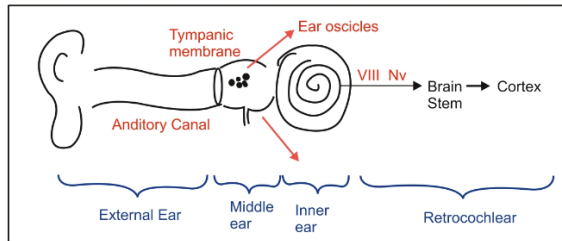


# Anatomy of Ear

Active Space



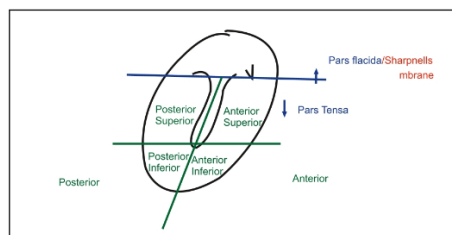
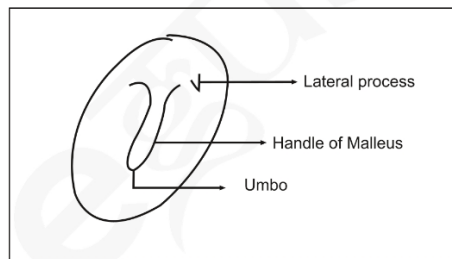
RetroCochlear mainly pertains to VIII Nerve.

### Tympanic Membrane

Shape : Oval

Colour : Pearly white

- Landmark's
- Handle of Malleus
  - Lateral Process
  - Umbo
  - Cone of light



### Antero Inferior quadrant

- M/C site for tympanic membrane perforation
- Site for Myringotomy with Grommet Insertion

Pinch to zoom



# ← Anatomy of Ear

Topic Notes: 9

- Has Cone of Light

Postero Inferior quadrant

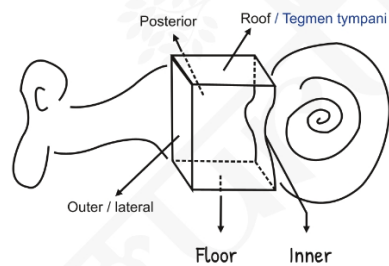
- Site for Myringotomy without Grommet Insertion done for ASOM

Postero Superior quadrant

- Traumatic Perforation

Middle Ear Anatomy

- Middle ear divided into 3
- Upper – Epitympanum / Attic
- Middle – Mesotympanum
- Lower – Hypotympanum



Outer or Lateral boundary is the Tympanic Membrane.

On the Inner wall, the bulged is known as Promontory

Roof of the middle ear is called as Tegmen tympani

Below the floor there is,

1. IX CN nerve and
2. Internal Juglar nerve.

Branch of the IX CN nerve, Jacobson's Nerve supply the middle ear and forms a plexus called Tympanic Plexus.

Anterior wall

2 Opening

- A. Eustatian tube opening
- B. Canal for Tensor tympani muscle

Active Space

Pinch to zoom



← **Anatomy of Ear**  
Topic Notes: 9

Active Space

Anterior wall	Middle wall	Posterior wall
Canal for Tensor tympani muscle	2 Bulge: --Promontory.	Facial Nerve-- Stylomastoid foramen
Eustatian tube opening	--LSCC.	Facial Recess.
<ul style="list-style-type: none"> <li>Middle ear to Nasopharynx.</li> <li>36mm long</li> <li>Outer 1/3 bony</li> <li>Inner 2/3 Cartilage</li> </ul>	#2 windows --Oval.	Sinus Tympani
	--Round	Pyramid-- Stapedius muscle
	#2 Nerves --Tympanic Plexus. --Facial Nerve	Fossa Incudis
	#2 more things --Processes Cochleariformis --Fistula Ante finestrum.	Door -- Aditus

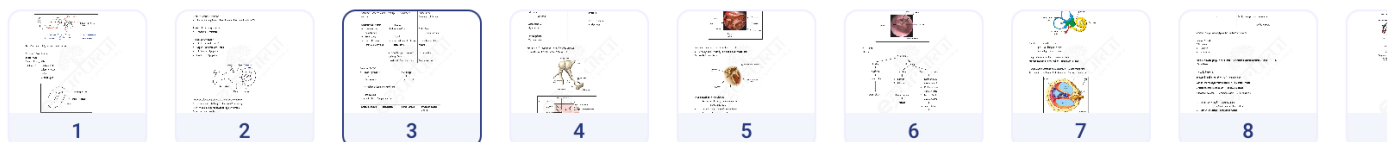
Function Of TM

- Balance pressure
  - ↓
  - VE pressure
  - ↓
  - Retraction of tympanic Membrane
- Drainage
  - ↓
  - otitis media

Baro Trauma  
Investigation= Tympanometry.

Stapedius Muscle	Facial Recess	Sinus Tympani	Prussack's Space ( TM )
Function: Dampen loud sound	Boundaries:	Surgery is difficult here.	Superior: Lateral Malleolar fold
Stapedial Reflex or Acoustic	<ul style="list-style-type: none"> <li>Facial nerve/ Facial Ridge</li> <li>Corda tympani nerve/Annulus.</li> <li>Fossa incudis or Short process of Incus</li> </ul>	↓ Residual Disease or Recurrent Disease.	Lateral : Pars Flaccida
Reflex ↓ Afferent Nerve. ↓ Efferent Nerve			Medial: Neck of Malleus

Pinch to zoom



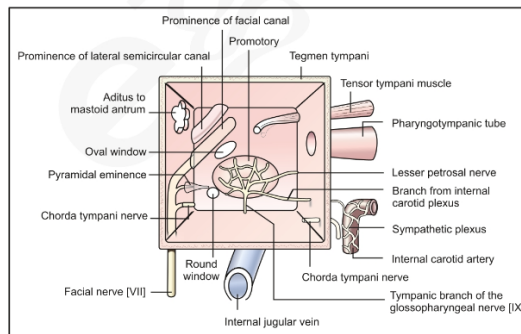
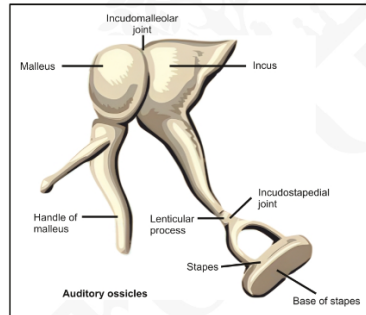
Anatomy of Ear

Topic Notes: 9

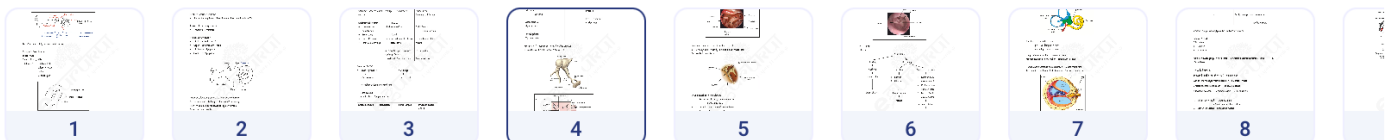
Active Space

<p>↓                      ↓</p> <p>VIII Nerve</p> <p>VII nerve</p> <p>Absent Reflex— Hyperacusis</p> <p>Investigation: Tympanometry</p>			<p>Inferior: Lateral Process</p> <p>Imp: M/c site for Cholestoma</p>
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Foot Plate of Stapes arises from the Otic Capsule  
 Incudo Stapedial Joint is a Ball & Socket Joint



Pinch to zoom

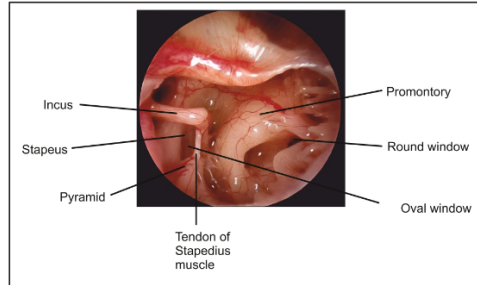




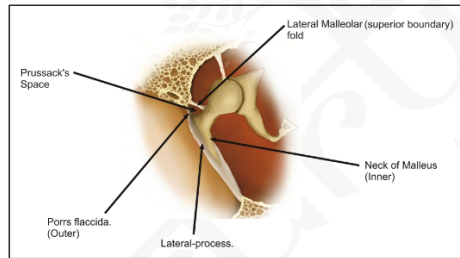
# Anatomy of Ear

Topic Notes: 9

## Active Space



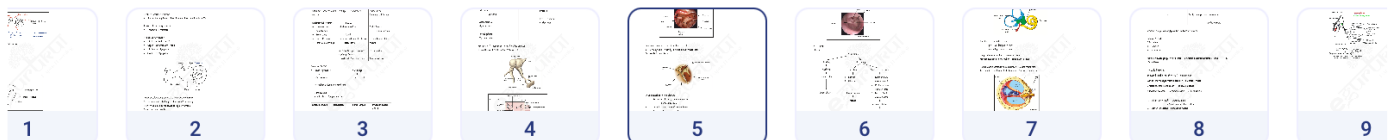
Tendon of stapedius arises from the Pyramid  
 Below the pyramid → cavity known as Sinus tympani area  
 Surgery is difficult here



- When Eustachian tube is blocked  
 Retraction of the tympanic membrane  
 4 Grades By Sade
- A. No contact with any bone of the middle ear
  - B. Touches Incus/Stapes but not Promontory
  - C. Touching the promontory
  - D. Adherent to the Promontory

Normally on Malleus is seen  
 But wen incus and stapes are seen retracted TM

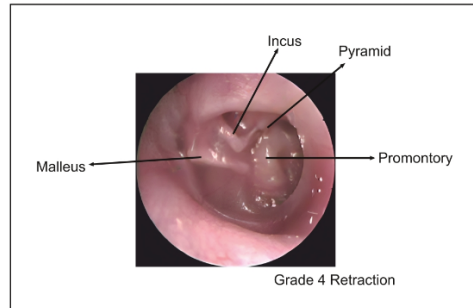
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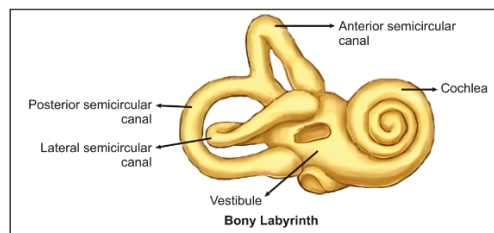
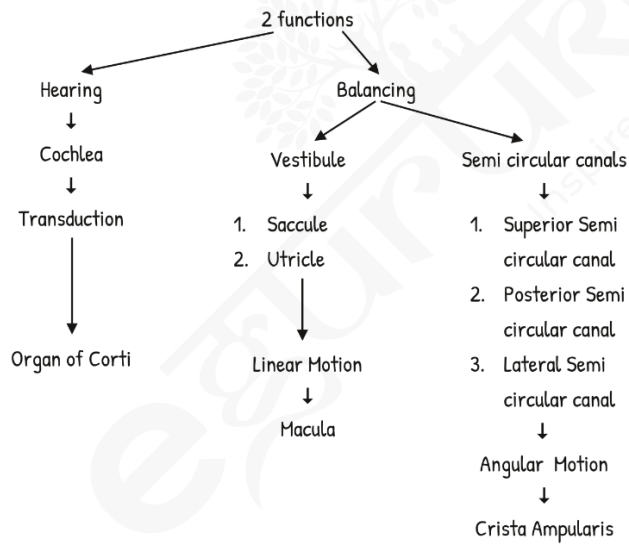
# Anatomy of Ear

Topic Notes: 9

## Active Space



### INNER EAR Labyrinth



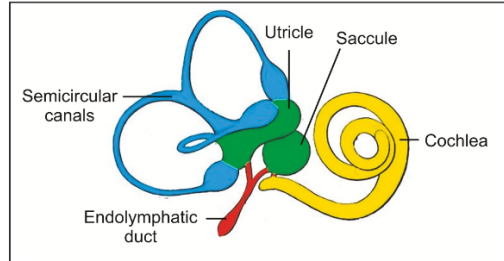
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Anatomy of Ear

Topic Notes: 9

Active Space



Cochlea – Has 2 and 1/2 turns

Apex - Low frequency sound

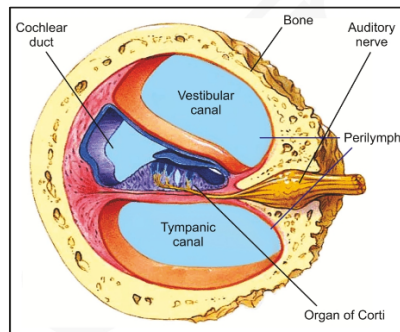
Base - High frequency sound

Bony cochlea cut section - Circular in shape

Membranous cochlea cut section - Triangular in shape

Between Scala vestibule and scala Media - Basilar membrane

Between Scala Media and Scala Tympani - Reissners Membrane



Stria Vascularis on the outer side

Organ of corti has 3 types of cells

- Inner hair cells
- Outer Hair cells
- Supporting cells

Inner Hair cells	Outer hair cells
Flask shaped, single row	Tubular in shape, multiple rows

Pinch to zoom



**Active Space**

X	Produces Otoacoustic Emission( OAE)
X	Easily damaged. --- Loud sounds ---- Too toxic drugs

Ototoxic drugs - Aminoglycosides like Gentamycin etc

**FACIAL NERVE**

7 Branches

- 4 motor
- 3 sensory

From Genuiculate ganglion. 1st branch---> Greater Superficial Petrosal Nerve-----> Vidian Nerve

**Nerve to Stapedius**

Sensory branch of Facial Nerve ( from middle ear )

Just before the style mastoid foramen---> Cordae Tympani

2 Motor branches outside ear --->Supply 4 muscles

5 terminal branches ---> comman name ---> Pes ansarinus

1. Vidian nerve supply – Lacrimal gland  
- Gland to Nose, Sinus, Palate
2. Nerve to stapedius---> stapedius muscle
3. Sensory branch of Facial nerve---> small skin in EAC
4. Chordae tympani--->Taste buds on anterior 2/3 of tongue  
---> Submandibular Gland  
---> Sub lingual Gland
5. Motor branch
6. Motor branch

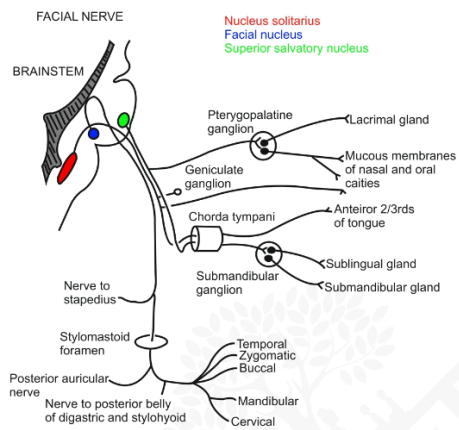
Pinch to zoom



# Anatomy of Ear

Topic Notes: 9

7 In parotid gland -- Pes Anserinus --> Supply All Facial muscles



Active Space

Pinch to zoom



# Investigations of Ear Diseases

Active Space

Hearing Tests	Vestibular Function Tests
Tuning Fork test	Caloric test
Audiometry	Fistula test
Tympanometry	HINT
BERA	Galvanic test
OAE	VEMP- Vestibular evoked myogenic potential

### Tuning Fork test

M/c used frequency = 512Khz

Subjective test for hearing = Audiometry

Objective test for hearing = Tympanometry, BERA, OAE

1. Rinne test - AC compared with BC
2. Weber test - Tuning fork kept in Vortex.  
Compare Right BC vs. Left BC  
No AC
3. ABC test / Schwabach's test: Compare Patients BC to Examiners BC  
We assume examiners BC is normal
4. Bing test
5. Gelle's test : Can be negative or positive  
Negative Gelle's is diagnostic of Otosclerosis.

Q

Rinne test

R	L
AC > BC	AC > BC

Schwabach

↓	↓
→	

Weber

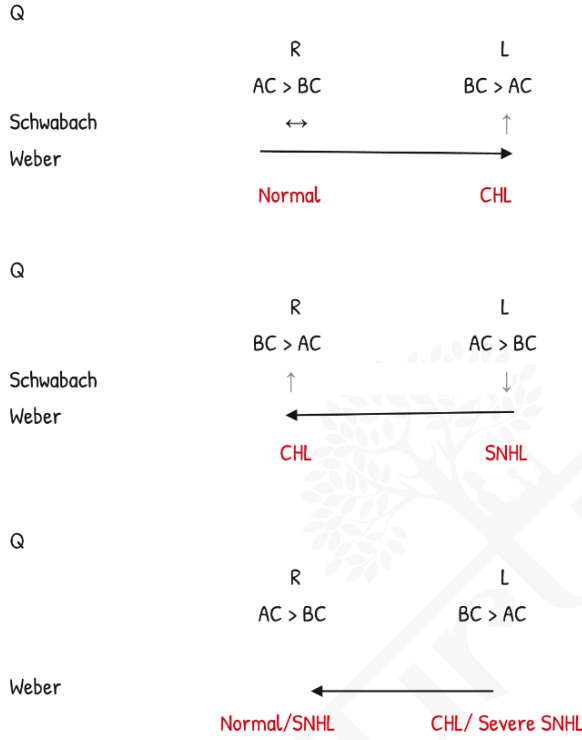
	B/L SNHL
SNHL	SNHL
(Worse)	(Better)

Left Better side ( lateralized to the left )

Investigations of Ear Diseases

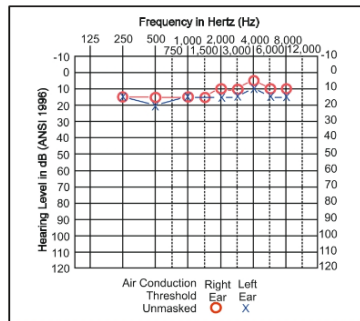
Topic Notes: 5

Active Space



Here Since Webers is not centralized. Therefore the left ear is not normal  
 Since Weber is coming to the right side. So Left side should be SNHL or Severe SNHL.  
 But since BC > AC in left. So it has to be Severe SNHL.  
 Schwabachs needs to be done to Differentiate between SNHL or normal in the right ear.

Pure Tone Audiometry



Investigations of Ear Diseases

Topic Notes: 5

RED  $\left\{ \begin{array}{l} R \text{ AC} = \bigcirc \text{ or } \triangle \\ R \text{ BC} = [ \text{ or } < \end{array} \right.$   
 Blue  $\left\{ \begin{array}{l} L \text{ AC} = \times \text{ or } \square \\ L \text{ BC} = ] \text{ or } > \end{array} \right.$

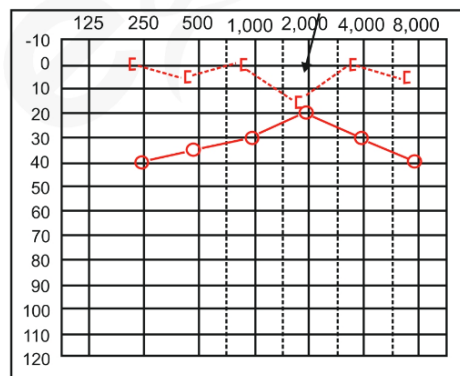
Steps in interpreting the audiogram

- Identify the 25dB line  
 Between 0 - 25 dB = Normal  
 Threshold below 25dB = Hearing Loss
- How many graphs for 1 ear  
 If only 1 graph = AC --> Conductive hearing loss  
 If 2 graphs = SNHL or Mixed hearing loss.
- Look at the gap between the graphs  
 SNHL --> Gap < 15-20dB  
 Mixed --> Gap > 15-20 dB

If 1 graph from each ear given then B/L Hearing Loss.

Special Audiograms

- Dip at 2000Hz in Bone conduction ---> Carhart's notch--> Diagnostic of Otosclerosis
- Dip at 4000 Hz in AC or BC graph--> Noised induced hearing loss
- Upward sloping audiogram / Rising audiogram in AC & BC both --> Meniere's disease.

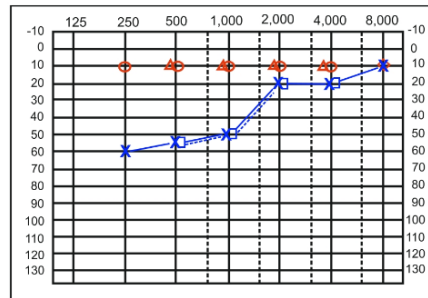


Carhart's notch

Active Space

## Investigations of Ear Diseases

Topic Notes: 5



Right normal

Left SNHL due to meniere's disease

Rinne test : B/L AC > BC

Weber test: Go to the right side

Tympanometry

Objective test

Frequency used= 220hz

5 Types

- A - Normal
- As - Otosclerosis (MCQ)
- Ad - Disruption or dislocation of the ossicles
- B - Flat tympanogram → serous otitis media (MCQ)
- C - -VE----→ Eustachian tube is blocked

BERA - Brainstem Evoked Response Audiometry

OtoAcoustic Emission (OAE) : Outer Hair cell

Both are used/ Indicated for

1. Screening/ Confirm Hearing loss in Newborn/Infants.  
(OAE is preferred)
2. Adult with SNHL : Differentiate between Cochlear and Retrocochlear diseases

VESTIBULAR FUNCTION TEST

- Caloric Test / Bithermal caloric test
- 2 temperatures are used : 37°C ( cold ) & 44°C ( warm)
- They stimulate the Lateral Semicircular canals ( LSCC)
- Patient will have Nystagmus and Vertigo

Active Space

## Investigations of Ear Diseases

Topic Notes: 5

### Active Space

**Position** : Supine and Raised head by 30°

Nystagmus has fast and slow component

Fast component decides the direction of Nystagmus

C	O	W	S
Cold	Opposite	warm	same side
30°	side	44°	

**Fistula Test**

To diagnose Fistula in ear

Increase pressure in the EAC

Nystagmus

If no nystagmus then Normal

Instrument – Siegel's Speculum

Other uses – check mobility of Tympanic membrane

Instillation of powdered medication in the ear

Elicit signs Like Fistula sign, Brown's sign, Gelle's test

True positive Fistula test	False Positive fistula test (Hennebert's sign)	False Negative fistula test
1. Labyrinthine fistula or CSOM 2. Fenestration Surgery type V tympanoplasty 3. Post stapedectomy 4. Perilymph fistula	Meniere's disease	1. Dead Labyrinth/ear 2. Fistula which is blocked by cholesteatoma.

## Inflammatory Diseases of Ear

Topic Notes: 9

# Inflammatory Diseases of Ear

Active Space

Inflammation of external ear → Otitis Externa

Otomycosis	Ramsay Hunt Syndrome	Furunculosis	Malignant Otitis Externa
M/c Fungus → Aspergillus. Niger (Black spores)	Herpes.Zoster infection of Geniculate Ganglion Infection of Facial Nerve 1 Vesicles 2 Facial palsy  Rx Acyclovir Steroids	Inflammation of hair follicles  By Staph. Aureus  Tragal sign positive  Icthyomol Glycerin (Hygroscopic agent)	Levensons Criteria: a) Patient is diabetic b) Caused by Psuedomonas c) Noctural pain is main complaint d) O/E Granulations in Bony canal  IOC- Technetium 99 Scintigraphy  DOC- 3 <sup>rd</sup> gen Cephalosporin  M/c complication - Osteitis--→ Facial palsy

Perichondritis – only cartilage part is affected ( Lobule spared)

Caused by pseudomonas

Cauliflower ear/ Boxers ear – Due to hematoma → Fibrosis

OTITIS MEDIA

Different types

1. ASOM- 3 pathogens
  - a. Pneumococcus/ Strep pneumoniae
  - b. H.influenza
  - c. Moraxella

← Inflammatory Diseases of Ear

Topic Notes: 9

Active Space

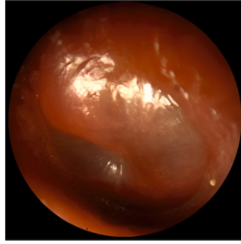
2. Serous otitis media - No Pathogen
3. Acute mastoiditis - Strep. Pyogenes
4. Chronic otitis media - Pseudomonas
5. Tuberculosis of the middle ear - Mycobacterium

ASOM	SOM	SAFE CSOM	UNSAFE CSOM	TB OM
X	Children	Adults	Adults	X
Nasopharyngitis	Adenoid Hypertrophy	X	X	X
Hearing loss +/- Pain	Only Hearing loss	Hearing loss with non smelly purulent discharge	Hearing loss with smelly purulent discharge	Painless & watery discharge
Findings	<ul style="list-style-type: none"> <li>• Retracted tympanic membrane</li> <li>• Air bubble seen</li> <li>• Foreshortened handle of malleus</li> </ul>	<ul style="list-style-type: none"> <li>• Central perforation of TM +/- Pale polyp</li> </ul>	<ul style="list-style-type: none"> <li>• Marginal perforation with red polyp</li> <li>• Red granulations</li> <li>• Cholesteatoma</li> </ul>	<ul style="list-style-type: none"> <li>• Multiple perforation with pale granulations</li> </ul>
-Red membrane with bulge				
-Fluid level				
-Cart wheel appearance				
-Light house sign				
-Reservoir sign				
Investigation	Tympanometry	Examination under microscope	Examination under microscope	ZN staining
Pure tone Audiometry	B / Flat type	Myringoplasty	MRM---	
Treatment	Myringotomy + Grommet insertion+ Adenoidectomy	Or Type 1 Tympanoplasty	Modified Radical Mastoidectomy	ATT
1 <sup>st</sup> -> Nasal decongestants + antibiotics				
If fails-> myringotomy(TOC)				

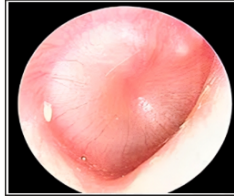
# Inflammatory Diseases of Ear

Topic Notes: 9

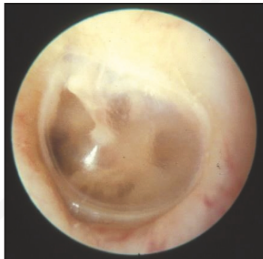
Active Space



Bulging Tympanic Membrane



Cartwheel Appearance



Fluid Level



Blue TM

# Inflammatory Diseases of Ear

Topic Notes: 9

Active Space



Retracted TM



air bubble seen



Central Perforation



Marginal perforation

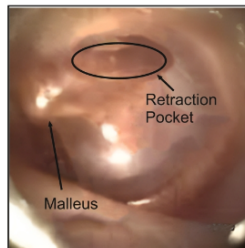
## ← Inflammatory Diseases of Ear

Topic Notes: 9

Active Space



Attic perforation



Retraction Membrane



Multiple perforations

### CHOLESTEOTOMA

A sac of keratinized squamous epithelium in Middle ear

M/c site : Prussack's space

#### Types

1. Congenital --→ Develops from the embryonic residual tissue
2. Primary Acquired--→ There is no pre existing disease
3. Secondary acquired--→ Due to some pre existing disease like Tympanic membrane perforation

## ← Inflammatory Diseases of Ear

Topic Notes: 9

### Active Space

#### Theories

Retractio Pocket or Negative pressure	Wittmack's theory (most acceptable)
Basal cell hyperplasia	Ruede's theory
Metaplasia	Sade's theory
Invasion/ migration	Habermann's theory (2 <sup>nd</sup> Acquired)

First 3 for primary acquired cholesteotoma

Invasion/Migration --→ Secondary acquired cholesteotoma

Treatment : Modified Radical Mastoidectomy

#### Complications of Otitis media

Extracranial/ Intratemporal complications	Intracranial complication
	Meningitis (m/c)
	Lateral sinus thrombophlebitis
Mastoiditis (m/c)	Sub dural abscess
Petrositis	Extra dural abscess
Gradenigo's Syndrome	Cerebral abscess (m/c → temporal lobe)
Labyrinthine fistula	Otitis hydrocephalus
Labyrinthitis	
Facial nerve Palsy	

#### Acute mastoiditis

Caused by Strep. pyogenes

Presentation: A child with U/L pain, Hearing loss +/- discharge.

O/E:

1. Light house sign
2. Reservoir sign
3. Ironed out mastoid
4. Pinna faces- Antero Inferior

IOC- CT scan

X- ray of mastoid

Schuller's view	}	Honey comb-→ Normal
Towne's view		Clouded-→ Mastoiditis

← **Inflammatory Diseases of Ear**  
Topic Notes: 9

**Active Space**

**TOC:**

Medicinal (Antibiotics + Pain killers)  
+/\_ Simple mastoidectomy

Abscesses can be formed

- Post aural----> Behind pinnah
- Luc's abscess----> Post- superior canal wall
- Bezold's----> Sterno Cleido mastoid
- Citelli's----> Post belly of Digastric



Acute Mastoiditis

Petrositis & Gradenigo's syndrome	Labyrinthine fistula	Lateral Sinus Thrombosis (Intracranial complication)
When CSOM spreads to petrous apex	Site: LSCC	Head ache + Fever
Involves V th and VI th nerve	Vertigo with nausea Nystagmus	( Picket fence fever)
3Ds	True positive Fistula sign	4 signs:
Discharge----> CSOM	MRI	1. Grey signer's sign
Diplopia----> VI th Nerve	MRM with closure of fistula	2. Delta sign
Deep pain----> V th nerve ( Retro orbital pain)		3. Tobey ayer
		4. Crow beck
		MRM with drainage of sinus

← **Inflammatory Diseases of Ear**  
Topic Notes: 9

**Active Space**

**Facial Palsy**

M/c cause : Idiopathic / Bell's palsy

2 types

Lower motor neuron palsy

Upper motor neuron palsy

Whole face on same side is  
Paralysed

Only lower half on opposite side is paralysed

Mouth deviates to the  
opposite side

Mouth deviates to the same side

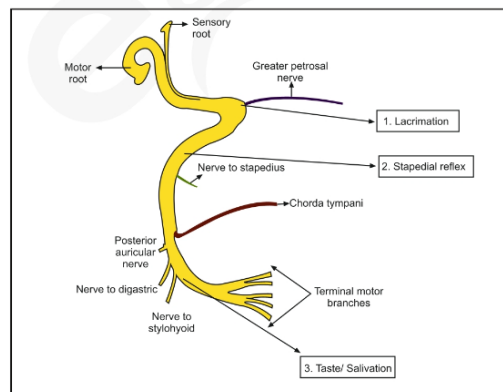
**Rx:**

Bell's palsy

Steroids (2-3 weeks) +/- Acyclovir

If no response,

- Electroneuronography---> Grades
  - Grade I, II, III ----> Steroids
  - Grades IV, V -----> Surgery ( M/c decompression in labyrinthine part)
- Topodiagnostic test -----> Site of lesion
  - Lacrimination
  - Stapedial reflex
  - Taste/ Salivation



 **Inflammatory Diseases of Ear**

Topic Notes: 9

**Active Space**

1 test	2 test	3 test	Site
X	X	X	Labyrinthine part
✓✓	X	X	Horizontal/ Tympanic part
✓✓	✓✓	X	Vertical/ Mastoid part
✓✓	✓✓	✓✓	Stylo Mastoid foramen

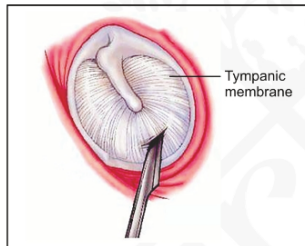
# Surgeries of Ear

Active Space

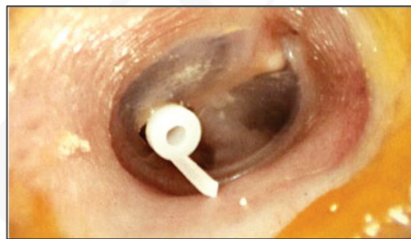
Surgeries
Myringotomy -----> ASOM
Myringotomy with grommet insertion----- > SOM
Myringoplasty----- > Safe CSOM
Oculoplastic-----> Both Safe and Unsafe CSOM
Tympanoplasty-----> Both Safe and Unsafe CSOM
Mastoidectomy----- > Unsafe CSOM

## Myringotomy

ASOM— Done in Postero inferior quadrant



## Myringotomy with grommet insertion



Done for Serous Otitis media

Done in Antero Inferior quadrant

## Myringoplasty /Type I tympanoplasty

Indication: Safe CSOM

C/I : Unsafe CSOM

Graft : M/c Temporalis fascia graft

## ← Surgeries of Ear

Topic Notes: 3

### Active Space

#### Advantages

1. Low metabolite rate
2. Tough fascia
3. Long survival

#### Ossiculoplasty

Ossicular chain may be damaged due to CSOM

Trauma- Ossicular damage +/- Battle sign



Battle sign

Prosthesis used may be made up of hydroxyapatite or titanium

If only 1 ossicle left then we use,

TORP - Total ossicular replacement prosthesis

PORP - Partial ossicular replacement prosthesis

#### Tympanoplasty (Miringoplasty + Ossiculoplasty )

Modified Wullestein classification

Type I - Miringoplasty - Graft over head of malleus

Type II - Absent Malleus handle

TM over incus

Type III - Collumela

Stapedo - myringopexy

Only stapes present

TM reconstructed to lie on stapes head (myringostapediopexy)

Type IV - TM placed over round window & Eustachian tube to create Cavus minor with baffle effect

Type V - Fenestration surgery

Fixed footplate

Fenestration/ Fistula on lateral semicircular canal

(True positive fistula sign, Vertigo, nystagmus )

## ← Surgeries of Ear

Topic Notes: 3

### Mastoidectomy

1. Simple or Schwartz or cortical
2. Modified radical mastoidectomy (MRM)
  - a. Canal wall up
  - b. Canal wall down
3. Radical mastoidectomy

Simple mastoidectomy -----> Acute Mastoiditis

Radical or MRM -----> Unsafe CSOM or Cholesteotoma

### Steps in Radical Mastoidectomy

1. Exteriorisation
2. Except : Footplate of stapes
3. Eustachian tube is blocked

Active Space

## Non Inflammatory Diseases of Ear

Topic Notes: 4

# Non Inflammatory Diseases of Ear

Active Space

### OTOSCLEROSIS

Site: Fistula ante fenestrum

Causes : Measles

2 types

- 1<sup>st</sup> stage—Otospongiosis/ Active
- 2<sup>nd</sup> stage – Otosclerosis/ Passive

**Patient** : young ladies ≈ 30 years

Increases in severity → During pregnancy

**Presentation** :

Conductive Hearing loss

Rarely SNHL

**Signs**:

- Schwartz sign -- -> Active stage & Flamingo pink colour of TM
- Paracusis willisi-----> Better hearing in noisy environment

**Investigation**

Gelle's test = -VE

PTA- Carhart's notch

IOC- Tympanometry--> As (imp)

**Syndrome**: Van der Hoeve syndrome

- Osteogenesis imperfect
- Blue sclera
- Otosclerosis

# Non Inflammatory Diseases of Ear

Topic Notes: 4

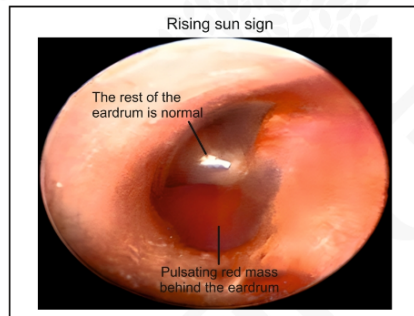
Active Space

## TOC - Stapedotomy/ Stapedectomy

Indication	C/I	Complication
Passive stage of otosclerosis	Active stage Cochlear otosclerosis Extreme age Only hearing ear Frequent flyer	m/c- SNHL Vertigo True +ve fistula sign Facial palsy Perilymph fistula

DOC - Sodium fluoride

Last option: Hearing aid



## Inner ear diseases

Meniere's disease	BPPV	Superior canal dehiscent syndrome	Presbycusis
Endolymphatic hydrops Cause: Mutation Arm of chr 6	X Canalolithiasis of PSCC	Minors syndrome Congenital disease	Senile deafness Old age
Fluctuating SNHL Fluctuating Tinnitus Episodic Vertigo(20mins-24hrs)	Position Vertigo (20sec)	CHL Autophony	SNHL +/- Tinnitus
Hennebert's sign Tulio's phenomenon	X		X

Non Inflammatory Diseases of Ear

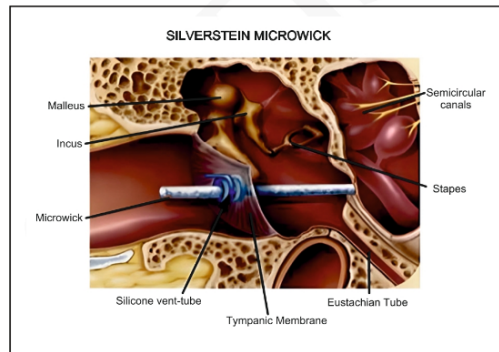
Topic Notes: 4

Active Space

IOC Electrocochleography MRI	Dix Hallpike maneuver	Third window effect	X
Drug: Betahistine	Epley's maneuver( canolith reposition done)	CT scan	PTA
Device: Meniere's device		Conservative	Hearing aid



Meniere's device



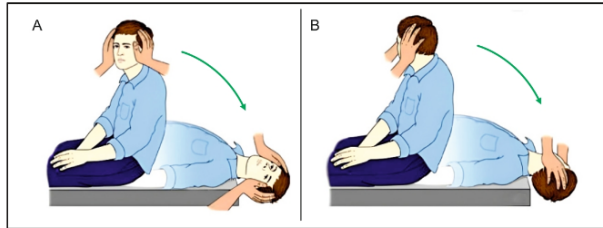
Microwick microcatheter

# Non Inflammatory Diseases of Ear

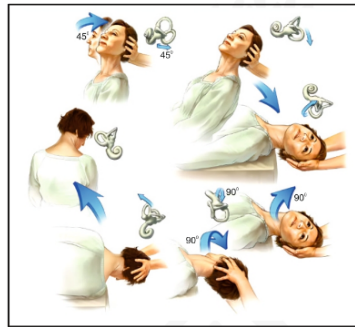
Topic Notes: 4

## Active Space

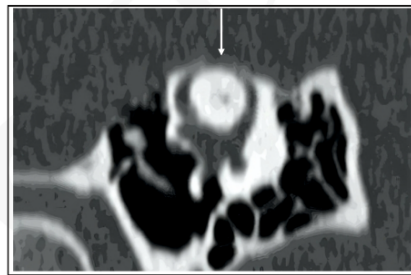
Placed at the round window



Dix Hallpike's maneuver



Epley's maneuver



superior canal dehiscence syndrome

## ← Tumors of Ear

Topic Notes: 2

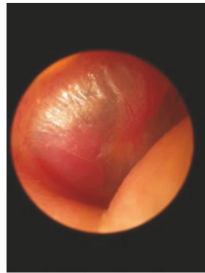
# Tumors of Ear

Active Space

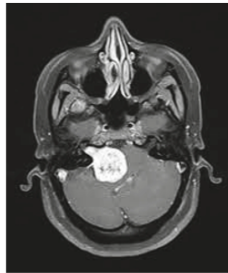
Glomus tumour	Acoustic Neuroma/Vestibular Schwannoma
Type of Paraganglioma	Schwannoma
Site: m/c 1. Finger tip 2. Ear	Arises from Inferior Vestibular nerve at Cerebello- pontine angle
M/c in females - 40- 60 yrs	Equal in Males and Females
M/c Presentation- Conductive hearing loss	Earliest symptom-→ Tinnitus and Sensory Neural Hearing loss.
Pulsatile tinnitus	m/c Presentation→ loss of corneal reflex
Signs -	Signs- Histelberger's sign
<ul style="list-style-type: none"> <li>• Rising sun sign</li> <li>• Browns sign</li> <li>• Phelp's sign</li> <li>• Aquino sign</li> </ul>	
IOC- CECT	IOC- Gadolinium MRI
Rx- Embolization→ Surgical Excision (Laser or Bipolar)	Surgery is TOC
Chemotherapy	Gamma knife stereo Tactic Radiotherapy
Radio therapy	
$\alpha$ - Blocker/ $\beta$ Blocker	

# Tumors of Ear

Topic Notes: 2



Glomus tumor



Ice cream Cone Appearance

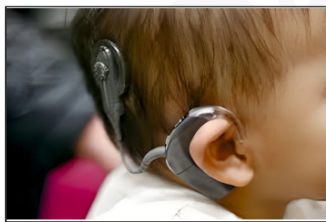
Active Space

### Devices for Hearing

- 1. Hearing Aid - Amplifier of Sound- Can be used in any hearing loss
- 2. Brainstem Implant } Speech Processors - Used only in Severe Hearing Loss in both ears.
- 3. Cochlear Implants }

Brainstem Implant- Implanted in - Recess of IVth Ventricle

Cochlear Implants - Electrodes are implanted in Scala Tympani through the Round window.



Cochlear Implant



BAHA

## Throat Anatomy

Topic Notes: 5

# Throat Anatomy

Active Space

Pharynx extends till the C6 Vertebrae.

Pharynx is divided into

1. Nasopharynx
2. Oropharynx
3. Laryngopharynx

Laryngopharynx is divided into Larynx and Hypopharynx

There are 2 tonsils in the Nasopharynx, 2 tonsils in the Oropharynx and No tonsils in the Laryngopharynx.

The line joining the 4 tonsils are called as Waldeyer's Ring.

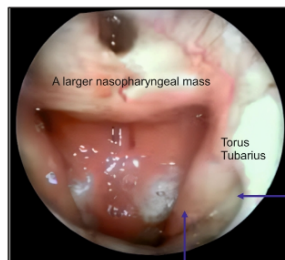
Palatine Tonsils	Adenoids
<ul style="list-style-type: none"> <li>• Two in number</li> <li>• Non-Keratinising squamous epithelium</li> <li>• Has crypts ( 10-15, Longest-Crypta Magna)</li> <li>• Has capsule</li> </ul>	<ul style="list-style-type: none"> <li>• Single</li> <li>• Ciliated columnarepithelium</li> <li>• Does not have crypts</li> <li>• No capsule</li> </ul>

Arteries of Tonsil

**Main:**

- Tonsilar branch of Facial artery
- Ascending Pharyngeal Artery
- Ascending Palatine Artery
- Descending Palatine Artery
- Dorsal Lingual Artery

Nasopharynx



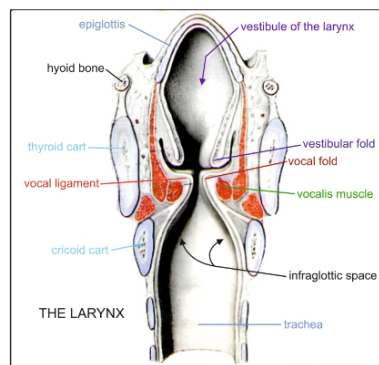
## Throat Anatomy

Topic Notes: 5

Carcinoma Mainly takes origin in the Fossa of Rossenmuller.  
If Eustatian tube is blocked it can lead to Otitis media or Glue ear.

### LARYNX ANATOMY

Mucosal lining of larynx in AP view



- Inlet of Saccule is called Ventricle.
- True cord produces Voice.
- Area containing the true cord = Glottis
- Above the glottis = Supraglottis.
- Area below the glottis = Subglottis.

#### True cord

- Lined by : Squamous epithelium
- Rienne's space
- Narrowest part
- No lymphatics.

#### Types of Cartilages

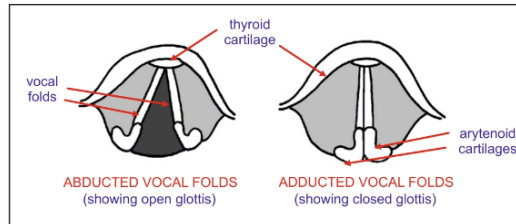
3 PAIRED	3 UNPAIRED
Cricoid	Arytenoid
Thyroid	Cunieform
Epiglottis	Corniculate

### Active Space

← **Throat Anatomy**

Topic Notes: 5

Cricoid cartilage shape: Signet ring shaped



**Important movements of Vocal cord**

1. Abduction
2. Adduction
3. Tension

Adduction and Abduction are required for Producing voice and Breathing properly  
Tension helps in modulating pitch.

Abduction	Adduction	Tension
Posterior cricoarytenoid ↓ Safety muscle ( helps breath properly)	Lateral crico arytenoid Inter arytenoid Thyro arytenoid Crico arytenoid	Cricothyroid (Main) Thyro arytenoids (weak)

Lateral crico arytenoid, Inter arytenoid - Pure Adductors

Lateral crico arytenoid, Inter arytenoid, Thyro arytenoids- Main Adductors

Crico arytenoids- Weak Adductor

Thyro arytenoids has weak tension power. Hence not regarded as tensor.

Adductors and Abductors are supplied by the Recurrent Laryngeal Nerve (RLN).

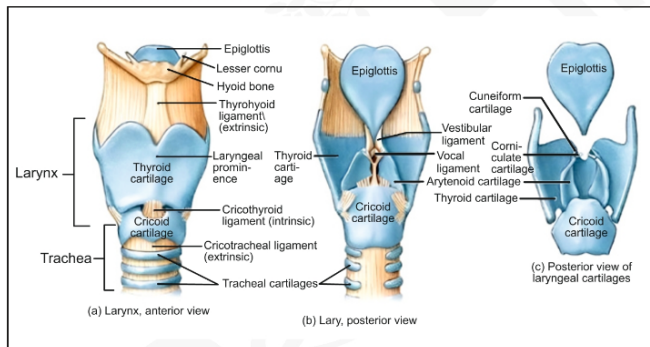
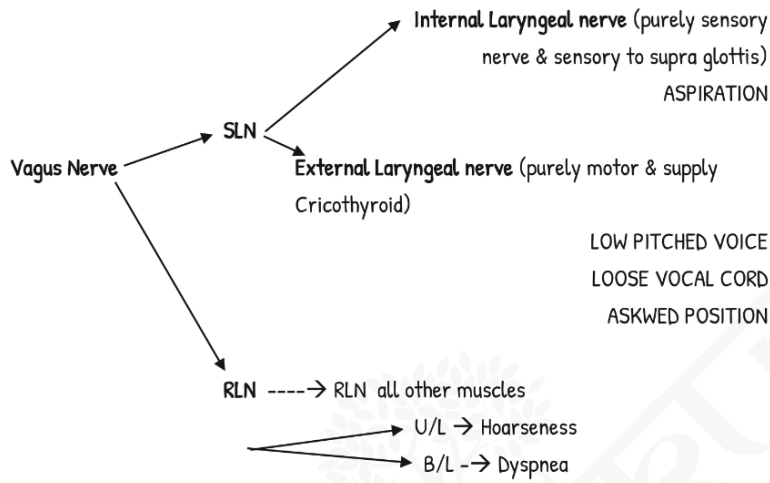
Cricothyroid - Supplied by External Laryngeal Nerve ( Superior Laryngeal nerve).

Recurrent Laryngeal Nerve & Superior Laryngeal nerve (SLN) are branches of Vagus nerve (X).

**Active Space**

← **Throat Anatomy**  
Topic Notes: 5

**Active Space**



**Instruments used for Laryngoscopy**



Indirect laryngoscopy mirror

# Throat Anatomy

Topic Notes: 5

## Active Space



Direct laryngoscope



Fiber optic laryngoscope



Laryngeal Stroboscope.



Vibration pattern of mucosa.

## ← Diseases of Throat

Topic Notes: 12

# Diseases of Throat

Active Space

### Adenoid Facies

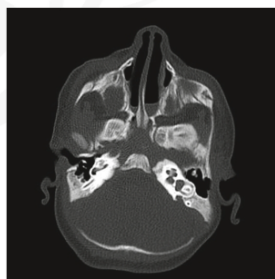
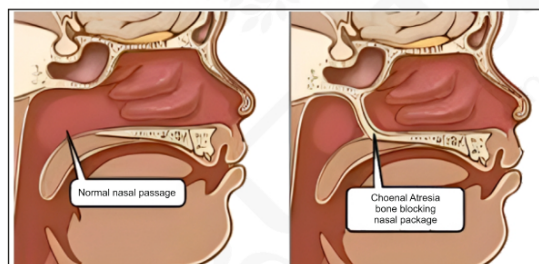
- High-arched palate
- Prominent upper teeth & crowded teeth
- Pinched nose or collapsed ala
- Hypoplastic maxilla
- Dull expressions
- Long face

**Choana** : posterior end of nose

Child has to breath through Choana

**Choanal Atresia**: Closed choana

Could be U/L or B/L



Causes: Bucco Nasal Membrane

Syndorme: CHARGE syndrome

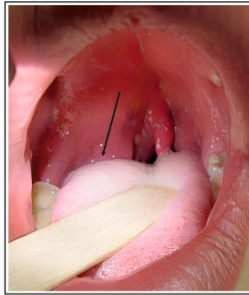
Treatment: Mc Govern's technique - Life saving (imp)

## ← Diseases of Throat

Topic Notes: 12

### Active Space

#### Quincy



- Peritonsillar abscess
- Pus lies between capsule and superior constrictor muscle
- Hot Potato condition
- Rx- Immediate Incision and drainage  
f/b interval tonsillectomy

#### Ranula



- Retention cyst of sublingual gland
- Marsupialisation is done

#### Ludwig's angina



- Cellulitis of Sub mandibular space
- Woody floor of mouth
- Double tongue
- Rx: Incision and Drainage + Antibiotics

## ← Diseases of Throat

Topic Notes: 12

### Active Space

#### Tonsillitis

5 types

- Catarrhal-----> m/c Adeno virus
- Follicular-----> Strep. pyogenes
- Membranous-----> Strep. pyogenes
- Parenchymatous-----> Strep. pyogenes
- Fibrinoid -----> any cause

Membranous- never cross the boundary of tonsil.

Diphtheria- crosses to involvr palate etc

#### Tonsillectomy

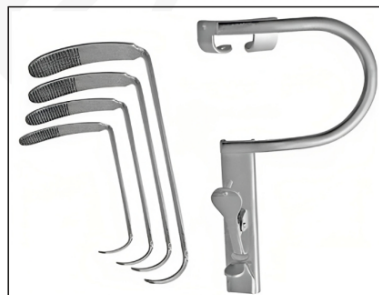
Indication	C/I
M/c : recurrent tonsillitis	Acute tonsillitis
Chronic tonsillitis	Bleeding disorders
Rheumatic tonsillitis	Cleft palate
Suspicion of malignancy	Polio epidemic
Quincy	
Eagle's disease	

#### Procedure

Position: Rose position

Instruments used

Boyle Davis Mouth gag



## ← Diseases of Throat

Topic Notes: 12

### Active Space



Eve's tonsillar snare



St Clair Thompson adenoid curette

#### Complication:

- (M/c) Bleeding
- Dislocation of joint----> Atlanto axial Joint ( Grisel's syndrome) ,Temporo-Mandibular joint
- Tooth extraction
- Sepsis

#### Bleeding

- Primary ---- During Surgery
  - Reactionary----within 24hrs
  - Secondary --- (m/c) 5-8days
- During surgery bleeding occurs due to venous blood from - Para tonsillar plexus of vein.
  - Reactionary Bleeding- Due to slippage of ligature. It is severe and sudden. Immediate reoperation under general anesthesia in OT
  - Secondary Bleeding - Due to infection. Requires antibiotic and reoperation under general anesthesia

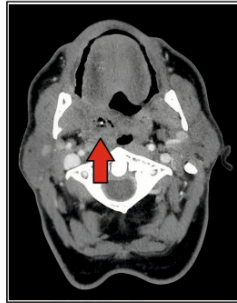
# Diseases of Throat

Topic Notes: 12

## Methods of tonsillectomy

- Snare
- Bipolar
- Laser
- Microdebridement
- Coblation radiofrequency

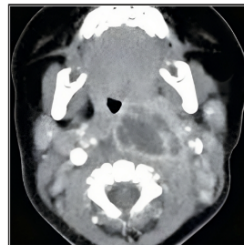
## Active Space



Peritonsillar space abscess / Quincy



Retropharyngeal abscess

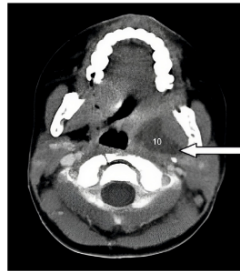


Retropharyngeal abscess

## ← Diseases of Throat

Topic Notes: 12

### Active Space



Parapharyngeal abscess

#### Laryngomalacia

- M/c congenital disease of larynx
- A newborn with inspiratory stridor
- O/E : Omega shaped epiglottis
- Rx: Reassurance

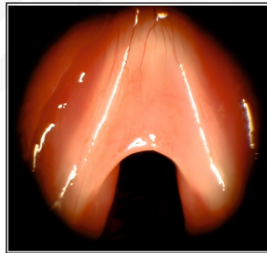
#### Subglottic stenosis

- Expiratory stridor
- Grading: Myer & Cotton grade (mcq)

Rx: Conservative +/- Steroids  
Local mitomycin C

#### Glottic web

M/c site : Anterior Glottis



#### Voice disorders

Spasmodic dysphonia - Change of voice due to spasm of the laryngeal muscles

Mainly: Adductor spasm.

Rx: Injection of Botox

## ← Diseases of Throat

Topic Notes: 12

### Active Space

#### Puberophonía

- K/a Falsetto mutation
- Rx- a) Speech therapy  
b) Gutzman's technique  
c) Type 3 thyroplasty or relaxation thyroplasty

#### Androphonia

- Adult female having male like voice  
Rx- Speech therapy  
Type IV thyroplasty / tension of vocal cord  
Reduction Glottoplasty
- Phonasthenia / Fatiguable muscles  
O/E - Key hole Glottis
- Rhinolalia Aperta a.k.a - Hypernasality  
Usually Palate problem like - Cleft palate, Soft palate palsy, Palatoplasty
- Rhinolalia Clausa a.k.a - Hyponasality  
Any growth in nose or nasopharynx  
Tumour, polyp, hypertrophy of tissue

#### Vocal cord palsy

4 causes

- Thyroidectomy surgery (m/c)
- Idiopathic
- Tumours
- Ortner's syndrome
- Arthritis

← **Diseases of Throat**  
Topic Notes: 12

**Active Space**

Due to nerve damage

Recurrent laryngeal nerve ( Abductor palsy)		Vagus palsy ( Adductor palsy )	
U/L	B/L	U/L	B/L
Paramedian position on One side	B/L paramedian position	U/L cadaveric position	B/L cadaveric position
Hoarseness	Dyspnea with good voice	Hoarseness +/- aspiration	Aspiration + aphonia
Normal			
No Surgery	<ul style="list-style-type: none"> <li>Type II thyroplasty or lateralization</li> <li>Kashima's operation</li> <li>Cordoplasty</li> <li>Arytenoidectomy or woodman's surgery</li> </ul>	Type I thyroplasty or medialisation	<ul style="list-style-type: none"> <li>Epiglottopexy</li> <li>Total laryngectomy</li> </ul>

External laryngeal nerve	Superior laryngeal nerve
Only Cricothyroid muscle	Cricothyroid muscle
Low pitched voice Loose vocal cord Askwed position	Low pitched voice Loose vocal cord Askwed position + Aspiration

## ← Diseases of Throat

Topic Notes: 12

### Active Space

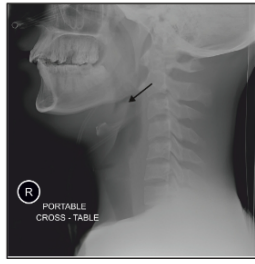
Thyroplasty	What is done	Indication
Type I	Medialisation	Adductor palsy & abductor spasm---- improve voice
Type II	Lateralization	Abductor palsy & adductor spasm--relieve dyspnoea
Type III	Shorten/loosen	Puberphonia- --decrease Pitch of voice
Type IV	Lengthen/tense	Androphonia- -Increase pitch

### Infections of larynx

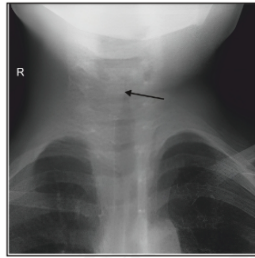
Acute epiglottitis	CROUP (acute laryngo- tracheo-bronchitis)	Laryngeal TB
Pathogen: Strep pyogenes Strop pneumonia	Para influenza	Mycobacterium
Age: 5years	3 years	Any
Dyspnea, dysphagia & fever	Dyspnea, voice change & mild fever	Hoarseness + throat Pain
Cherry red epiglottitis	X	Turban epiglottitis Mouse nibbled appearance Cobble stone appearance
X-ray -> Thumb sign	Steeple sign/ Pencil tip	X
DOC- 3 <sup>rd</sup> gen cephalosporins	Steroid Nebulisation Antibiotic	ATT

← Diseases of Throat  
Topic Notes: 12

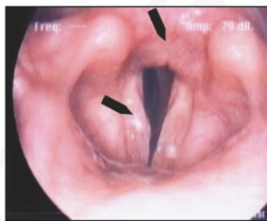
Active Space



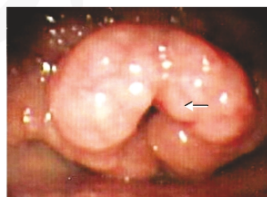
Acute epiglottitis



Steeple sign



Cobblestoning



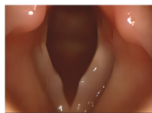




Turban epiglottitis

← Diseases of Throat  
Topic Notes: 12

Cherry red epiglottitis



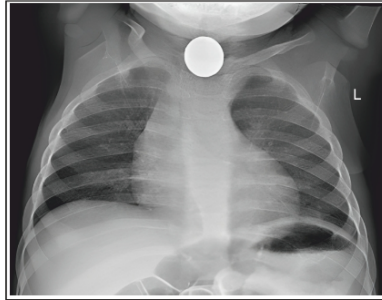
Active Space

Vocal cord nodule (Singer's)	Vocal cord polyp	Rienke's edema	Laryngocoele	Intubation granuloma
Chronic misuse of voice	Chronic misuse of voice	Talkative, smoking in females	Trumpet blower	Long intubation
Hoarseness +/- Diplophonia	Hoarseness +/- Diplophonia	Change of voice	Neck swelling	Dyspnea
Site: Junction of anterior 1/3 and posterior 2/3 of vocal cord	Junction of anterior 1/3 and posterior 2/3 of vocal cord	Rienke's space	Saccule	Junction of anterior 2/3 and posterior 1/3 of vocal cord
Rx: Voice rest	<u>Surgery</u>	Conservative	Conservative	CO2 laser + steroid + Botox + Mitomycin C
For late nodule -micro-laryngeal surgery	<ul style="list-style-type: none"> <li>• MLS</li> <li>• MicroFlap</li> <li>• Pulse dye laser</li> </ul>			
				

## Diseases of Throat

Topic Notes: 12

Foreign bodies



If the seen as whole - Coin in Cricopharynx or epiglottis

If edge of the coin is seen - Larynx or trachea

Active Space

## Tumors of Throat

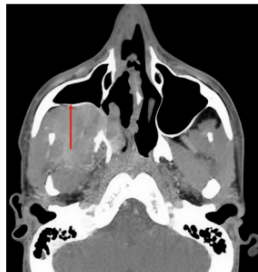
Active Space

Juvenile NP angiofibroma	Juvenile Laryngeal papilloma
Site: Sphenopalatine foramen	Site: Glottis
Causes: Incomplete regression of 1 <sup>st</sup> brachial arch arteries	HPV 6 and HPV 11
Complaint- Epistaxis	Hoarseness +/- dyspnea
Signs- Antral sign Frog face	X
IOC- CECT	Bronchoscopy
Rx- Embolization Surgical excision ( laser or bipolar)	Microdebridement + anti viral (Intralesional injections - cidofovir Systemic- $\alpha$ -2 interferons

Juvenile NP angiofibroma



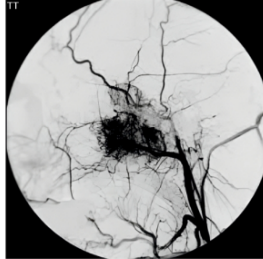
Antral sign



← **Tumors of Throat**  
Topic Notes: 4

Active Space

Digital subtraction angiography



Multiple papilloma of larynx



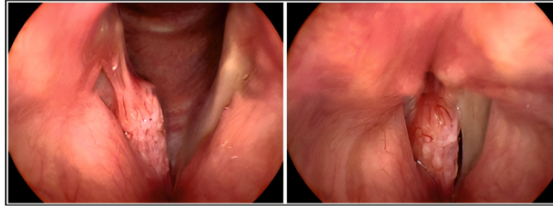
Nasopharyngeal Carcinoma	Laryngeal Carcinoma
Site: Fossa of Rosenmuller	Glottis
Cause- EBV Genetic Nitrosamine	Smoking+/- alcohol
M/c presentation - Cervical Lymphadenopathy	Hoarseness +/- Dyspnea
Trotter's triad- Soft Palate palsy Facial pain Hearing loss	Stages I } Transoral laser microsurgery II } Subglottic---- Radiotherapy III } IVa } Concurrent Chemo radiation IVb }
Rx- Chemoradiation	IVc } Concurrent Chemo radiation + Salvage surgery

# Tumors of Throat

Topic Notes: 4

## Active Space

Laryngeal carcinoma



Tracheostomy

M/c : Laryngeal obstruction due to laryngeal carcinoma

Site: Ring 2 & ring 3 ( ring 3 - best ans )

Ring 1 - High tracheostomy --- > only done in Laryngeal carcinoma

Complication - Dislodgement of tube

Bleeding

Sub Cutaneous emphysema

Loss of speech Can happen in Tracheostomy and Total laryngectomy

Given speech Rehabilitation

Tracheostomy----> best option - Tracheostomy tube with muir passy valve

Total laryngectomy ----> Tracheo Esophageal speech with valve



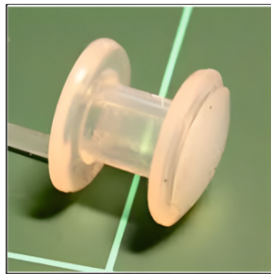
Tracheostomy tube with muir passy valve

← **Tumors of Throat**  
Topic Notes: 4

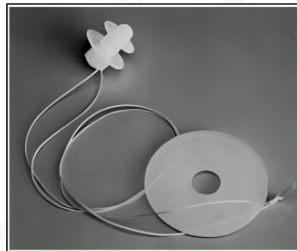
Active Space



Blom singer Valve



Groningen button



Panje voice button

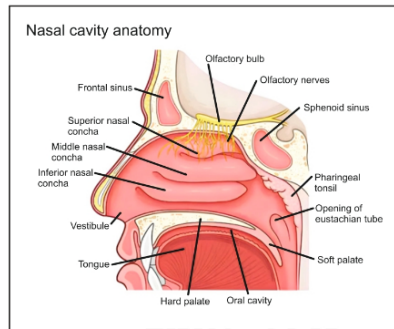
All the above

- Valve for Tracheo-Esophageal speech after total laryngectomy.

## Nose and Sinuses

Active Space

Anatomy



**Roof :**

Cribiform plate - If fractured—CSF rhinorrhea

Fovea Ethmoidalis

Lining: Olfactory epithelium

Tumour- Esthioneuroblastoma



Esthioneuroblastoma

CSF rhinorrhea

m/c cause- # of cribriform plate

Surgical Fracture

Non surgical Fracture

CSF different from Normal discharge-

Halo sign/ Target sign

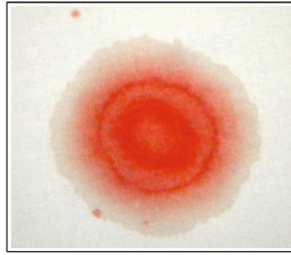
Glucose > 30gms

# Nose & Sinuses

Topic Notes: 13

Active Space

Beta-2-trasferrin----- MOST SPECIFIC



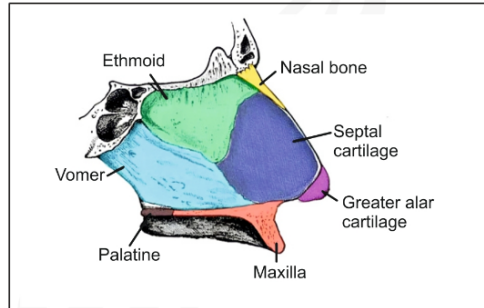
csf rhinorrhea halo sign

### Investigation - HRCT

MR Cisternography

Rx- Conservative

### NASAL SEPTUM



### Arteries supplying the nasal septum

- 1. Sphenopalatine artery
  - 2. Greater palatine
  - 3. Superior labial artery
- } External Carotid artery
- 
- 4. Anterior ethmoidal
  - 5. Posterior ethmoidal
- } Internal Carotid artery

Sphenopalatine artery --- Branch of maxillary artery

Superior labial artery--- branch of Facial artery

## ← Nose & Sinuses

Topic Notes: 13

### Active Space

First 4 forms a Plexus called as Kiesselbach's plexus. Located in Little's area.

M/c site for epistaxis

Epistaxis

**m/c bleed** – Sphenopalatine artery

Causes – idiopathic

Trauma (m/c cause)---- nose picking

Foreign body – U/L

Hypertension – Adult

Control Epistaxis-

Nose pinching ( 5-10mins)

↓

Cautery--- Silver nitrate

↓

Nasal packing

↓

If fails ---- Ligation (Sphenopalatine artery ligation)

Procedure- Transnasal endoscopic sphenopalatine artery ligation ( TESPA)

↓

Maxillary artery ligation

↓

External carotid artery

↓

Anterior Ethmoidal Ligaton

Trauma of septum can cause

1. Epistaxis
2. Hematoma
3. Fracture
4. Deviated Nasal Septum

Hematoma of septum

Almost always B/L

Immediate drainage should be done --- otherwise--→ Septal perforation

Septal perforation

M/c cause - Submucosal resection

Inflammatory condition

## ← Nose & Sinuses

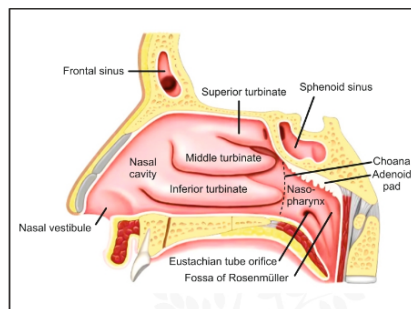
Topic Notes: 13

### Active Space

#### Lymphomas

Septal buttons can be used to close it

#### Lateral wall of nose



#### 3 turbinates/ Concha

#### 4 meatus

Inferior meatus

Middle meatus

Superior meatus

Supreme meatus a/k/a—Spheno ethmoidal recess

#### 5 ostia

Maxillary } Middle meatus  
Frontal } Middle meatus

Anterior Ethmoidal }

Posterior Ethmoidal-- opening in the--Superior meatus

Sphenoid --- opening in the -Spheno ethmoidal recess

Inferior meatus doesn't have ostia

But has Naso Lacrimal duct (NLD)

Direction - Downward, backward and outward

Disease --- If blocked--- Dacrocystorhinostomy ( opening made in the middle meatus)

--- Forms cyst--Nasolabial cyst

Rx - surgical incision

#### Sinuses

First sinus to start development : Maxilla > Ethmoid > Sphenoid > Frontal

## ← Nose & Sinuses

Topic Notes: 13

### Active Space

#### Maxillary sinus

- Largest
- 15ml of volume
- Antrum of highmore
- X-ray view - water's view + Pierre's view

#### Ethmoidal sinus

Multicellular (8-9) (some have Names)

- Largest --- Bulla ethmoidalis
- Most anterior—Agar nasi
- Below orbit—Heller cell
- Near optic nerve—Onodi cell

#### Sphenoid sinus

X-ray view-- Pierre's view

#### Frontal sinus

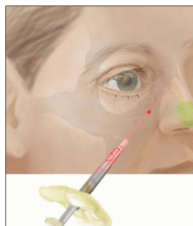
X-ray view—Caldwell's view

#### Nerves

1. Olfactory nerve
2. Autonomic nervous system—Para sympathetic and Sympathetic---→ Vidian nerve
  - ↑ Para sympathetic---→ Vaso motor Rhinitis
  - Vidian neurectomy can be done
3. Sensory supply
 

<ol style="list-style-type: none"> <li>1. Naso palatine nerve</li> <li>2. Anterior ethmoidal nerve</li> <li>3. Posterior ethmoidal nerve</li> <li>4. Greater palatine nerve</li> </ol>	}	Usually blocked.
--	---	------------------

Only block 2 of the 4 nerves.



## ← Nose & Sinuses

Topic Notes: 13

### Active Space

#### Rhinosinusitis

- a. Allergic rhinitis
- b. Vasomotor rhinitis
- c. Infective rhinitis- Fungal, viral, bacteria
- d. Irritative rhinitis
  - Simple chronic rhinitis
  - Hypertrophic rhinitis
  - Rhinitis medicamentosa
  - Rhinitis caseosa
  - Rhinitis sicca
  - Atrophic rhinitis

#### Atrophic rhinitis

- A/K/a—Ozeana
- M/c/c: ↓ Estrogen

#### Features

- Roomy cavity
  - Dryness
  - Crust-----> Blockade is m/c presentation
  - Anosmia
  - Foul smell
  - May bleed
- } Merciful anosmia

#### Rx- Alkaline Nasal Douche

- Sodium Bicarbonate
- Sodium Biborate
- Sodium chloride

#### Surgery- Young's operation

- Modified Young's
- Lautenslayer's surgery

#### Fungal rhinosinusitis

1. Aspergillosis --- Aspergillus. Fumigates  
m/c --- aspergilloma----- Surgical excision
2. Fulminant fungal sinusitis - → Aspergillus fumigatus

## ← Nose & Sinuses

Topic Notes: 13

### Active Space

3. Mucormycosis or----->Rhizopus  
Rhino-Orbito-Cerebral mucormycosis (ROCM)

Fulminant fungal sinusitis & Mucormycosis

Both seen in Diabetic/ steroid

Invasive fungal disease

Investigation—Staining/ culture

Gadolinium MRI

DOC- Lyosomal Amphotericin B + FESS

- Mucormycosis - angio invasive----> necrosis----> Black in colour



4. Allergic Fungal rhinitis

Bent & Kuhn criteria

#### Major

- IgE mediated/ Type 1 Hypersensitivity
- Nasal polyps
- CT scan : Double density scan

#### Minor

Charcot leiden crystals  
Fungal culture = +ve

Rx-

Steroids + Antifungal + FESS



Double density scan

## ← Nose & Sinuses

Topic Notes: 13

### Active Space

IOC for rhinosinusitis : CT scan

X-ray--(m/c) Occipito- mental view

With closed mouth



Water's view

Maxilla seen the best

Sphenoid not seen

With open mouth



Pierre's view

Maxilla & Sphenoid both seen



Water's view



Pierre's view

Caldwell's - For frontal sinus



**DNS** (Deviated Nasal Septum )

M/c cause - Birth trauma

Presentation:

- Nasal block—mainly on the same side, sometimes on the opposite side (Due to compensatory hypertrophy of the inferior turbinate)
- Other nasal symptom
- Headache - due to referred pain by the anterior ethmoidal nerve. Hence called anterior ethmoidal syndrome.

Cottle's test- used for DNS

## ← Nose & Sinuses

Topic Notes: 13

### Active Space

#### Treatment-

- Septoplasty -----> Freer's incision  
or
- SMR( sub mucosal recession)-----> Killian's incision  
( more complications)  
+/-  
Turbinoplasty

#### Nasal polyps

Poor blood supply - Pale & do not bleed

poor nerve supply - Painless

#### Site-

Adult- Ethmoidal Polyp

Child - Maxillary polyp or Antro-Choanal polyp or Killian's polyp

Cause: M/c Allergy

Infection

Syndromes ( rare)

#### Syndromes

#### SAMTER'S TRIAD

- Ethmoidal polyp
- Asthma
- Aspirin sensitivity

#### KARTEGEMNER'S SYND

- Bronchiectasis
- Polyp/Sinusitis
- Situs inversus/dextrocardia

#### YOUNG'S SYND

- Polyp/Sinusitis
- Bronchiectasis
- Azoospermia/infertility

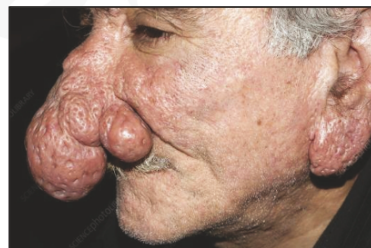
← **Nose & Sinuses**  
Topic Notes: 13

**Active Space**

Maxillary polyp	Ethmoidal polyp
Children	Adult
Infection	Allergy
Single & U/L	B/L & multiple : bunch of grapes
Not recurrent	Recurrent
Antibiotic + FESS	Steroid + FESS
	Recurrent--> Ethmoidectomy

Rhinolith	Rhinophyma	Rhinoscleroma	Rhinosporidiosis
Old calcified Foreign body in nose	'Potato Nose'	Caused by Klebsiela. Rhinoscleromatis or Frisch bacilli	Caused by Rhinosporidium seeberi ( Aquatic protozoan)
U/L foul smell +/- bleed	Hypertrophy of sebaceous gland	'Woody nose'	Presentation: Strawberry Polyps
Removal	Cosmetic problem	HPE- Mikulicz cell Russel body	
		Rx: DOC- Streptomycin Cautery incision	Rx: DOC- Dapsone Cautery incision

Rhinophyma



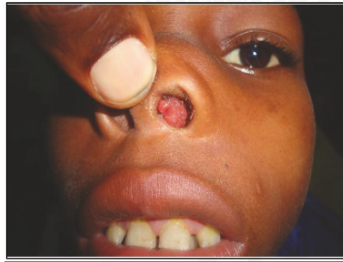
← **Nose & Sinuses**  
Topic Notes: 13

Active Space

Rhinoscleroma



Rhinosporidiosis



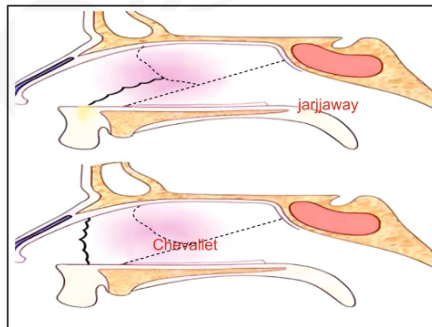
Fractures of Facial bone

Septal fracture

Chevellet fracture----> Vertical

Jarjaway fracture----> Horizontal

Rx: Closed reduction



## Nose & Sinuses

Topic Notes: 13

### Active Space

Ash's forceps



Used for septal fracture reduction

Welsham's forceps



Used for nasal bone reduction ( Straight)

### TUMOURS OF NOSE & SINUSES

- Inverted Papilloma: Ringertz tumour
- Benign tumour of nose with malignant potential
- Males > females
- Epistaxis
- CT scan or MRI

Rx:

Excision with wide margin ( 1-2 cm)

Or

Medial Maxillectomy (MM)

OR

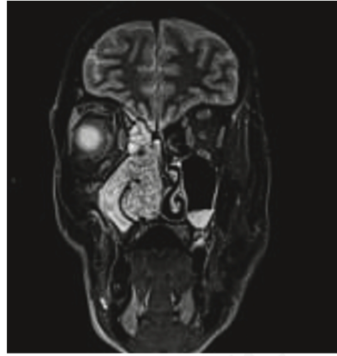
TEMM ( transnasal endoscopic Medial Maxillectomy)

MRI- Convoluted cerebriform pattern/ cerebral cortical gyrations

# Nose & Sinuses

Topic Notes: 13

## Active Space



Sino Nasal carcinoma

m/c site: Maxilla--- Squamous cell CA

2<sup>nd</sup> m/c ----> Adenocarcinoma-----> woodworker (*mcq*)

Ohngren's line : Line drawn from Medial canthus of eye to angle of mandible

Above--Supra structure--- Poor prognosis

Below --- Infra structure--- Good prognosis

