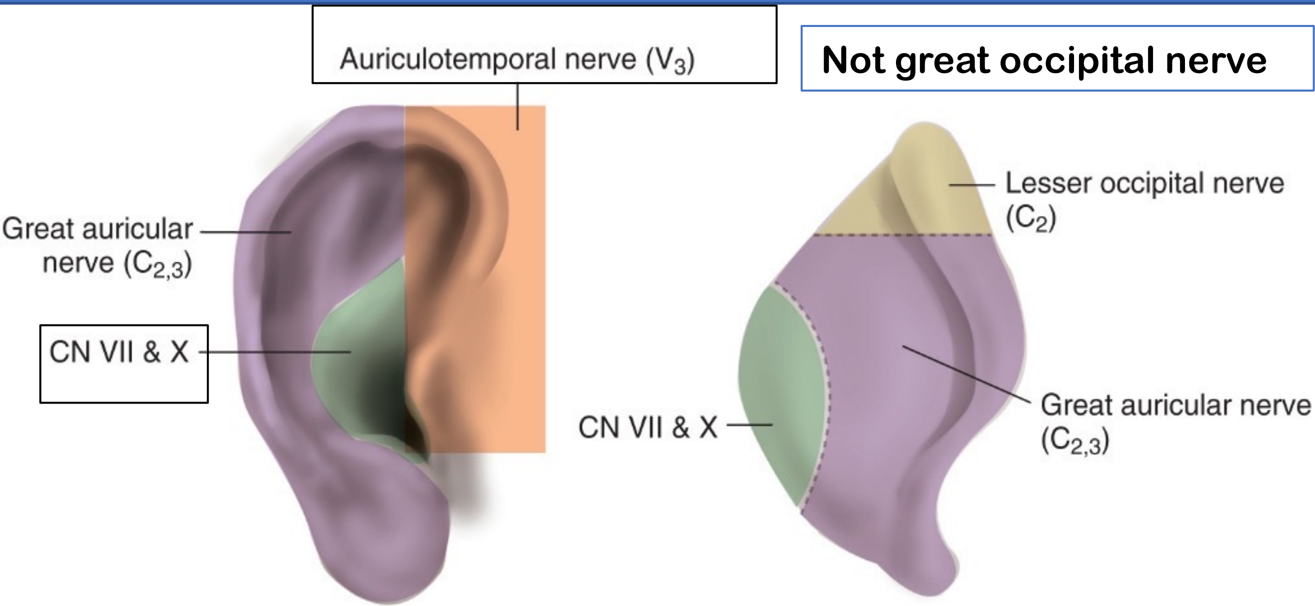
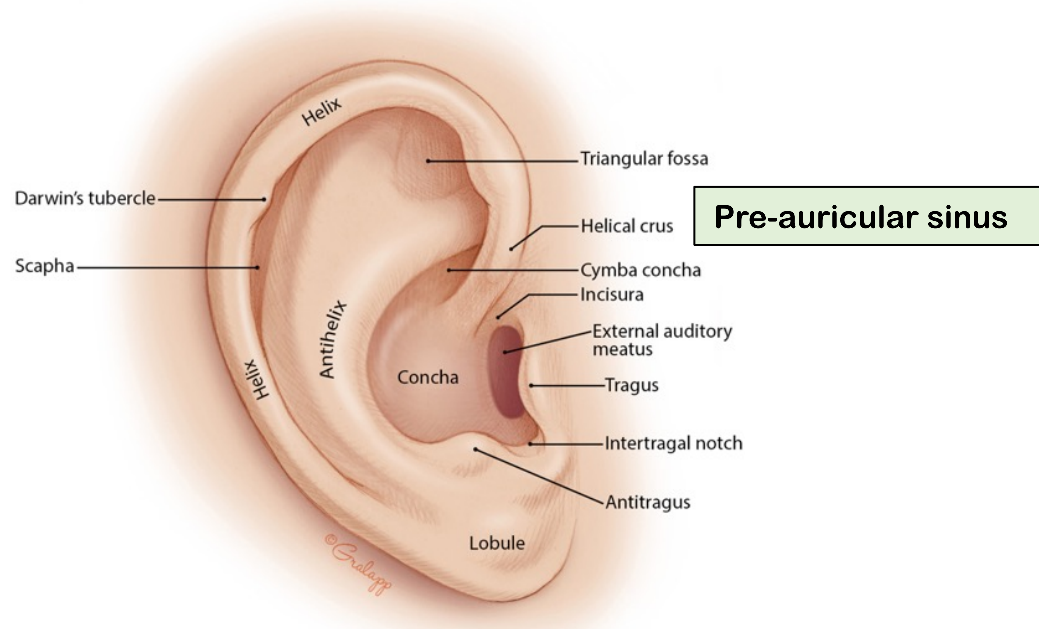
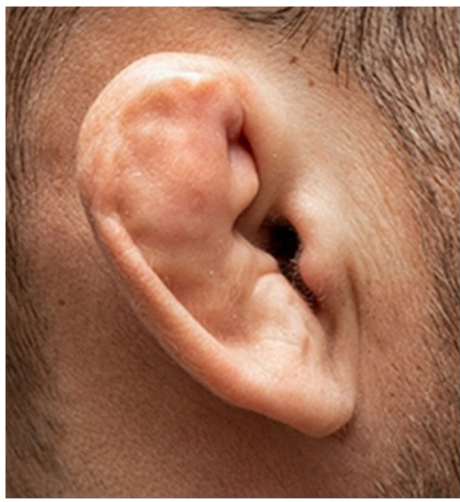
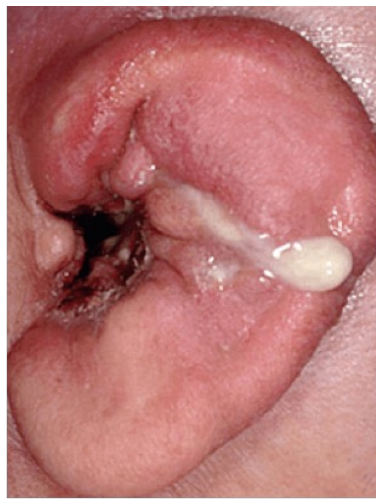
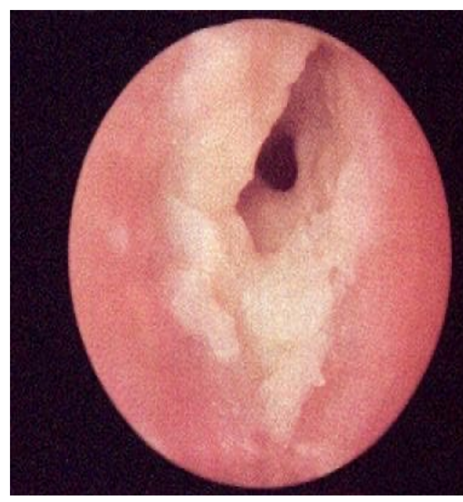
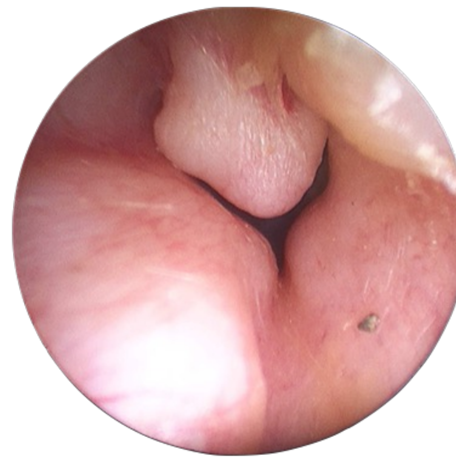
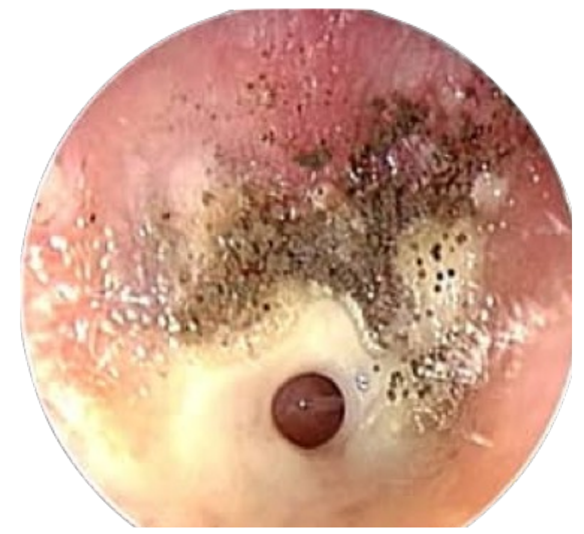
ENT

External ear





Middle ear:
Utricle, Sup, Lat SCC:
Saccule, Post SCC:
<u>Referred Otalgia</u>:
-Tonsillitis:
-Larynx/ Pharynx:
-Face:
<u>EAC : 24mm</u>
<u>Narrowest:</u>
Outer 1/3: Cartilaginous-SANTORINI-
Inner 2/3: Bony-HUSHKE (<4yrs)-
Syringing direction-
Syncope on syringing:
Hitzelberger sign:
Incisura terminalis-Lempert endaural incision

SURFER EAR:

SWIMMER EAR:

TYMPANIC MEMBRANE

55 degree, 55mm2 vibratory area

- Epithelial
- Fibrous
- Mucosal

Areal ratio: 17 (TM: stapes)

Lever ratio: 1.3 (amplifying force)

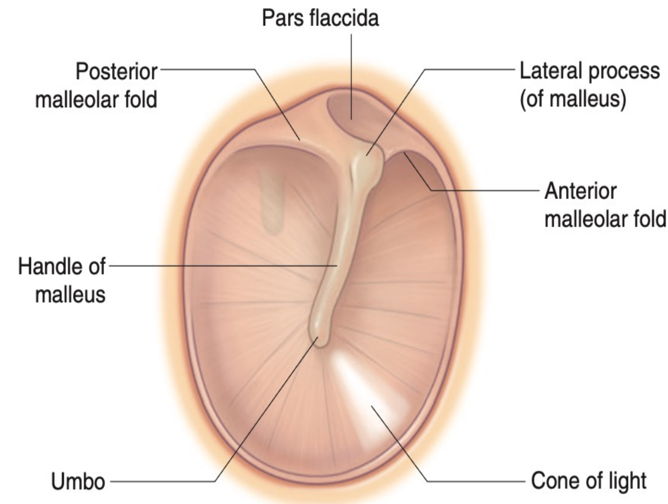
Transformer ratio: 22 (total amplification)

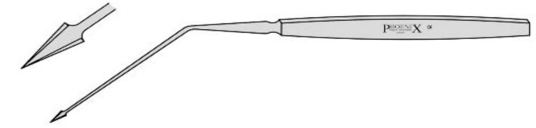
Phase difference between OW and RW

Epitympanum

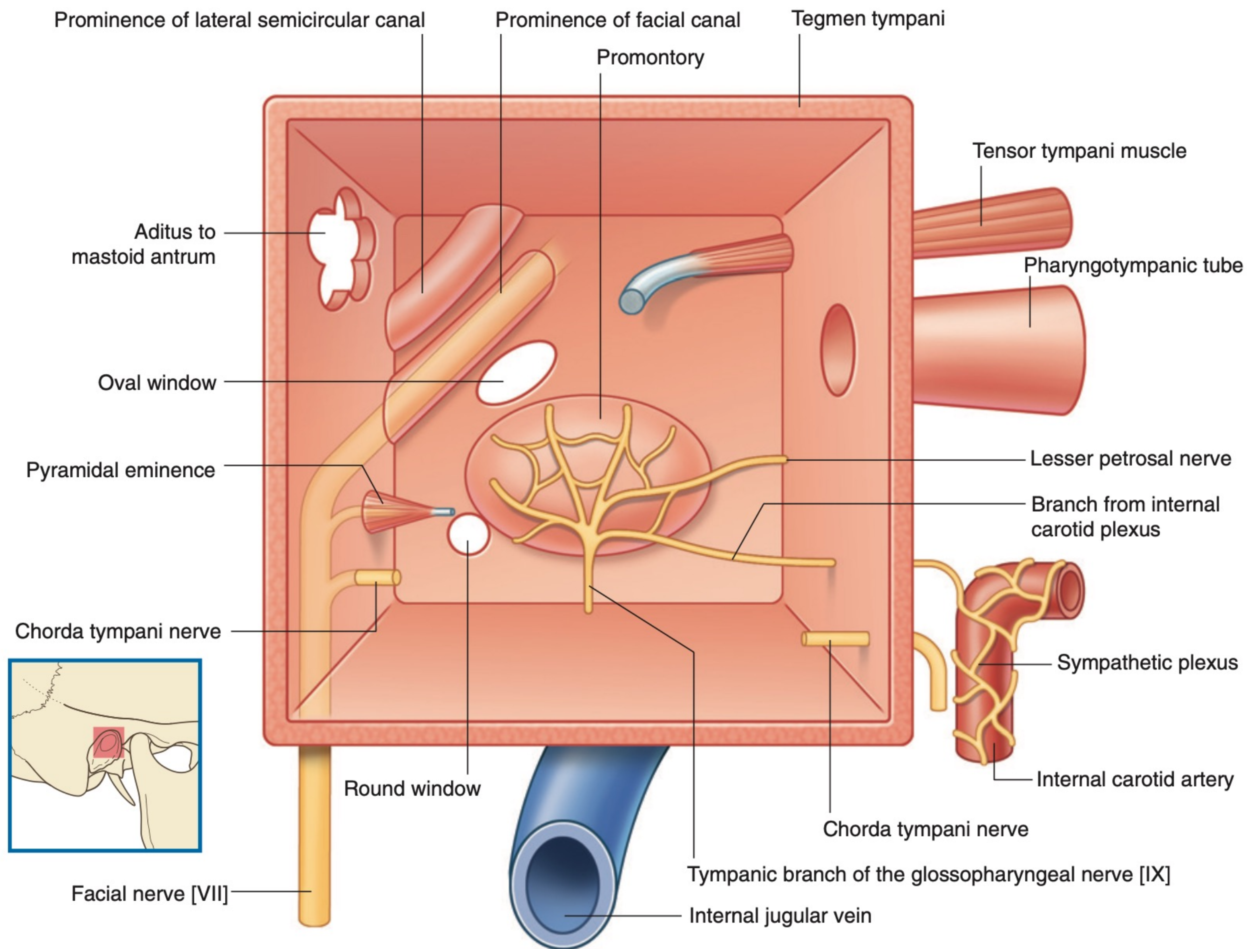
Mesotympanum

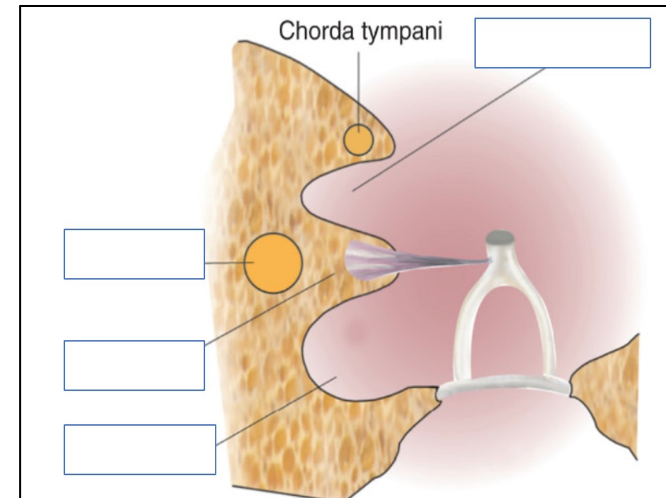
Hypotympanum

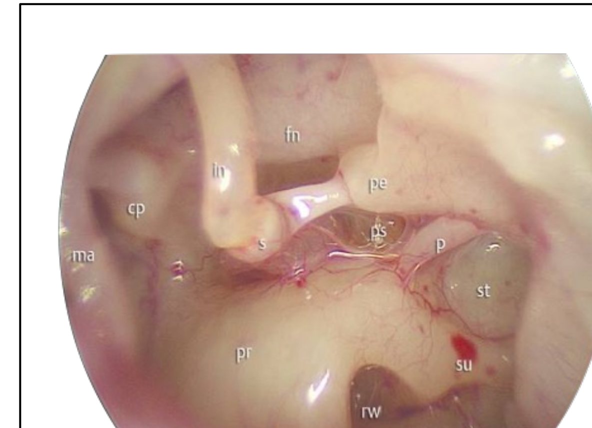


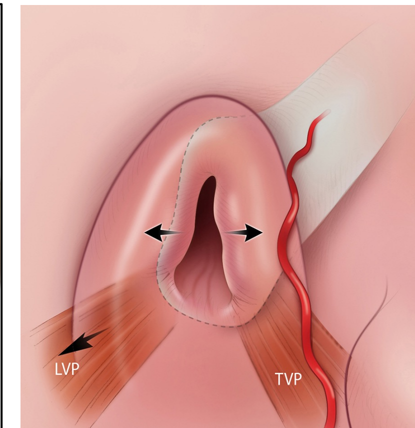


Middle ear anatomy

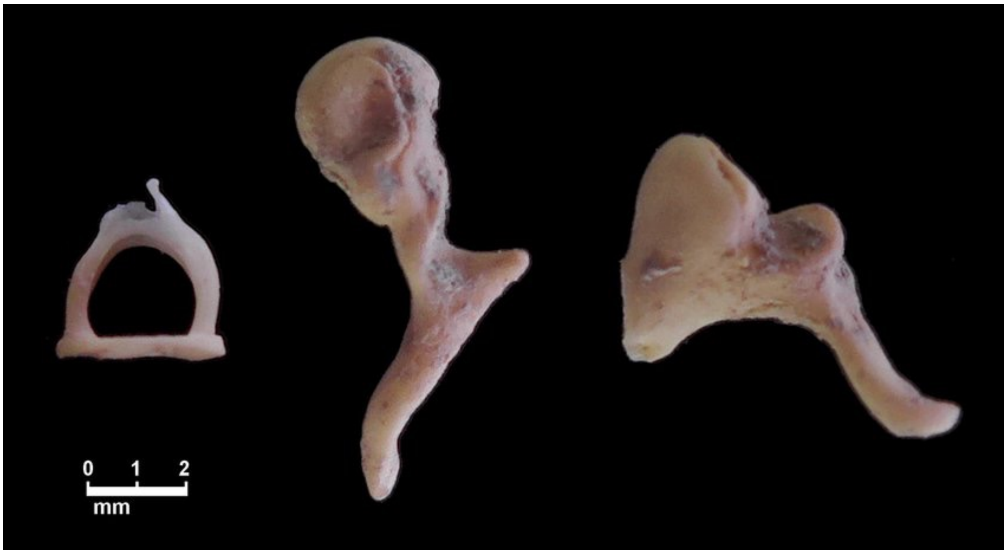


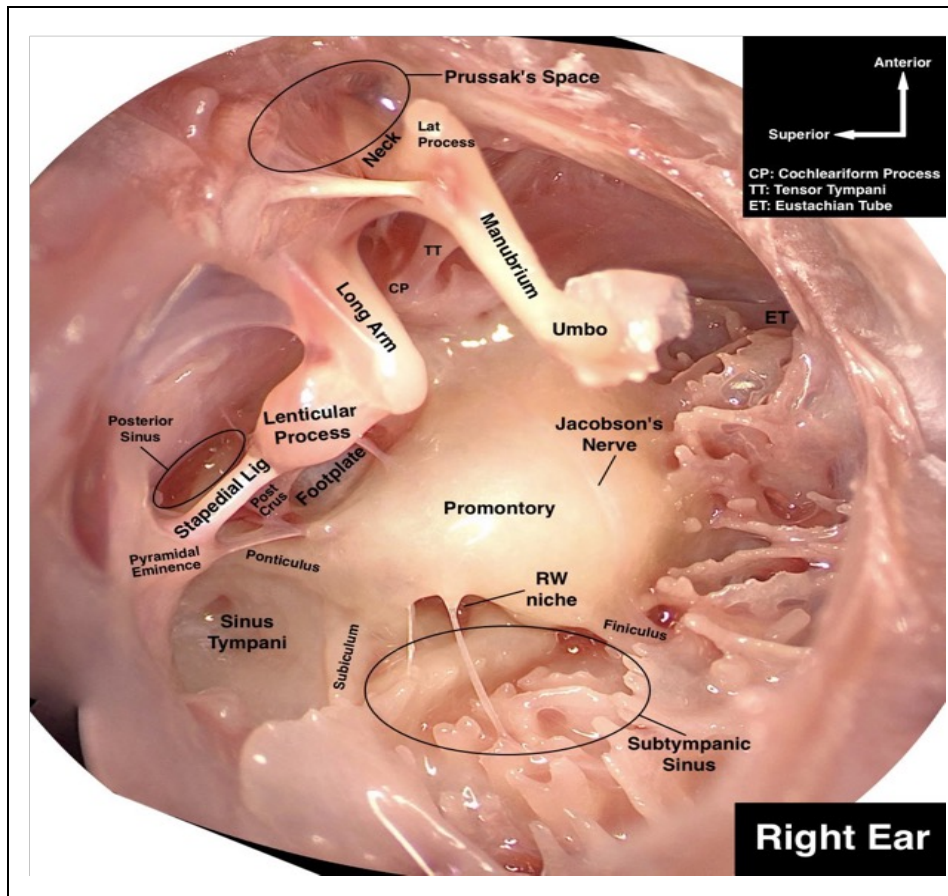




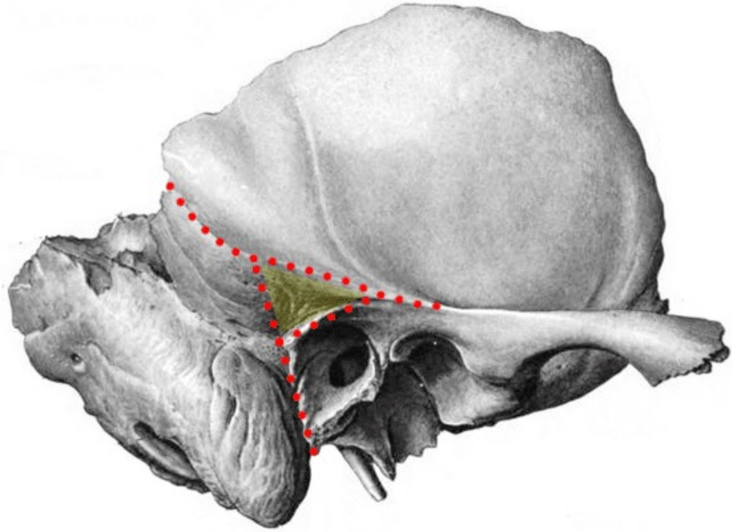


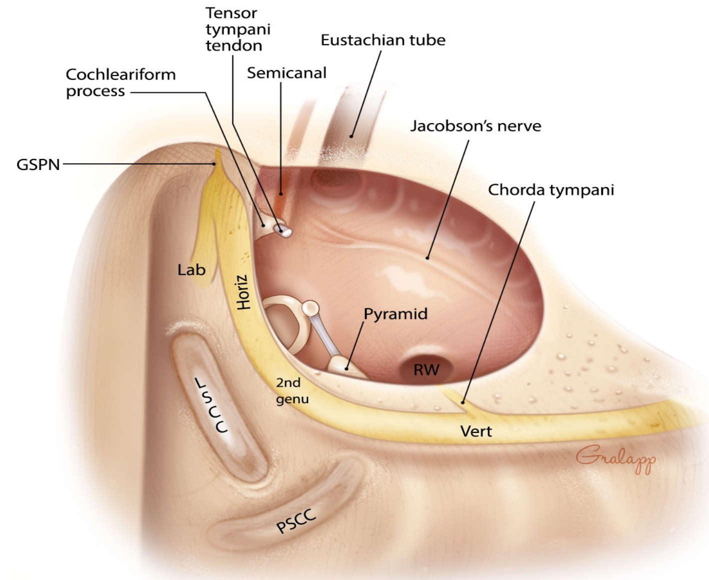
Eustachian tube:
Childer: Shorter, wider, horizontal
Ostmann pad of fat: Patulous ET- autophony

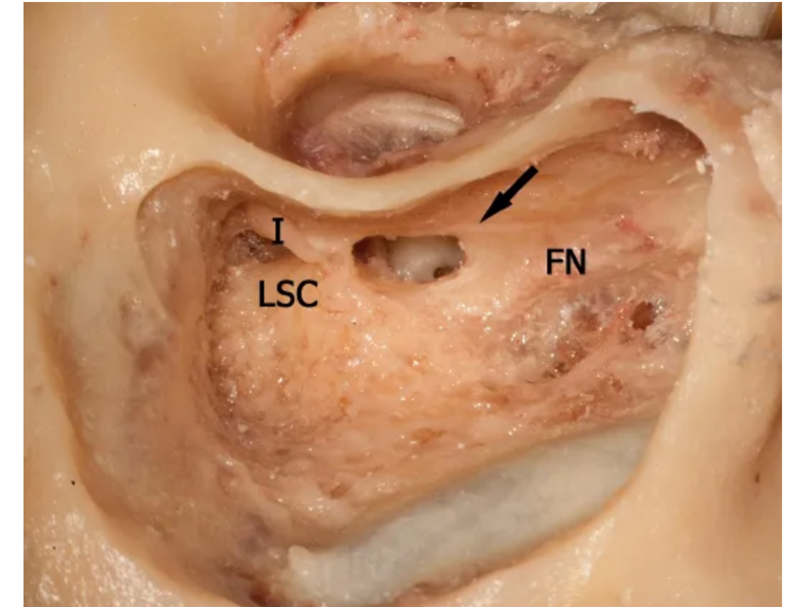

0 1 2
mm

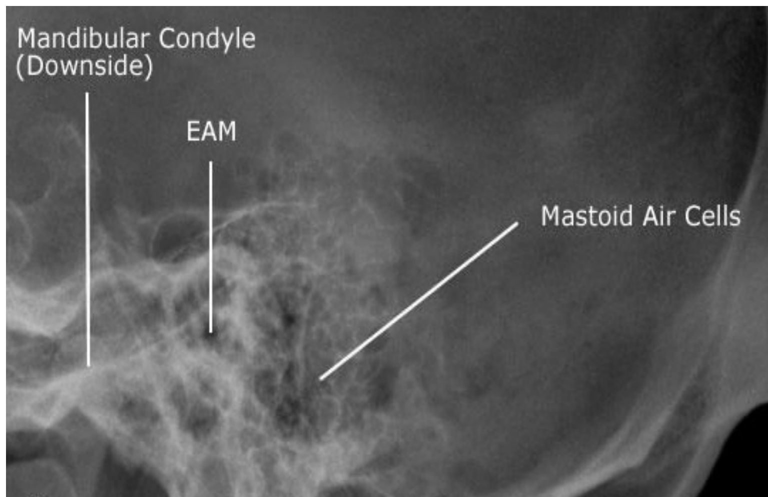

Anterior
Superior
CP: Cochleariform Process
TT: Tensor Tympani
ET: Eustachian Tube
Prussak's Space
Neck
Lat Process
Manubrium
TT
CP
Long Arm
Umbo
ET
Posterior Sinus
Lenticular Process
Jacobson's Nerve
Stapedial Lig
Post Crus
Footplate
Promontory
Pyramidal Eminence
Ponticulus
RW niche
Finiculus
Sinus Tympani
Subiculum
Subtympanic Sinus
Right Ear

Surgical approach





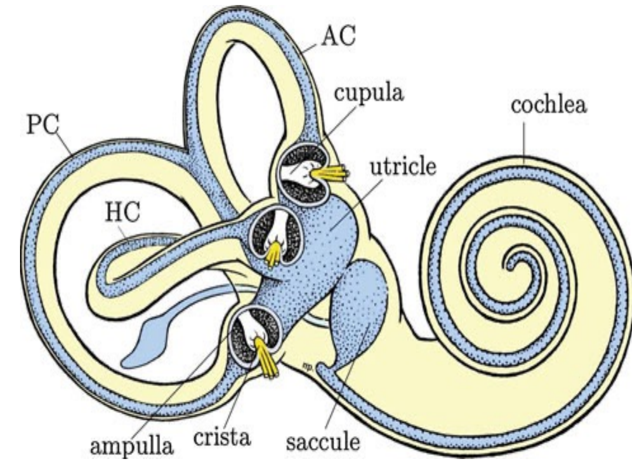


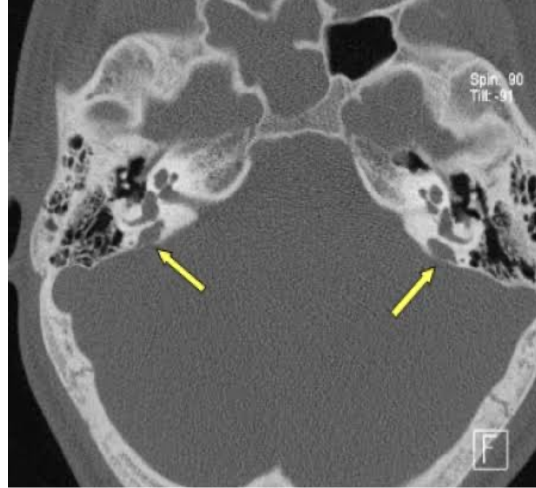


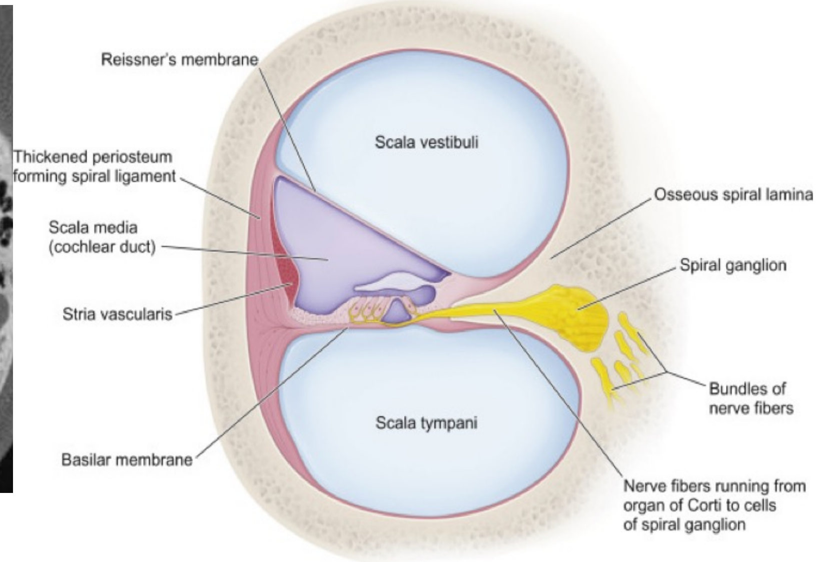
- Superior: Superior petrosal sinus
- Posterior: Sigmoid sinus
- Anterior: Bony labyrinth

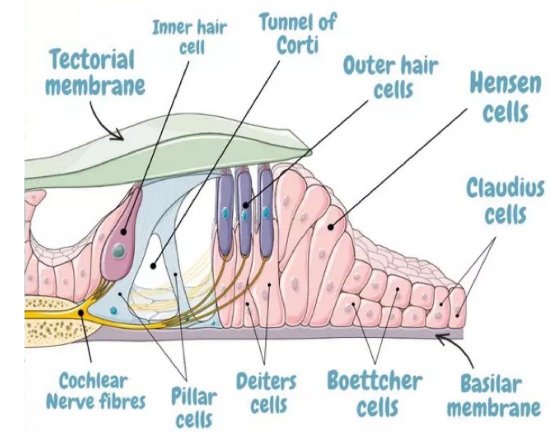
Korner septum: Persistent petrosquamous suture

Inner ear







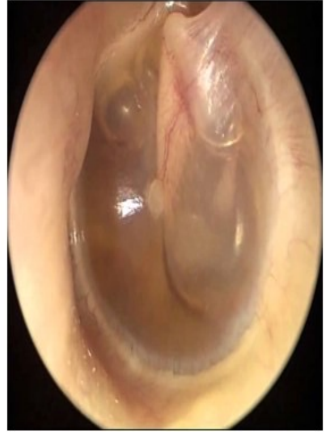
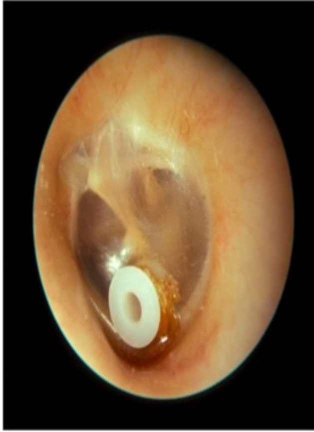
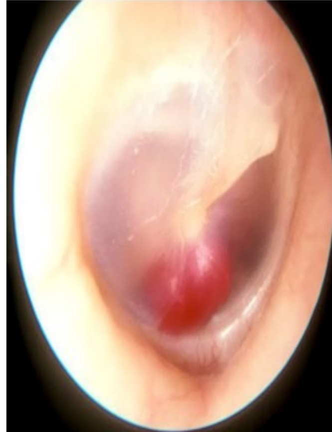
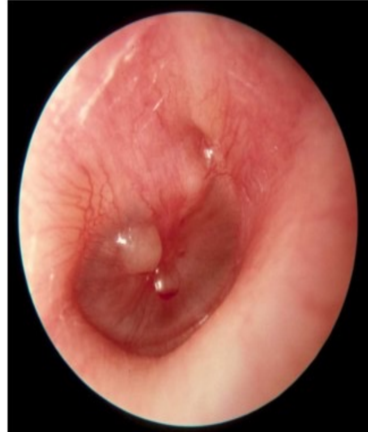
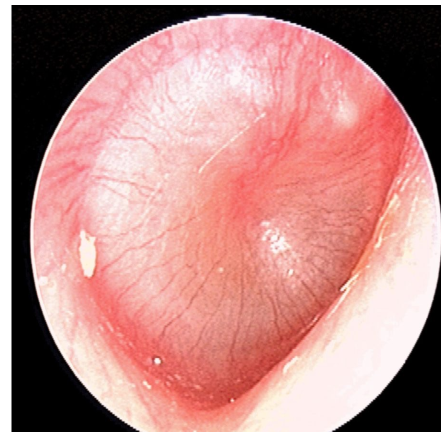
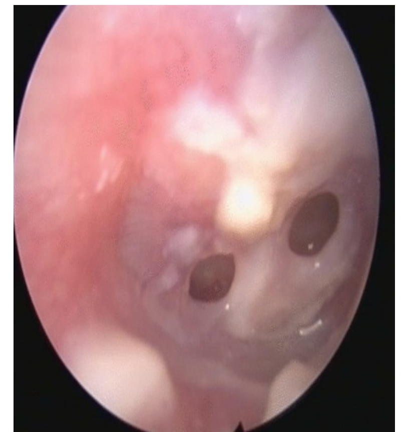


Cristae in SCC:
Maculae in utricle/saccule:
Endolymph:
Production-
Absorption-
Perilymph:
Cochlear aqueduct: CSF

Low frequency:
High frequency:

OHC: 3 rows, Modulate cochlear input
IHC: Single row
Transduce mechanical -> electrical (Glutamate)
Afferent of spiral ganglion

Middle ear diseases through TM

Rising sun sign
Aquino sign
Brown sign
Phelp sign
Fisch staging

Cholesteatoma

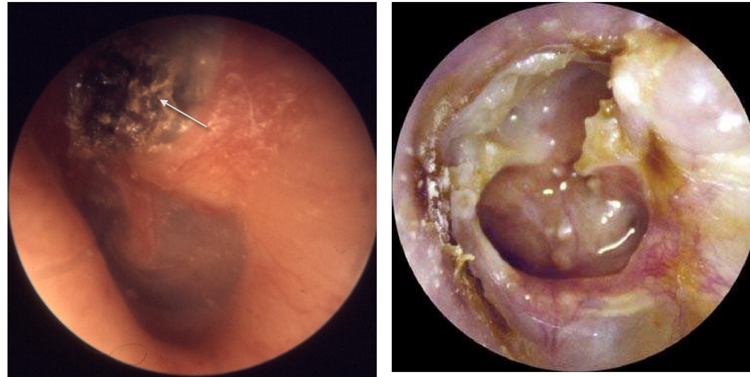
Primary:

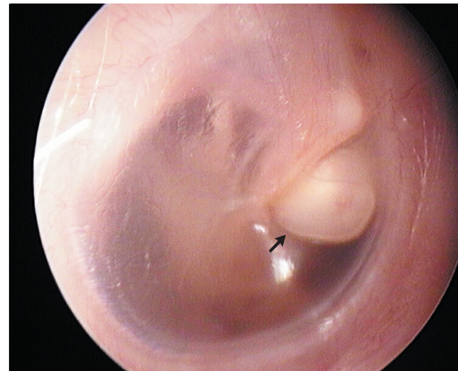
Secondary:

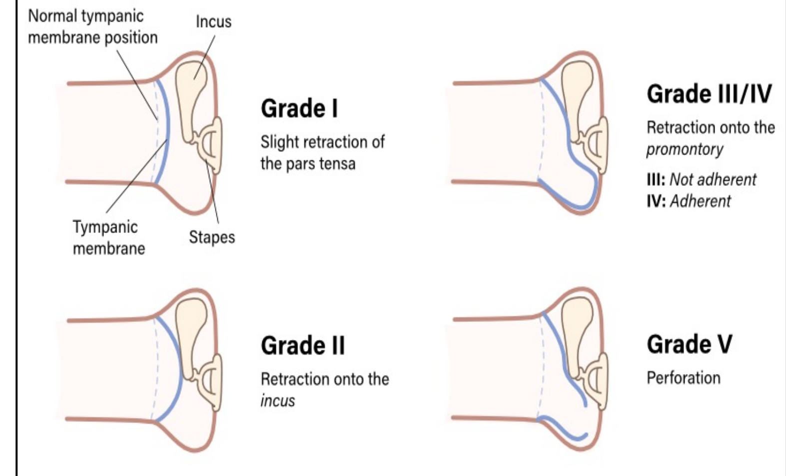
Congenital:

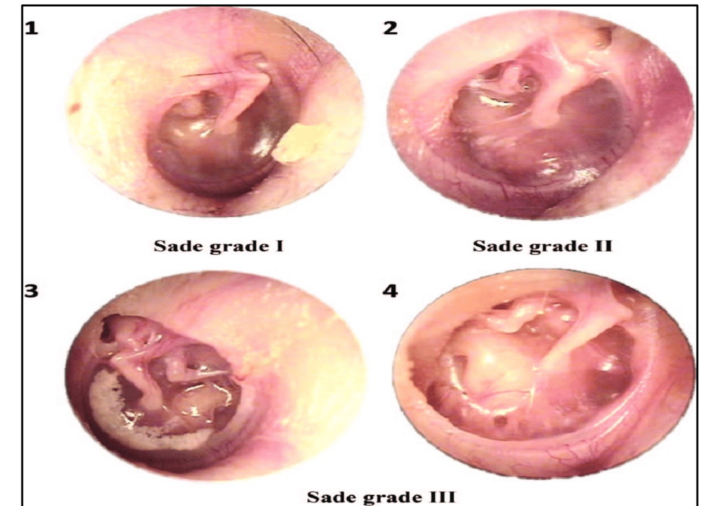
Retraction Grading:

PT: **PF:**



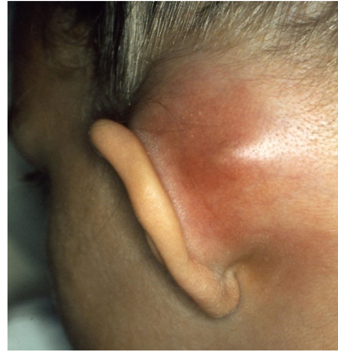




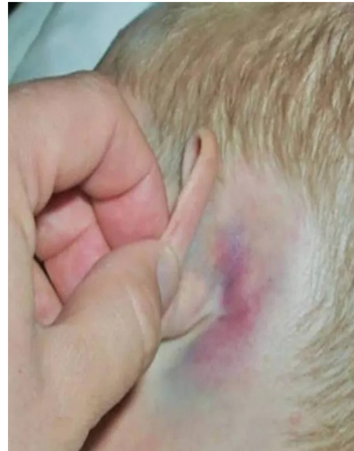


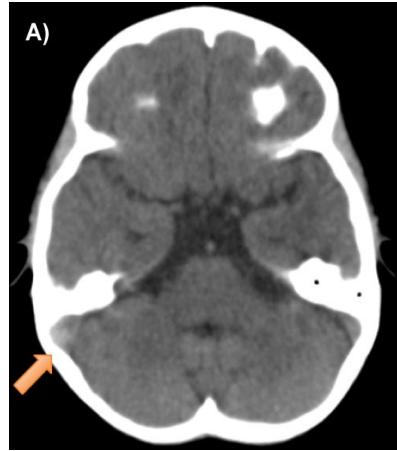
CSOM

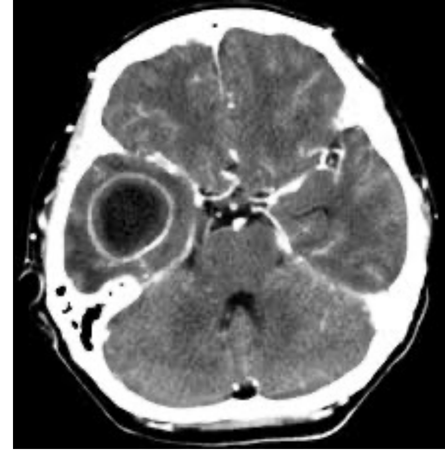
Features	Tubotympanic type	Atticoantral type
Etiology	Recurrent acute otitis media	Retraction Pocket Cholesteatoma Marginal/attic perforation
Ear discharge	Profuse, Mucoid, Non-foul smelling	Scanty, Purulent, Foul smelling
Granulation Tissue, Polyp	-	++
Complication	Low risk	High risk: Bony erosion Earliest: MC: Austin classification: Facial nerve palsy, Intracranial complications



Soft tissue abscess:
MC site:
Bezold:
Citelli's:
Luc's:







Griesinger sign:
Tobey-Ayer test
Crowe-Beck test
Picket fence fever
Gradenigo syndrome:

Management

Type I	Myringoplasty: Tympanic membrane (TM) placed over malleus
Type II	TM grafted over incus
Type III	Columella tympanoplasty / Myringostapediopexy TM grafted over stapes
Type IV	Round window shielding/ Cavum minor- Oval window exposed
Type V	Fenestration Lateral semicircular canal (SCC) opening

Canal Wall Up = Posterior tympanotomy	Canal Wall Down = Radical M: Stapes footplate preserved MRM: TM, ossicles preserved
• Posterior wall of EAC preserved • High rate of residual disease and recurrence	• Posterior wall of EAC not preserved -Common cavity • Poor water tolerance • Hearing aid: Hard to fit

Indications of Simple Cortical Mastoidectomy (Schwartz Operation)

- Acute coalescent or masked mastoiditis
- Acute otitis media with reservoir sign
- As initial step to perform: Endolymphatic sac surgery,
- Decompression of facial nerve

Indications of Radical Mastoidectomy

- Residual cholesteatoma
- Glomus tumour
- Carcinoma middle ear

Microtia/Anotia
Pinna reconstruction: Costal cartilage

Approach to hearing loss

Tuning Fork: 256 512 1024 Hz

Air-bone gap: 20-30, 30-45, 45-60 dB

Rinne's Test:
Positive
AC >BC

Negative
BC > AC

False Negative

Weber
Lateralized
Same-
C/L-

Degree of hearing loss
TM perforation
Complete obstruction of EAC
Headphones
Ossicular discontinuity:
With TM perforation:
With intact TM:
Complete stapes footplate fixation

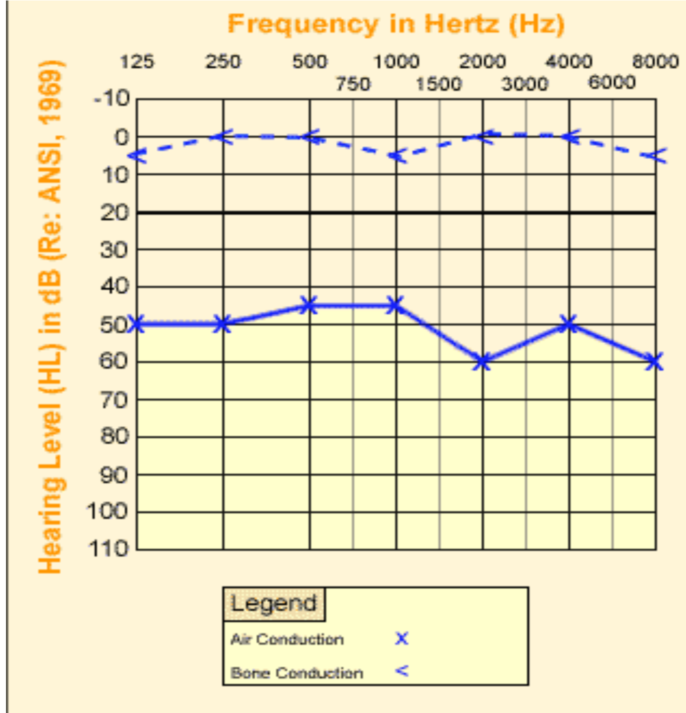
ABC reduced
Schwabach reduced

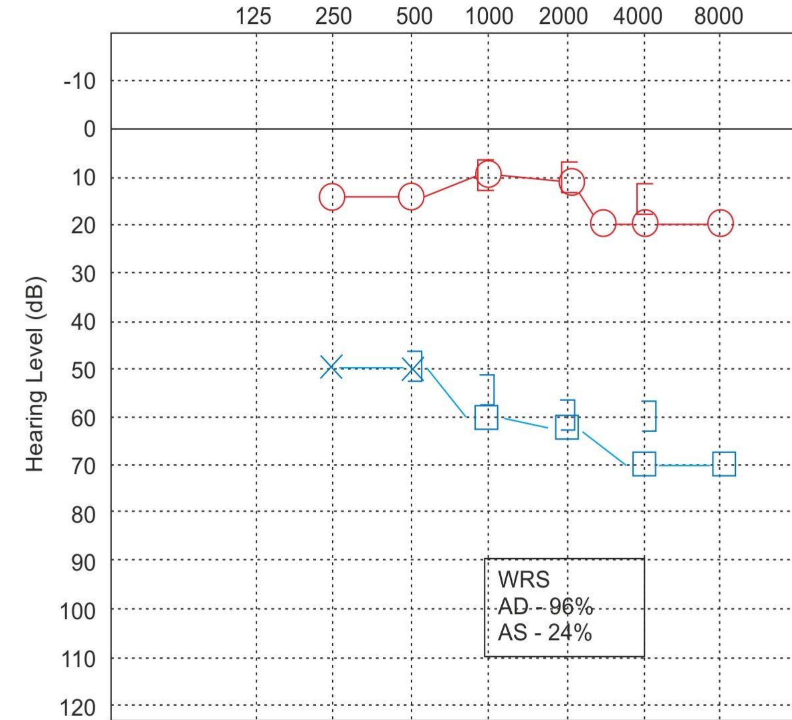
Bing negative
Gelle's test negative

WHO Grade	dBHL	Description	Performance
0	≤25	No impairment	No/very slight problem; able to hear whisper at 1 m
1	26–40	Slight impairment	Able to hear and repeat words in normal voice at 1 m
2	41–60	Moderate impairment	Able to hear and repeat words using raised voice at 1 m
3	61–80	Severe impairment	Able to hear some words when shouted into better ear
4	≥81	Profound impairment including deafness	Unable to hear and understand even shouted voice

Tolerable sound level:
TM rupture:

APPROACH TO PTA

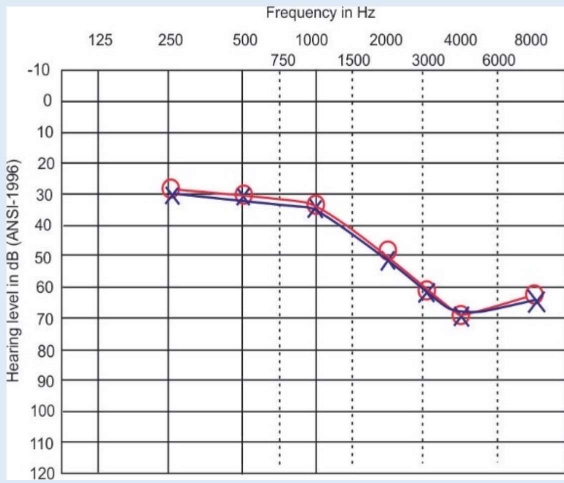


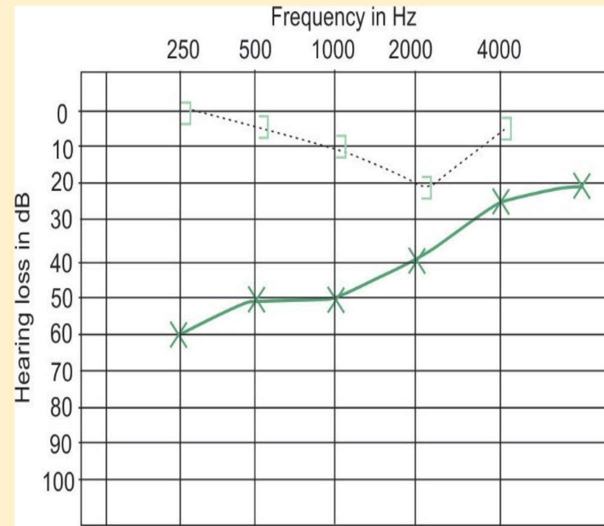


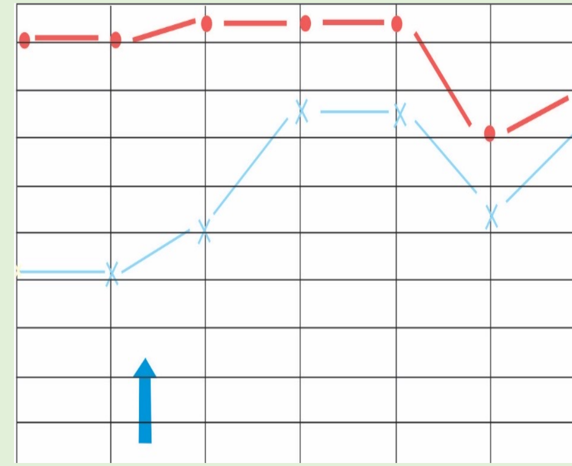
Pick the right combination of tuning fork test results that would be seen in this patient:

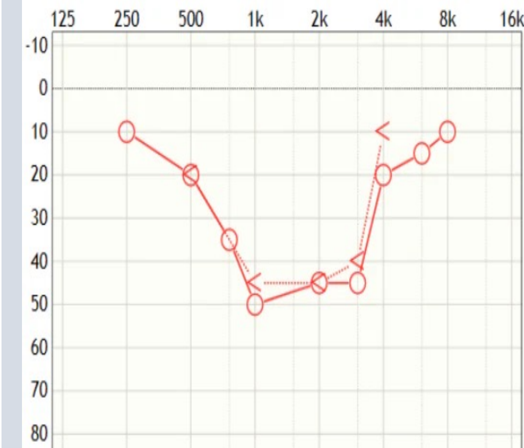
a) Left Rinne's test negative, Weber's test lateralized to right ear
b) Left Rinne's test negative, Weber's test lateralized to left ear
c) Left Rinne's test positive, Weber's test lateralized to right ear
d) Left Rinne's test positive, Weber's test lateralized to left ear

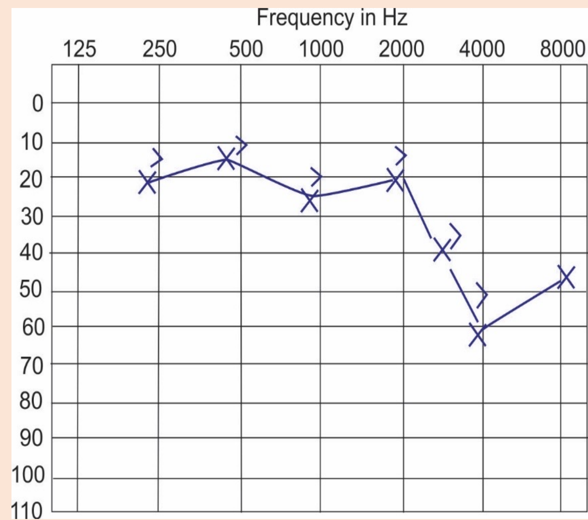
APPROACH TO PTA





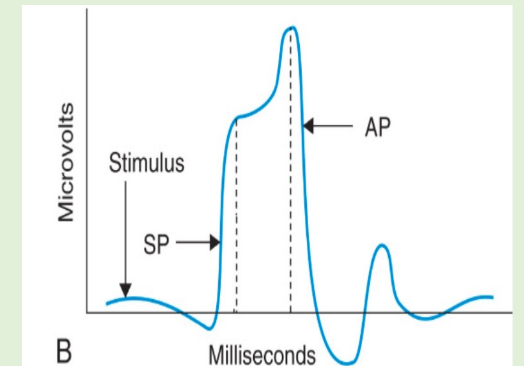




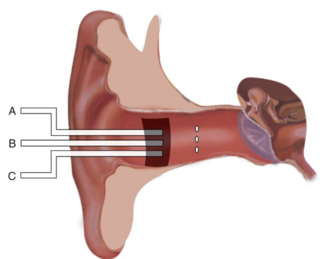


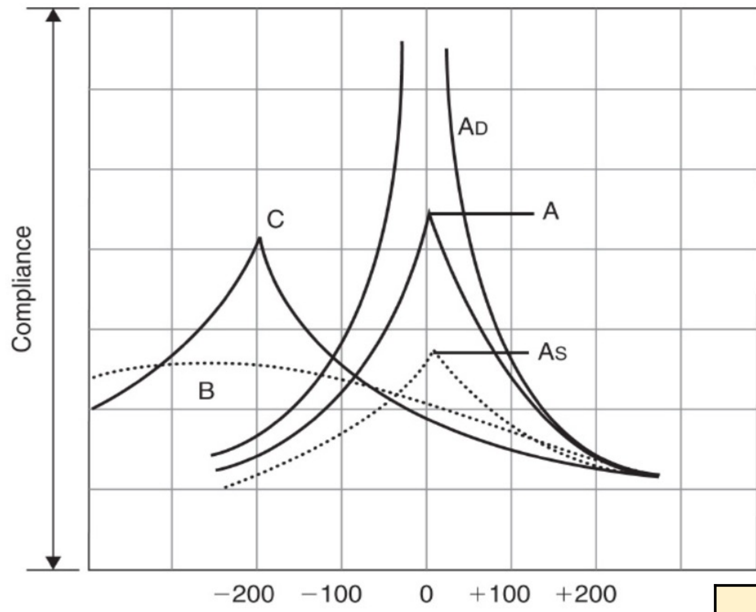
Paracusis
Pregnancy
B/L gradual CHL
Fissula ante fenestrum
Von der Hoeve:
Schwartz sign
Active:
Rx:

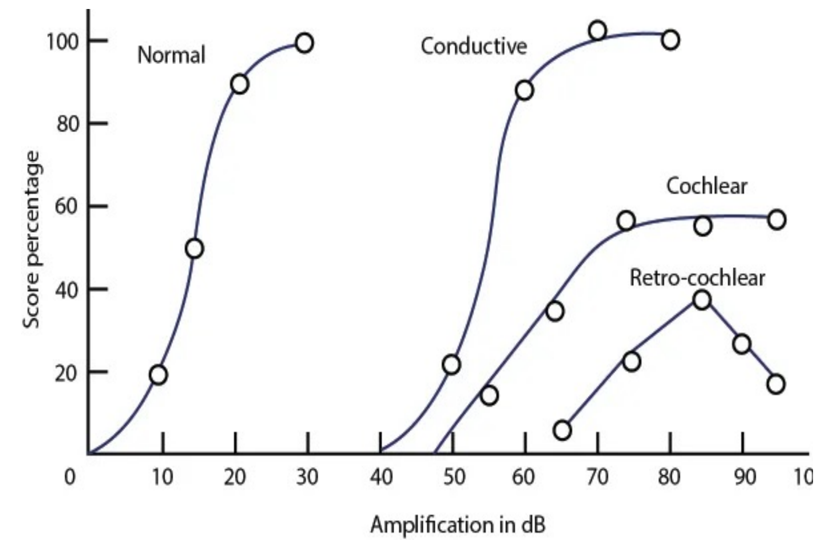
U/L episodic TVS
Lermoyez Sx:
Diplacusis
Tulio
Tumarkin
IOC:
Rx:
Meniett device
Donaldson line: ELS decompression
Silverstein microwick



Tests for hearing loss





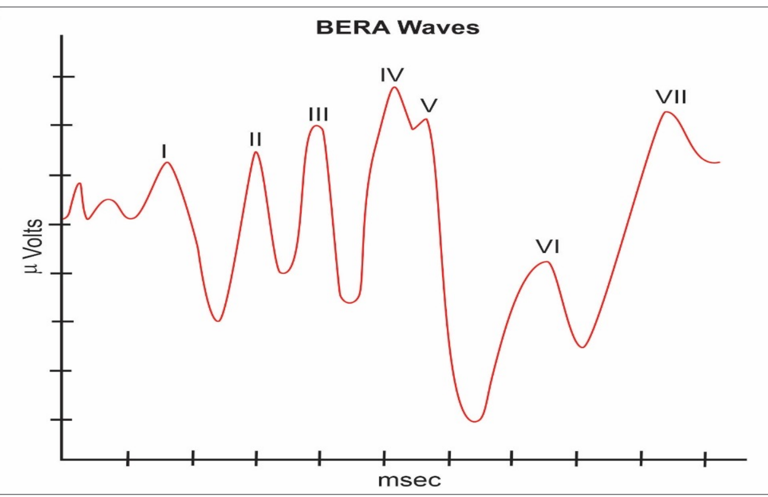


Cochlear Lesion	Retrocochlear Lesion
• SISI score Abn high • Recruitment present (ABLB) (Abnormal growth of perceived loudness with increasing sound intensity)	• Roll over phenomenon • Speech discrimination poor • Tone decay present • Stapedial reflex AbN • BERA IOC

Stapedial reflex
Afferent-
Efferent-

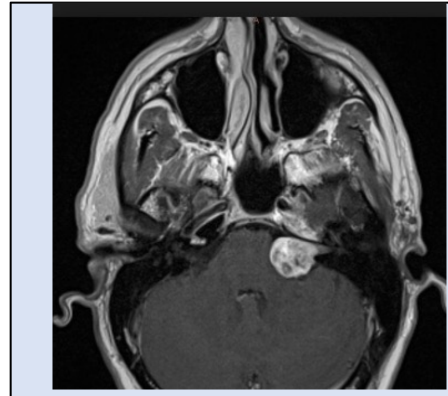
SUPERIOR CANAL DEHISCENCE: CHL

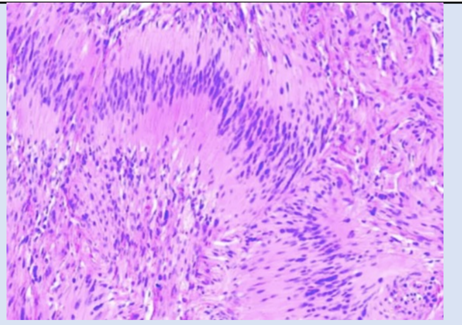
Tests for hearing loss



Screening – By
Confirm- By
Rehabilitation-By
Cochlear implant
Min age:

<u>Transient evoked OAE</u>
OHC → basilar membrane → perilymph → OW→ ossicles → TM→ EAC





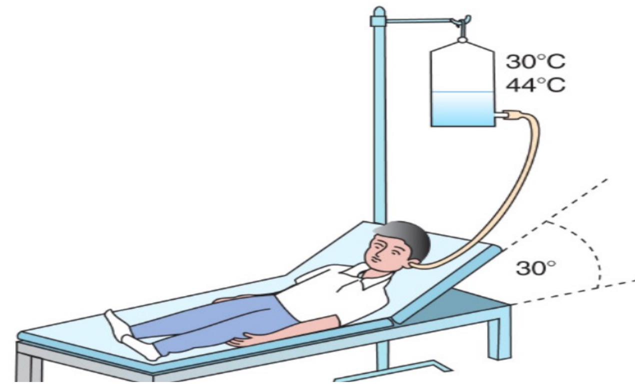
OTOTOXIC DRUGS
GST:

Stria vascularis:

MC nerve:
IOC:
Rx:
Association:

Vestibular function tests

Feature	Peripheral Vertigo	Central Vertigo
Latency	2–20 seconds	No latency
Duration	Less than 1 minute	More than 1 minute
Direction of nystagmus	Direction fixed, towards the undermost ear	Direction changing
Fatigability	Fatiguable	Non-fatiguable
Accompanying symptoms	Severe vertigo	-
Supression by optic fixation	+	-
Enhanced in darkness/ Frenzel glasses	+	-



Fitzgerald–Hallpike Test (bithermal caloric test)

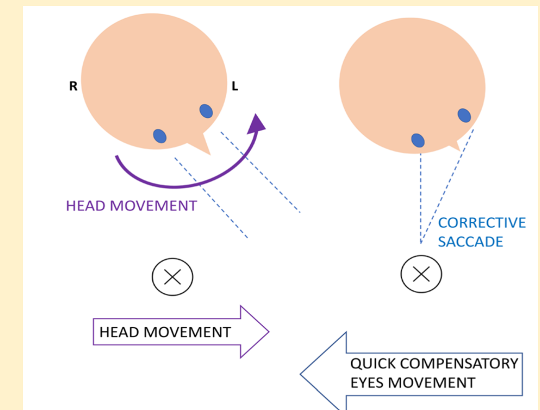
FISTULA TEST

Erosion of horizontal SCC
Fenestration surgery
Post-stapedectomy fistula
A *false negative fistula :*

A *false positive fistula :*

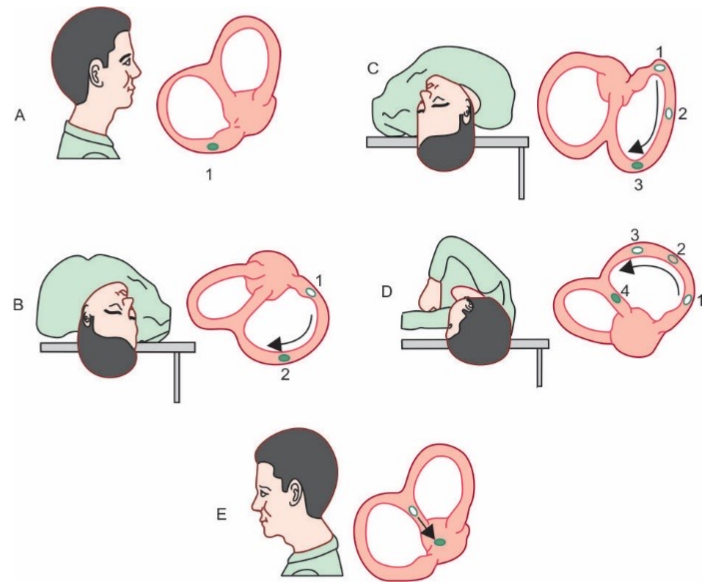
cVEMP: Saccule- IVN- vestibular nuclei- i/l vestibular spinal tract- CN XI- SCM
oVEMP: Utricle- SVN – vestibular nuclei- MLF- CNIII- inferior oblique muscle
Decreased response in Acoustic neuroma / neuritis

Head impulse test



Approach to vertigo

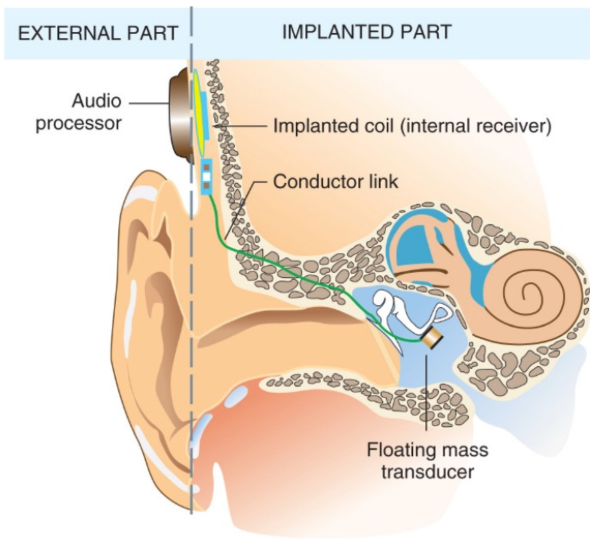
A. Only Vertigo (No Hearing Loss)	B. Vertigo with Hearing Loss

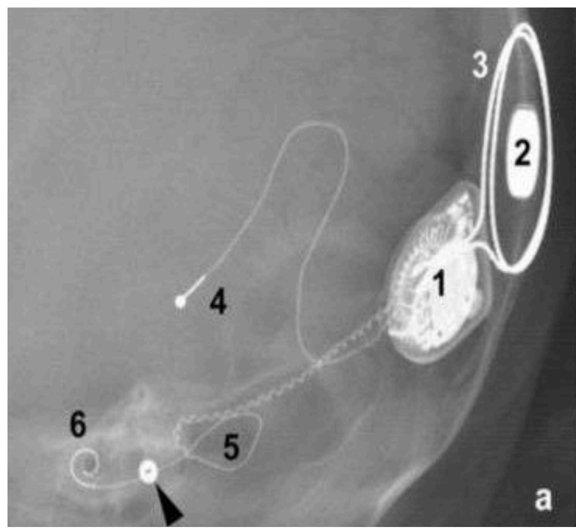


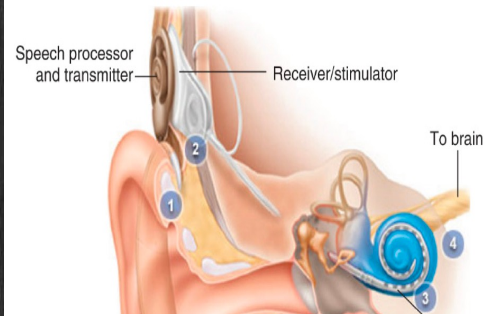
Serous labyrinthitis (Hyperactive):
Purulent labyrinthitis/Trauma (Hypoactive)

HINTS examination (for Acute Vestibular Syndrome)

Treatment







Auditory brainstem implant:
Location:

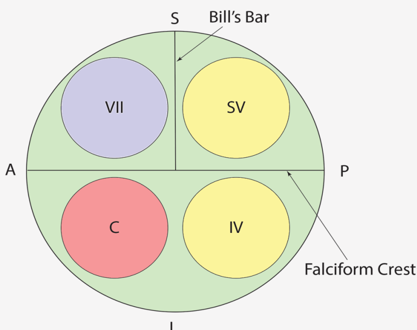
Unilateral hearing loss
>5yrs
Osseo-integration

William House
Bilateral severe to profound HL not responding to hearing aids
Intact nerve
Michel aplasia:
Mondini dysplasia:
Scheibe dysplasia:

30 dB or more of SNHL over at least three contiguous frequencies occurring within a period of 3 days
Rx:

Facial nerve

Meatal:
Fallopian canal



Labyrinthine
Narrowest
Shortest
MC in viral infections (HSV-1)

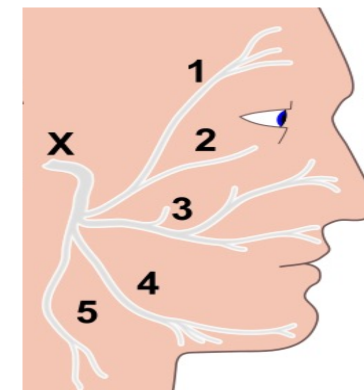
GG: 1st Genu
Landmark:

Tympanic/ Horizontal
MC site for dehiscence

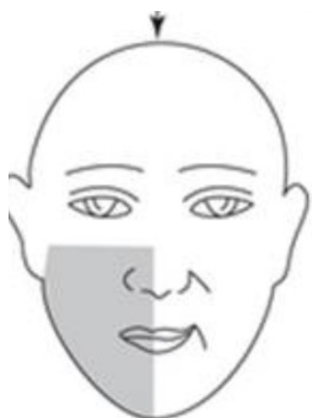
2nd genu
Landmark:

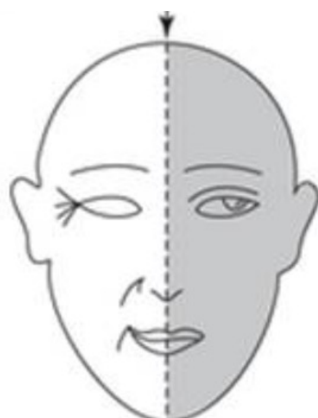
Mastoid/Vertical
MC site for injury in mastoid surgery

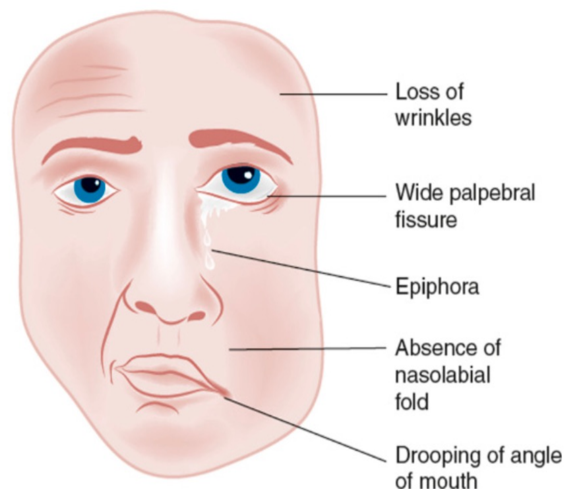
Stylomastoid foramen



Surgical landmarks of VII in parotid surgery
Cartilaginous pointer –Tragus
Tympanomastoid suture
Styloid process
Posterior belly of digastric
Injury:

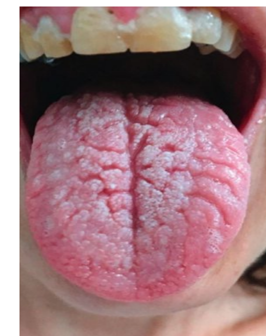




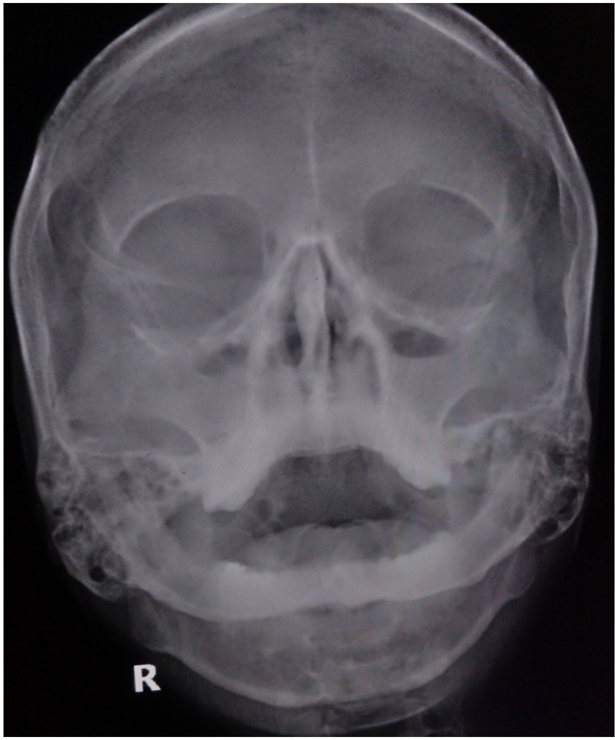


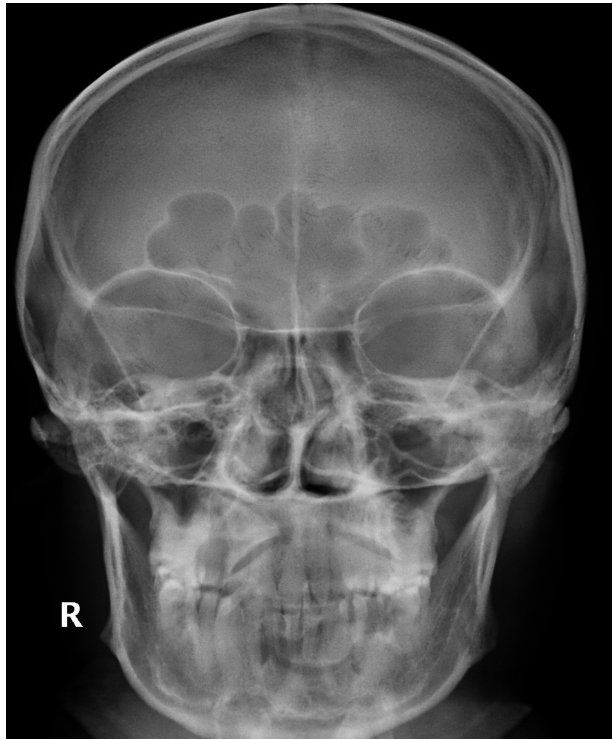
Crocodile tears: Gustatory lacrimation
Ramsay Hunt syndrome

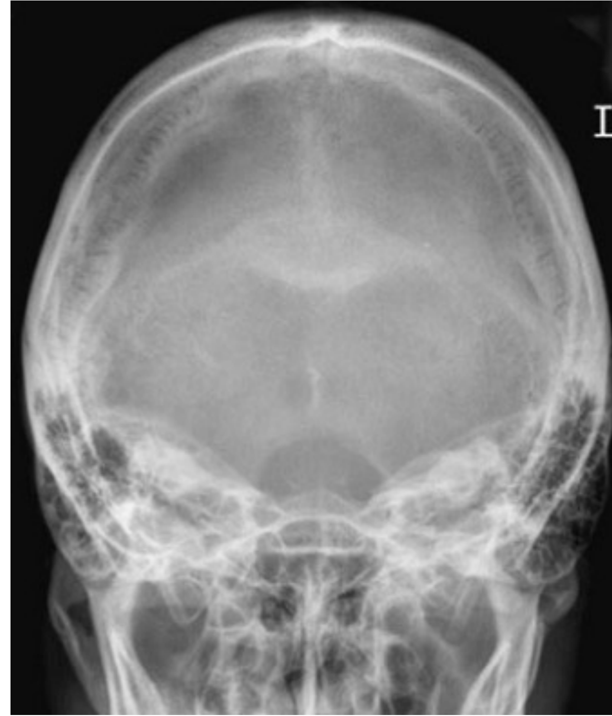
Melkersson Rosenthal syndrome

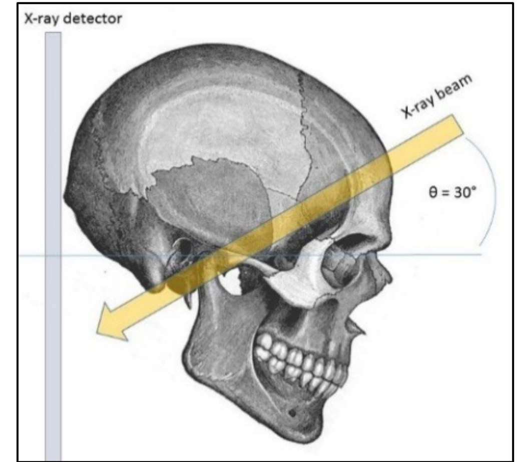


PNS X-rays









PNS anatomy

IOC- Gold standard-

Drainage:

Inf meatus:

Middle meatus:

Superior meatus:

SE recess:

Ethmoidal air cells:

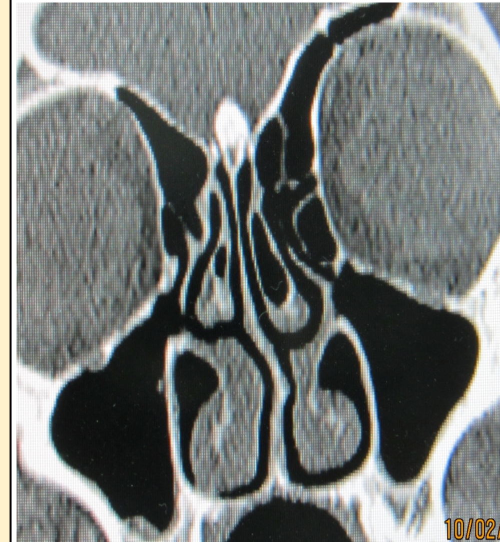
Anterior most-

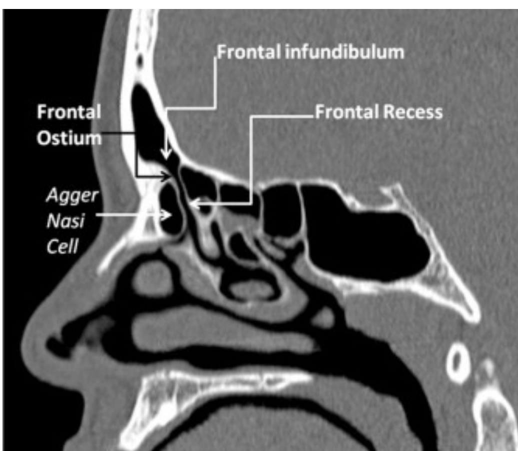
Largest-

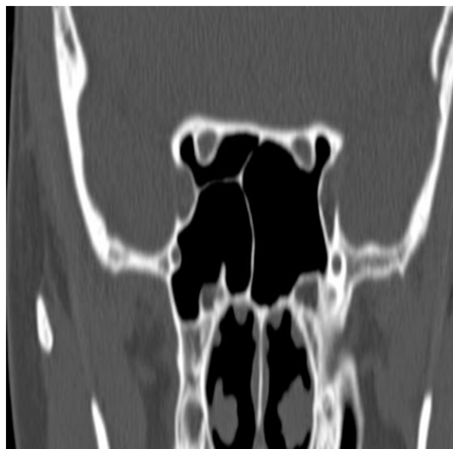
Infra-orbital-

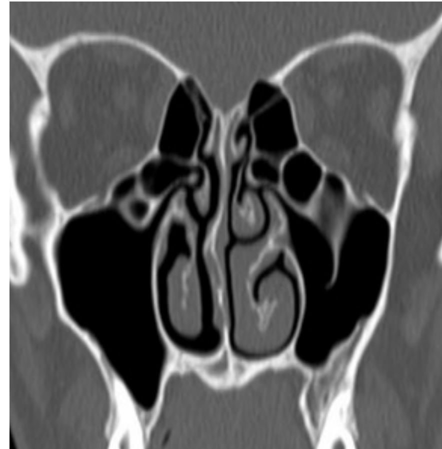
Optic nerve compression-

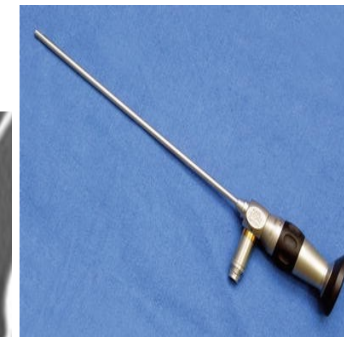
Anterior cells that extend into frontal sinus-

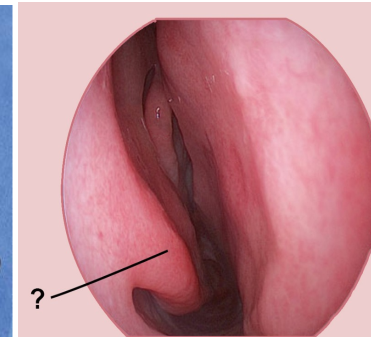


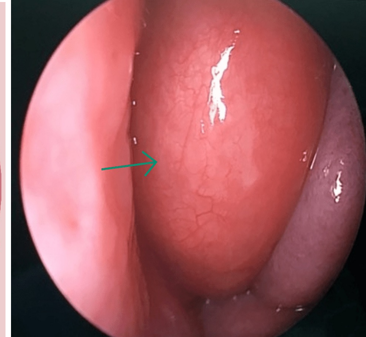








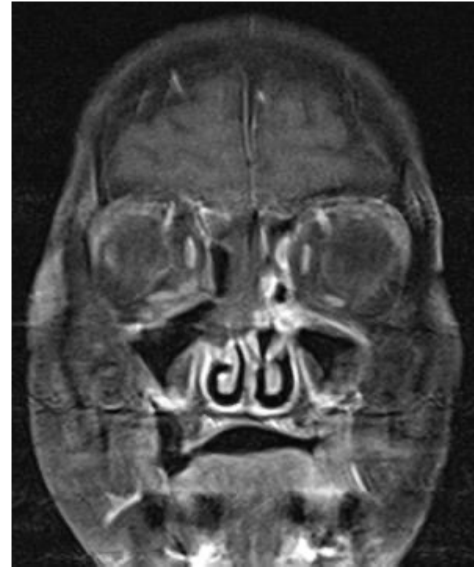


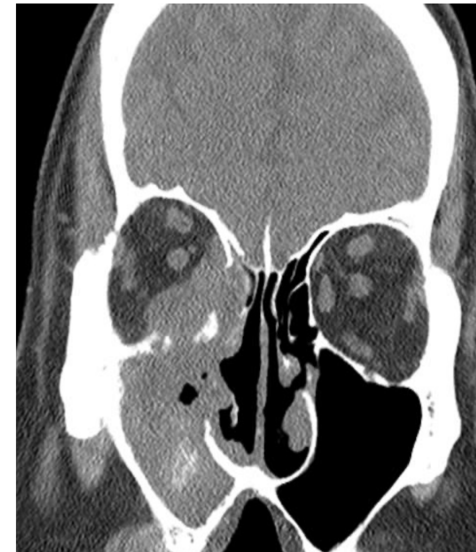


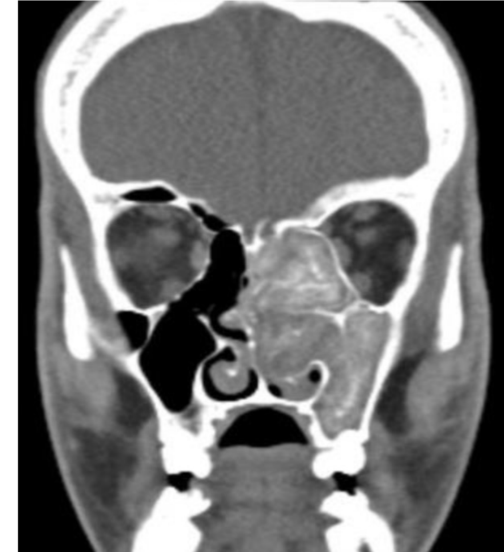
First pass: Inferior meatus → NLD
Second pass: Middle meatus lateral wall → access to maxillary sinus ostium
Third pass: Medial surface of middle turbinate → sphenoethmoidal recess

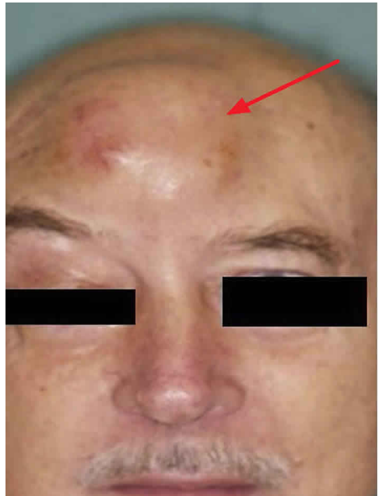
Sinusitis

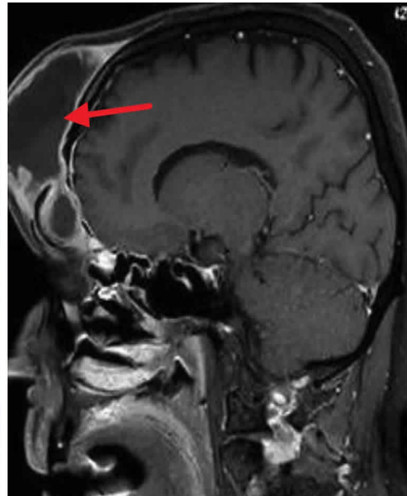
Sinusitis:
MC site child- adult-
MC mucocele, osteomyelitis-
MC orbital complication-
1st sinus to be seen radiologically:
Not present at birth:

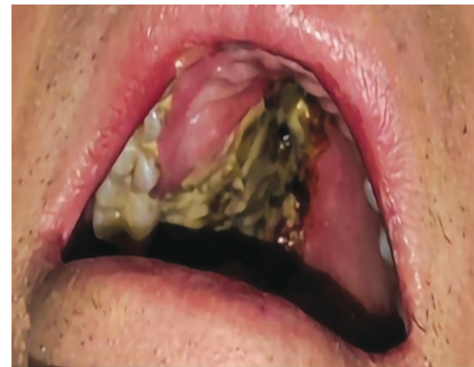






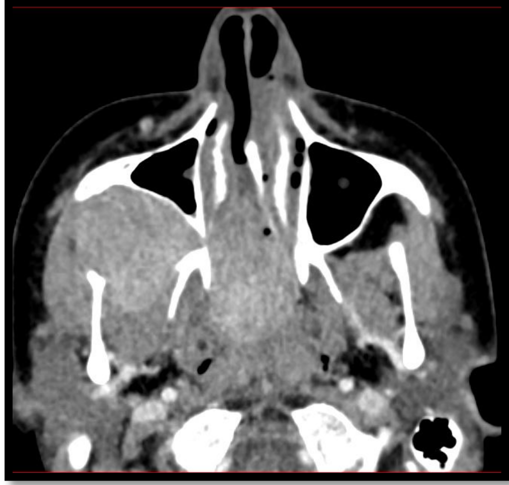


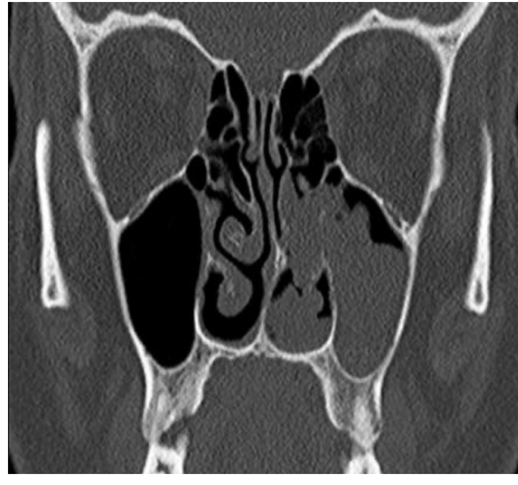


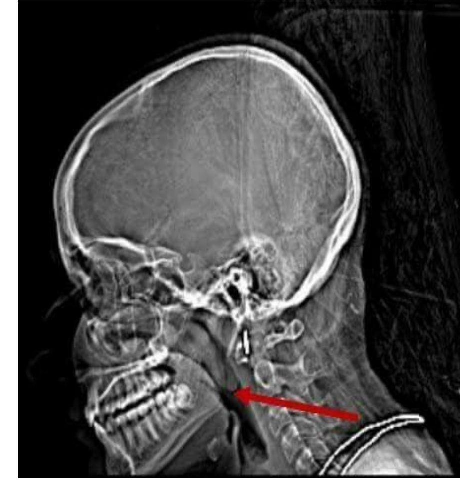


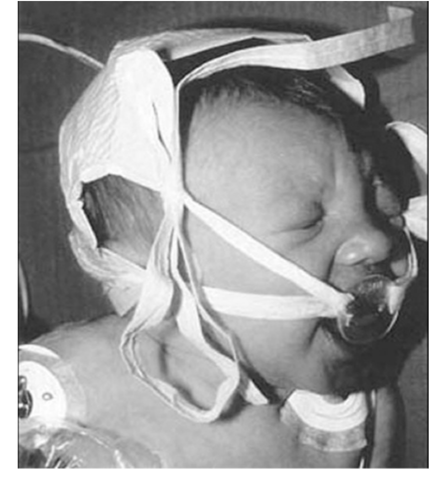
Major Criteria	Minor Criteria
•Type I Hysn •Nasal polyposis •Characteristic CT Eosinophilic mucin without invasion •Positive fungal stain	•Asthma •Unilateral disease •Bone erosion •Fungal cultures •Charcot–Leyden crystals •Serum eosinophilia

PNS and nasopharynx pathologies









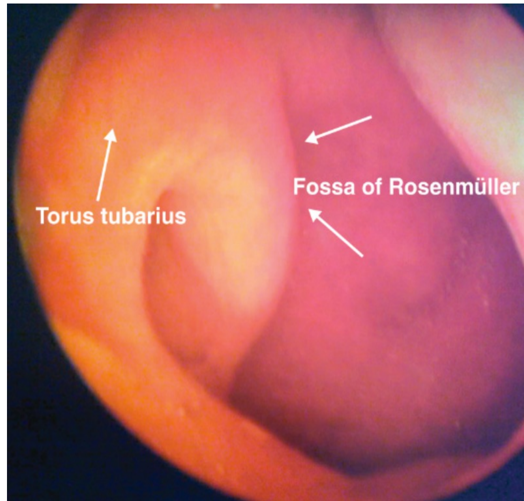
Adolescent male with epistaxis
IOC:
SIGN:
Staging:

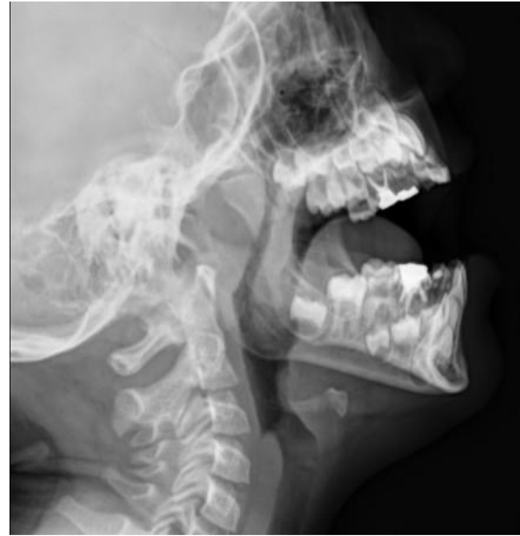
Sampter's triad:

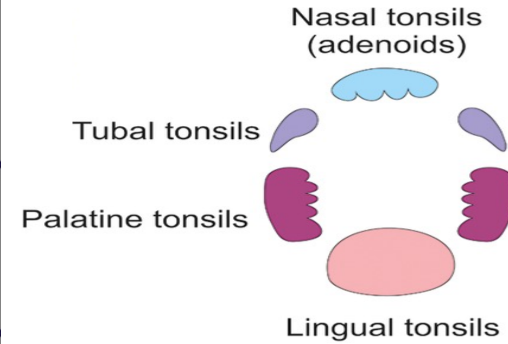
Non-allergic, non-IgE mediated

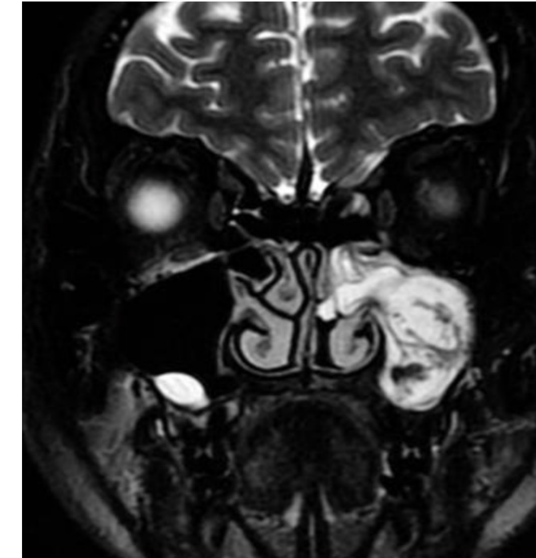
IA: Limited to nose or nasopharynx
IB: Extension into >1 paranasal sinus
IIA: Minimal extension through the sphenopalatine foramen
IIB: Full occupation of the pterygopalatine fossa, displacing the posterior wall of the maxilla forward
IIC: Extension into the cheek & infratemporal fossa
IIIA: Erosion of the skull base with minimal intracranial extension
IIIB: Extensive intracranial extension

Nasopharynx pathologies





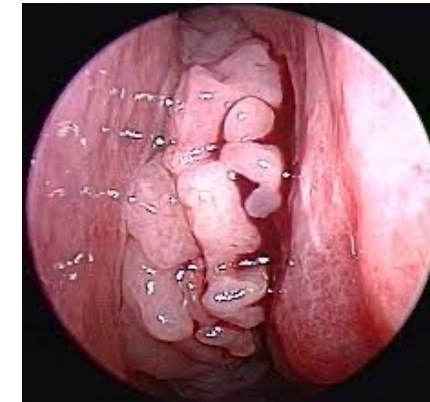




NP carcinoma
EBV
Radiosenstive
MC C/F:
Trotter's triad:

Indications-Adenoidectomy

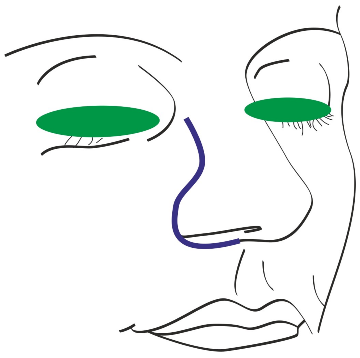
- Sleep apnea
- Chronic serous otitis media
- Recurrent infections
- **Contraindications (C/I):**
- Bleeding diathesis
- Acute infection
- Velopharyngeal insufficiency



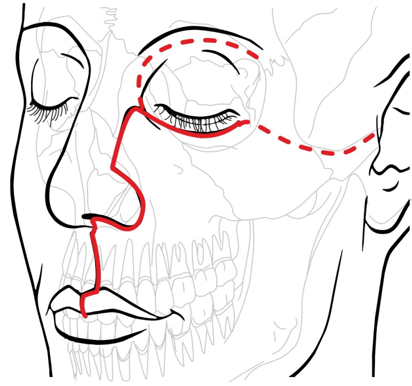
Rhinolalia clausa:

Rhinolalia aperta:

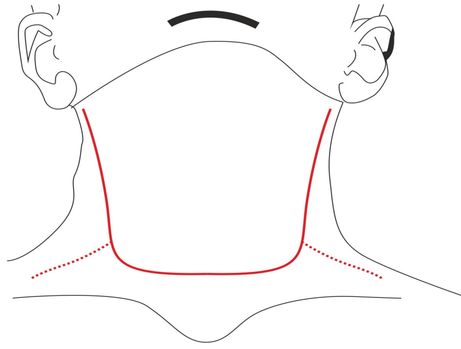
Incisions, lines and instruments



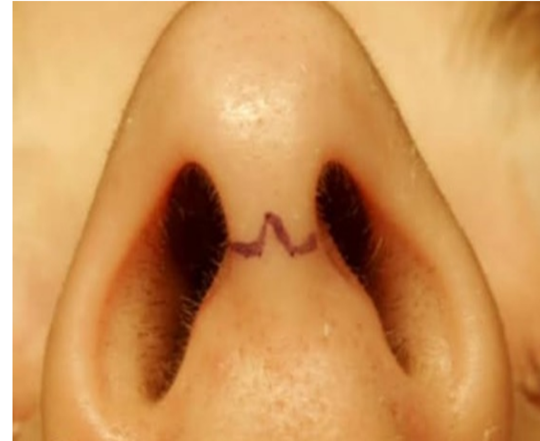
Moure

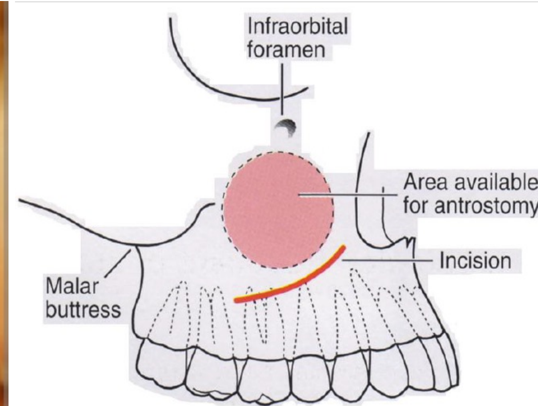


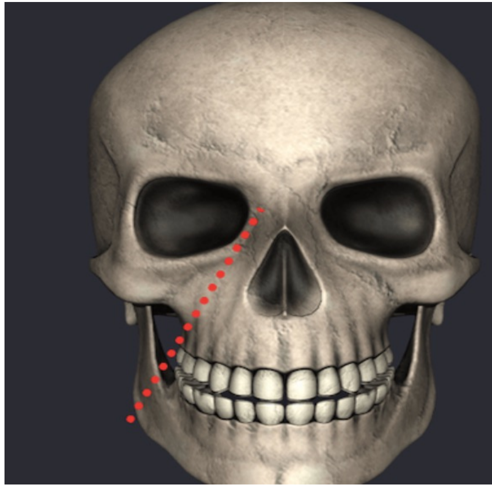
Weber-Ferguson

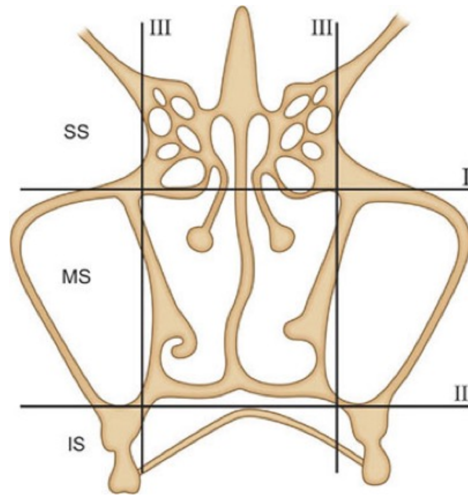


Gluck-Sorensen

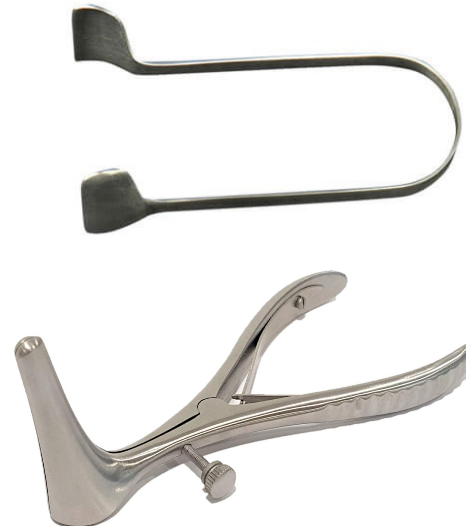


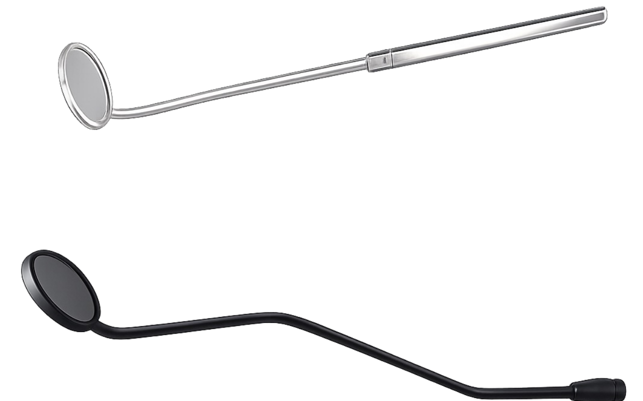




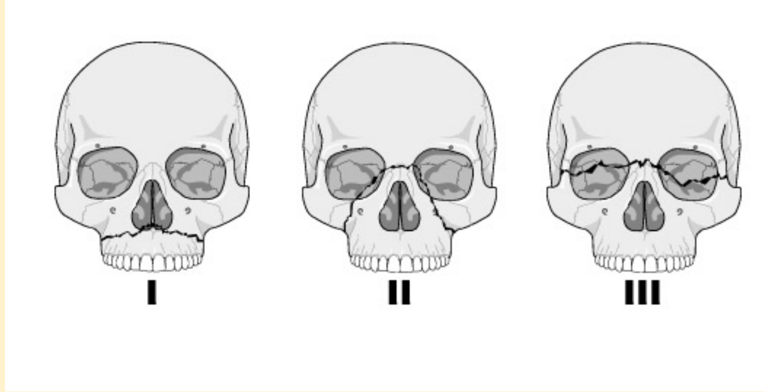


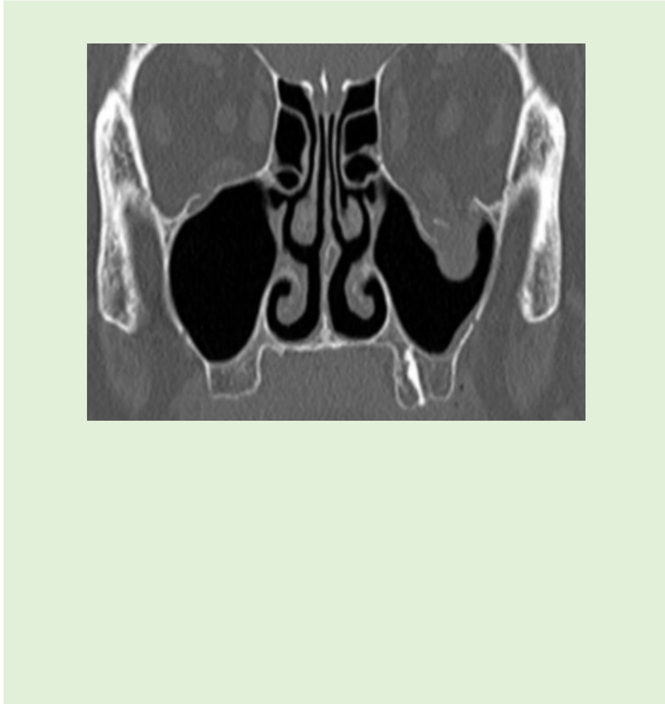
Wood-
Nickel-

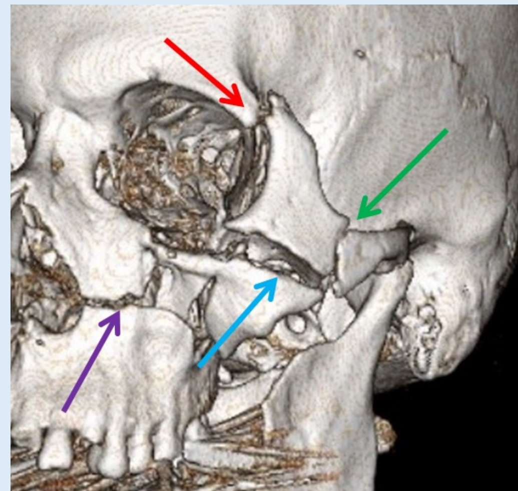




Facial trauma

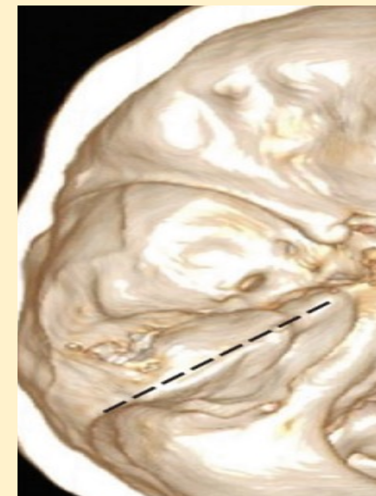


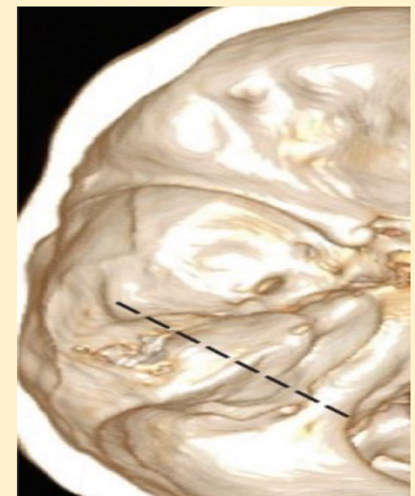


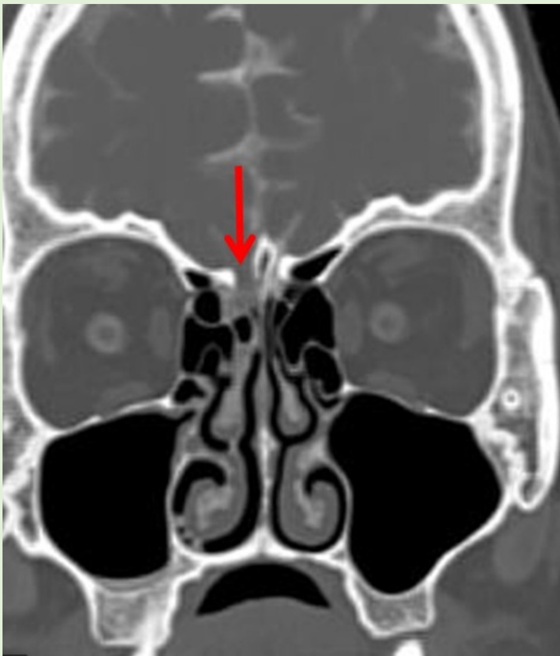


Zygomatico-frontal suture +
Zygomatico-temporal suture +
Zygomatico-maxillary suture

TEMPORAL BONE #	
Longitudinal	Transverse
Parallel to long axis of petrous	Perpendicular to long axis of petrous
Conductive hearing loss	Sensorineural hearing loss
Ossicular injury, TM rupture	Facial Nerve paralysis
Otic capsule involvement rare	Otic capsule more common



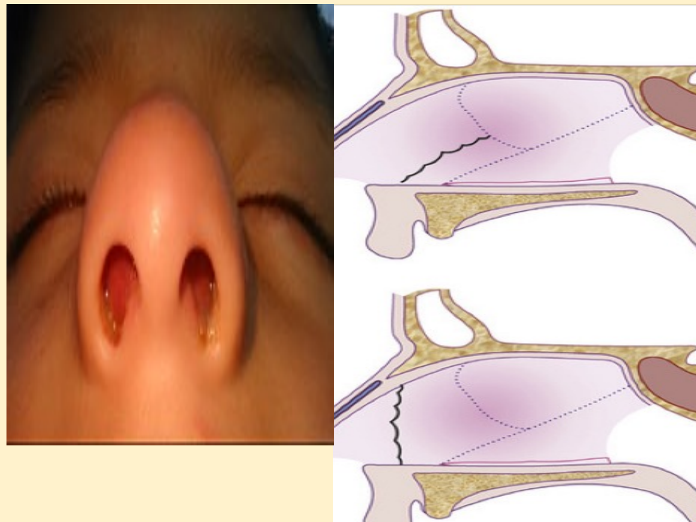


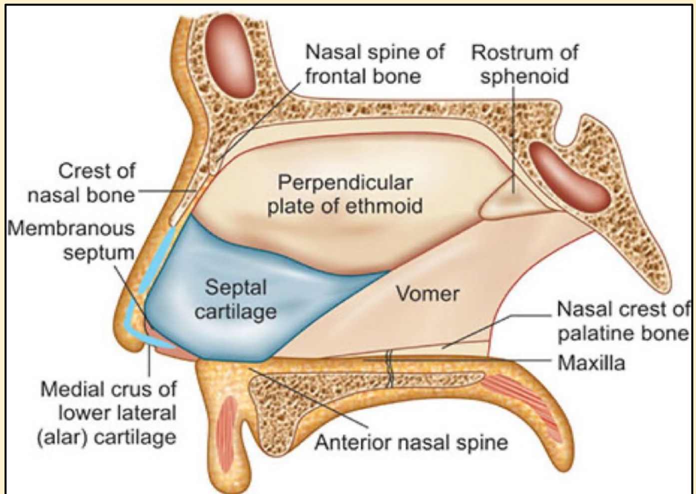


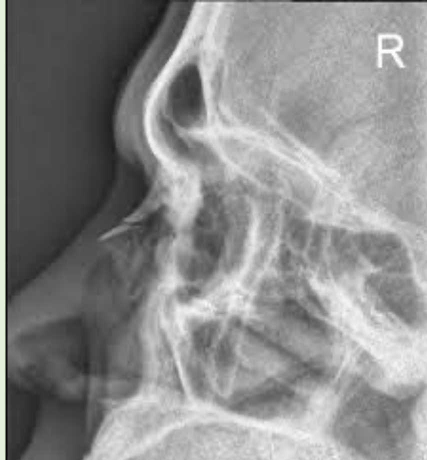
MC SITE:

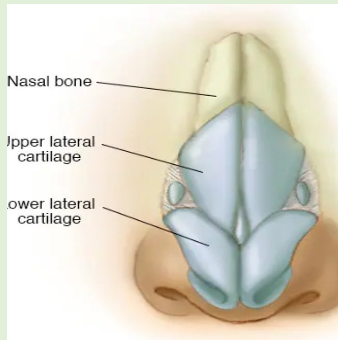
IOC to confirm CSF:

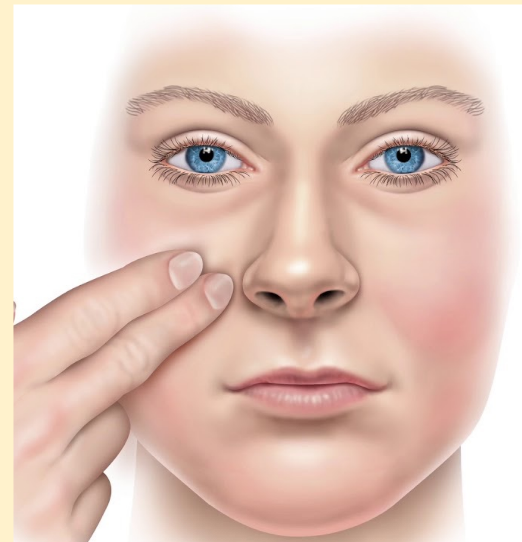
IOC to confirm site:











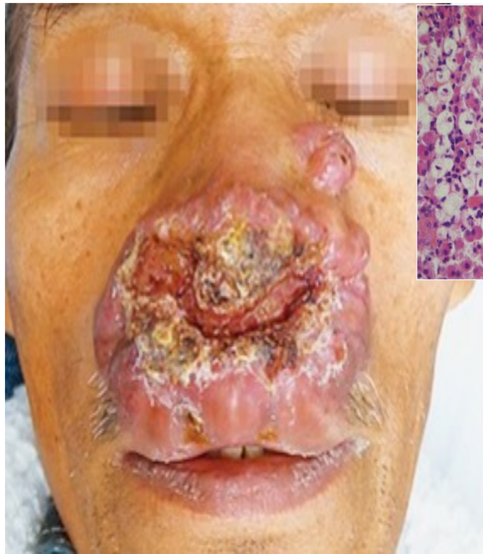
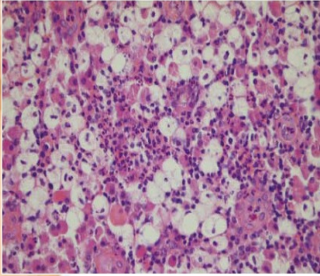
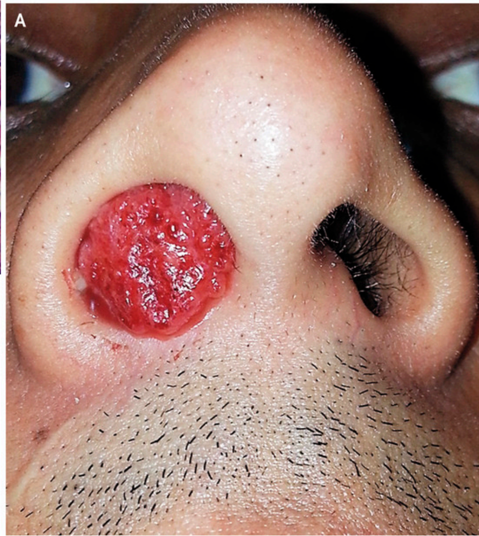
MCC:

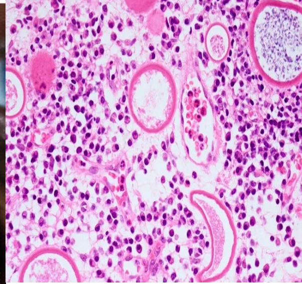
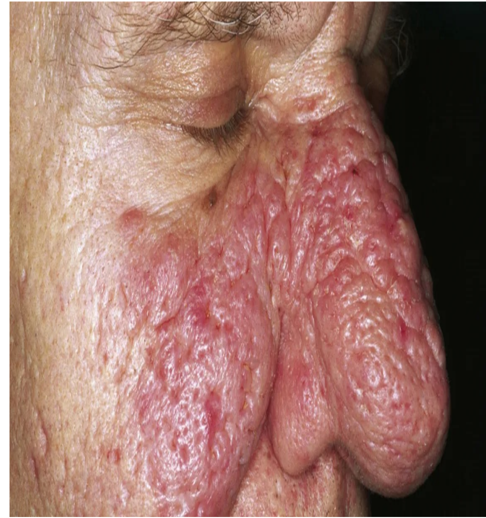
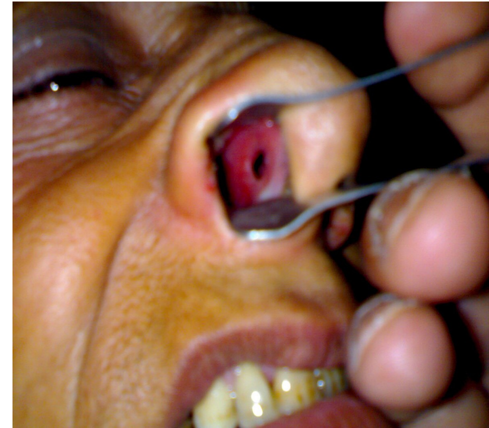
Sluder's neuralgia:

Management:

SMR vs Septoplasty

Nose pathologies

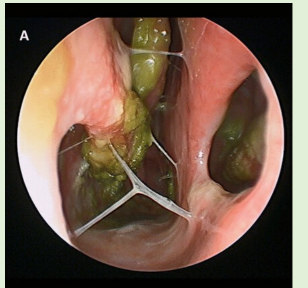
Tapir/ Hebra nose
Diagnosis-
Frisch bacillus
Russel Body / Mikulicz Cells
DOC: Antibiotics: FQ/ Ag

Swimmer
Diagnosis-
H/P-
TOC: Excision + Dapsone

Diagnosis-

TB, Sarcoidosis, SLE, Leprosy, Cocaine
Syphilis, Wegener

Roomy Nasal Cavity + Merciful Anosmia:
Diagnosis-
Cause- (Perez bacillus)
Mx-
Lautenslager's procedure:



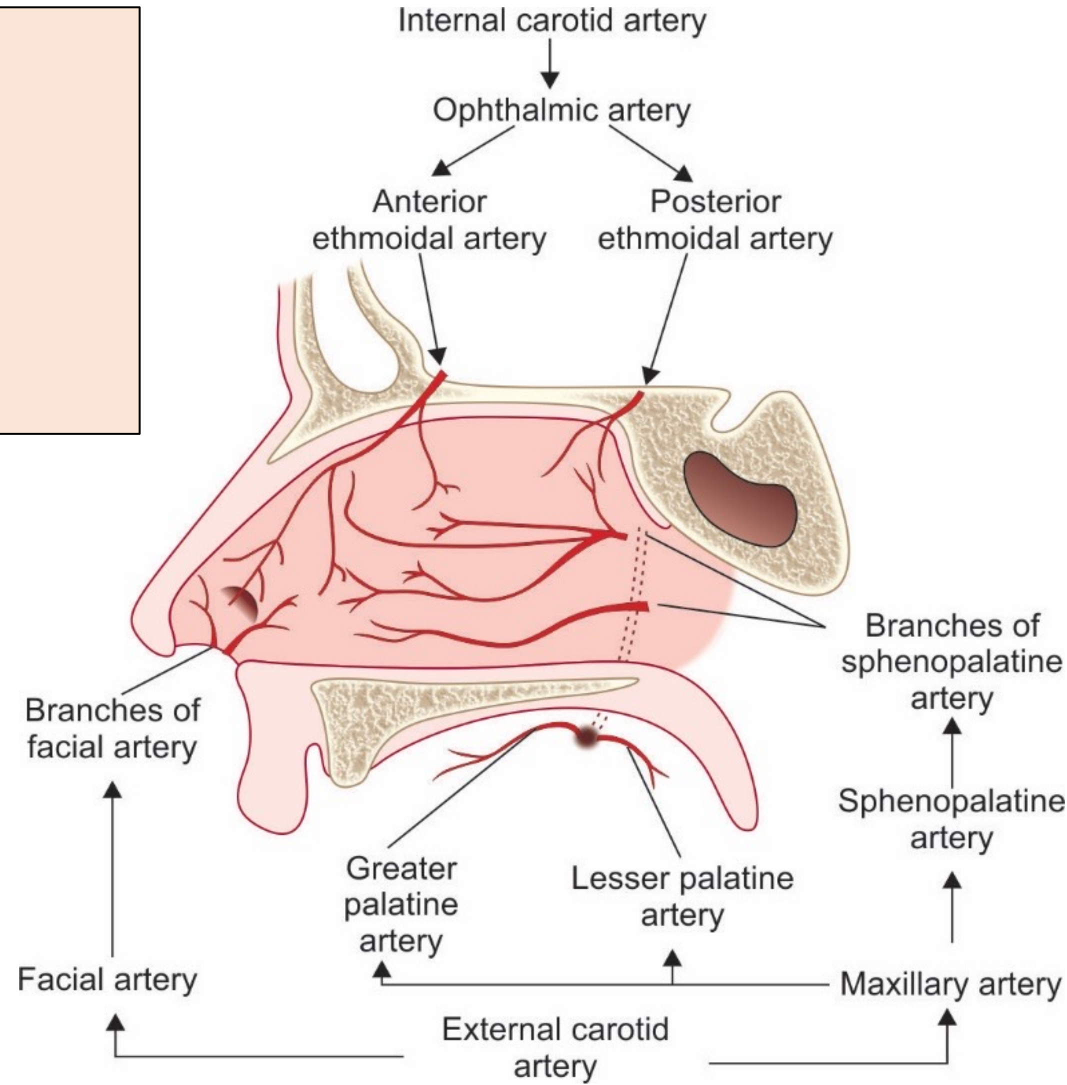
Vasomotor rhinitis:
Mx:
Rhinits medicamentosa:

Dennie Morgan folds, Allergic shiners

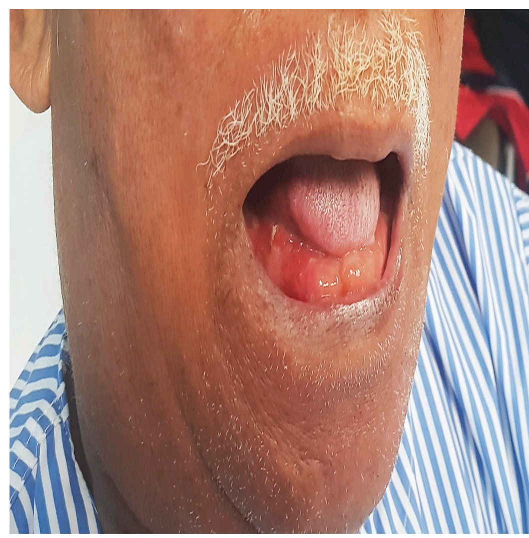
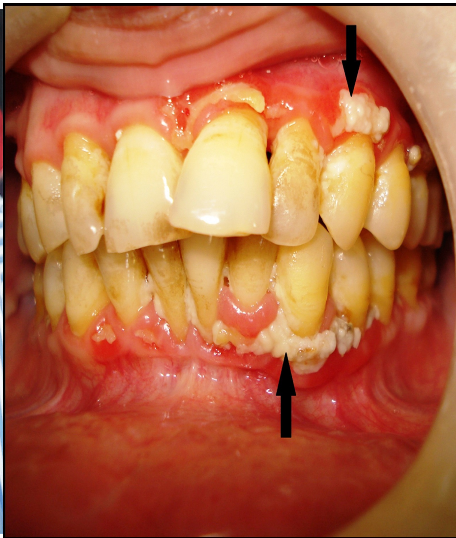
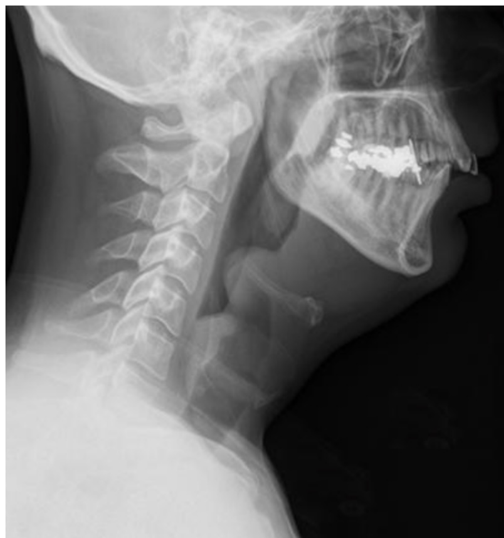
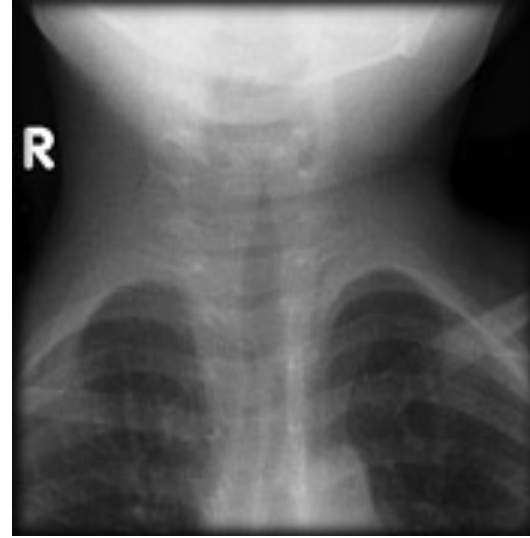
Epistaxis

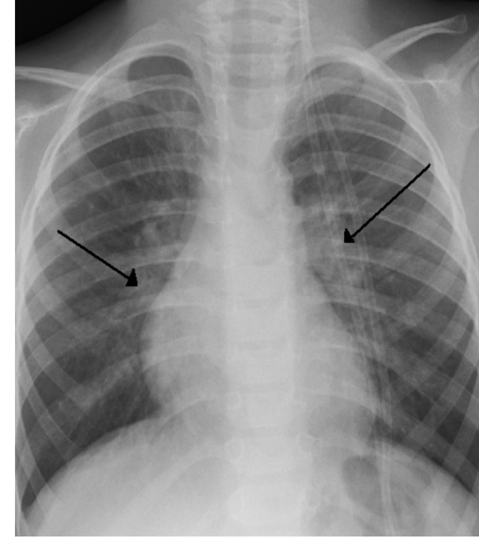
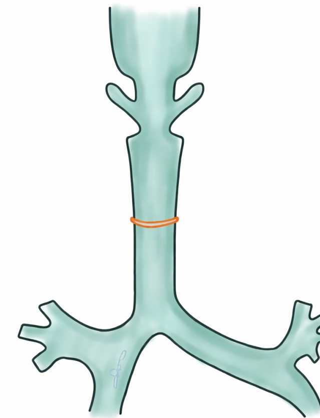
Anterior:
Little's area
Kiesselbach plexus
Vein:

Posterior:

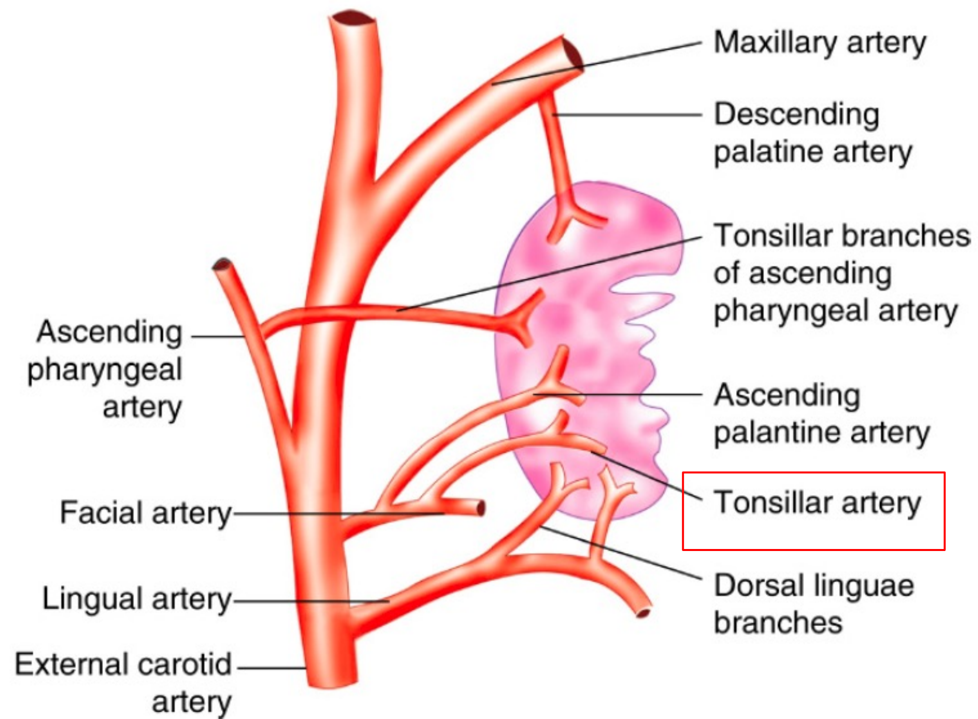


Infections of head and neck

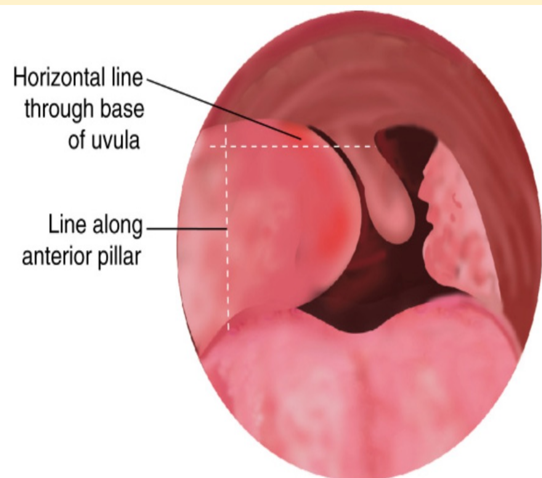
Tonsils



Indications-Tonsillectomy

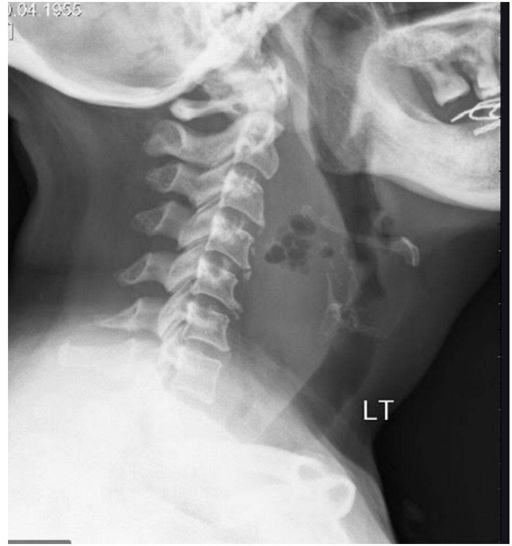
- **Recurrent infections**
  - **≥3/year for 3 consecutive years**
  - **≥5/year for 2 consecutive years**
  - **≥7 in a single year**
- **Obstructive symptoms (Sleep apnea)**

Tonsillectomy-related hemorrhage:
Primary-
Source:
Reactionary-
Secondary-



Grisel syndrome:

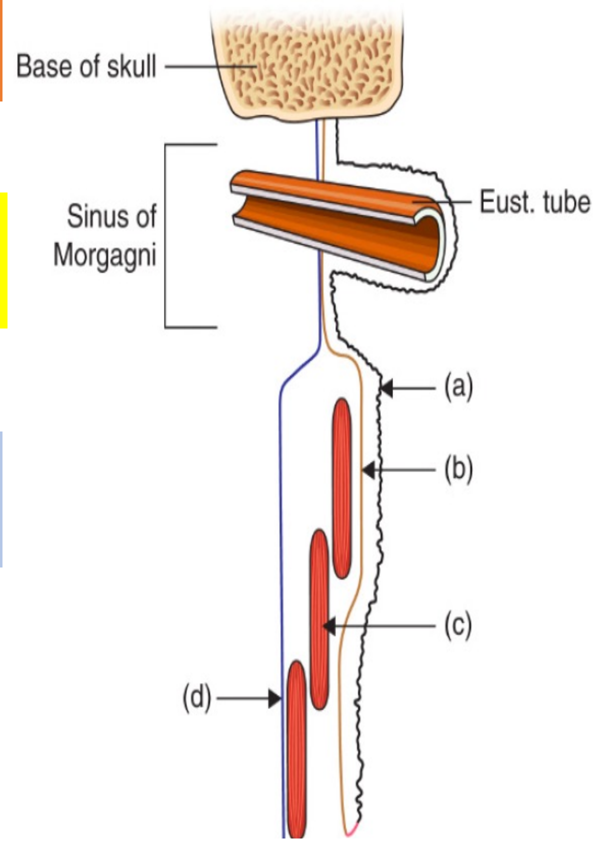
Head and neck spaces

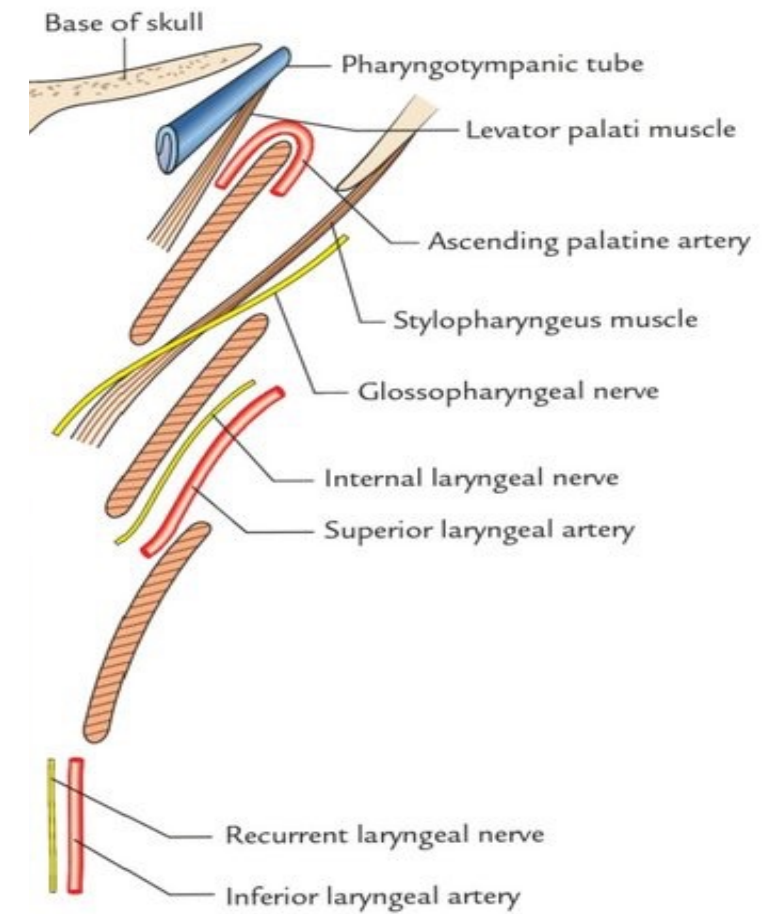


Prevertebral fascia

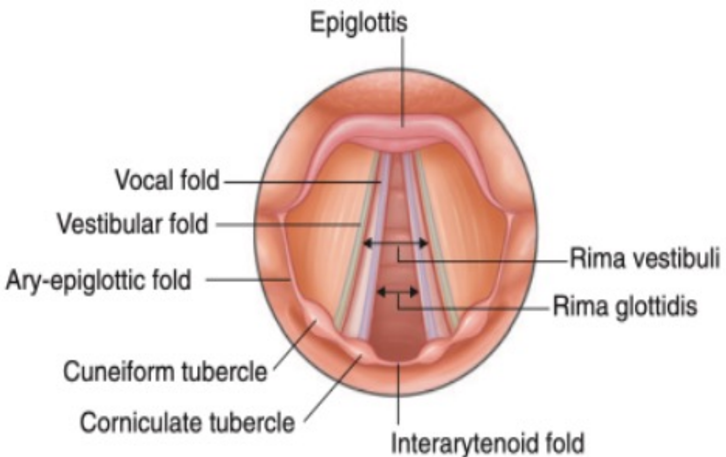
Alar fascia

Buccopharyngeal fascia

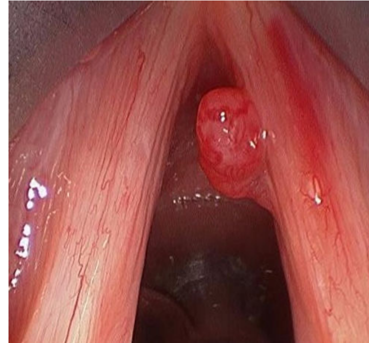




Larynx



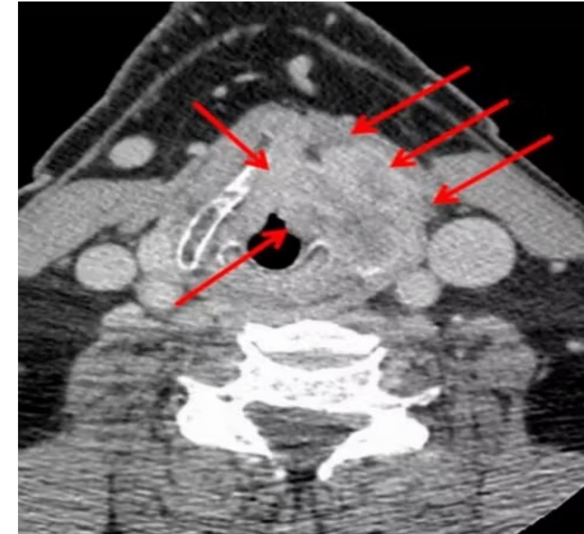
Structures not visible on IL
- Vestibule
- Epiglottis (laryngeal surface)
- Subglottic area
- Posterior cricoid area
- Apex of piriform fossa



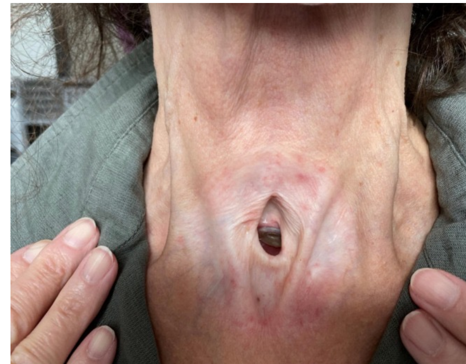
Keyhole appearance:
Pachyderma laryngitis:

Carcinoma larynx

T1 **T2** **T3** **T4**



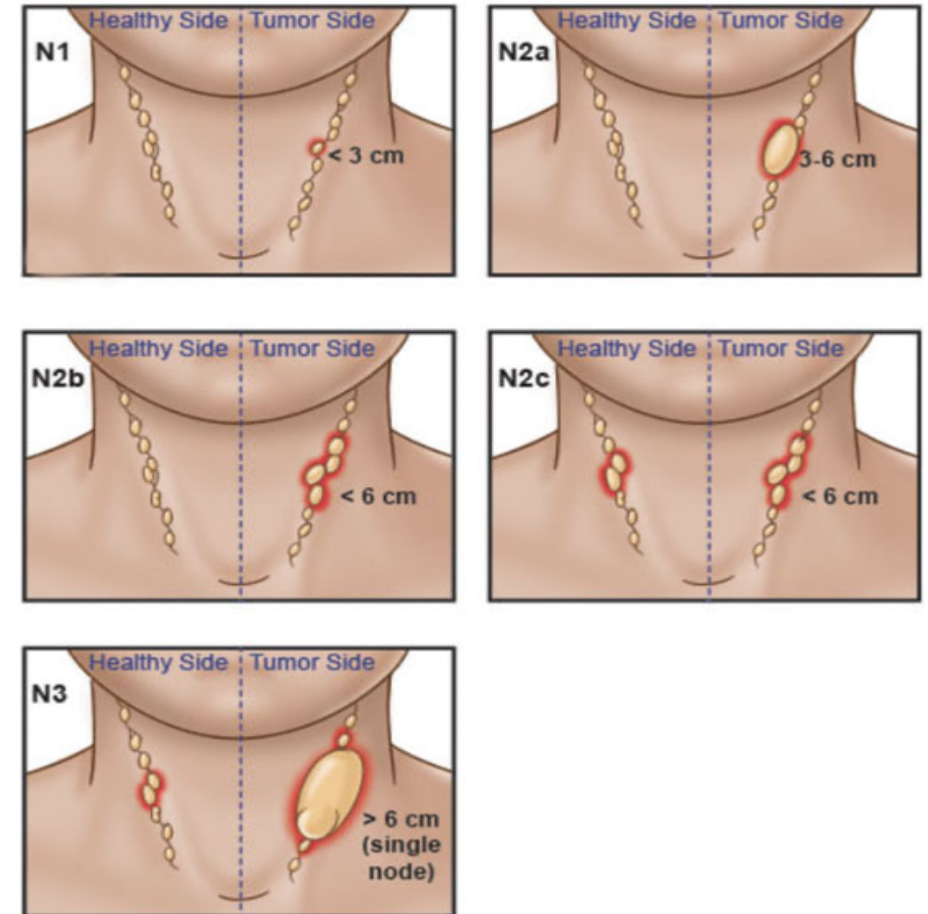
MC:
Best prognosis:
IOC for staging ca larynx-
IOC for cartilage invasion-
STAIN-



T1 glottic: Co2 laser
T1/ T2: RT > PL
T3/T4: TL > CT-RT

Oral cavity cancer

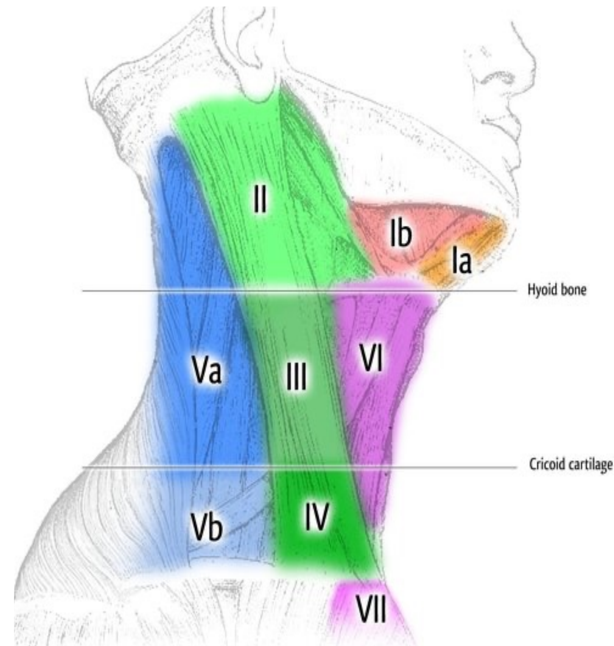
TNM staging
T1: Tumor ≤ 2 cm, depth of invasion (DOI) ≤ 5 mm
(not tumor thickness)
T2: Tumor 2-4cm OR DOI 5-10mm
T3: Tumor > 4 cm OR DOI > 10 mm
T4a: Moderately advanced local disease: (lip) tumor invades through cortical bone or involves the inferior alveolar nerve, floor of mouth, or skin of face or maxillary sinus
T4b: Very advanced local disease: tumor invades skull base/ encases the internal carotid artery/ masticator space / pterygoid plates

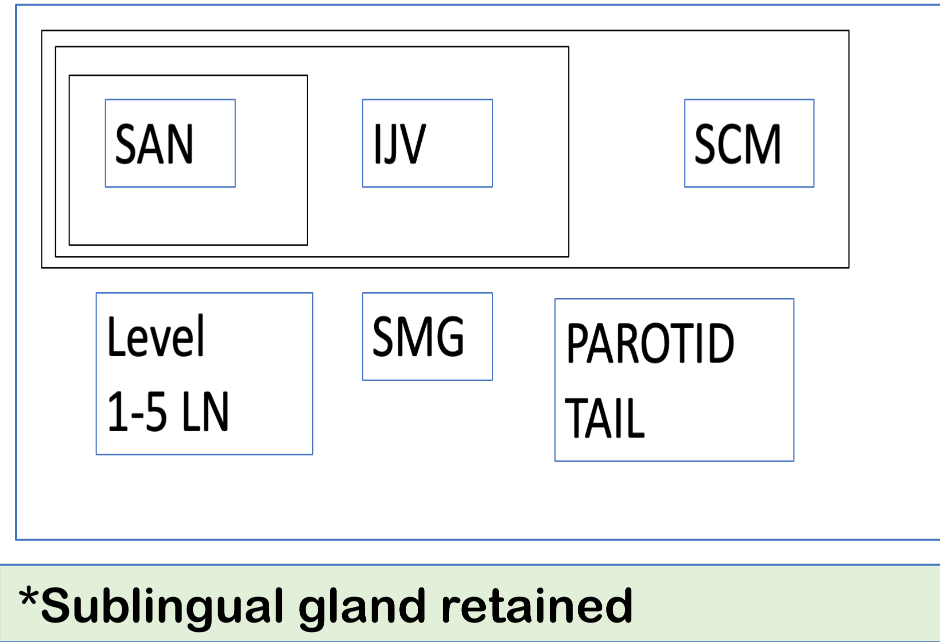


IOC FOR CA ORAL CAVITY :
IOC FOR CA TONGUE:
Erythroplakia > leukoplakia
Field cancerization

COMMANDO Procedure
(COMbined MAndibulectomy and Neck Dissection Operation)

MRND and salivary gland

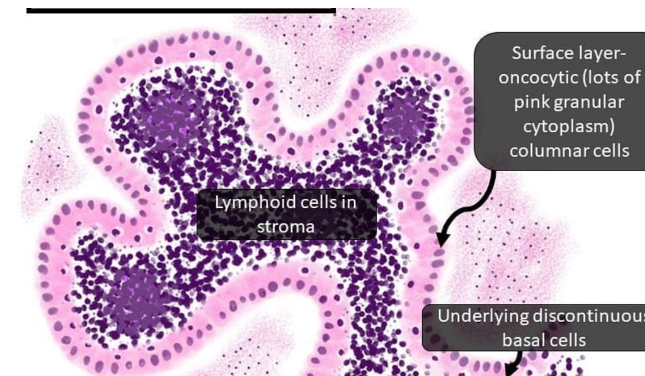




*Sublingual gland retained

Modified Schobinger's incision
Supra-omohyoid:
Central =Delphian LN

Sialolithiasis MC site:
Salivary gland tumor Grading system:
MC benign / overall-
MC malignant-
Perineural invasion –
Elderly, smoker, Hot spot-



Vocal cord palsy

All muscles supplied by RLN except cricothyroid
SLN :External
Internal (pierces thyrohyoid membrane)
Cough reflex impaired
Posterior cricoarytenoid:

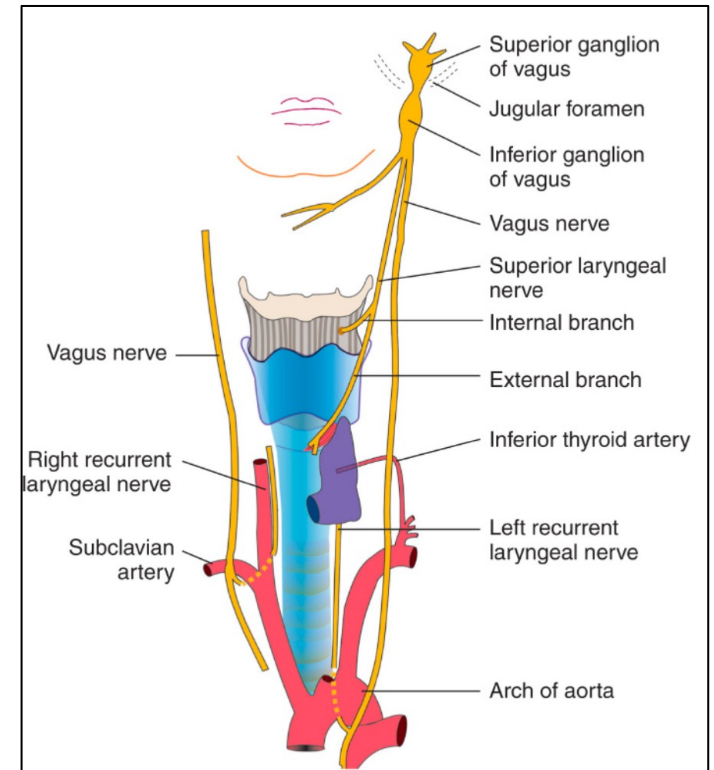
ILN

ELN

SLN

RLN

COMPLETE

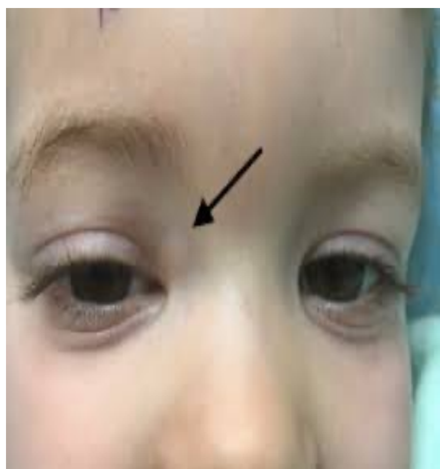
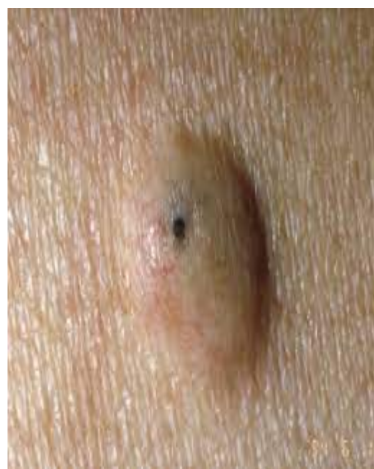
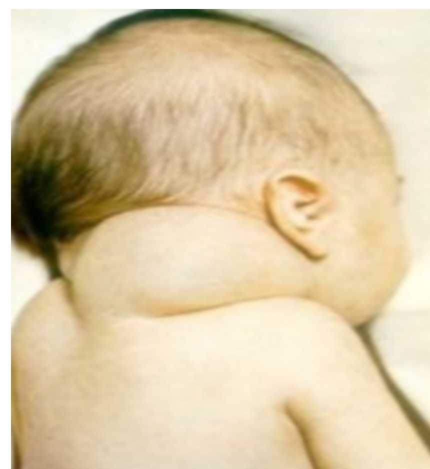
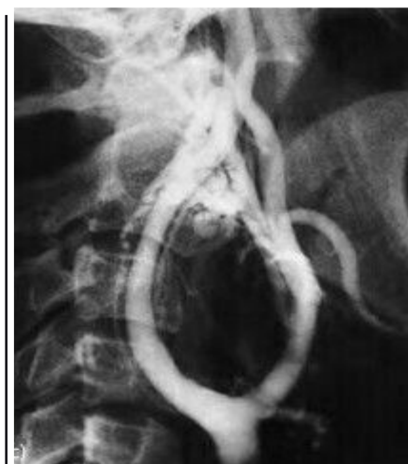
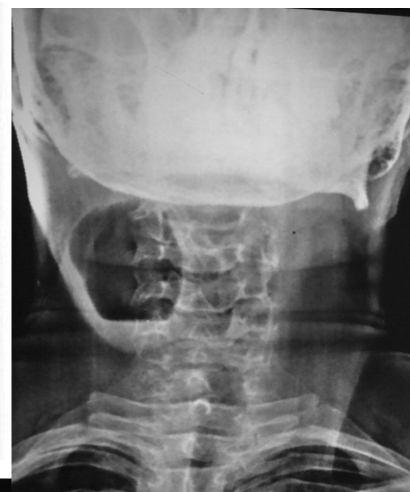
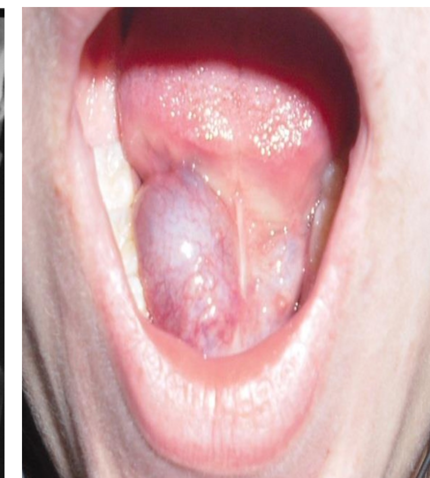
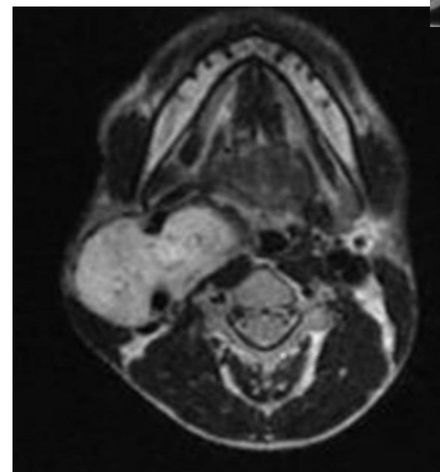
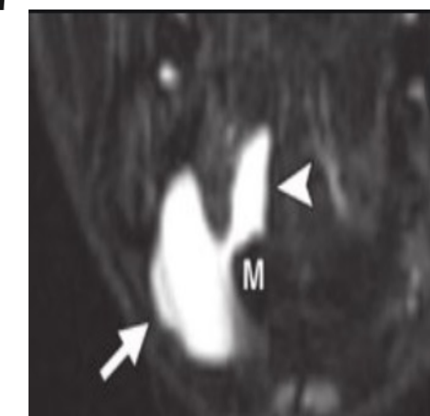


Position	Distance	Seen in
Median	0 mm	During speech/swallowing
Paramedian	1.5 mm	RLN palsy
Intermediate/ Cadaveric	3.5 mm	Complete paralysis
Slight abduction	7 mm	Normal respiration
Full abduction	9.5 mm	Strained respiration

Dysphonia plica ventricularis : Low pitch voice

Thyroplasty
1-
2-
3- Shortening/ relaxation
4- Lengthening/ tightening

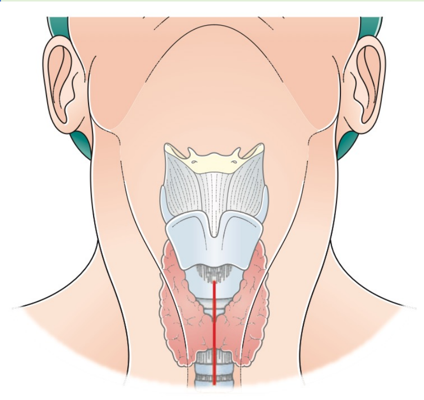
Head and neck masses

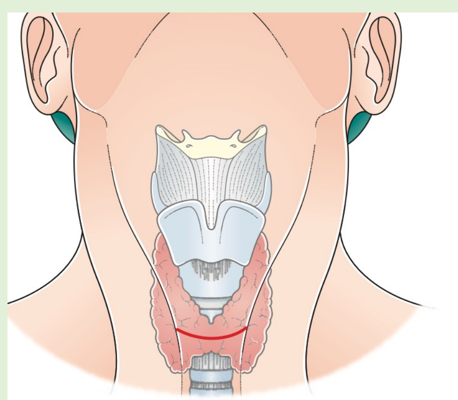









D/D:
Meningocele –Furstenberg sign +

Glioma

Miscellaneous

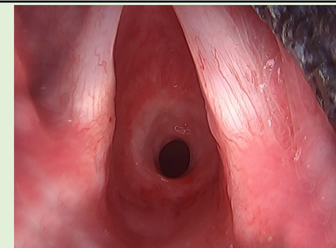




Position (MC): 2-3rd ring
High:
Low:
Block: Partial -
Complete-

Narrowest part and location of larynx
Children-
Adult-

Subglottic stenosis
Staging:
Treatment:



Ciliocytophoria:

Hyoepiglottic, Thyrohyoid, Cricotracheal:
Extrinsic membranes