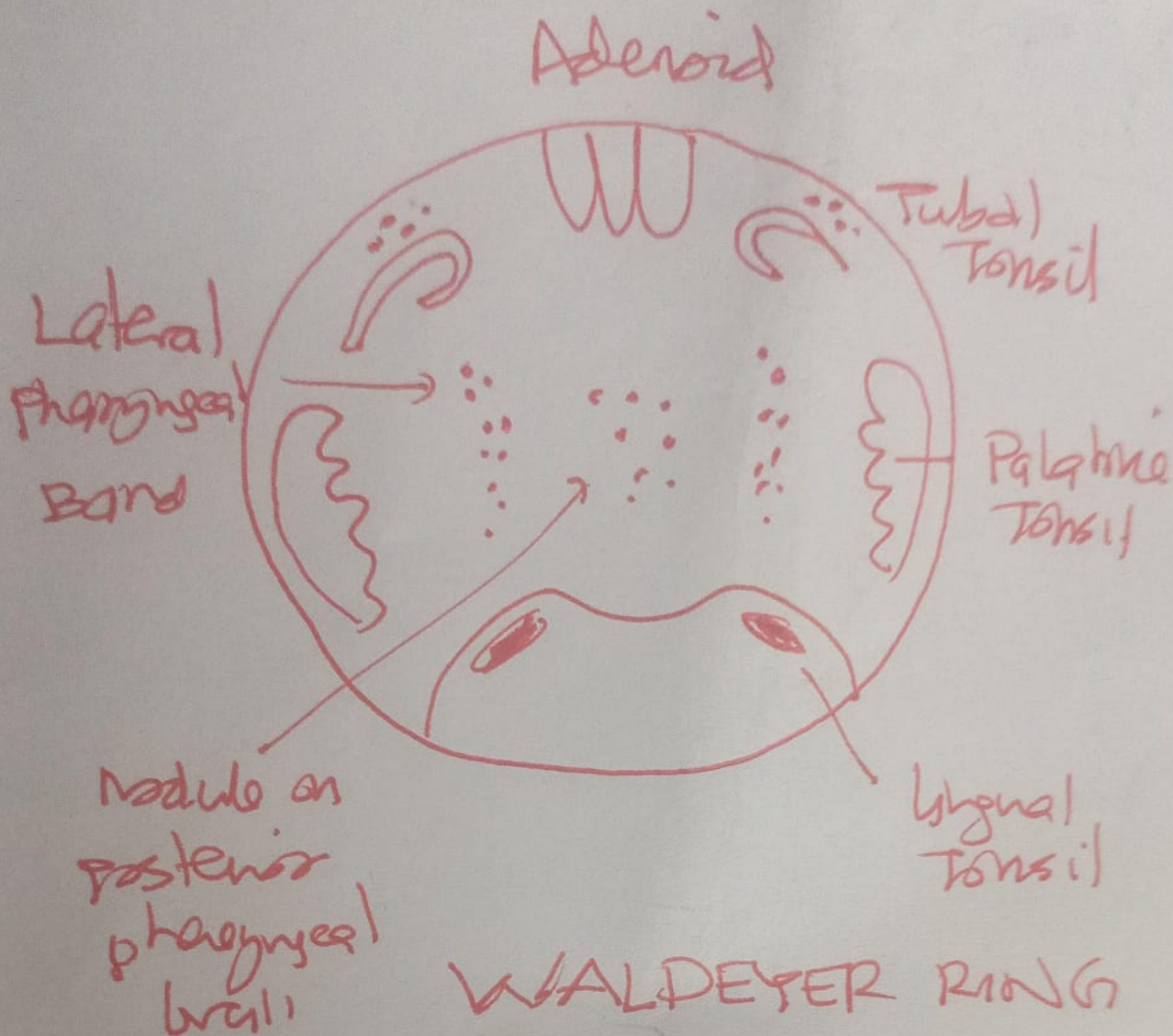
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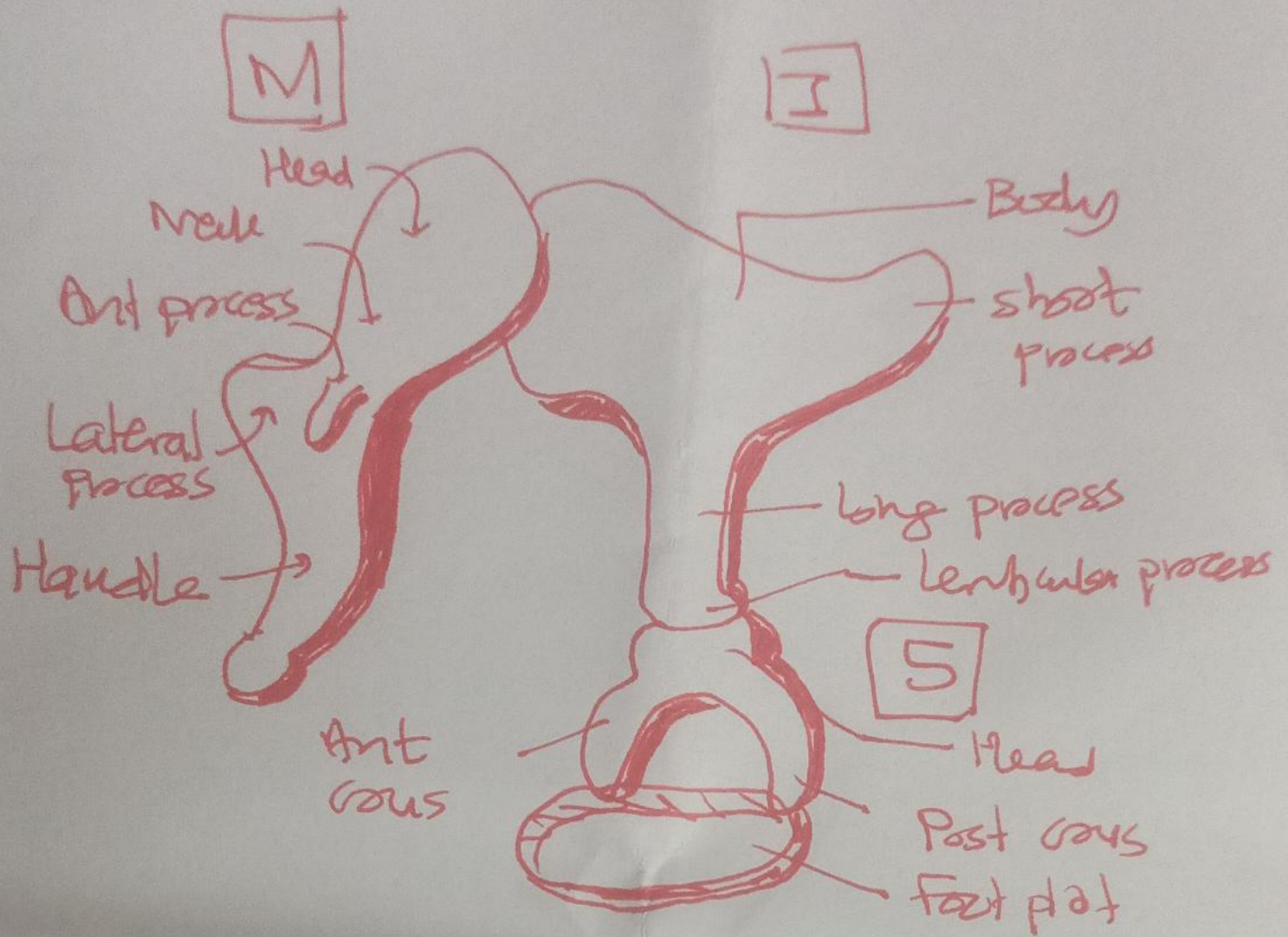


ARTERIAL SUPPLY OF TONSIL

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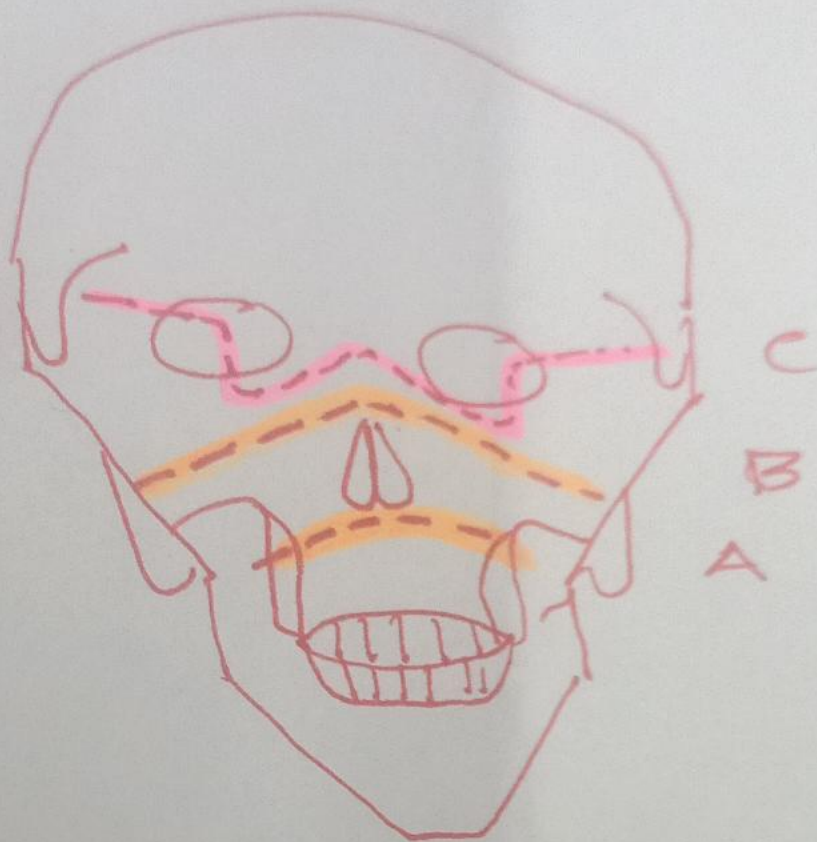
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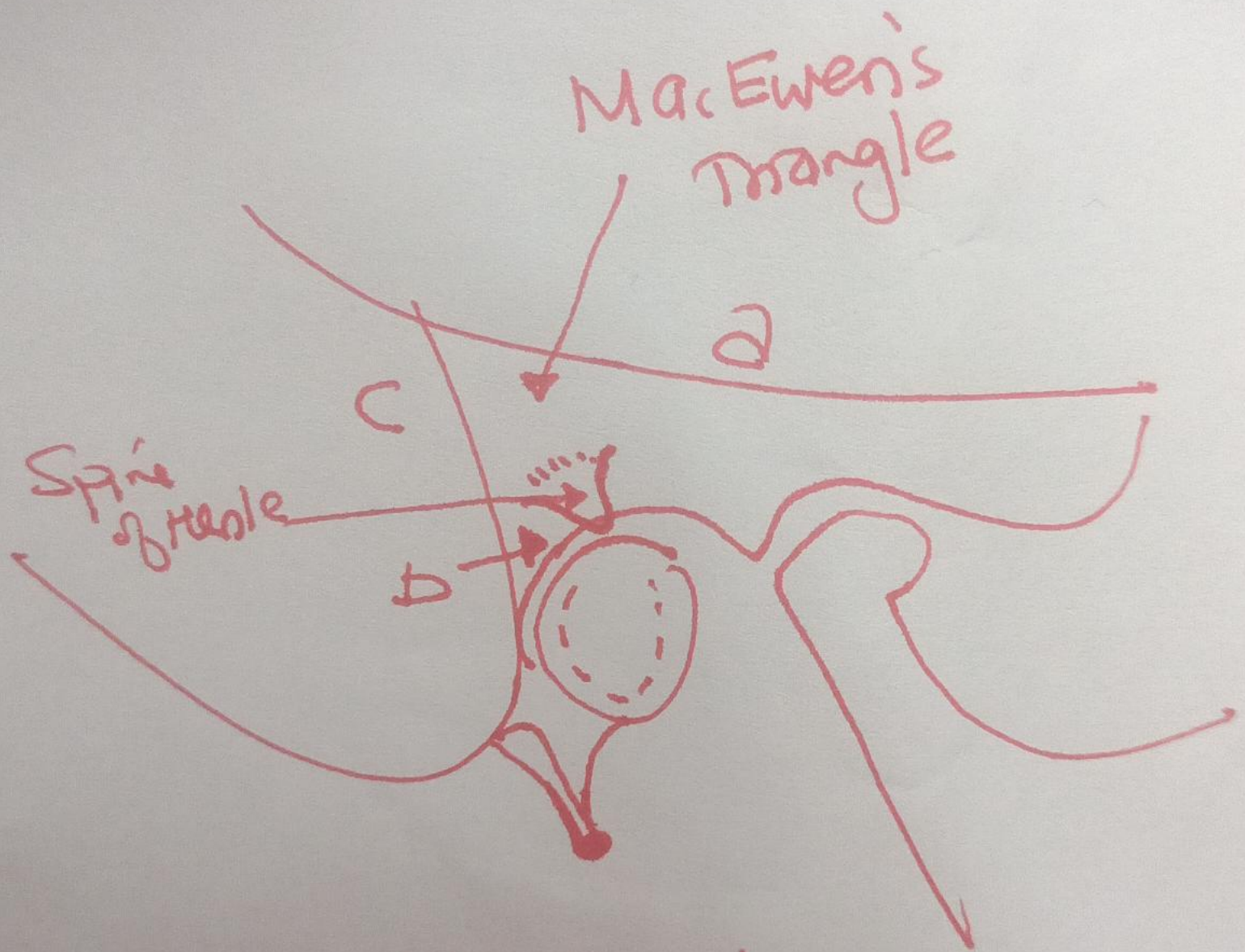
- Craniofacial dysfunction
- Pyramidal
- Transverse



LE FORT #

(MAXILLA)

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MacEwen's  $\Delta$

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# STEPS IN CONSENT WRITING FOR SURGERY

**DEFINITION:** Informed surgical consent is a voluntary authorization given by a competent patient after understanding the nature, benefits, risks, alternatives, and consequences of a surgical procedure.

ETHICAL OBLIGATION

LEGAL REQUIREMENT

ESSENTIAL COMPONENT OF PATIENT AUTONOMY



## COMPONENTS OF INFORMED CONSENT



1. Disclosure
2. Understanding
3. Capacity/Competence
4. Voluntariness
5. Authorization

## CHARACTERISTICS OF VALID CONSENT



- ✓ Informed
- ✓ Voluntary
- ✓ Specific
- ✓ Written
- ✓ Competent

## TYPES OF CONSENT

| Type                   | Example              |
|------------------------|----------------------|
| Implied consent        | Physical examination |
| Express verbal consent | Minor procedures     |
| Written consent        | Surgery / anesthesia |
| Informed consent       | Major surgery        |
| Proxy consent          | Guardian consent     |

## STEPS IN SURGICAL CONSENT WRITING

### 1 IDENTIFICATIONS OF PATIENT



- Name
- Age / Sex
- Hospital number
- Diagnosis

### 2 NAME OF PROCEDURE



Procedure should be written clearly and specifically.

Examples:

- Open appendectomy
- Tracheostomy
- Modified radical mastectomy

Avoid abbreviations.

### 3 EXPLANATION OF DIAGNOSIS



- Nature of disease
- Indication for surgery
- Consequences if untreated

### 4 EXPLANATION OF PROCEDURE



- Nature of surgery
- Type of anesthesia
- Major operative steps
- Expected duration of surgery

Use simple and understandable language.

### 5 BENEFITS OF SURGERY



- Curative
- Diagnostic
- Palliative
- Functional improvement
- Symptom relief

### 6 RISKS AND COMPLICATIONS

#### COMMON COMPLICATIONS

- Pain
- Bleeding
- Infection
- Scar formation



#### PROCEDURE-SPECIFIC COMPLICATIONS

Examples:

- Facial nerve injury
- Hearing loss
- Anastomotic leak
- Voice change



#### SERIOUS COMPLICATIONS

- ICU admission
- Reoperation
- Organ failure
- Death



High-risk complications must be specifically mentioned.

### 7 ALTERNATIVES TO SURGERY



- Medical treatment
- Observation
- Other procedures

### 8 CONSEQUENCES OF REFUSAL



Patient should understand possible consequences if surgery is refused.

Examples:

- Disease progression
- Organ dysfunction
- Mortality risk

### 9 BLOOD TRANSFUSION CONSENT



Mention possibility of:

- Blood transfusion
- Blood products
- Associated risks

Separate consent may be required.

### 10 ANESTHESIA CONSENT



Separate anesthesia consent required.

Explain:

- Type of anesthesia
- Risks
- Possible complications

### 11 POSSIBILITY OF ADDITIONAL PROCEDURES



Mention possibility of:

- Conversion from laparoscopic to open surgery
- Stoma creation
- Organ removal
- Extension of procedure if needed intraoperatively

### 12 POSTOPERATIVE COURSE



- ICU stay
- Catheters / drains
- Ventilator support
- Recovery period
- Rehabilitation

### 13 OPPORTUNITY FOR QUESTIONS



Patient / guardian should be allowed to:

- Ask doubts
- Clarify concerns

### 14 VOLUNTARY AGREEMENT

Consent should be:

- Free from coercion
- Free from pressure
- Voluntary

Patient can withdraw consent anytime before surgery.

### 15 DOCUMENTATION

Consent form should contain:

- Patient signature / thumb impression
- Doctor signature
- Witness signature
- Date and time



## CAPACITY TO CONSENT



Patient must be able to:

- Understand information
- Retain information
- Weigh risks and benefits
- Communicate decision

## WHO CAN GIVE CONSENT?

Adult competent patient

Age > 18 years



Proxy / Surrogate Consent

Needed in:

- Minors
- Unconscious patients
- Mentally incapacitated patients

Can be given by:

- Parent
- Spouse
- Legal guardian



## HIGH-RISK CONSENT



Should specifically mention:

- ICU admission
- Ventilator support
- Major disability
- Organ failure
- Mortality risk

## SPECIAL CONSENTS

Separate consent may be required for:

- Blood transfusion
- Organ donation/removal
- Sterilization
- Photography / video recording
- Research participation



## WITHDRAWAL OF CONSENT



Patient can withdraw consent at any time before surgery, even after signing, provided patient is mentally competent.

## REFUSAL OF TREATMENT



If patient refuses:

- Explain consequences clearly
- Document refusal
- Obtain patient / witness signature if possible

## LANGUAGE OF CONSENT



Consent should:

- Be in language understood by patient
- Avoid medical jargon
- Use interpreter if necessary

## WITNESS IN CONSENT



Especially important in:

- Illiterate patients
- High-risk procedures
- Thumb impression may be used
- Independent witness preferred

## AUDIO-VISUAL CONSENT



May be required in:

- Clinical trials
- Certain high-risk procedures

## IMPORTATIONS WHEREBY SURGEON IS NOT REQUIRED

### EMERGENCY DOCTRINE



Treatment may proceed without consent when:

- Life-threatening emergency exists
- Patient unconscious
- Delay may endanger life

### THERAPEUTIC PRIVILEGE



Rare situation where disclosure may severely harm patient psychologically. Used very cautiously.

## COMMON MEDICO-LEGAL ERRORS

- ✗ Incomplete consent
- ✗ Blanket / general consent
- ✗ Wrong-site consent
- ✗ Illegible documentation
- ✗ Failure to mention complications
- ✗ Consent after sedation
- ✗ Undated consent



## WHO SURGICAL SAFETY CHECKLIST



**SIGN IN** Before induction of anesthesia



**TIME OUT** Before incision



**SIGN OUT** Before patient leaves operating room

Helps improve:

- Patient safety
- Team communication
- Reduction in surgical errors



## DOCUMENTATION PEARLS



- Use blue / black ink
- Avoid overwriting
- Corrections should be counter-signed
- Mention date and time
- Mention surgeon and procedure clearly



## IMPORTANT PRINCIPLES OF SURGICAL CONSENT

- Consent is procedure-specific.
- Blanket consent is invalid.
- Consent for anesthesia is separate.
- Consent should be taken before premedication / sedation.
- Patient autonomy must be respected.



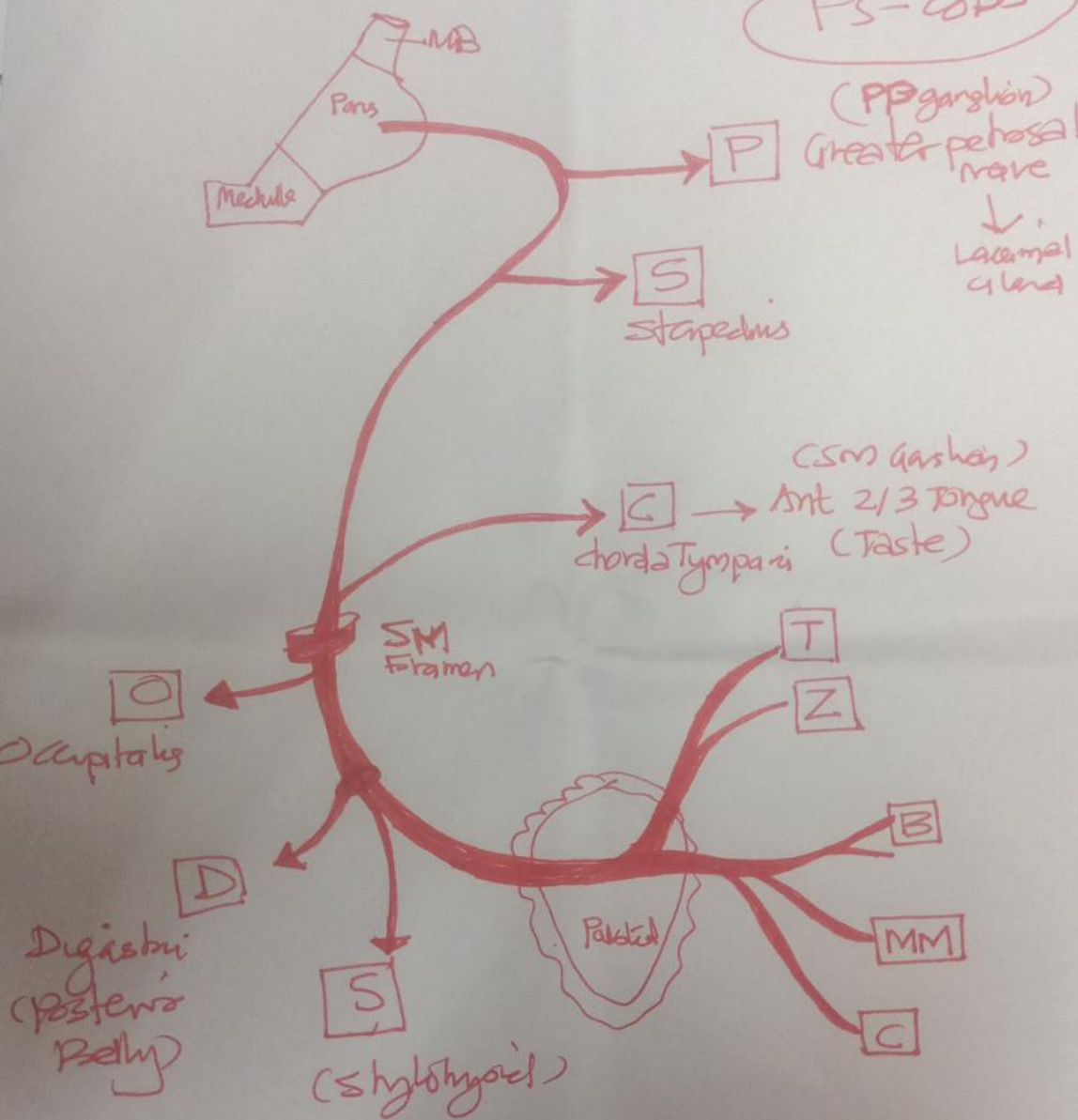
## CONCLUSION

Proper surgical consent is an ethical, legal, and professional obligation. A valid informed consent establishes patient autonomy, improves doctor-patient communication, and protects both patient and surgeon medico-legally. Accurate documentation, proper disclosure of risks, and voluntary participation are essential for safe surgical practice.

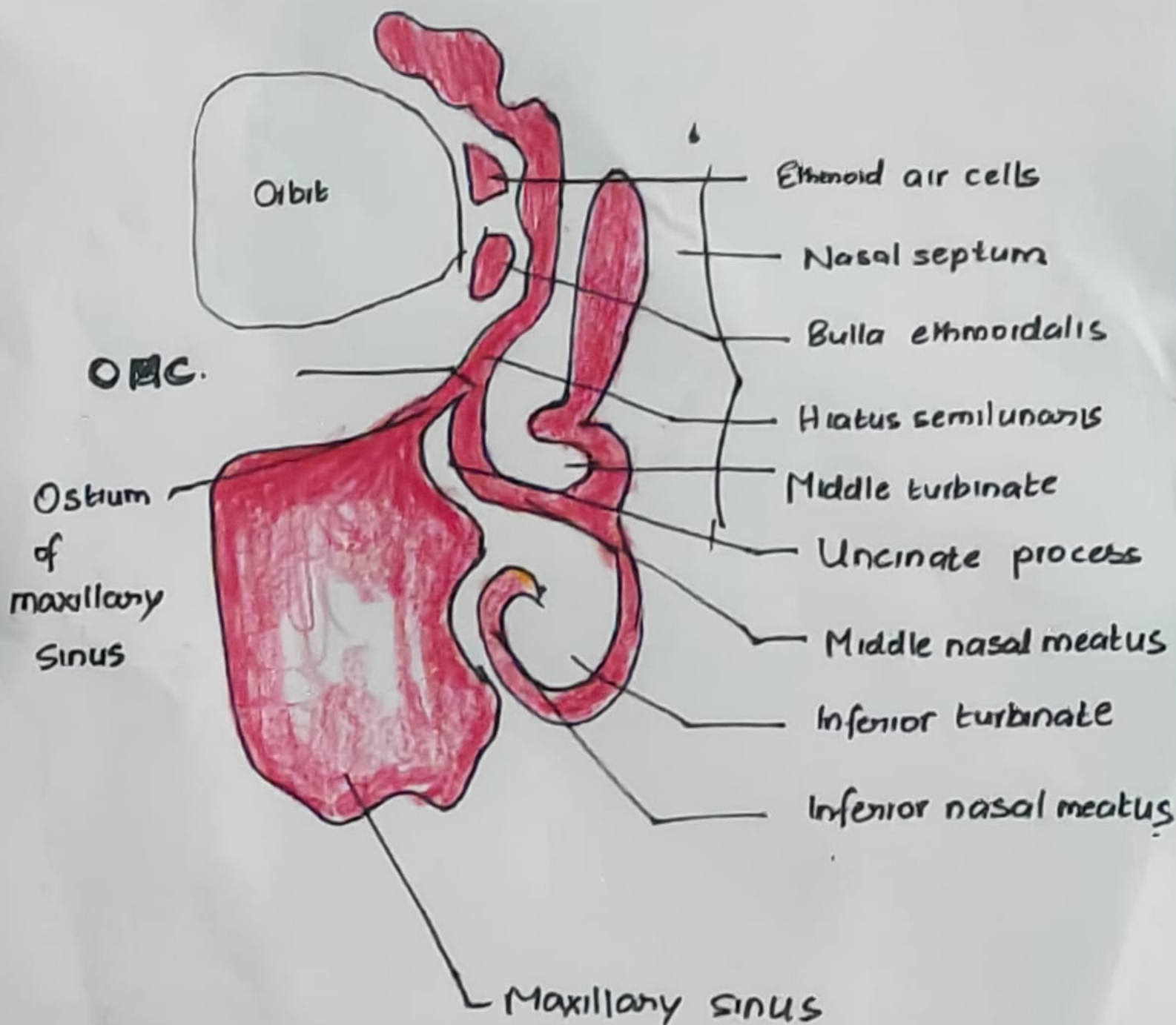


# Facial Nerve (course)

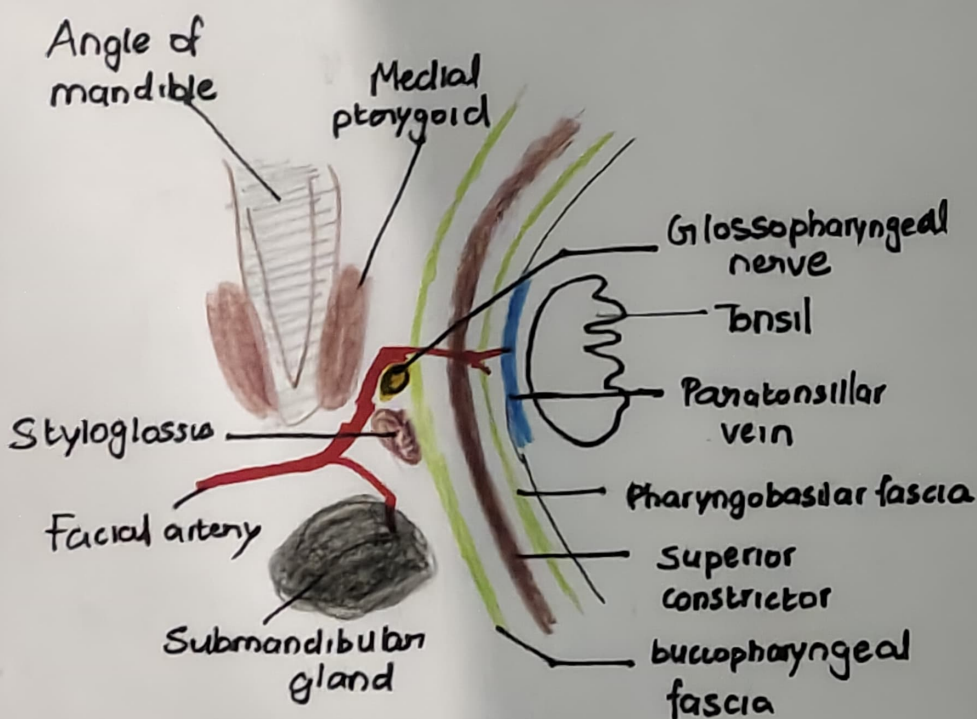
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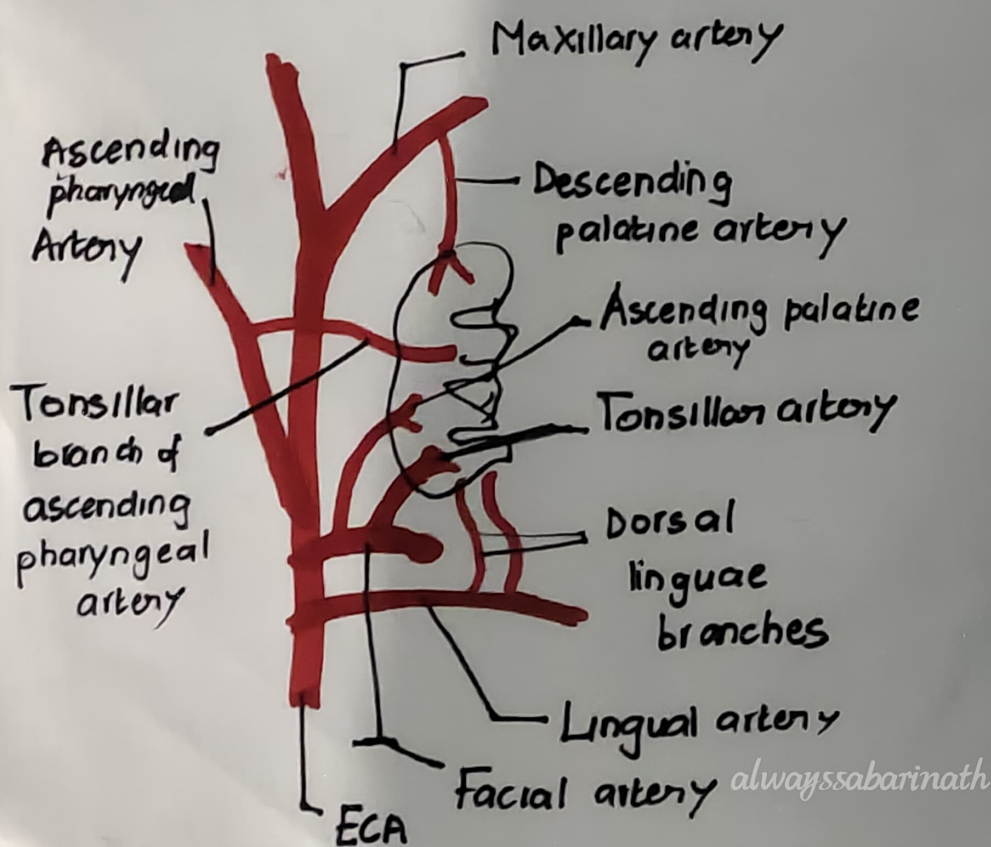
# OSTEOMEATAL COMPLEX



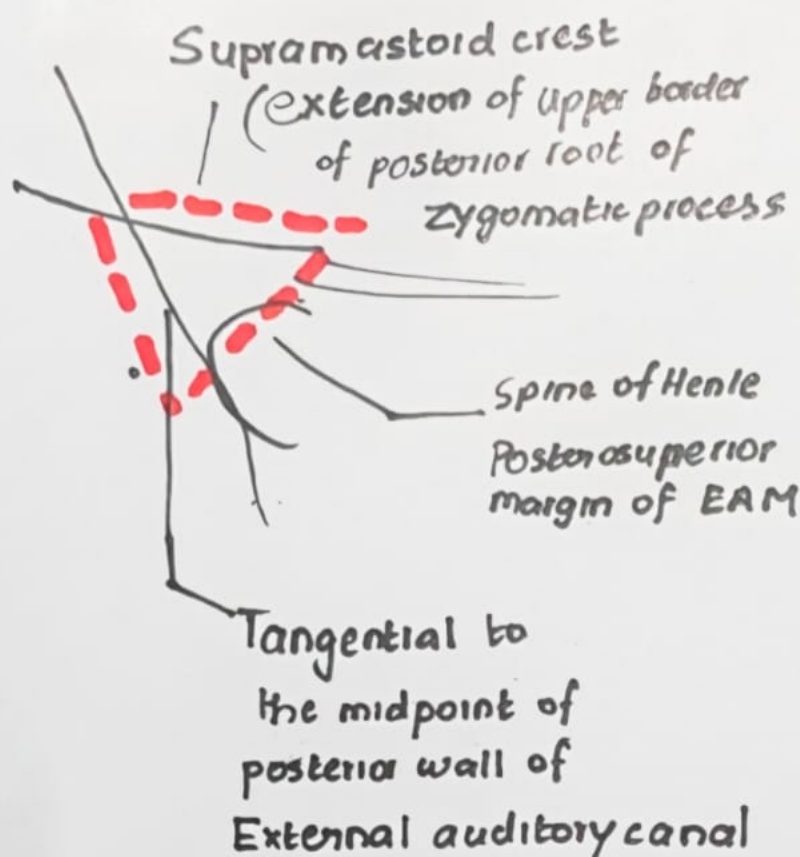
# TONSILLAR BED



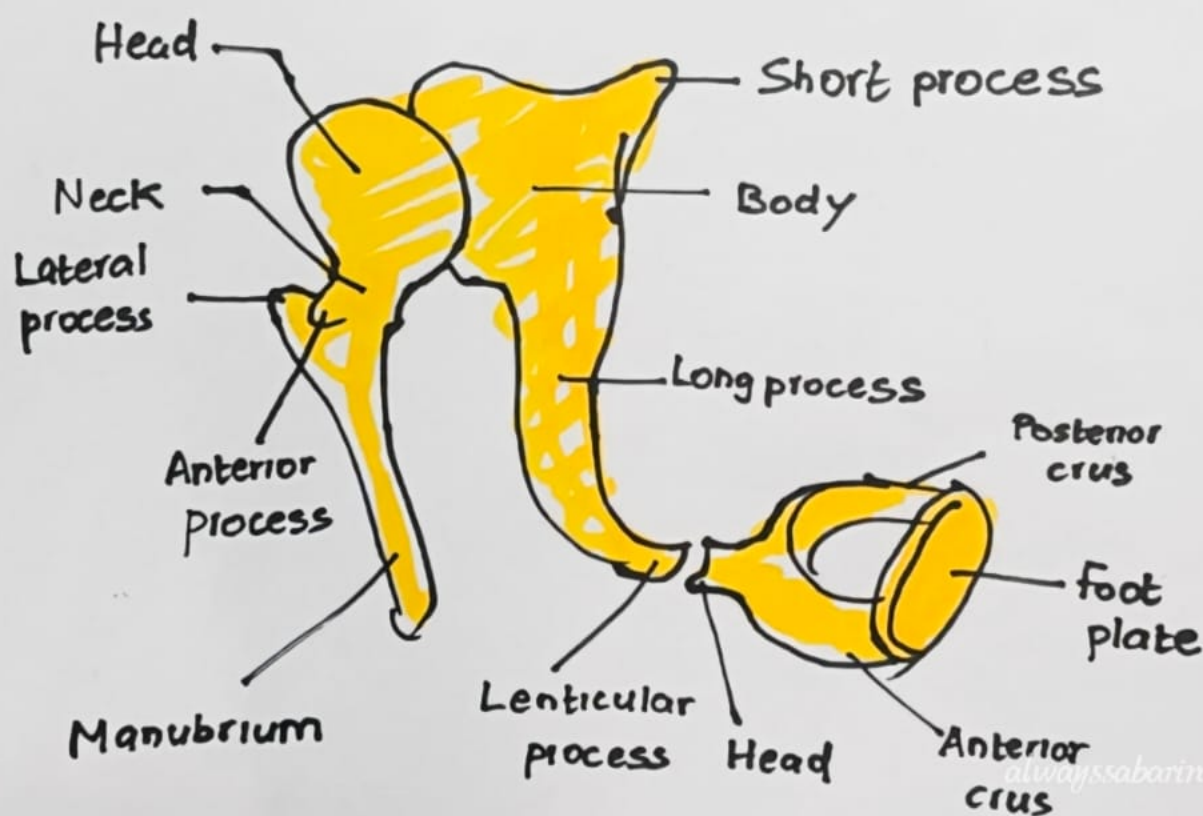
## BLOOD SUPPLY OF TONSIL



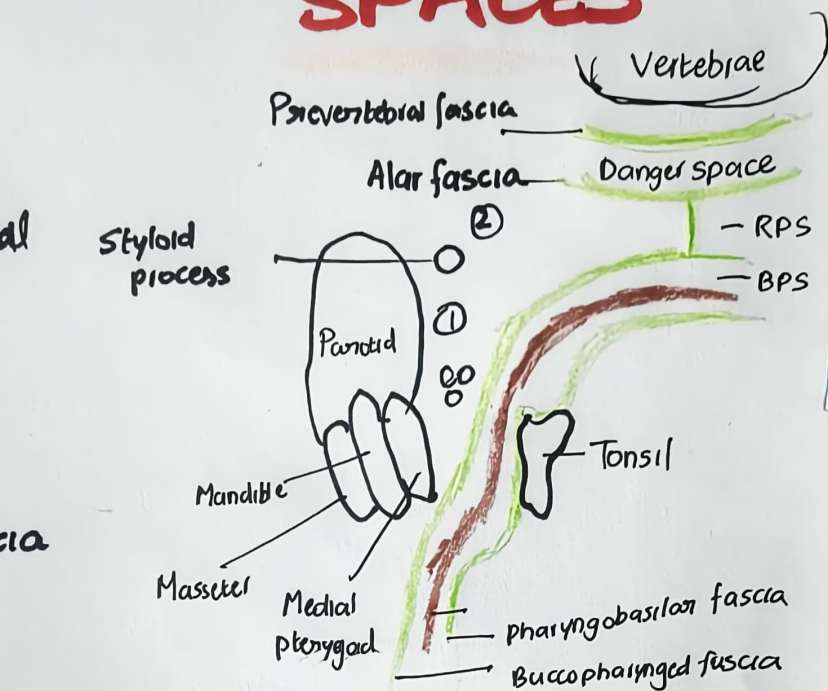
# Mac Ewen's Triangle



## EAR OSSICLES

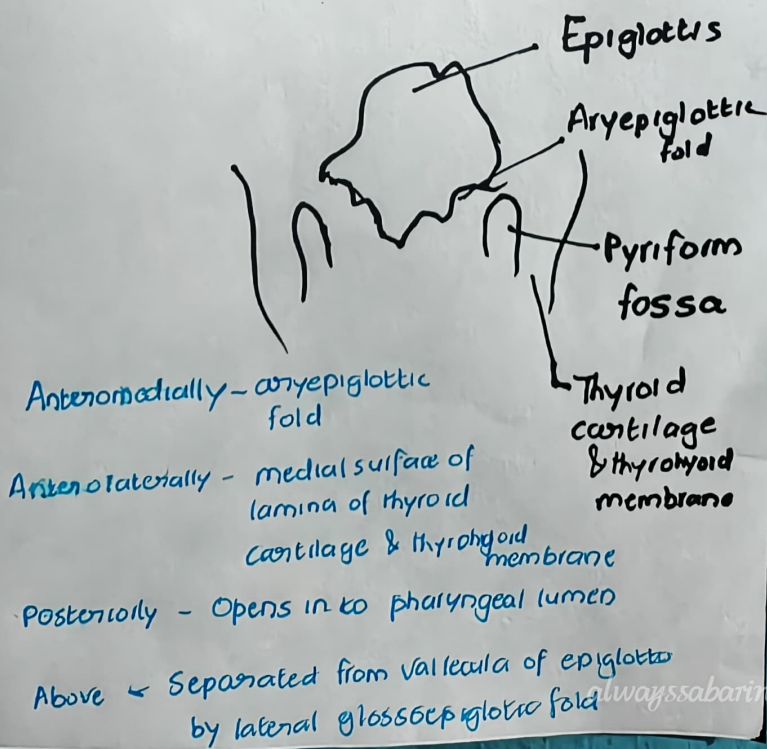


# DEEP NECK SPACES

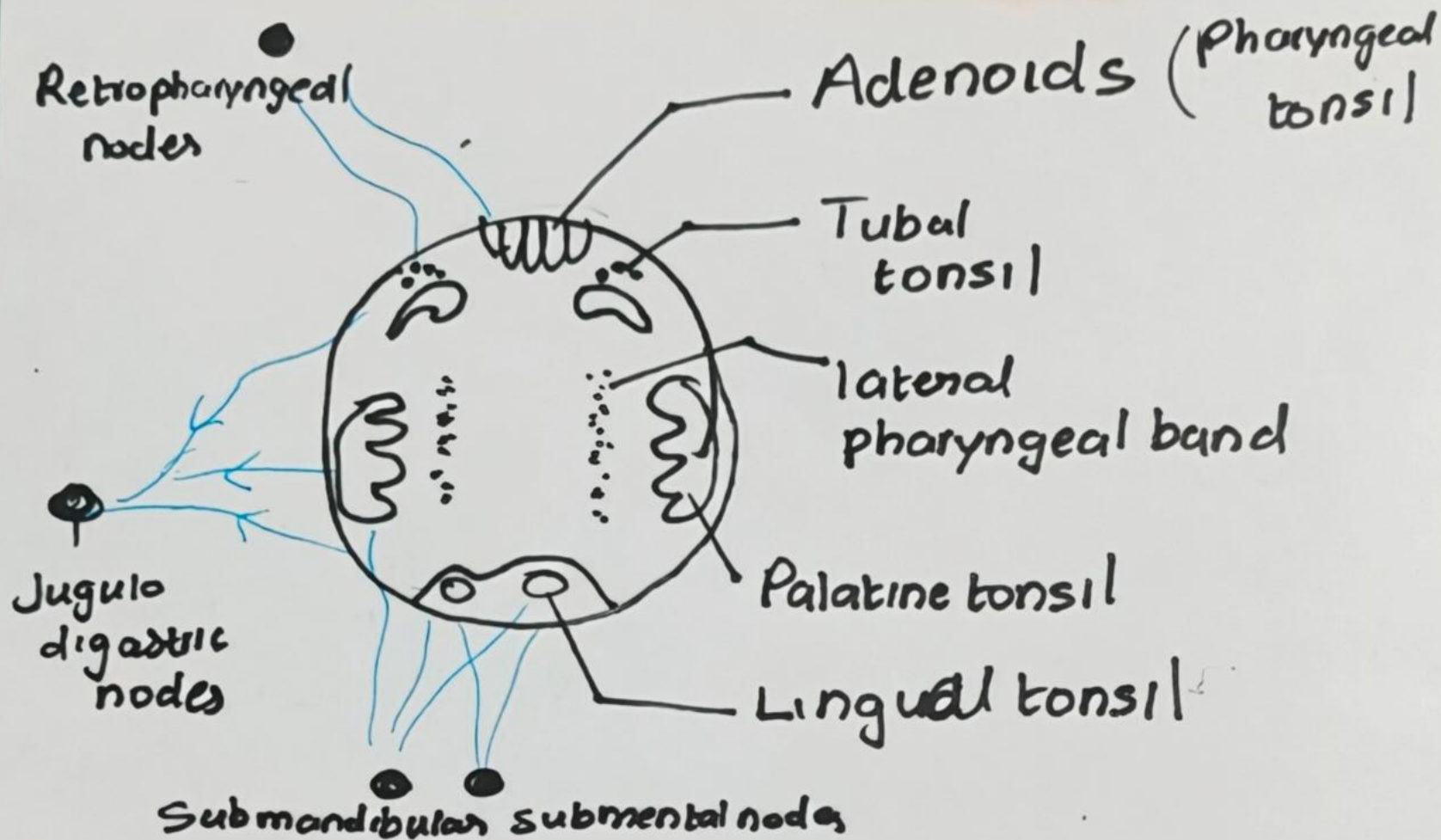


Panopharyngeal . (1) Prestyloid  $\Rightarrow$  Maxillary artery, mandibular nerve  
 Space (2) Poststyloid  $\Rightarrow$  ICA, JV, CNIX, X, XI  
 Cervical sympathetic chain

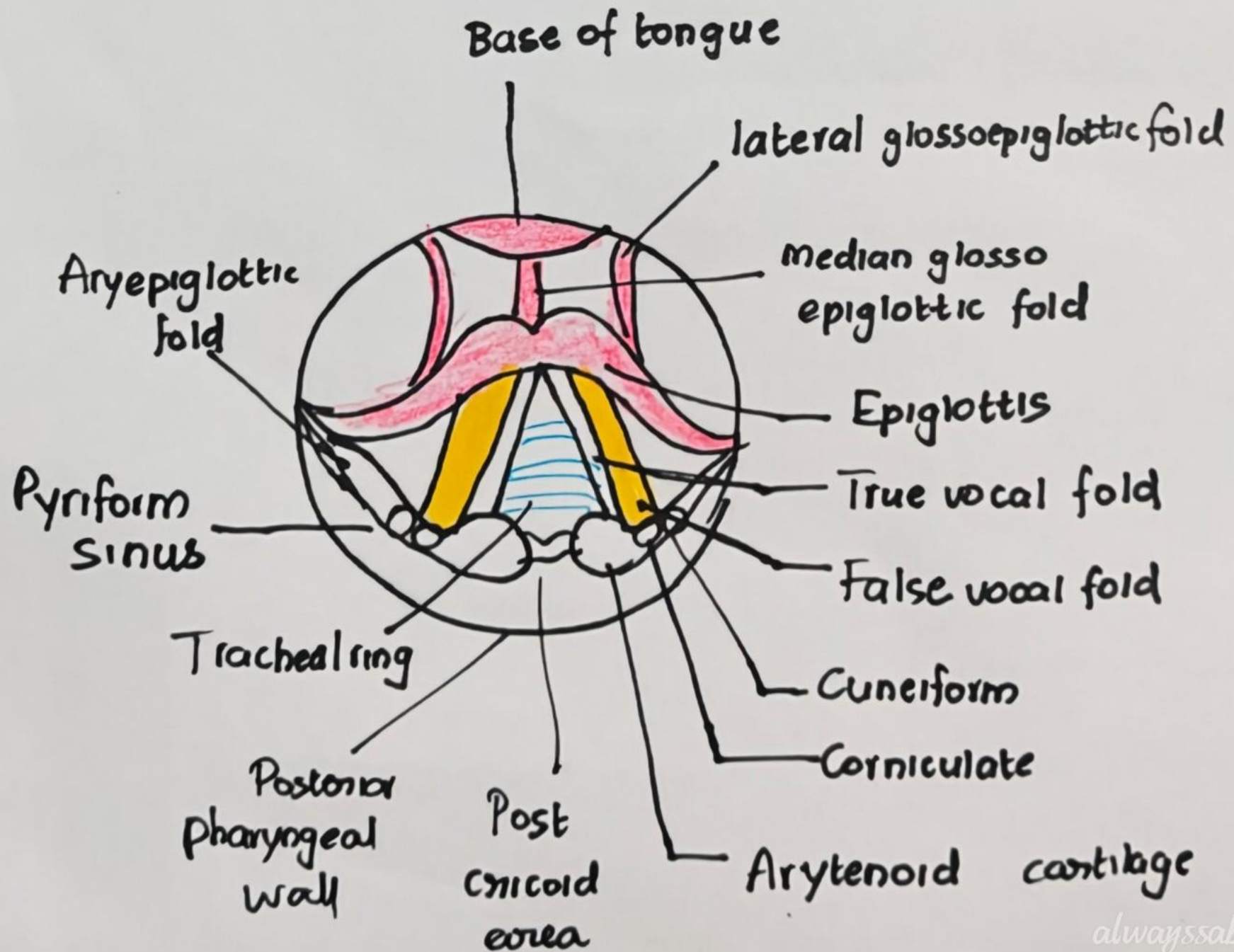
## PYRIFORM FOSSA

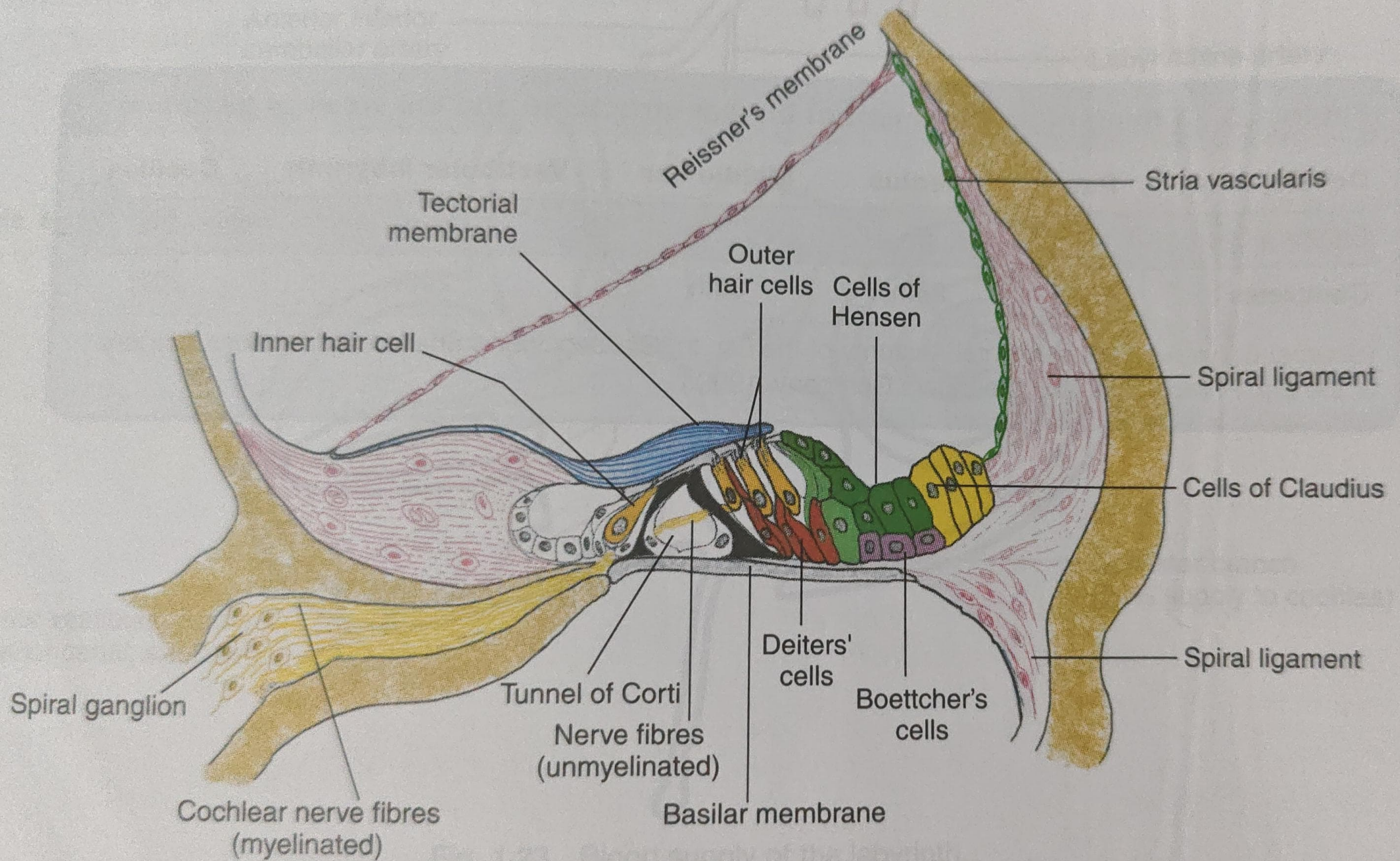


# WALDEYER'S RING



# Structures seen in Indirect laryngoscopy





**Fig. 2.1** Structure of organ of Corti.

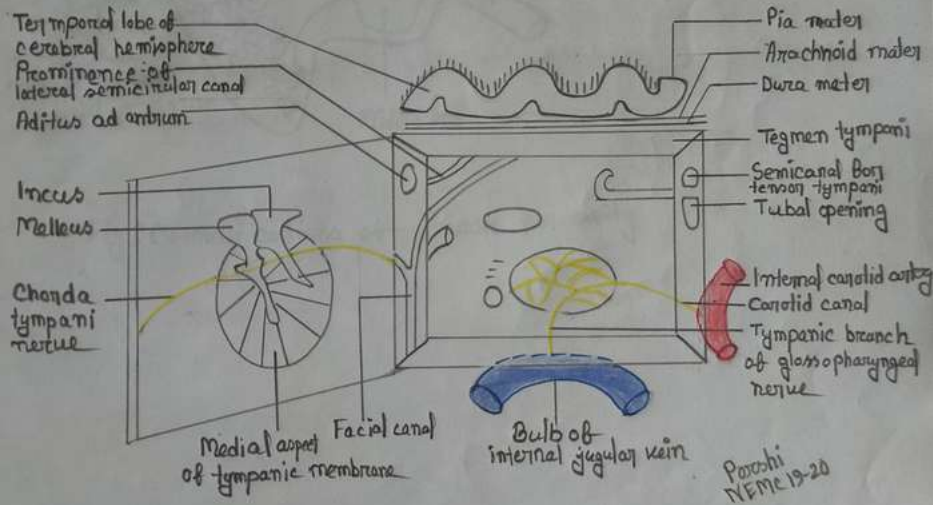
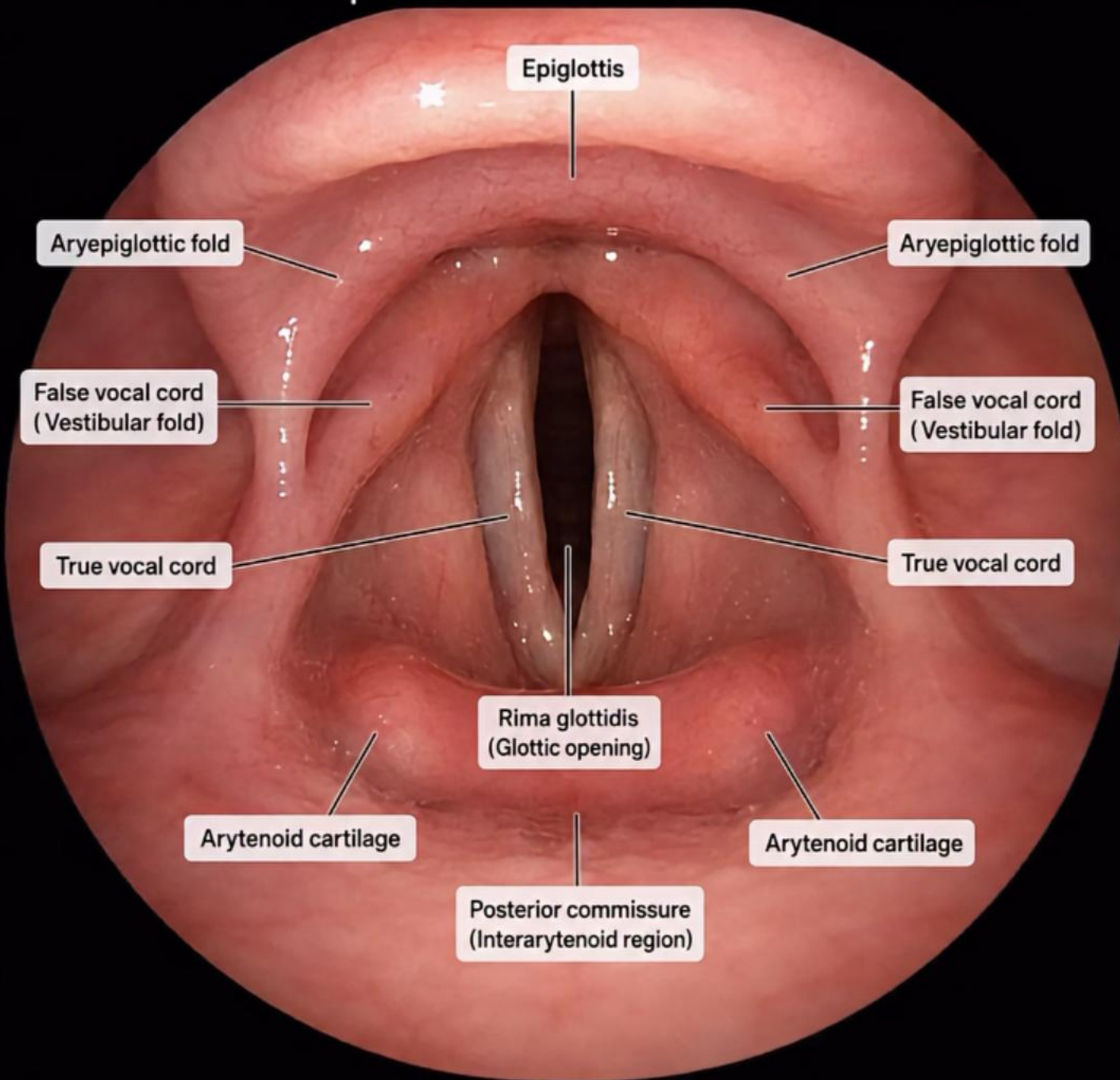


Fig: Boundaries of middle ear cavity





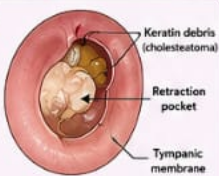
# CHOLESTEATOMA

Keratinizing Squamous Epithelium in Middle Ear & Mastoid



## DEFINITION

- Cholesteatoma is a non-neoplastic keratinizing squamous epithelium in the middle ear cleft, mastoid or both, which produces local destructive effect.



## ORIGIN (THEORIES)

1. Congenital (embryonic epithelial rests)
2. Acquired (most common)
  - > Retraction pocket theory (most accepted)
    - ~ Negative pressure → Retraction pocket → Squamous metaplasia → Cholesteatoma
  - > Basal cell hyperplasia theory
    - ~ Basal layer proliferates and forms keratin through pars flaccida/retained epithelium
3. Implantation theory (iatrogenic)

## TYPES OF CHOLESTEATOMA

1. **TUBOTYMPANIC (Most common)**
  - Arises in pars tensa of tympanic membrane
  - Attic usually disease-free
  - Safe type (extra-attic structures are intact)
2. **ATTICOANTRAL (Unsafe/Dangerous)**
  - Arises in pars flaccida (attic)
  - Attic & mastoid involved
  - May erode ossicles, complications common

## DIFFERENCES BETWEEN TUBOTYMPANIC & ATTICOANTRAL CSOM

| FEATURE       | TUBOTYMPANIC (SAFE)           | ATTICOANTRAL (UNSAFE)           |
|---------------|-------------------------------|---------------------------------|
| Discharge     | Profuse, mucoid, odourless    | Scanty, purulent, foul smelling |
| Perforation   | Central                       | Attic or marginal               |
| Granulations  | Uncommon                      | Common                          |
| Polyps        | Rare                          | Red and fleshy                  |
| Cholesteatoma | Absent                        | Present                         |
| Complications | Rare                          | Common                          |
| Hearing loss  | Mild to moderate (conductive) | Conductive or mixed (deafness)  |

## PATHOLOGY

- The disease remains localized to the mucosa. Over time, healing & destruction take place depending on virulence & resistance of organism and the patient.

### Pathological changes:

1. Perforation of pars tensa (central)
2. Middle ear mucosa: oedematous & velvety
3. Polyp: smooth, oedematous, usually pale
4. Ossicular chain: intact & mobile but may show necrosis, especially long process of incus

## CLINICAL FEATURES

### 1. EAR DISCHARGE

Persistent, foul smelling, mucoid or mucopurulent, may be scanty or profuse.



### 2. HEARING LOSS

Conductive type, severity varies (rarely >50 dB).

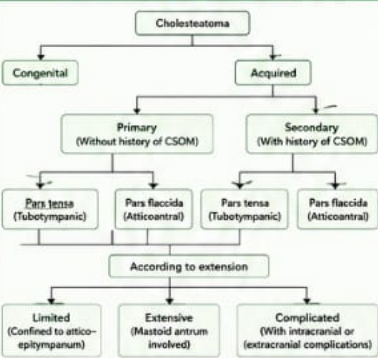


### 3. OTHER FEATURES

- Tinnitus
- Aural fullness
- Earache
- Dizziness (rare)
- Facial weakness (rare)



## CLASSIFICATION (ANATOMICAL)



## PERFORATIONS IN TYMPANIC MEMBRANE

### A. CENTRAL PERFORATION (Pars tensa)

- Anterior
- Posterior
- Inferior
- Subtotal



### B. MARGINAL PERFORATION (Pars flaccida)

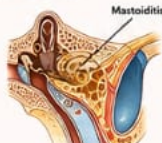
- Posterosuperior (most common)
- Anterior
- Inferior
- Total (posterosuperior marginal most common)



## COMPLICATIONS

### INTRATEMPORAL

- Acute otitis media
- Labyrinthitis
- Facial palsy
- Mastoiditis
- Petrositis
- Extradural abscess
- Subperiosteal abscess
- Sinus thrombosis



### INTRACRANIAL

- Meningitis
- Lateral sinus thrombosis
- Brain abscess
- Extradural abscess
- Subdural abscess

## INVESTIGATIONS

- Otoscopic examination
- Tuning fork tests (Rinne -, Weber lateralizes)
- Audiometry - Conductive hearing loss
- X-ray mastoid (Schüller's / Stenver's view)
- HRCT temporal bone - Gold standard (extent, bone erosion, complications)

## MANAGEMENT

### GOALS

- Eradicate disease
- Create safe, dry ear
- Prevent complications
- Improve or preserve hearing

### PRINCIPLES

- Remove disease completely
- Restore ventilation & drainage
- Reconstruct hearing mechanism
- Obliterate / exteriorize disease prone areas

### TYPES OF SURGERY

#### 1. Canal Wall Up (CWU)

- Posterior canal wall preserved
- Good anatomical result
- Requires second look
- Higher recurrence

#### 2. Canal Wall Down (CWD)

- Posterior canal wall removed
- Wide open cavity
- Easy to clean
- Less recurrence

### Approach

Postaural / Endaural / Endoscopic

## BACTERIOLOGY

- Mixed infection - Aerobic & anaerobic
- Common organisms:**
  - *Pseudomonas aeruginosa*, *Proteus*, *Staphylococcus aureus*, *Streptococci*, *Bacteroides fragilis*, *Anaerobes*

## SYSTEMIC ANTIBIOTICS

- Useful in acute exacerbation, cellulitis, complications
- Based on culture & sensitivity
- Topical antibiotics are mainstay

### PRECAUTIONS

- Keep ear dry
- Avoid forcible nose blowing
- Treat URTI / allergic rhinitis
- Regular follow up

## KEY POINTS

- ✓ Retraction pocket in pars flaccida → Atticoantral cholesteatoma (unsafe)
- ✓ Retraction in pars tensa → Tubotympanic cholesteatoma (safe)
- ✓ Posterosuperior marginal perforation most common in atticoantral type
- ✓ Cholesteatoma is locally destructive, not neoplastic
- ✓ Early diagnosis & surgery → Prevent complications & preserve hearing

## THREE D'S OF CHOLESTEATOMA



**Destroy** - Bone (ossicles, mastoid, facial canal)



**Discharge** - Persistent foul smelling otorrhea



**Deafness** - Conductive hearing loss

## IMPORTANT EXAM POINTS

- Definition & origin theories
- Types & differences:
- Complications (intra & intracranial)
- Treatment - CWU vs CWD
- X-ray / HRCT findings



Dr Ashik Sureshkumar





# CARCINOMA OF MAXILLA

## (MALIGNANT TUMOURS OF MAXILLARY SINUS)



### INTRODUCTION

- Arises from the lining (mucosa) of maxillary sinus.
- Usually remains silent for a long time and presents with vague symptoms of "sinusitis".
- Common in 40-60 years age group with preponderance in males.
- More common in areas where snuff is used (South Africa - "Bantus").

**RISK FACTORS:** Nickel refining, leather work, wood dust, mustard gas, cigarette smoking.

**HISTOLOGY:** >80% are squamous cell carcinoma. Others - Adenocarcinoma, Adenoid cystic carcinoma, Melanoma, Sarcomas.

### FIBROUS DYSPLASIA OF MAXILLA (DIFFERENTIAL)



Fig. Fibrous dysplasia in a 13-year-old girl.

A. External swelling B. Expansion of upper alveolus C. CT scan showing opacity

### CLINICAL FEATURES

#### Early features

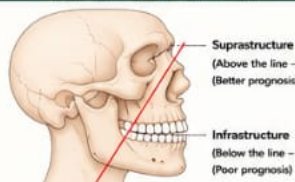
- Nasal stuffiness / obstruction
- Bloodstained nasal discharge
- Facial paraesthesia or pain
- Epistaxis

#### Late features (depend on spread & growth)

- Swelling of cheek / face
- Displacement of eyeball, diplopia
- Pain in teeth, loosening of teeth
- Paresthesia of upper lip & palate
- Trismus
- Orbital symptoms (proptosis, diplopia, pain)
- Intracranial symptoms (headache, meningitis)

\*Extension through cribriform plate.

### OHNGREN'S LINE (IMPORTANT LANDMARK)



Imaginary line between medial canthus of eye and angle of mandible dividing the area into:

- Suprastructure - Above the line
- Infrastructure - Below the line

### SPREAD OF DISEASE

#### A. Direct Spread

- Medial - Nasal cavity (obstruction, discharge, epistaxis)
- Anterior - Cheek, upper lip, facial skin
- Inferior - Upper alveolus, teeth, hard palate
- Superior - Orbit (proptosis, diplopia)
- Posterior - Pterygopalatine fossa, infratemporal fossa, nasopharynx, sphenoid sinus, base of skull
- Intracranial - Ethmoid, cribriform plate, foramen lacerum

#### B. Lymphatic Spread

- Submandibular and upper jugular nodes

#### C. Blood Borne Spread

- Lungs (common), bones

### DIAGNOSIS

#### 1. Radiograph of sinuses:

Opacity with expansion and destruction of bony walls.

#### 2. CT Scan (Best non-invasive method):

Defines extent of disease in axial and coronal planes. Helps in staging.

#### 3. Biopsy:

Through nose or mouth. Caldwell-Luc approach preferred in early cases.

#### 4. Endoscopy:

Detailed examination and accurate biopsy.

### TNM CLASSIFICATION - MAXILLARY SINUS

|     |                                                                                                                                                       |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| T1  | Tumour limited to maxillary sinus mucosa with no erosion or destruction of bone.                                                                      |
| T2  | Tumour causing bone erosion or destruction including extension into hard palate and/or middle nasal meatus, except posterior wall / pterygoid plates. |
| T3  | Invades: posterior wall, subcutaneous tissues, floor or medial wall of orbit, pterygoid fossa & ethmoid sinuses.                                      |
| T4a | Invades: anterior orbital contents, skin of cheek, pterygoid plates, infratemporal fossa, cribriform plate, sphenoid or frontal sinuses.              |
| T4b | Invades: orbital apex, dura, brain, middle cranial fossa, cranial nerves (other than V2), nasopharynx or clivus.                                      |

### NODAL INVOLVEMENT (N)

|     |                                                                                     |
|-----|-------------------------------------------------------------------------------------|
| Nx  | Regional lymph nodes cannot be assessed                                             |
| N0  | No regional lymph node metastasis                                                   |
| N1  | Metastasis in a single ipsilateral lymph node, ≤3 cm in greatest dimension          |
| N2  | Metastasis in a single ipsilateral node >3-6 cm or multiple ipsilateral nodes ≤6 cm |
| N2a | Single ipsilateral node >3-6 cm                                                     |
| N2b | Multiple ipsilateral nodes ≤6 cm                                                    |
| N2c | Bilateral or contralateral nodes ≤6 cm                                              |
| N3  | Node >6 cm in greatest dimension                                                    |

### DISTANT METASTASIS (M)

|    |                                       |
|----|---------------------------------------|
| Mx | Distant metastasis cannot be assessed |
| M0 | No distant metastasis                 |
| M1 | Distant metastasis present            |

### STAGE GROUPING (MAXILLARY & ETHMOID SINUS)

| Stage      | TNM                          |
|------------|------------------------------|
| Stage I    | T1 N0 M0                     |
| Stage II   | T2 N0 M0                     |
| Stage III  | T3 N0 M0 / T1-3 N1 M0        |
| Stage IV A | T4a N0-1 M0                  |
| Stage IV B | Any T N2 M0                  |
| Stage IV C | Any T N3 M0 / Any T Any N M1 |

### TREATMENT

- Depends on stage, extent, histology and general condition.
- Multidisciplinary approach.
- Early stage (I & II):** Surgery (e.g., Caldwell-Luc, medial maxillectomy).
- Advanced stage (T3 & T4):** Combined modality - Surgery + Radiotherapy / Chemoradiation.
- Radiotherapy:** Preoperative: 5500 cGy Postoperative: 5000-5500 cGy
- Chemotherapy:** Cisplatin + 5-FU with radiation for better results.



Fig. (A) Maxillectomy with orbital exenteration on the right side, (B) Same patient after rehabilitation with maxillary prosthesis and artificial eye.

### HISTOLOGY

>80% are Squamous cell carcinoma. Others - Adenocarcinoma, Adenoid cystic carcinoma, Melanoma, Sarcomas.



Adenocarcinoma (Glandular pattern)



Well differentiated Squamous cell carcinoma (Keratin pearl)

### PROGNOSIS

- Depends on stage, extent, site (above or below Ohngren's line) and nodal status.
- 5-year survival rate:
  - Overall - 40% to 50%
  - Advances in multimodal therapy with radiation have improved results.
- Suprastructure lesions - Better prognosis than infrastructure lesions.
- Early diagnosis and treatment improve outcomes and prevent complications (orbital, intracranial, neural injuries).



### KEY POINTS



More common in 40-60 years age group with male preponderance.



Presents as persistent "sinusitis" with nasal symptoms.



Ohngren's line divides into suprastructure (better prognosis) and infrastructure (poor prognosis).



CT scan is the best non-invasive method for extent and staging.



Multidisciplinary approach gives the best outcome.



# ADENOIDECTOMY

## SURGICAL REMOVAL OF ADENOIDS

Adenoidectomy may be indicated alone or in combination with tonsillectomy. In the latter event, adenoids are removed first and the nasopharynx packed before starting tonsillectomy.

### INDICATIONS

1. Adenoid hypertrophy causing snoring, mouth breathing, sleep apnoea syndrome or speech abnormalities, i.e. rhinolalia clausa.
2. Recurrent rhinosinusitis.
3. Chronic otitis media with effusion associated with adenoid hyperplasia.
4. Recurrent ear discharge in benign CSOM associated with adenoiditis/adenoid hyperplasia.
5. Dental malocclusion: Adenoidectomy does not correct dental abnormalities but will prevent its recurrence after orthodontic treatment.

### CONTRAINDICATIONS

1. Cleft palate or submucous palate. Removal of adenoids causes velopharyngeal insufficiency in such cases.
2. Haemorrhagic diathesis.
3. Acute infection of upper respiratory tract.

### ANAESTHESIA

Always general, with oral endotracheal intubation.

### POSITION

Same as for tonsillectomy. Hyperextension of neck should always be avoided.

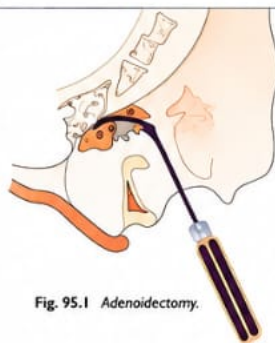


Fig. 95.1 Adenoidectomy.

Treatment rate is another indicator. Treatment is same as for preoperative haemorrhage. Postnasal pack under general anaesthesia is often required.

### STEPS OF OPERATION

1. Boyle-Davis mouth gag is inserted. Before actual removal of adenoids, nasopharynx should always be examined by retracting the soft palate with curved end of the tongue depressor and by digital palpation, to confirm the diagnosis, to assess the size of adenoids mass and to push the lateral adenoid masses towards the midline.
2. Proper size of adenoid curette with gauze\* is inserted transnasally into the nasopharynx till its free edge touches the posterior border of nasal septum and is then pressed backwards to engage the adenoids. At this level, head should be slightly flexed to avoid injury to the odontoid process.
3. With gentle sweeping movement, adenoids are shaved off.
4. Haemostasis is achieved by packing the area for some time.

#### Important Points

- Lateral masses are similarly removed with smaller curettes, small tags of lymphoid tissue left behind are removed with punch forceps.
- Take care not to injure pharyngeal ends of eustachian tubes.

#### Note

Persistent bleeders are electrocoagulated under vision. If bleeding is still not controlled, a postnasal pack is left for 24 h.

### COMPLICATIONS

1. **Haemorrhage:** It is usually seen during the immediate postoperative period. Nose and mouth may be full of blood or the only indication may be vomiting of dark-coloured blood which the patient had been swallowing gradually in the postoperative period. Rising pulse rate is another indicator.

### ENDOSCOPIC ADENOIDECTOMY

These days adenoids can be removed more precisely by using a debriider under endoscopic control or by coblation technique. The latter uses radio frequency current to create a plasma field which dissociates molecular bonds.

### POSTOPERATIVE CARE

Same as in tonsillectomy. There is no dysphagia and the patient is up and about early.

### OTHER COMPLICATIONS

#### 2. Injury to eustachian tube opening



Injury to torus tubarius and vertebrae due to hyperextension of neck and the pressure of curette.

Care should be taken when operating have atlantoaxial instability. An X-ray may be required.

#### 3. Injury to pharyngeal structures



Injury to posterior pharyngeal wall, uvula, soft palate due to hyperextension of neck and movement of the curette.

Care should be taken accordingly.

#### 4. Grisel's syndrome



Complaints of neck pain and develops torticollis. Mostly it is due to spasm of atlantoaxial joint during surgery or infection. Treat conservatively.

#### 5. Velopharyngeal insufficiency



It is necessary to determine adequacy of adenoidectomy by inspection and palpation before removal of adenoids.

#### 6. Nasopharyngeal stenosis



It occurs due to scarring. Preoperative haemorrhage. Postnasal pack under general anaesthesia is often required.

#### 7. Recurrence



This is due to regrowth of adenoid tissue left behind.

#### 8. Others



- Infection
- Eustachian tube dysfunction
- Dental effects
- Velopharyngeal inadequacy (in predisposed patients)

\* Gauge: Small children – No. 1 or 2; Older children & adults – No. 3 or 4.



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# TONSILLECTOMY

AT A GLANCE



## INDICATIONS

### A. ABSOLUTE

1. Recurrent infections of throat (most common)
  - $\geq 7$  episodes in 1 year
  - $\geq 5$  episodes per year for 2 years
  - $\geq 3$  episodes per year for 3 years
  - $\geq 2$  weeks or more of lost school/work in 1 year
2. Peritonsillar abscess
3. Tonsillitis causing febrile seizures
4. Hypertrophy causing
  - airway obstruction (sleep apnoea)
  - difficulty in deglutition
  - interference with speech
5. Suspicion of malignancy

### B. RELATIVE

1. Diphtheria carriers
2. Streptococcal carriers
3. Chronic tonsillitis with bad taste / halitosis
4. Recurrent streptococcal tonsillitis in valvular heart disease

### C. AS A PART OF ANOTHER OPERATION

1. Palatopharyngoplasty (sleep apnoea)
2. Glossopharyngeal neurectomy
3. Removal of styloid process

## CONTRAINDICATIONS

1. Haemoglobin level  $< 10$  g%
2. Acute infection in upper respiratory tract, acute tonsillitis with bleeding
3. Children  $< 3$  years (poor surgical risk)
4. Overt or submucous cleft palate
5. von Willebrand's disease (bleeding disorders - leukaemia, purpura, aplastic anaemia, haemophilia, sickle cell disease)
6. Epidemic of polio
7. Uncontrolled systemic disease (e.g. diabetes, cardiac disease, hypertension, asthma)
8. Avoid during menses

## ANAESTHESIA

Usually under general anaesthesia with endotracheal intubation.  
In adults, may be done under local anaesthesia.

## POSITION

### Rose's position

- Patient lies supine
- Head extended by a pillow under the shoulders
- Rubber ring placed under the head to stabilize
- Hyperextension of head should be avoided



## STEPS OF OPERATION (DISSECTION AND SNARE METHOD)

| 1                                            | 2                                                               | 3                                                               | 4                                                                                                  | 5                                                                                                    | 6                                                                                                | 7                                                                    | 8                                                                  |
|----------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------|
| Boyle-Davis mouth gag introduced and opened. | Tonsil grasped with tonsil-holding forceps and pulled medially. | Incision in the mucous membrane from tonsil to anterior pillar. | Blunt curved scissor used to dissect tonsil from peritonsillar tissue and separate its upper pole. | Tonsil now held at its upper pole and traction applied downwards and medially. Dissection continued. | Wire loop or snare passed over tonsil on its pedicle, tightened, pedicle cut and tonsil removed. | Gauze sponge placed in fossa and pressure applied for a few minutes. | Bleeding points tied with silk. Same steps repeated on other side. |
|                                              |                                                                 |                                                                 |                                                                                                    |                                                                                                      |                                                                                                  |                                                                      |                                                                    |

## TECHNIQUES

### Cold methods

- Dissection and snare (most common)
- Guillotine method (rare)
- Intracapsular tonsillectomy
- Harmonic scalpel (ultrasound)
- Plasma-mediated ablation / dissection
- Cryosurgical technique

### Hot methods

- Electrocautery
- Laser tonsillectomy ( $\text{CO}_2$  or KTP)
- Radiofrequency ablation
- Coblation tonsillectomy

## POSTOPERATIVE CARE

1. Keep patient in coma position till recovery.
2. Watch for bleeding from nose and mouth.
3. Monitor vital signs - pulse, respiration, blood pressure.
4. Diet:
  - Start with liquids (cold milk / ice cream)
  - Soft diet as tolerated
  - Avoid hot, spicy or hard food
5. Oral hygiene - saline gargles 3-4 times/day.
6. Analgesics for pain relief.
7. Antibiotics for about 5-7 days.
8. Patient can resume normal diet in 2 weeks (unless complications).

## COMPLICATIONS

### A. IMMEDIATE

1. Primary haemorrhage - during operation
2. Reactionary haemorrhage - within 24 hours
3. Injury to tonsillar pillars, uvula, soft palate, tongue, superior constrictor
4. Injury to teeth
5. Aspiration of blood
6. Facial oedema
7. Surgical emphysema
8. Mortality - rare ( $\approx 1$  in 35,000)

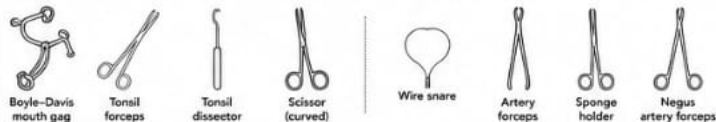
### B. DELAYED

1. Secondary haemorrhage - 5th to 10th day
2. Infection - parapharyngeal abscess, otitis media
3. Lung complications - atelectasis, pneumonia
4. Scarring in soft palate and pillars
5. Tonsillar remnants
6. Hypertrophy of lingual tonsil

## KEY POINTS

- ✓ Most common indication - recurrent infections
- ✓ Adequate haemostasis is essential
- ✓ Maintain airway, hydration and nutrition
- ✓ Early ambulation and oral hygiene help recovery
- ✓ Watch for secondary haemorrhage (day 5-10)
- ✓ Complete recovery usually in 2 weeks

## INSTRUMENTS (ESSENTIAL SET)



# BLEEDING SWELLINGS OF THE NOSE – SALIENT POINTS

## Key Clinical Features for Differential Diagnosis

**Profuse epistaxis • Unilateral nasal mass • Correct diagnosis • Timely management**

|                                 | <b>JUVENILE NASOPHARYNGEAL ANGIOFIBROMA (JNA)</b><br>                                            | <b>RHINOSPORIDIOSIS</b><br>                                              | <b>INVERTED PAPILLOMA</b><br>                                                                          | <b>OTHER BLEEDING SWELLINGS OF NOSE</b><br><ul style="list-style-type: none"><li>• Capillary Hemangioma</li><li>• Pyogenic Granuloma</li><li>• Hemangiopericytoma/ Solitary Fibrous Tumor</li><li>• Sinonasal Malignancies</li><li>• Antrochoanal Polyp</li><li>• Telangiectasia</li><li>• Foreign Body Granuloma</li></ul> |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Age &amp; Sex</b>            | 10–20 years, Males (>95%)                                                                                                                                                         | Children & young adults (5–30 yrs), M > F                                                                                                                 | 30–60 years, M > F                                                                                                                                                                       | Varies with condition                                                                                                                                                                                                                                                                                                       |
| <b>Common Presentation</b>      | <ul style="list-style-type: none"><li>• Recurrent epistaxis (main)</li><li>• Nasal obstruction</li><li>• Nasal mass</li><li>• Post nasal drip</li></ul>                           | <ul style="list-style-type: none"><li>• Profuse epistaxis</li><li>• Nasal mass</li><li>• Nasal obstruction</li></ul>                                      | <ul style="list-style-type: none"><li>• Nasal obstruction (most common)</li><li>• Recurrent epistaxis</li><li>• Nasal mass</li><li>• Anosmia</li></ul>                                   | <ul style="list-style-type: none"><li>• Epistaxis</li><li>• Nasal mass/obstruction</li><li>• Local symptoms vary</li></ul>                                                                                                                                                                                                  |
| <b>Site / Origin</b>            | Nasopharynx (sphenopalatine foramen region)                                                                                                                                       | Septum (antero-inferior part) more common, also floor, lateral wall, nasopharynx                                                                          | Lateral wall of nasal cavity (middle meatus) (Attachment – unciniate process, ethmoidal bulla, ME complex)                                                                               | Variable: <ul style="list-style-type: none"><li>• Anterior septum (hemangioma, pyogenic granuloma)</li><li>• Any site in nasal cavity / paranasal sinuses</li></ul>                                                                                                                                                         |
| <b>Mass – Description</b>       | Reddish / reddish-blue, highly vascular, lobulated mass in nasopharynx                                                                                                            | Red to pink, <b>strawberry-like</b> , friable polypoidal mass studded with <b>white dots</b> (sporangia). Bleeds profusely on touch.                      | Pinkish/grey, fleshy polypoidal mass with irregular or cerebriform surface. Bleeds on touch.                                                                                             | <ul style="list-style-type: none"><li>• Capillary hemangioma – red, soft, compressible</li><li>• Pyogenic granuloma – red, friable, bleeds easily</li><li>• Hemangiopericytoma – red-purple, firm</li><li>• Malignancy – irregular, ulceroproliferative mass</li></ul>                                                      |
| <b>Epistaxis</b>                | Profuse, recurrent, may be torrential                                                                                                                                             | Profuse, spontaneous, recurrent                                                                                                                           | Usually mild to moderate, may be recurrent                                                                                                                                               | Varies – often recurrent or mild; may be profuse in vascular lesions                                                                                                                                                                                                                                                        |
| <b>Other Features</b>           | <ul style="list-style-type: none"><li>• Conductive deafness (Eustachian tube block)</li><li>• Facial swelling (advanced)</li><li>• Anemia (chronic blood loss)</li></ul>          | <ul style="list-style-type: none"><li>• Aquatic exposure (common)</li><li>• Endemic in India &amp; South Asia</li><li>• Recurrence common</li></ul>       | <ul style="list-style-type: none"><li>• Unilateral disease</li><li>• May cause bone erosion</li><li>• Associated with malignancy (5–15%)</li></ul>                                       | <ul style="list-style-type: none"><li>• Hemangioma – present since childhood</li><li>• Pyogenic granuloma – history of trauma/pregnancy</li><li>• Antrochoanal polyp – suggests sinusitis</li><li>• Malignancy – pain, loosened teeth, epiphora, weight loss</li></ul>                                                      |
| <b>Investigations of Choice</b> | <ul style="list-style-type: none"><li>• CT scan – extent, bony erosion</li><li>• MRI – soft tissue detail</li><li>• Angiography (pre-op embolization)</li></ul>                   | <ul style="list-style-type: none"><li>• Clinical diagnosis (typical)</li><li>• Biopsy – sporangia with endospores</li><li>• MRI/CT – extent</li></ul>     | <ul style="list-style-type: none"><li>• CT scan – extent, bony changes</li><li>• MRI – extent, intracranial / orbital spread</li><li>• Biopsy – confirm diagnosis</li></ul>              | <ul style="list-style-type: none"><li>• As per condition</li><li>• Imaging (CT/MRI) for extent</li><li>• Biopsy – essential to rule out malignancy</li></ul>                                                                                                                                                                |
| <b>Treatment</b>                | <ul style="list-style-type: none"><li>• Pre-operative embolization</li><li>• Endoscopic surgical removal (classic or endoscopic assisted)</li><li>• Control of bleeding</li></ul> | <ul style="list-style-type: none"><li>• Complete surgical excision (with cauterization of base)</li><li>• Dapsone (adjunct/ in recurrent cases)</li></ul> | <ul style="list-style-type: none"><li>• Endoscopic medial maxillectomy / endoscopic excision</li><li>• Wide removal including site of attachment</li><li>• Long term follow up</li></ul> | <ul style="list-style-type: none"><li>• Depends on diagnosis (excision, cauterization, medical management, oncologic treatment)</li></ul>                                                                                                                                                                                   |
| <b>Recurrence / Prognosis</b>   | Recurrence up to 10–20%. Good prognosis with complete excision and follow up.                                                                                                     | Recurrence 10–20% if incomplete excision. Excellent prognosis.                                                                                            | Recurrence 10–20%. Malignant transformation 5–15%. Requires long term follow up.                                                                                                         | Depends on pathology. Malignant lesions – guarded prognosis.                                                                                                                                                                                                                                                                |

### GENERAL POINTS TO REMEMBER

- ✓ Unilateral nasal mass with epistaxis – think of these conditions.
- ✓ Nature of mass (color, surface, bleeding tendency) gives important clues.
- ✓ Imaging helps in extent, origin & surgical planning.
- ✓ Histopathology is essential in doubtful cases.
- ✓ Complete excision and follow up are key to prevent recurrence.

### RED FLAGS – THINK MALIGNANCY IF...

- ⚠ Older age (>40 years)
- ⚠ Unilateral mass with pain, epistaxis, loosening of teeth
- ⚠ Ulceroproliferative / irregular mass
- ⚠ Epiphora, facial swelling, numbness
- ⚠ Weight loss, constitutional symptoms

### ABBREVIATIONS

CT – Computed Tomography  
MRI – Magnetic Resonance Imaging  
ME – Middle Ear

## SYMPTOMS ACCORDING TO SITE

| Site         | Earliest Symptom      | Other Features                                              |
|--------------|-----------------------|-------------------------------------------------------------|
| Supraglottic | Dysphagia             | Odynophagia, referred otalgia, neck node, muffling of voice |
| Glottic      | Hoarseness (of voice) | Change in voice, stridor (late)                             |
| Subglottic   | Dyspnea / Stridor     | Airway obstruction, stridor                                 |

### **Advanced / Late Features**

Hemoptysis, weight loss, neck swelling, respiratory distress, aspiration