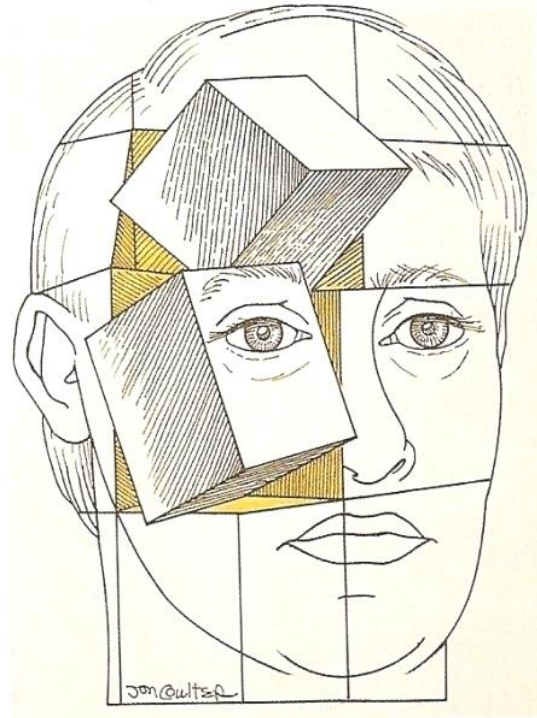


CLINICAL ANATOMY OF THE HEAD



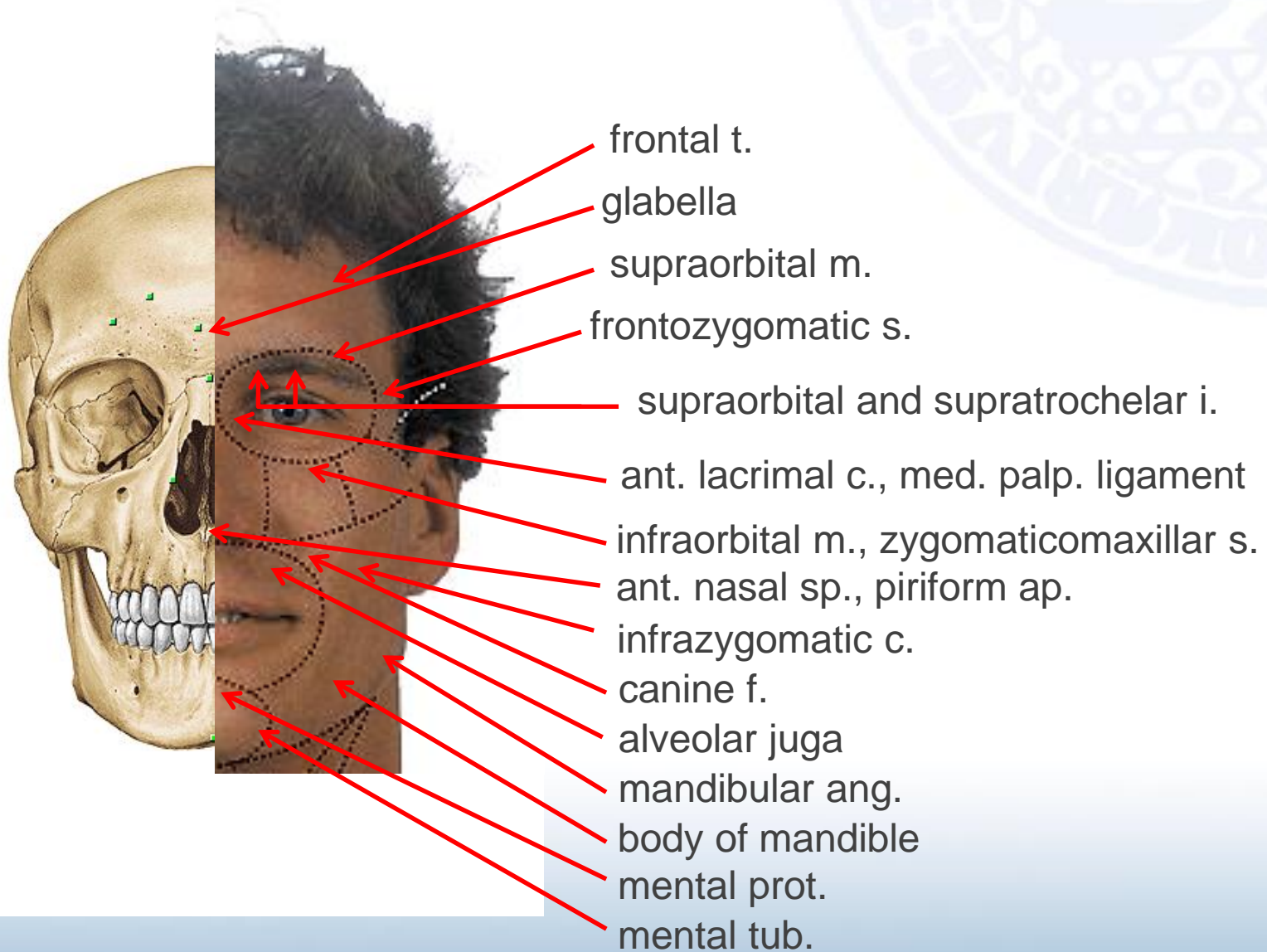
Chovanec M^{1,2}

¹Department of Otorhinolaryngology, 3rd Medical Faculty,
University Hospital Kralovske Vinohrady

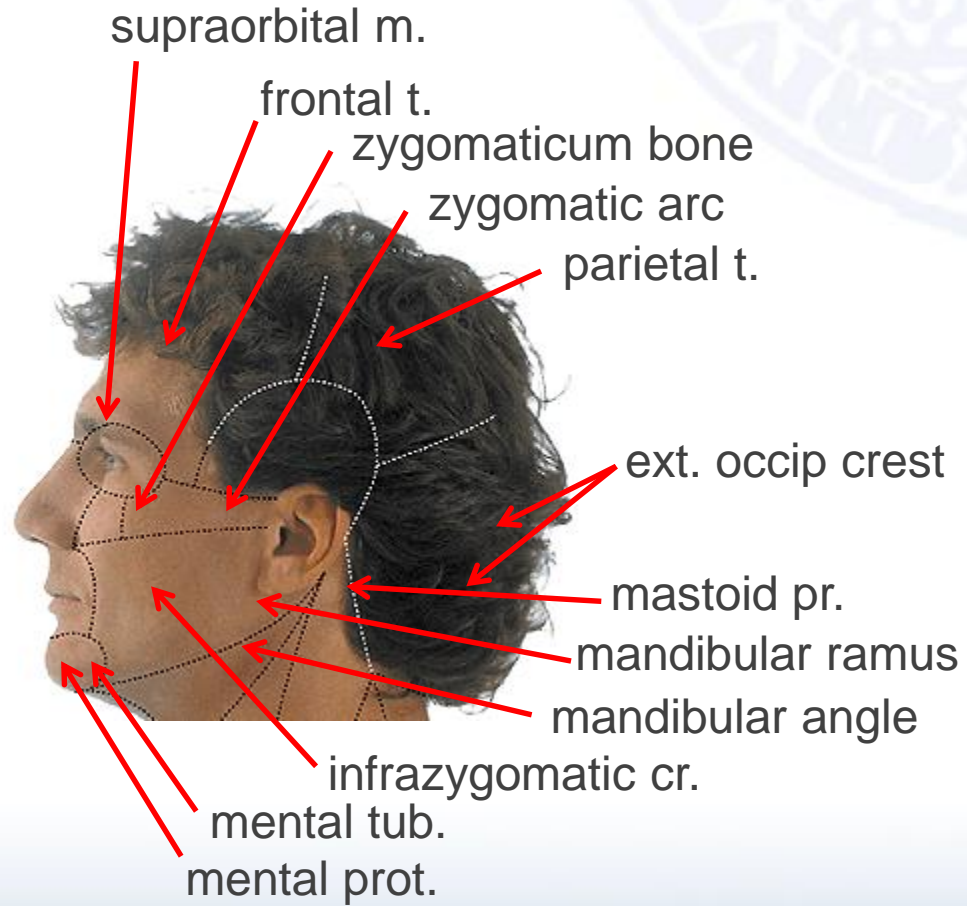
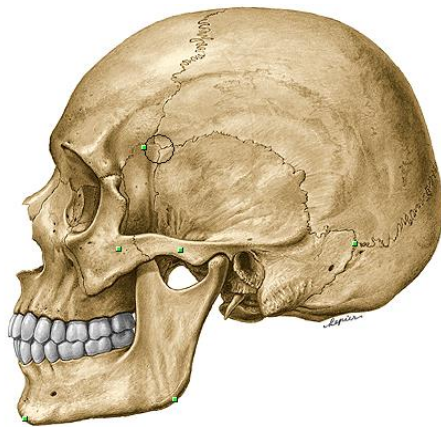
²Institute of Anatomy, 1st Medical Faculty,
Charles University Prague



Head – palpation

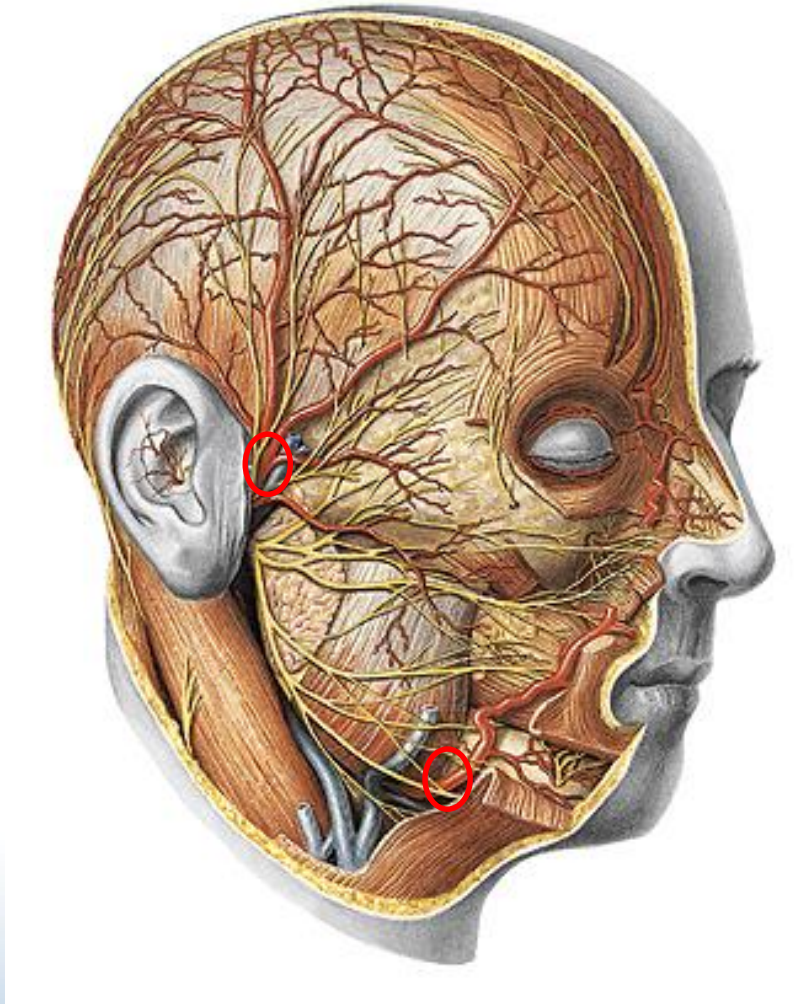


Head – palpation

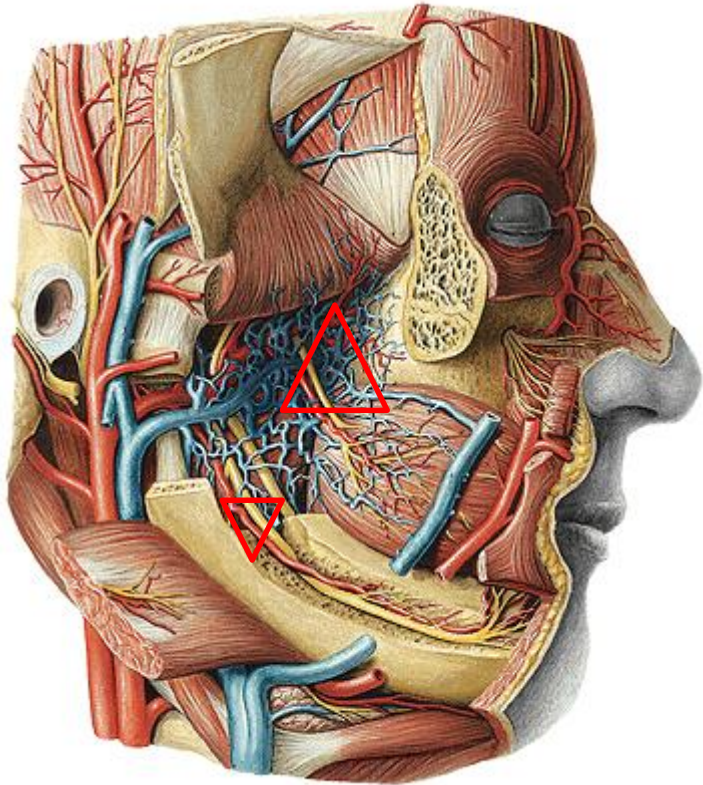


Arteries of the head

Bleeding - compression
facial a.
superf. temporal a.



Arteries of the head

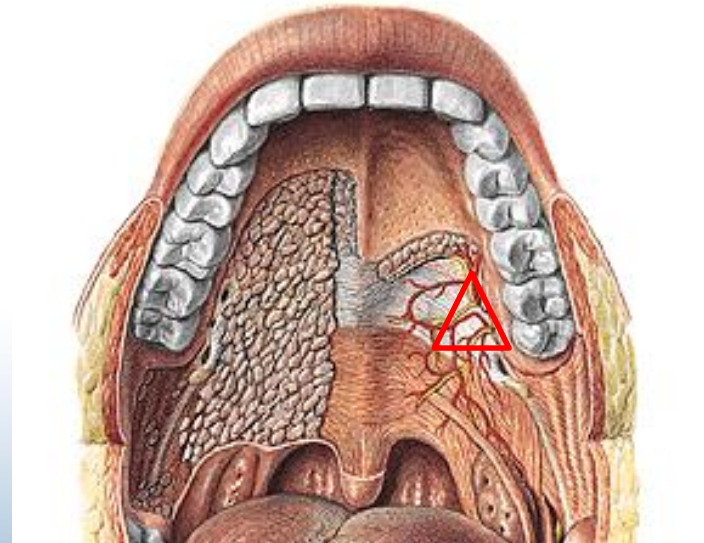


bleeding - compression

gret. palatine a.

inf. alveolar a. – alveolus

pterygoid v. plexus



Arteries of the head

bleeding - ligation

lingual a.

(Pirogov's tr. Béclard's ang)

facial a.

(submandibular tr.)

maxillary a.

(infratemporal f.)

ext. carotid a.

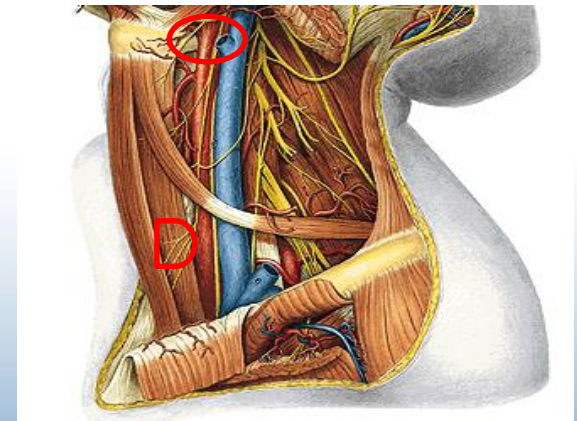
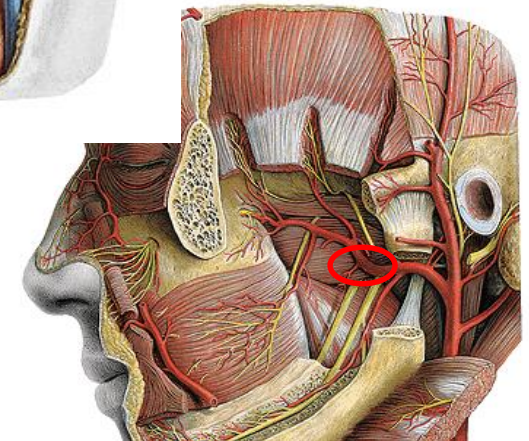
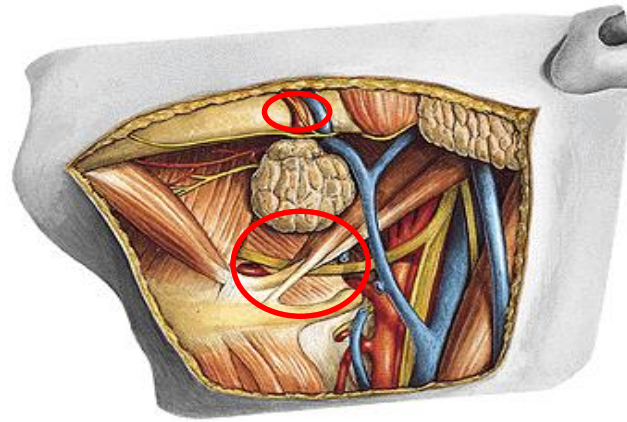
(carotic tr.)

comon carotid a.

(arterial circle of Willis!)

comon carotid a.

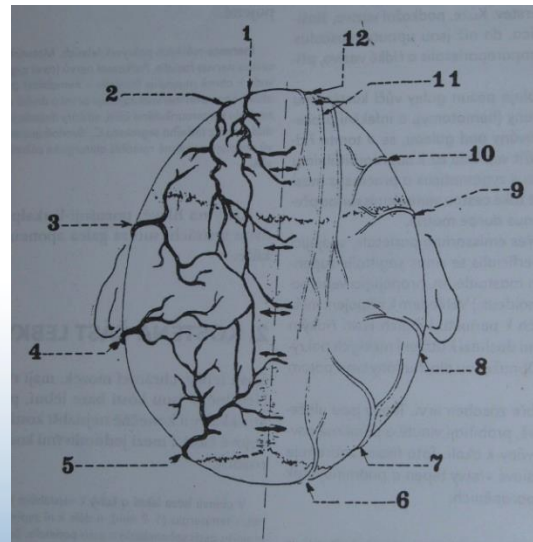
(compression – carotic tr. - transv. pr. C6)



Arteries of the head



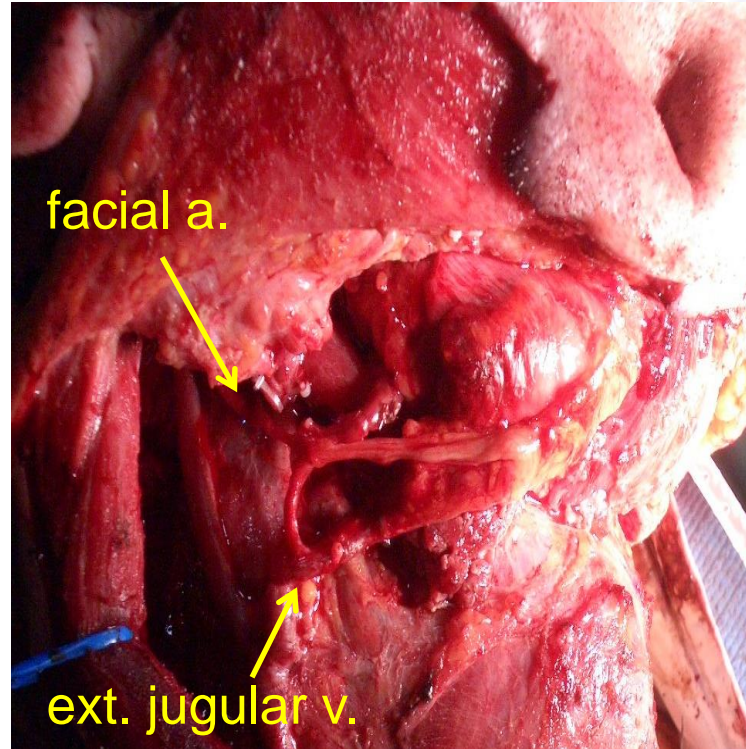
skin incisions



arteries and nerves of the scalp

- 1 - supratrochlear a.
- 2 - supraorbital a.
- 3 - superf. temporal a.
- 4 - post. auricular a.
- 5 - occipital a.
- 6 - tert. occipital n.
- 7 - great. occipitali n.
- 8 - lesser occipital n.
- 9 - auriculotemporal n.
- 10 - zygomaticotemporal n.
- 11 - supraorbital n.
- 12 - supratrochlear n.

Arteries of the head



microvascular reconstruction
(rect. abdominis free flap)

Arteries of the head

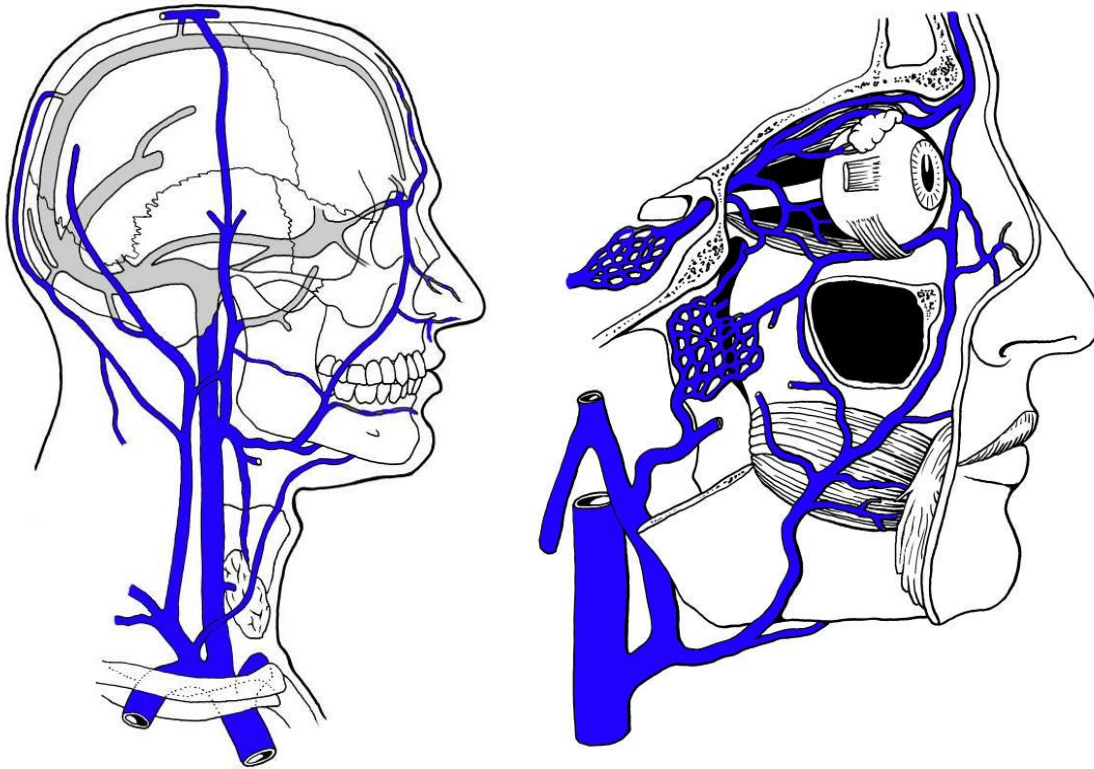


CAVE:! anastomoses
ext. and int. carotid aa.
supratrochl. a./angular a.
vidian a.



Angiofibroma of nasopharynx
(sphenopalatine f.) maxillary a. -
angiography and embolization

Veins of the head

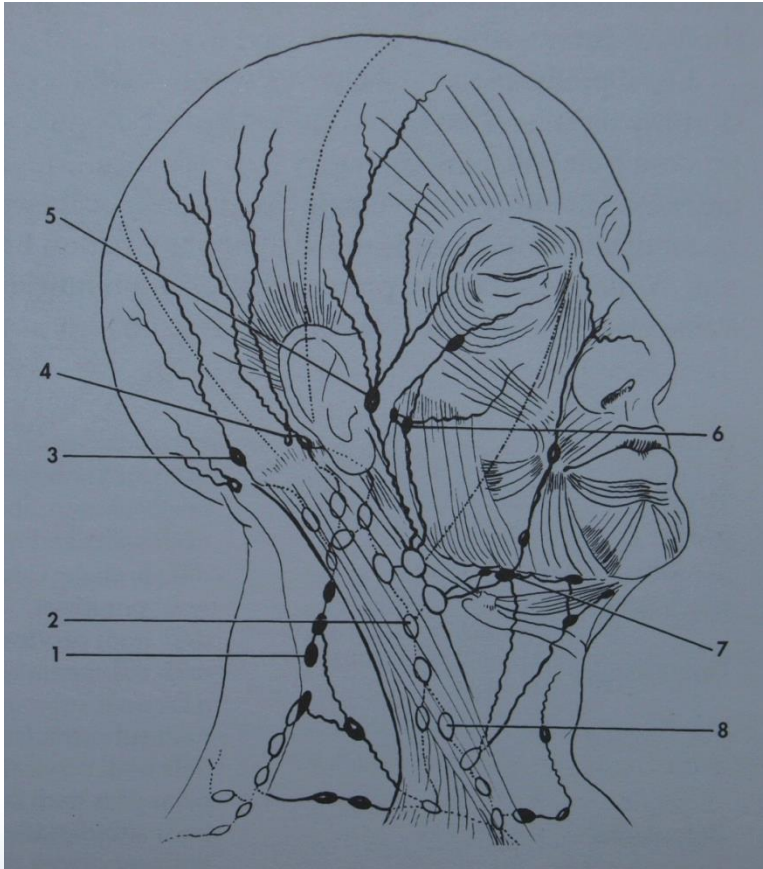


venous anastomoses (spread of infection)

- facial v.
- supraorbital/supratrochlear v.
- sup. and inf. ophthalmic vv.
- cavernous s.
- pterygoid v. pl.
- maxillary v.
- retromandibular v.
- ext. palatine v.
- deep facial v.
- superf. and med. temp. vv.
- parotid vv.
- transv. facial v.



Lymphatic drainage of the head



Lymph nodes of the head and neck

(acc. to Borovanský 1976)

- 1 - cervic. superf. LNs
- 2 – deep sup. cervical LNs
- 3 – occipital LNs
- 4 – retroauricular LNs
- 5 – preauricular LNs
- 6 – parotid LNs
- 7 – submandibular LNs
- 8 – deep inf. cervical LNs

Sensitive innervation of the head

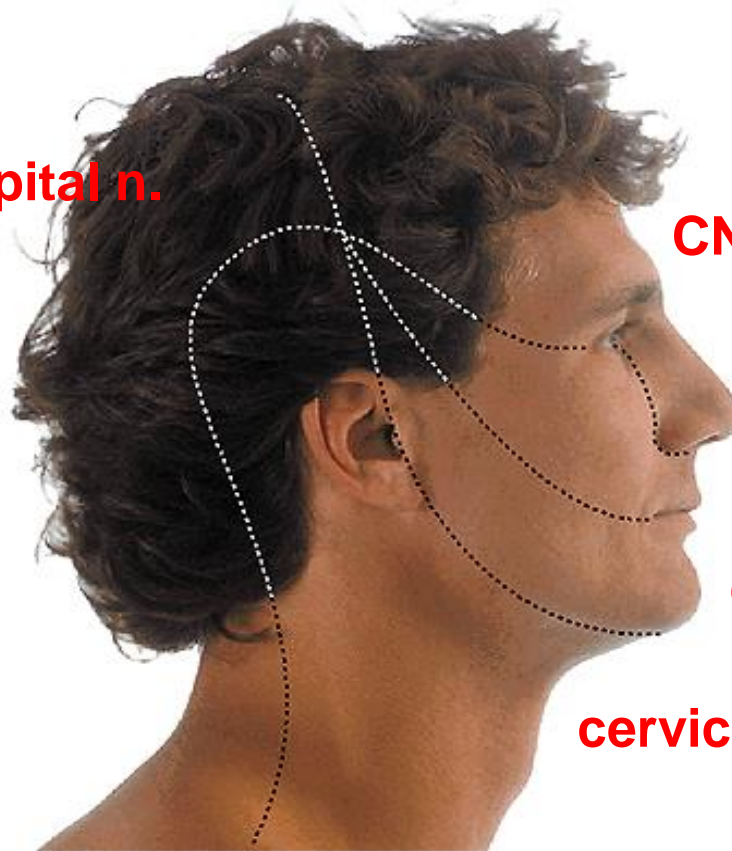
gr. occipital n.

CN V/1

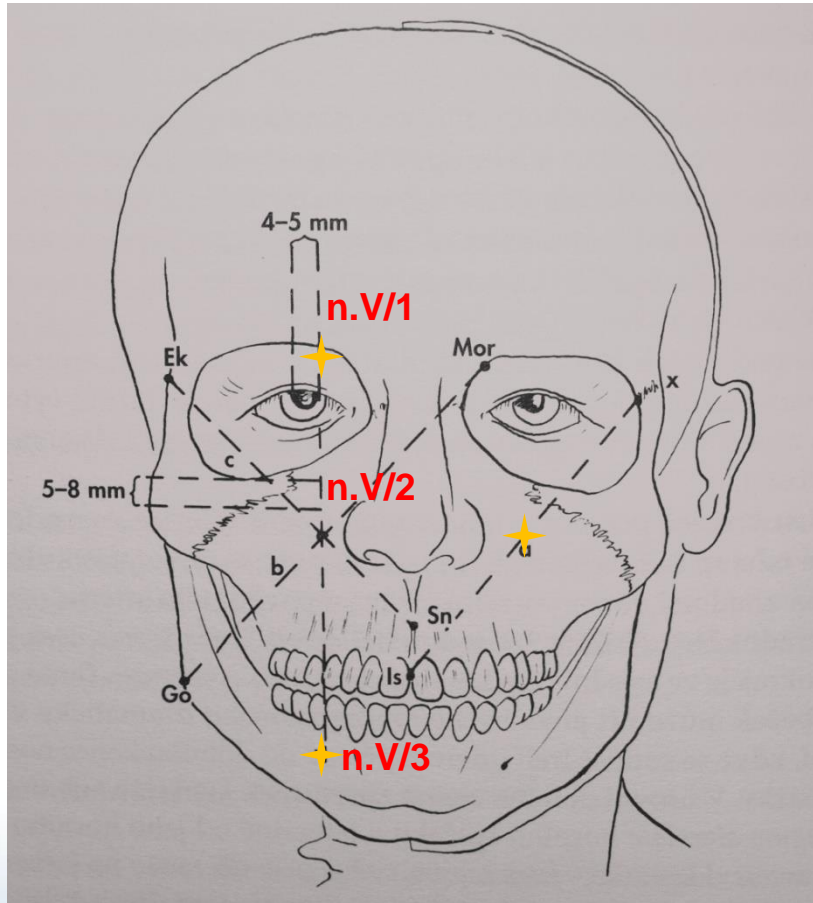
CN V/2

CN V/3

cervical pl.



Sensitive innervation of the head



Exit points of CN V

Ek - ektokonichion

Go - goniale

Is - incisale superius

Mor - medioorbitale

x – frontozygomatic s.

a – line of Černý

b – line - Mor a Go

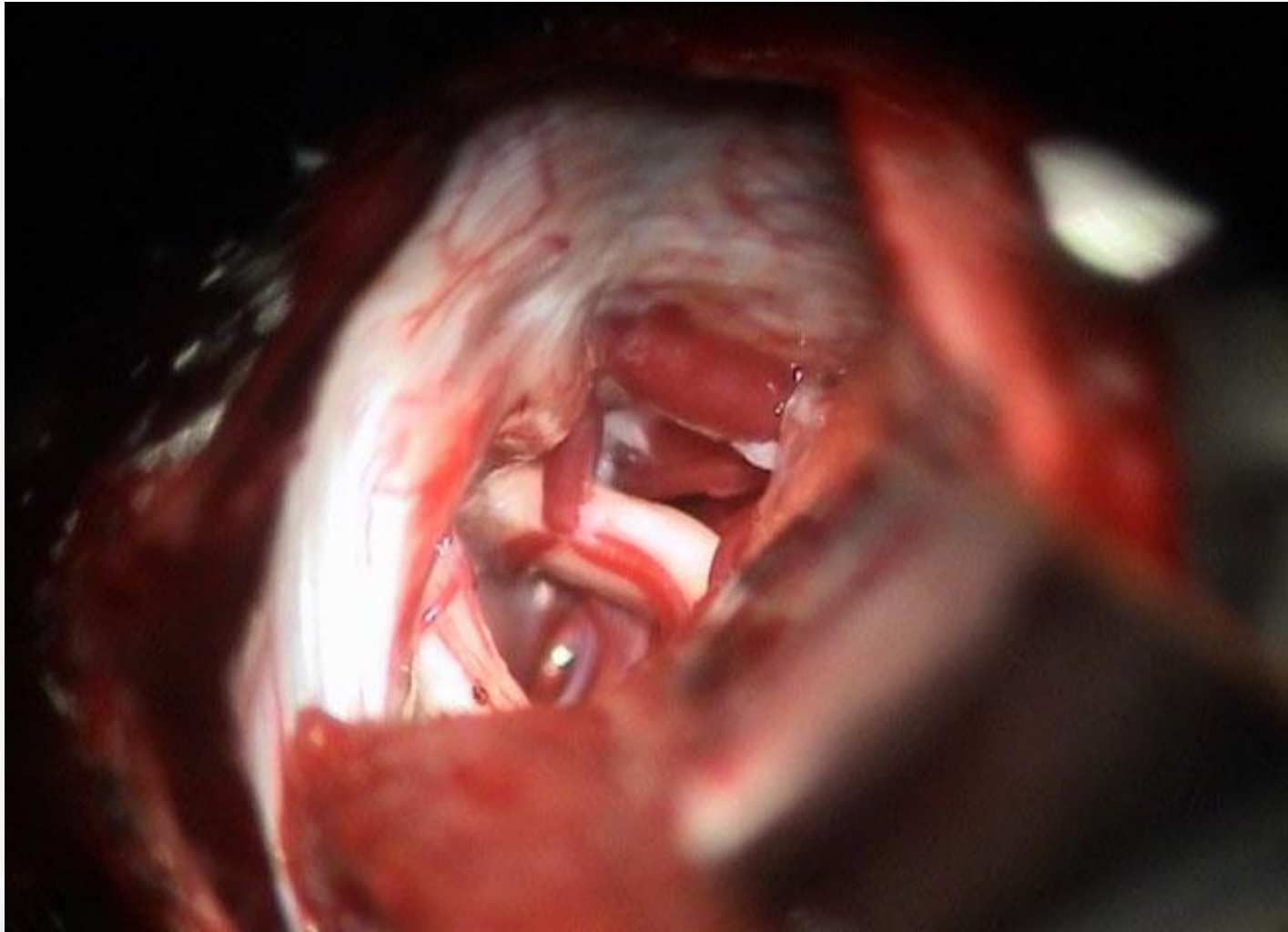
c – line - Sn a Ek

Sensitive innervation of the head



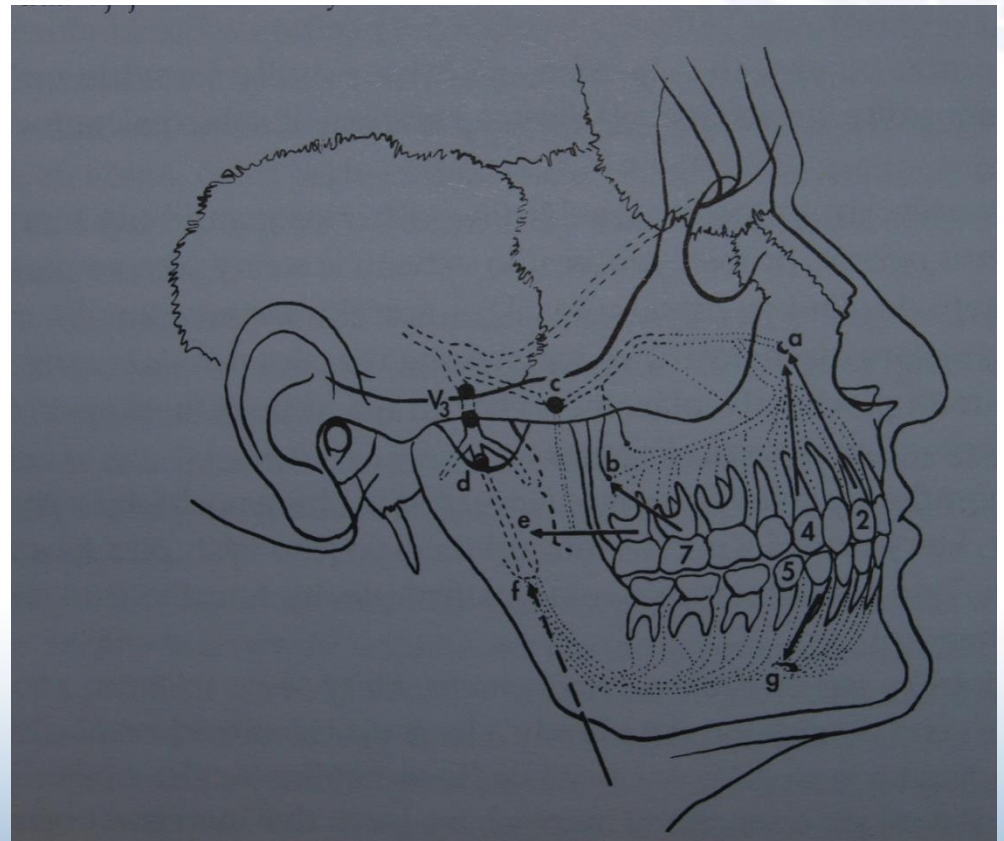
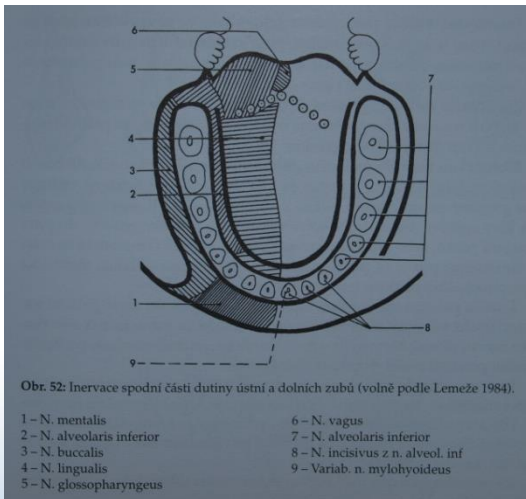
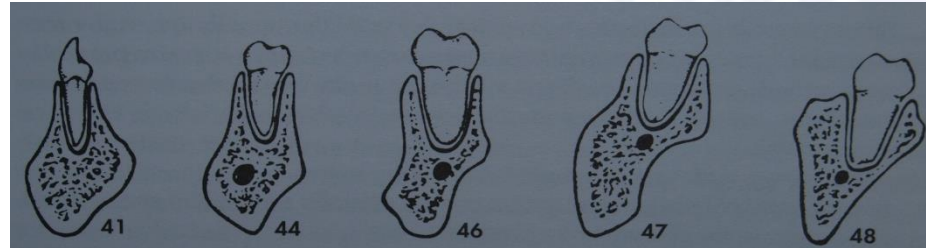
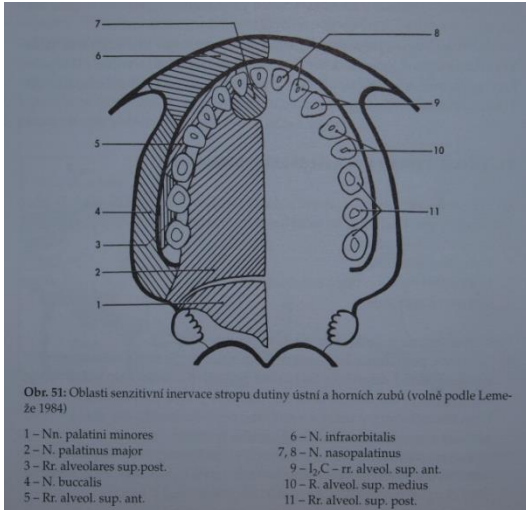
palpation

Esencial neuralgia of CN V

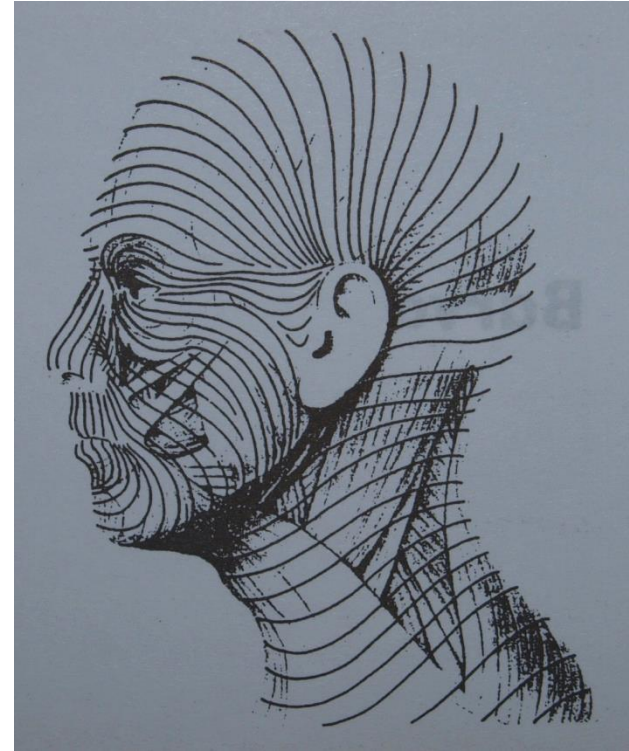
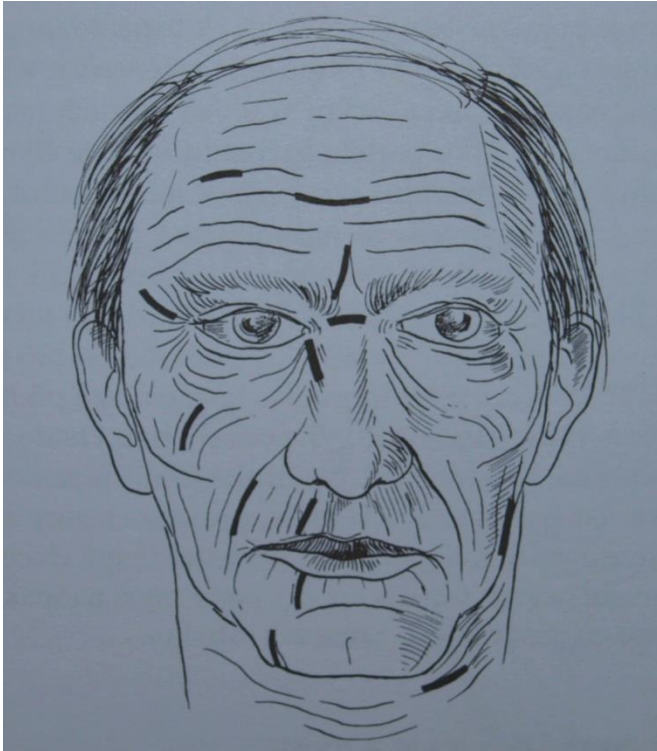


neurovascular conflict of CN V and AICA

Anesthesia of the oral cavity

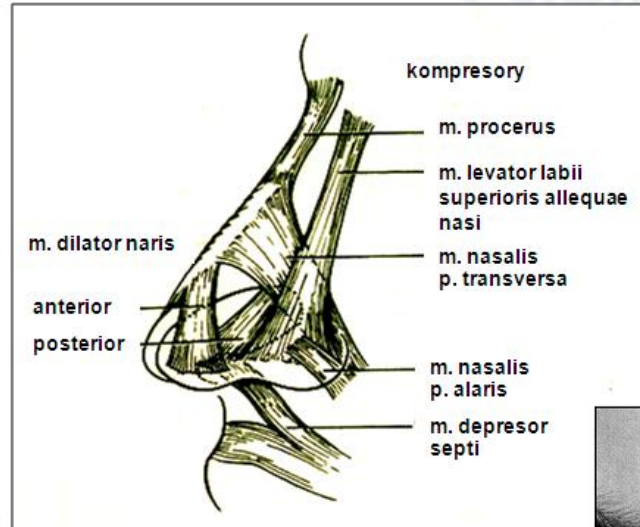
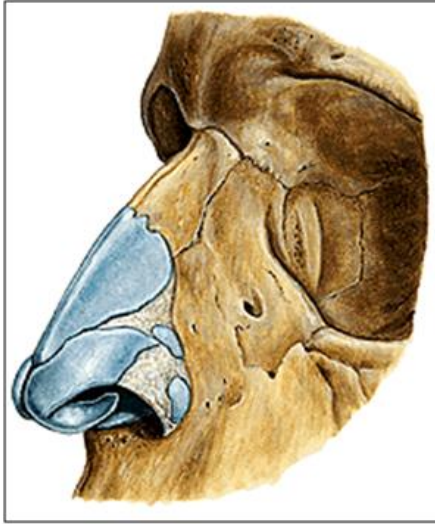


Skin incisions in the face

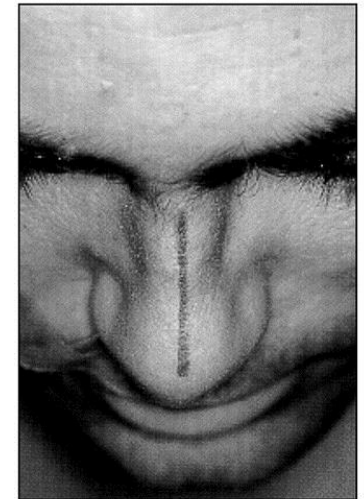
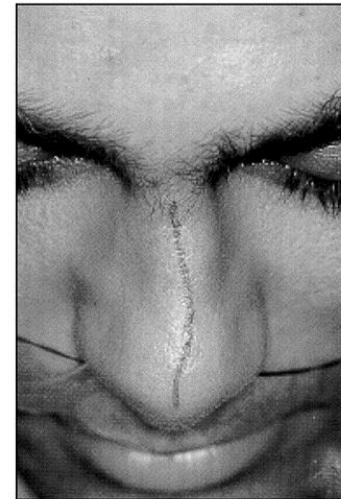


skin relaxation lines and skin creases of the face

External nose

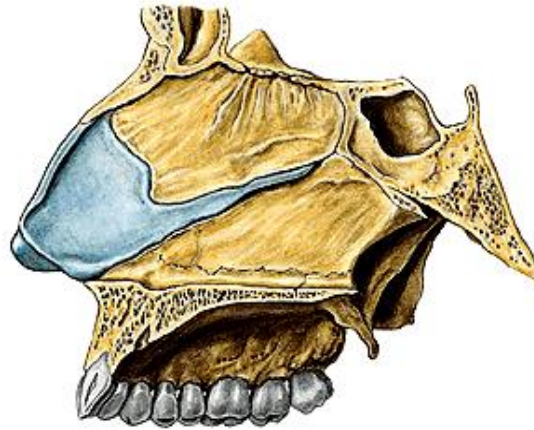


collapse of the nasal valve



deviation of the external nose
(rhinoplasty)

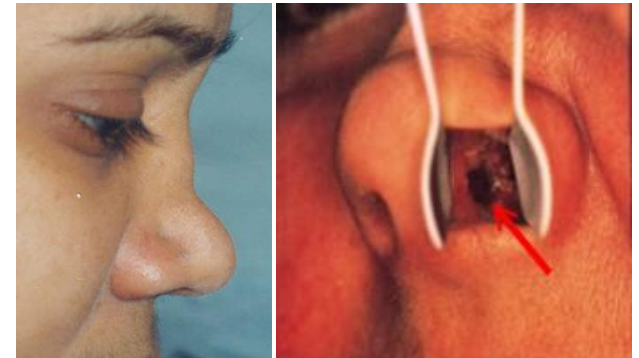
Nasal septum



septal haematoma

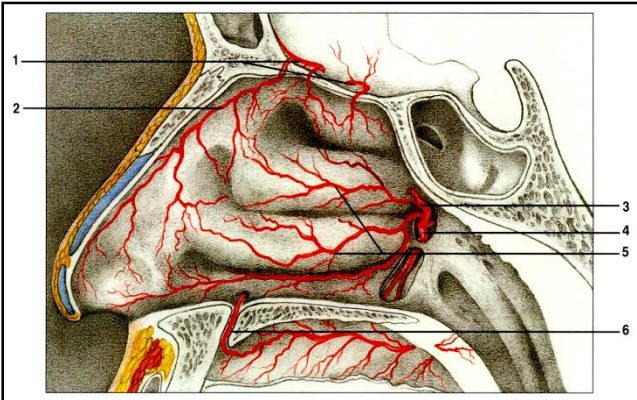
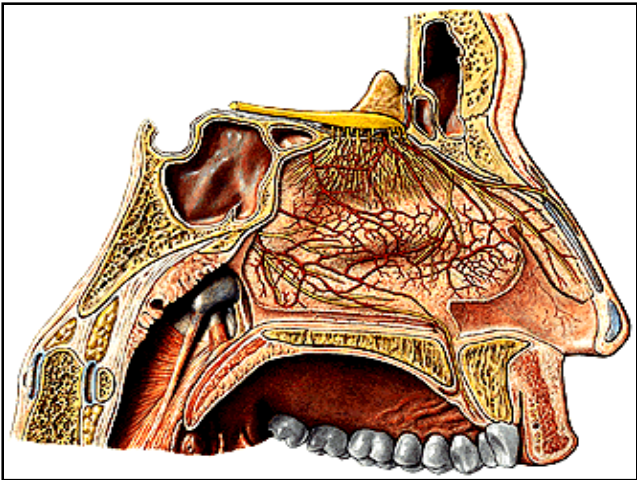


deviation

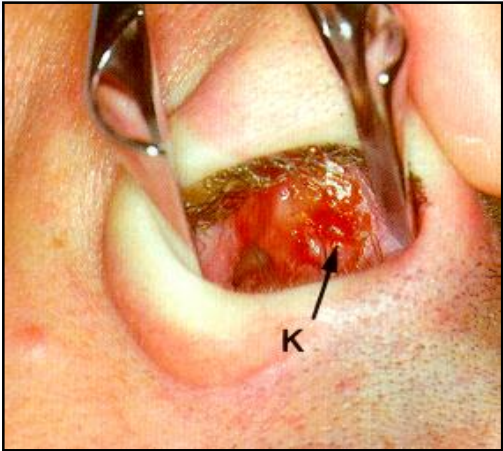


saddle nose deformity and perforation

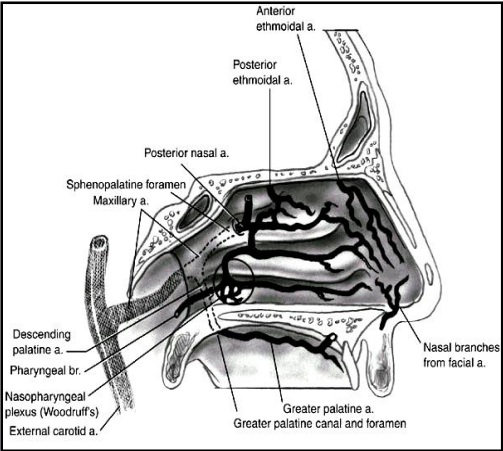
Epistaxis



ext. carotid a..
int. carotid a.

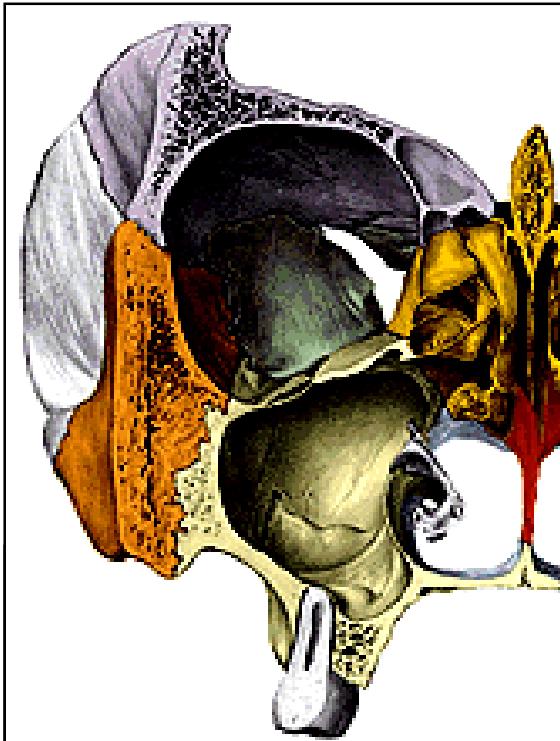


Little's area

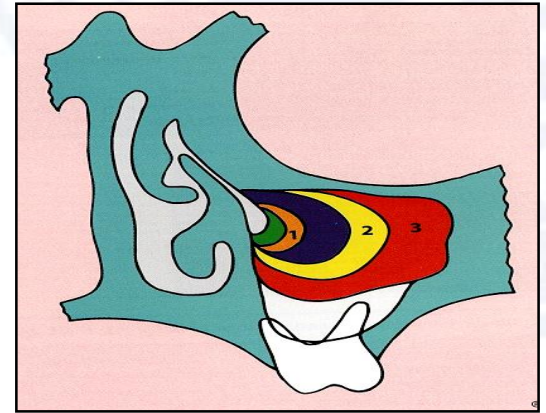


naso-nasopharyngeal pl. of Woodrof

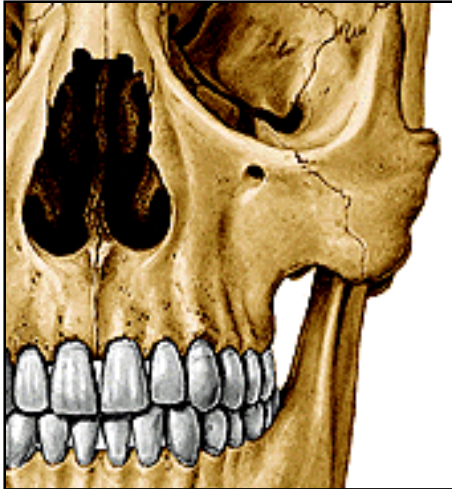
Maxillary sinus



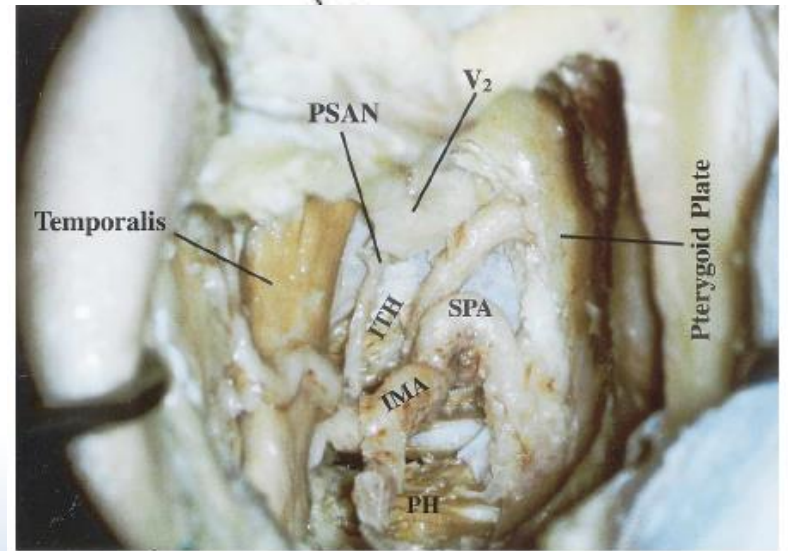
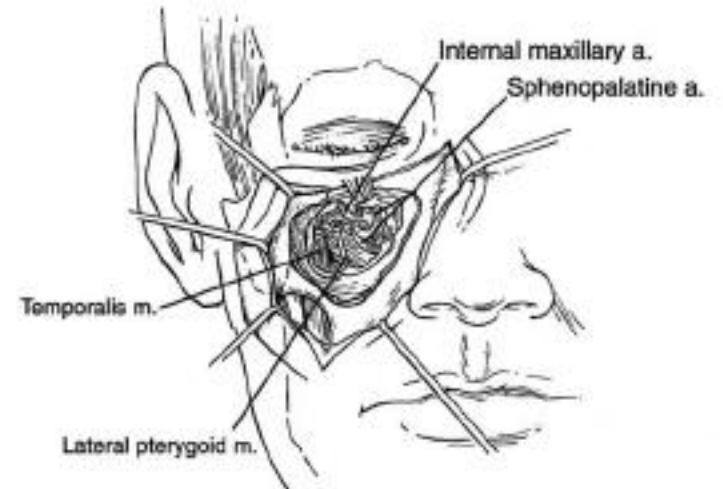
- antrum Highmori
- birth
7x4x4 mm
- X-ray
4-5 mo
- bifasic growth
0-3 y & 7-12 y
- 18y: 34x33x23 mm
- topography
orbit – infraorbital n., a., v.
alveolar pr. – M1, M2, PM2, M3, C
pterygopalatine & infratemporal f.
MNM – ostium + acces. ostia



Maxillary sinus

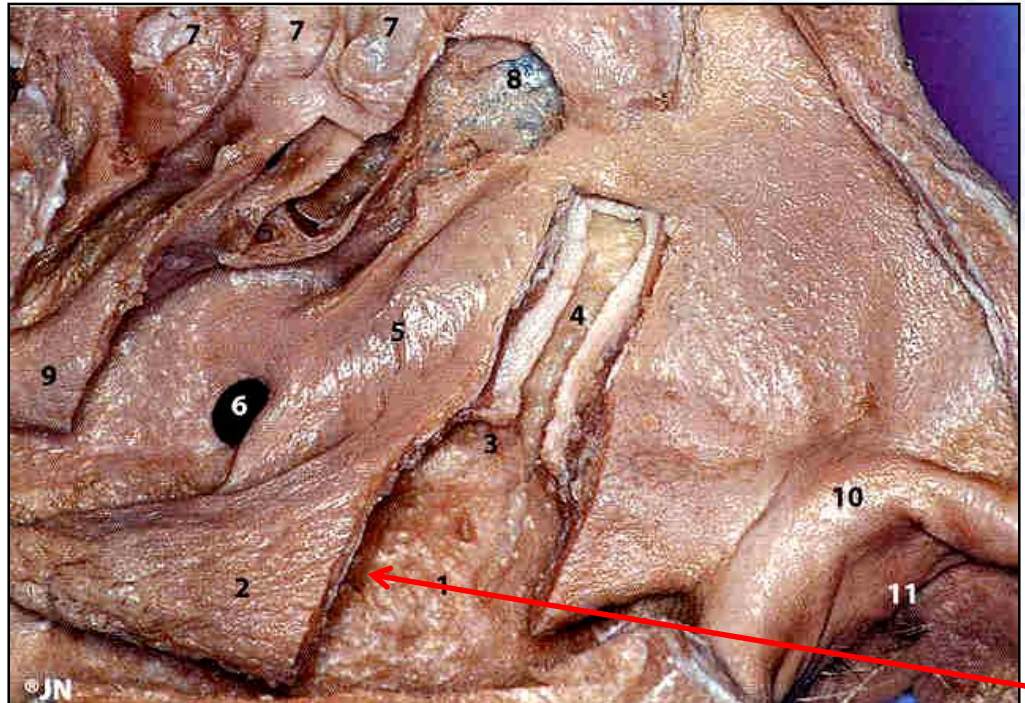
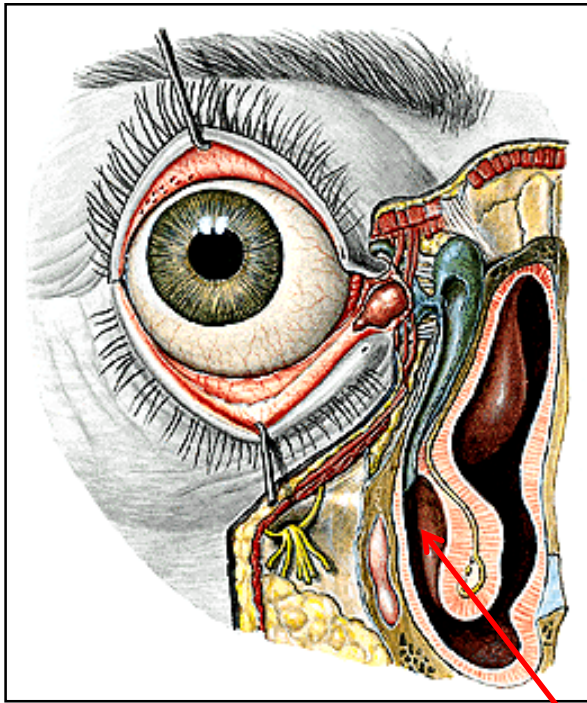


Caldwell Luc's op.



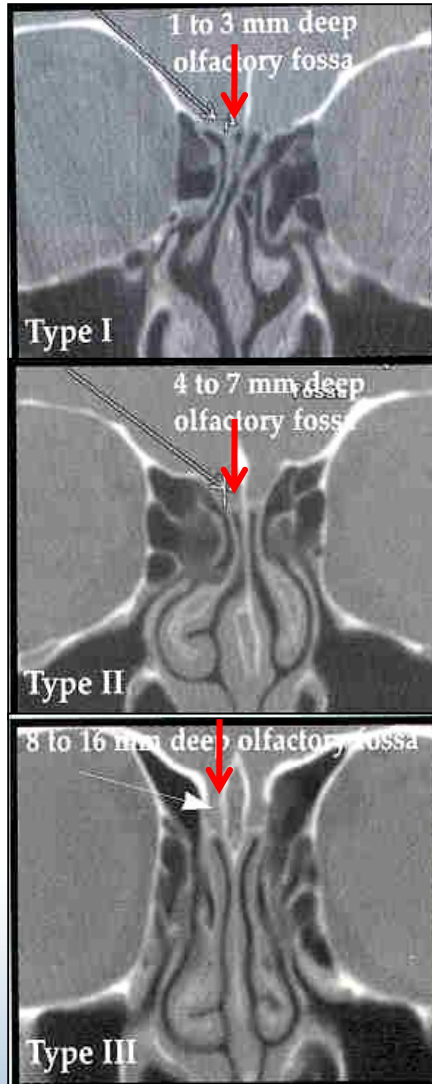
transmaxillary appr. to infratemporal f.

Puncture of maxillary s.



ostium of maxillary s. – nasolacrimal d.: 4-9 mm

Ethmoidal sinuses

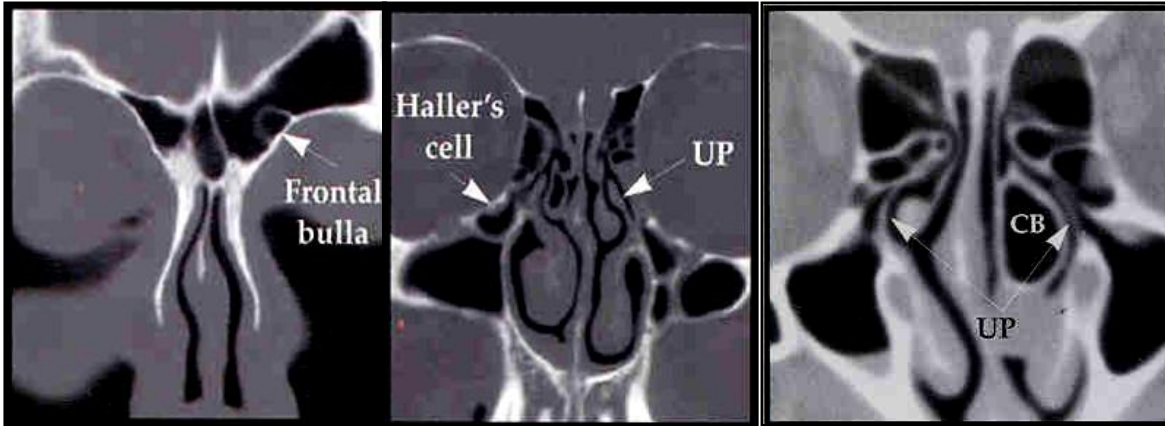


- anterior (AE) and posterior (PE)
- basal lamel – „ground lamela“
- AE: middle nas. meatus
birth: 2x4x2 mm
18 y: 20x22x10 mm
- PE: sup. nas. meatus
18 y: 20x20x10 mm



Ethmoidal sinuses

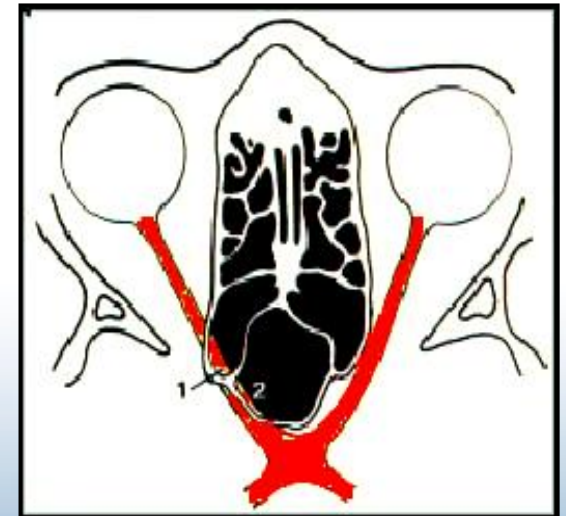
bullous concha



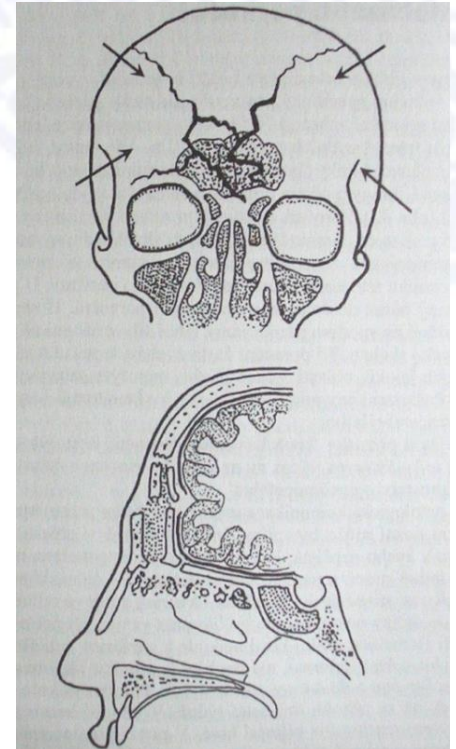
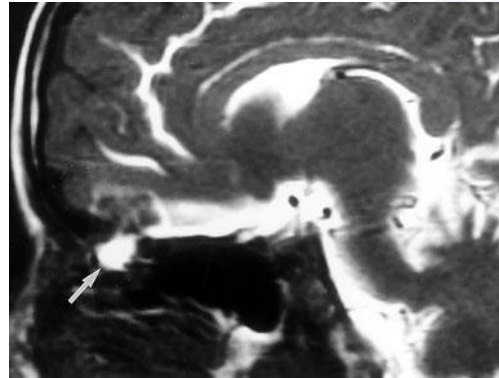
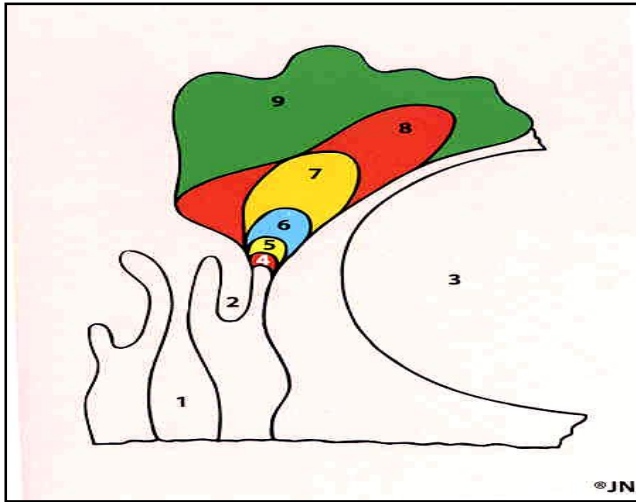
frontal bulla

Hallers's cell

Onodi's cell

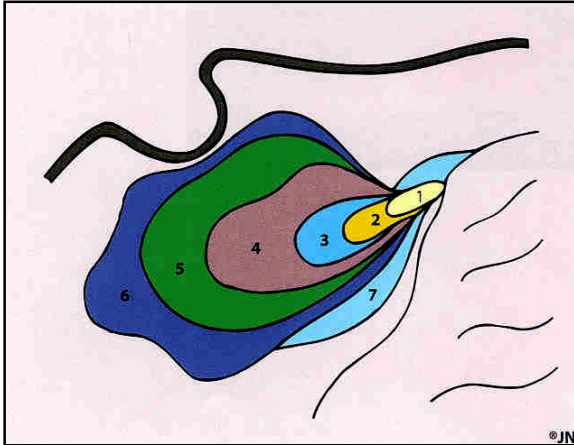


Frontal sinus

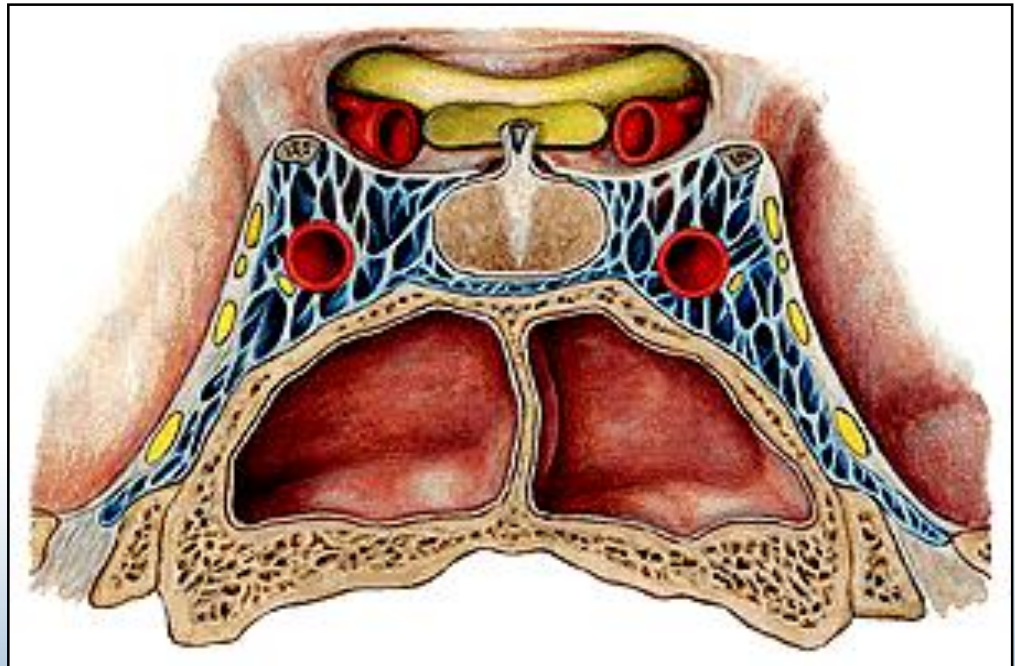


- X-ray: 2 y
- frontal bone invasion: 5 y
- adolescence: 17x28x27 mm
- unilateral aplasia: 7% (4-15%)
- ant. and post. lamina: diploe, ant./post. = 2/1
- topography: ant. cranial fossa, orbit

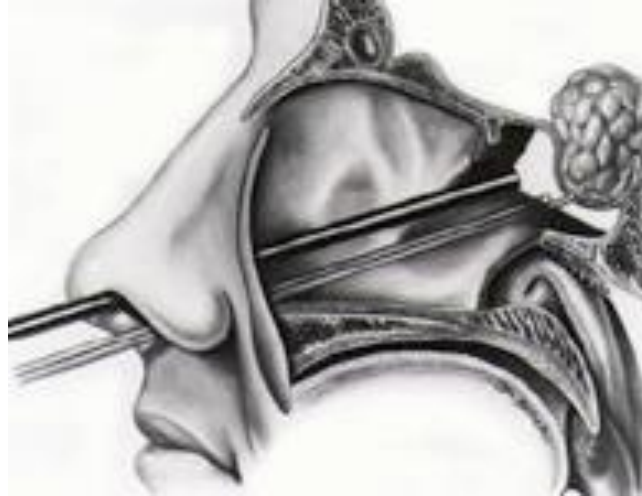
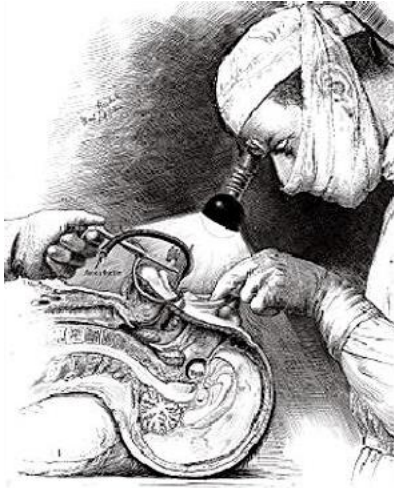
Sphenoid sinus



- pneumatization after 3rd y, 7th y: sella turcica
- 18 y: 23x20x17 mm
- ev. invasion of: gr. wings of sph. bone, clivus, pterygoid pr., palatine bone
- topography: sella turcica, CN II, int. carotid a.

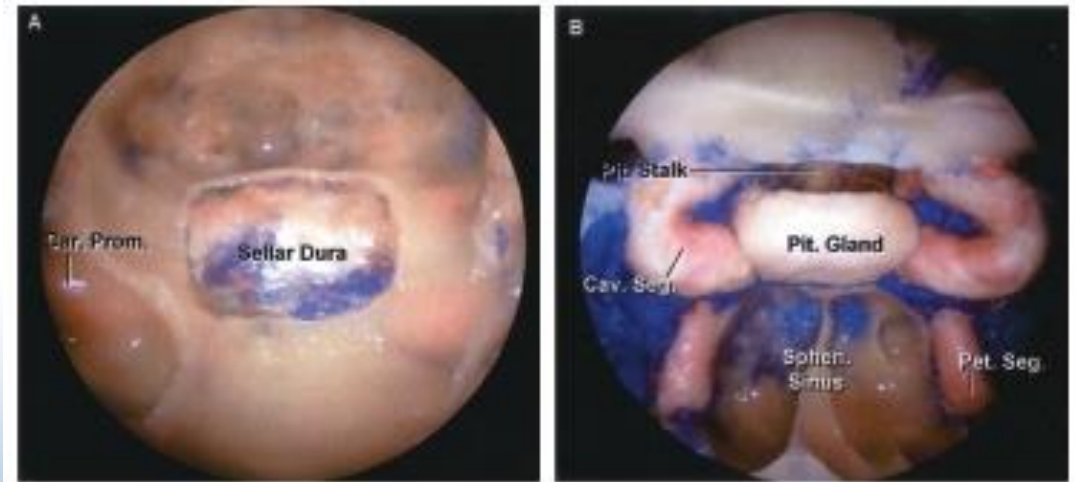


Sphenoid sinus



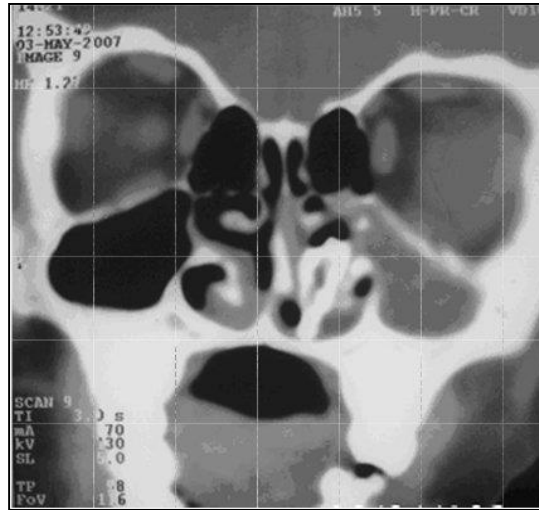
pituitary surgery
CN II decompression
other skull base pathologies

endoscopic transsphenoidal appr.



Complications of sinustitis

Cranial: osteomyelitis



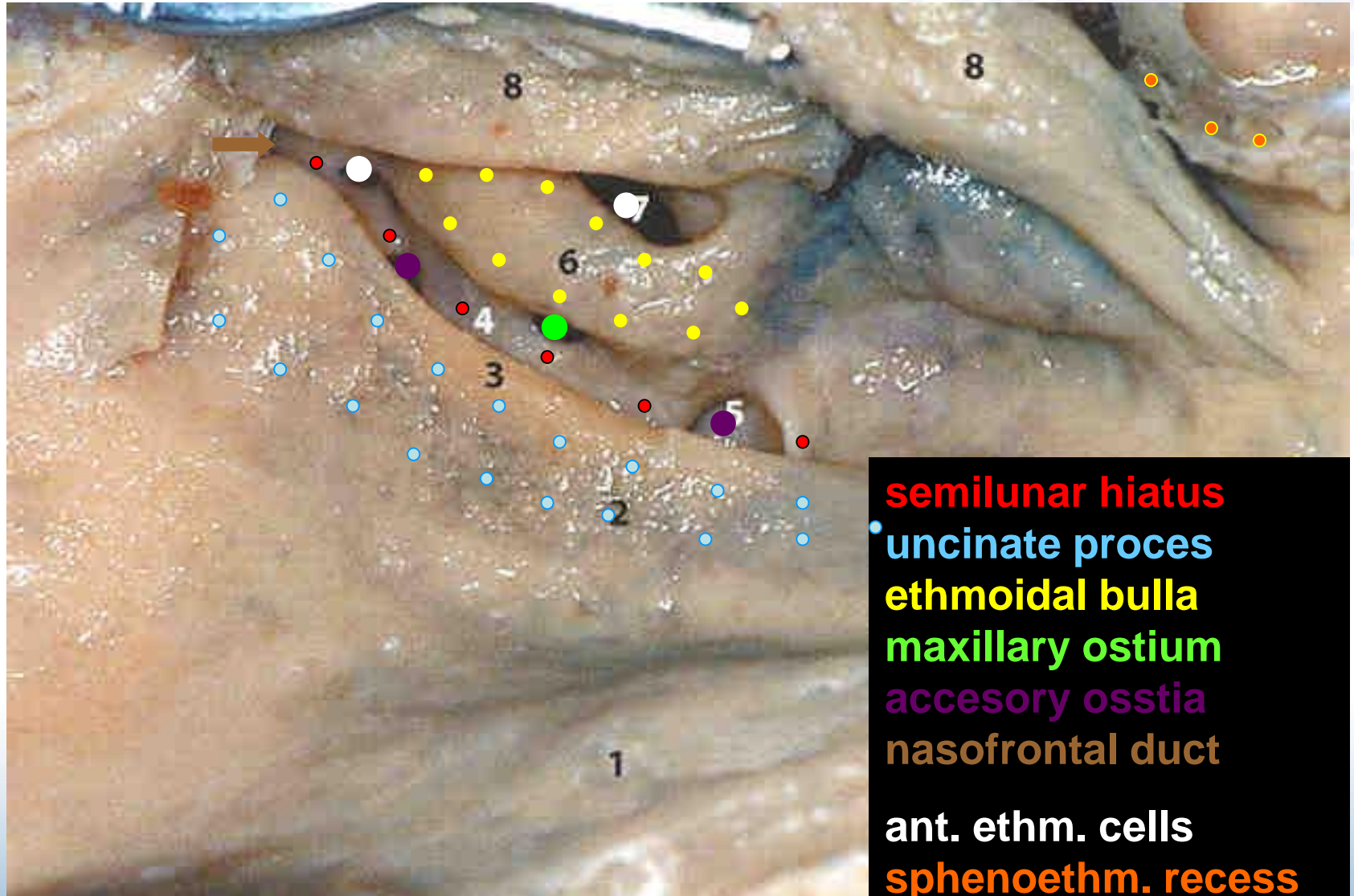
Intracranial:
meningitis
empyema
abscess

trombosis of cavernous s.



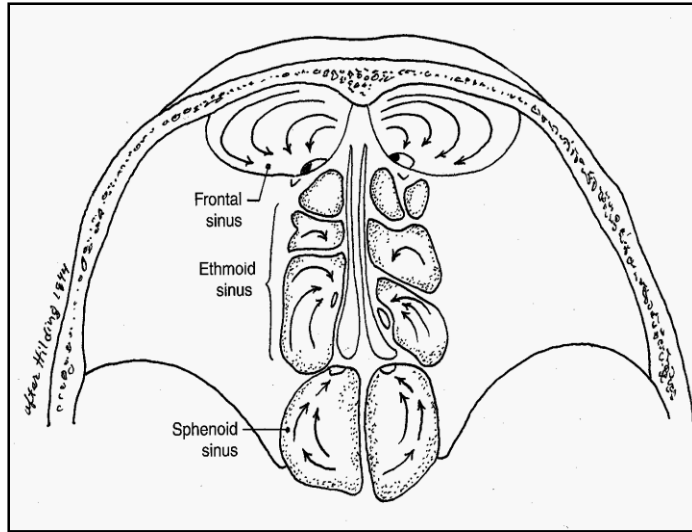
Orbital: orbitocelulitis, abscess, neuritis of CN II

Lateral nasal wall

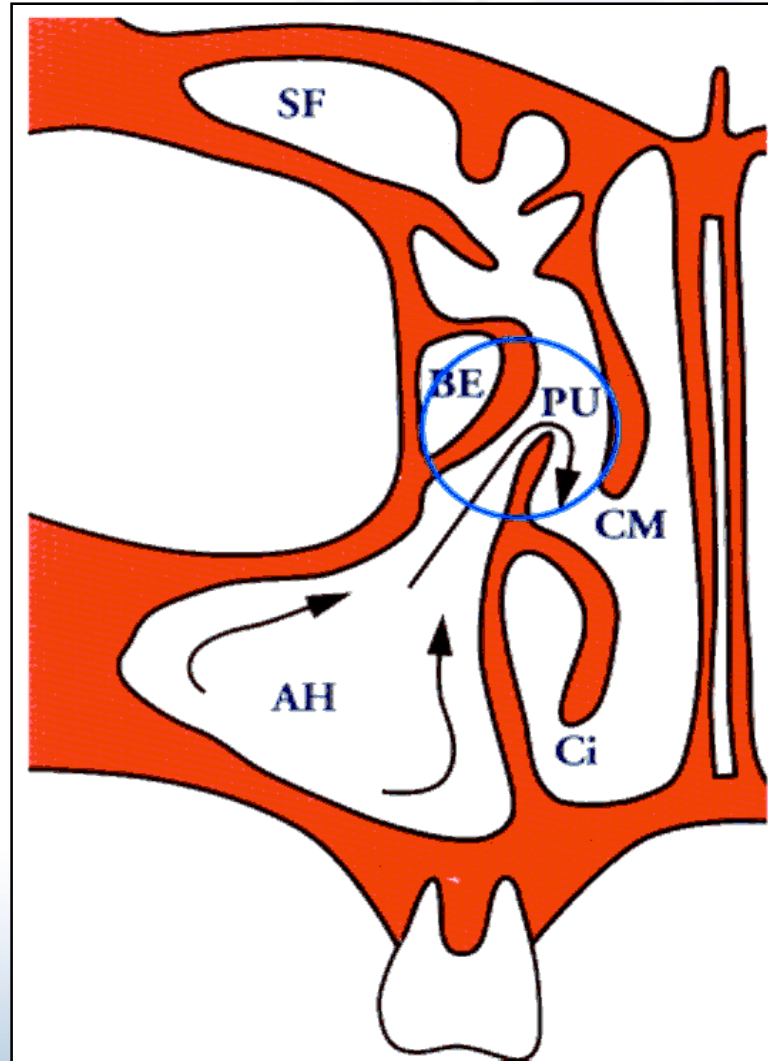


- semilunar hiatus**
- uncinate proces**
- ethmoidal bulla**
- maxillary ostium**
- acesory osstia**
- nasofrontal duct**
- ant. ethm. cells**
- sphenoethm. recess**

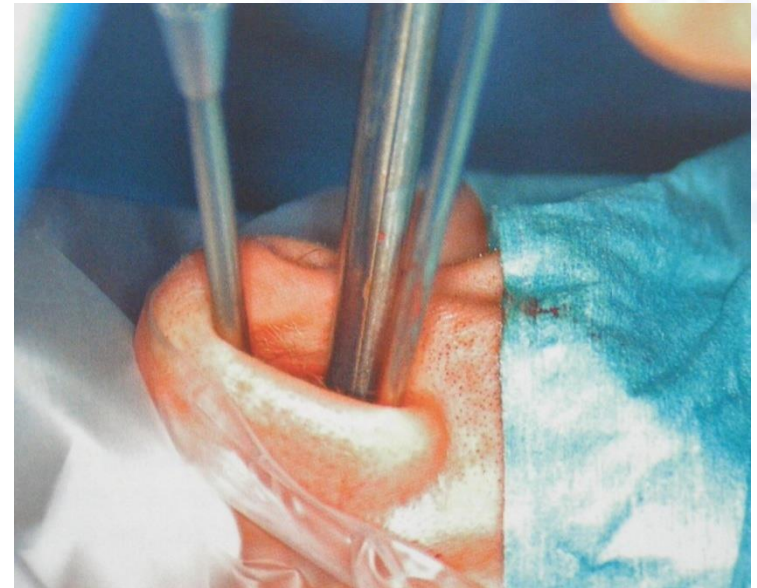
Ostiomeatal complex



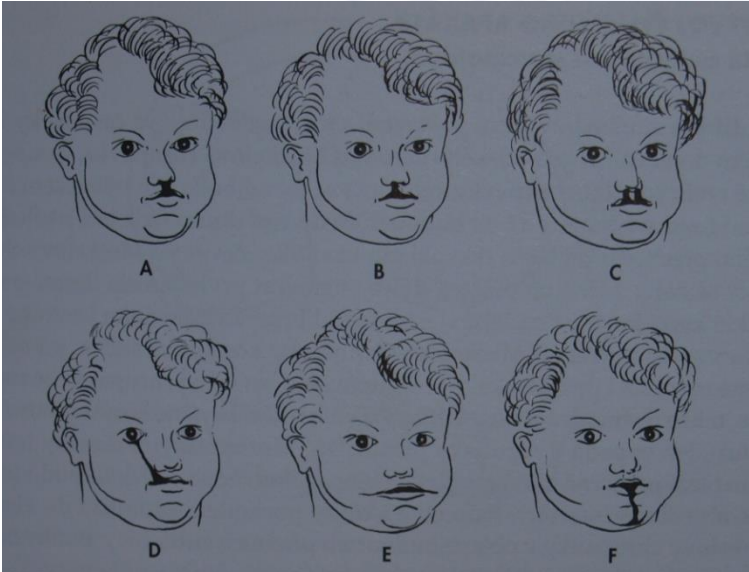
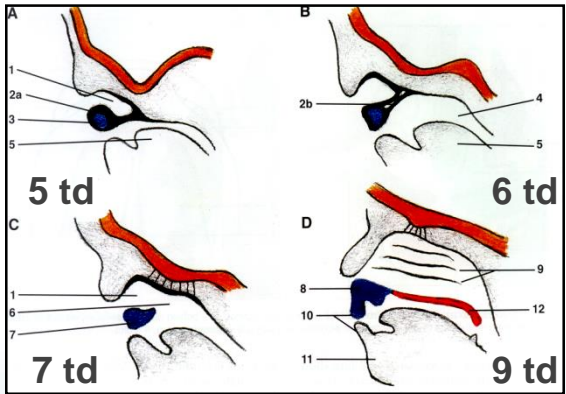
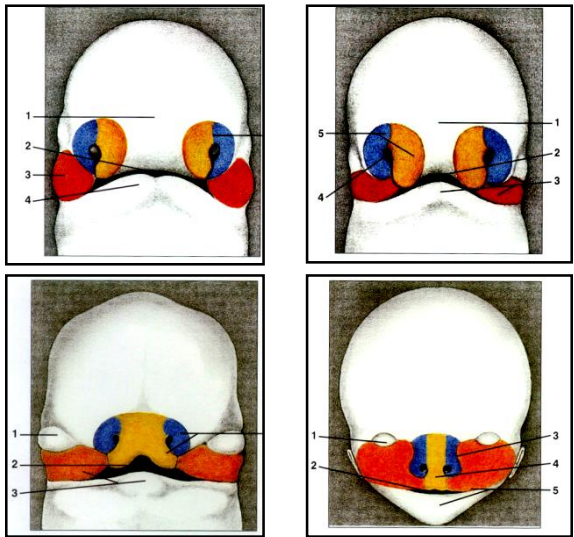
mucociliar clearance



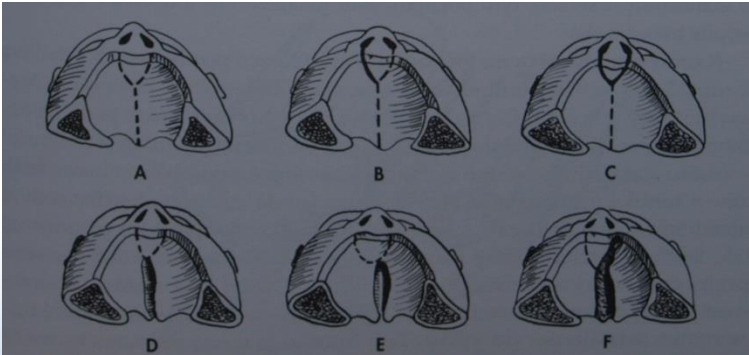
FESS – Functional endoscopic endonasal surgery



Clefts

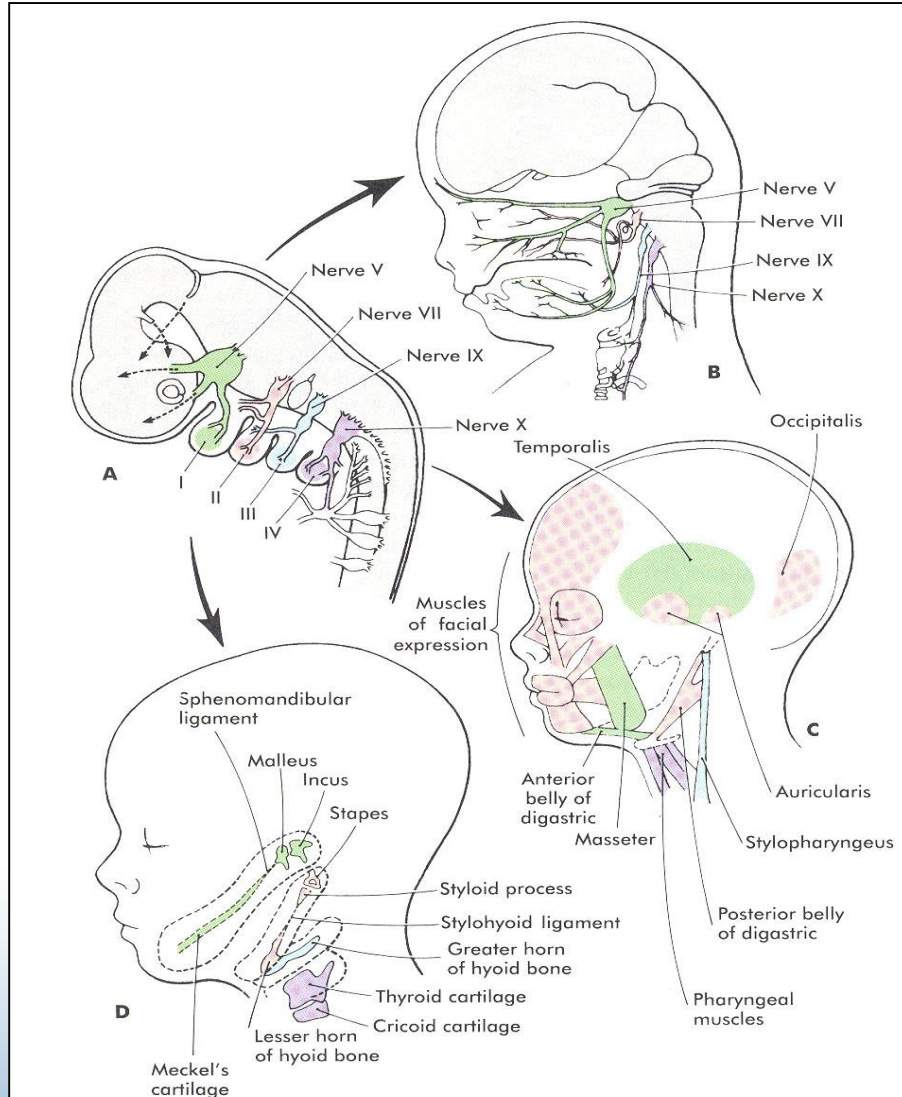


facial clefts



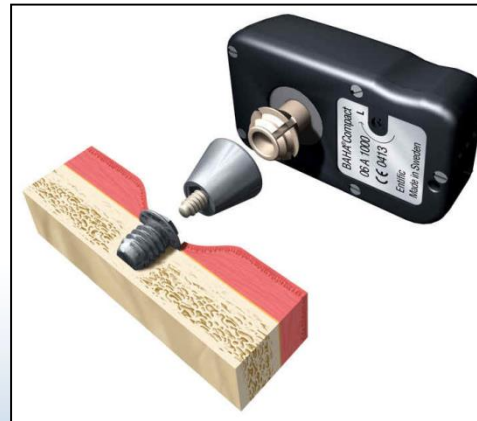
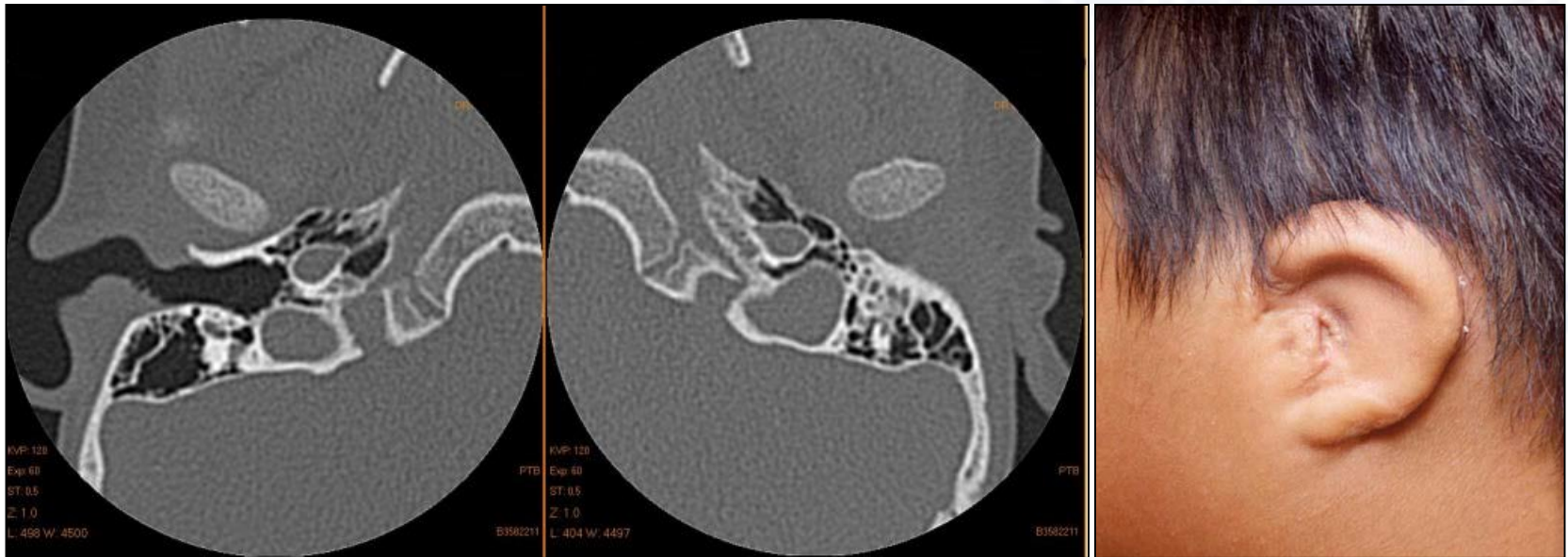
clefts of lip, jaw, palate

External ear development



Treacher Collins syn.

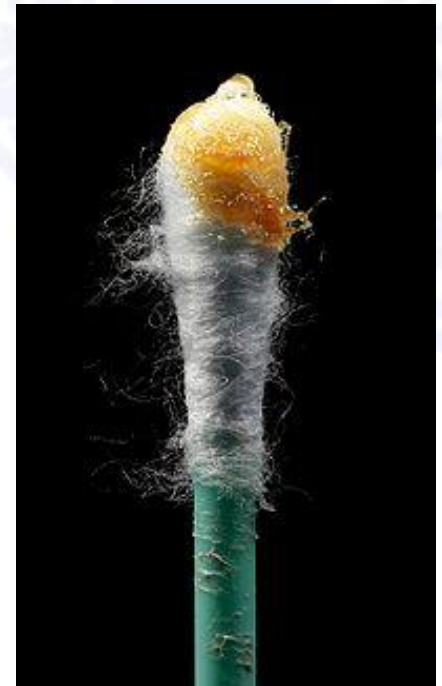
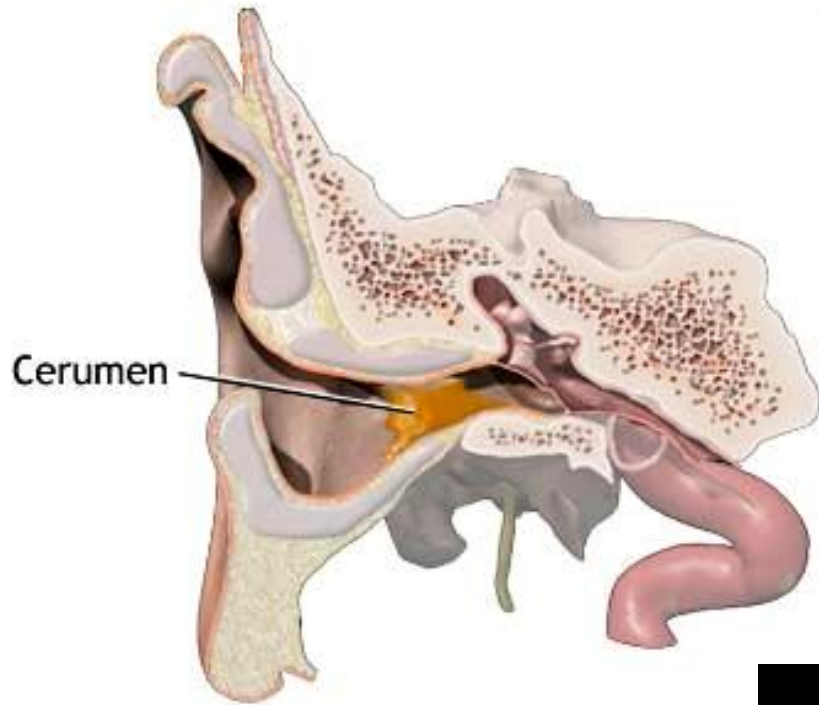
External auditory canal atresia



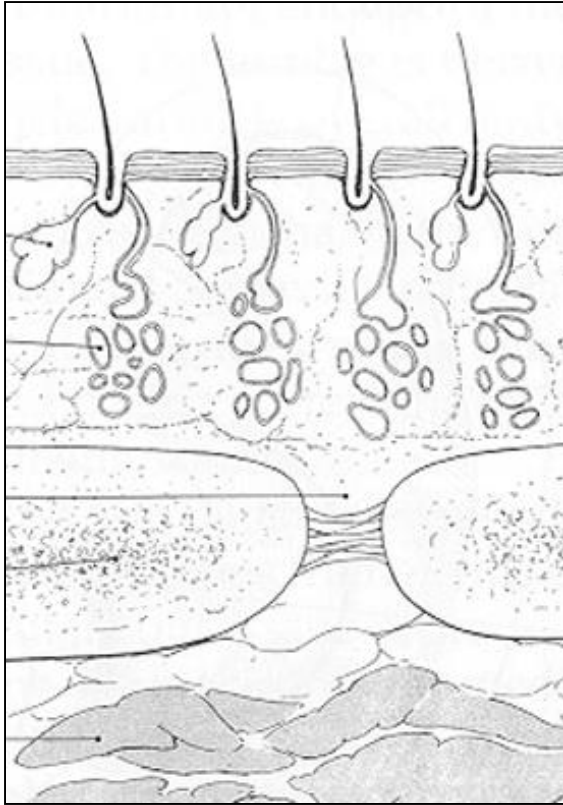
BAHA

Bone Anchored Hearing Aid

External auditory canal



External auditory canal

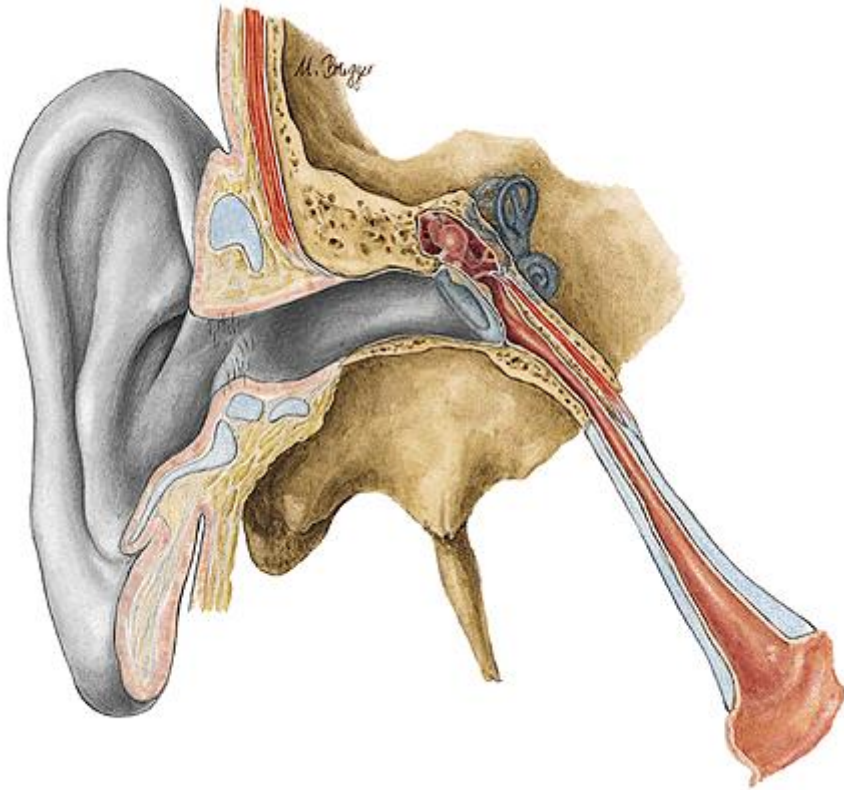


Apilosebaceous unit



External otitis

Fissurae of Santorini



ca of parotid gland



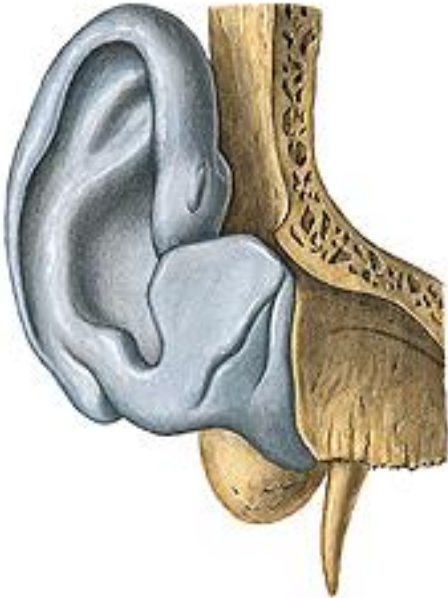
ca of ext. auditory canal

External auditory canal



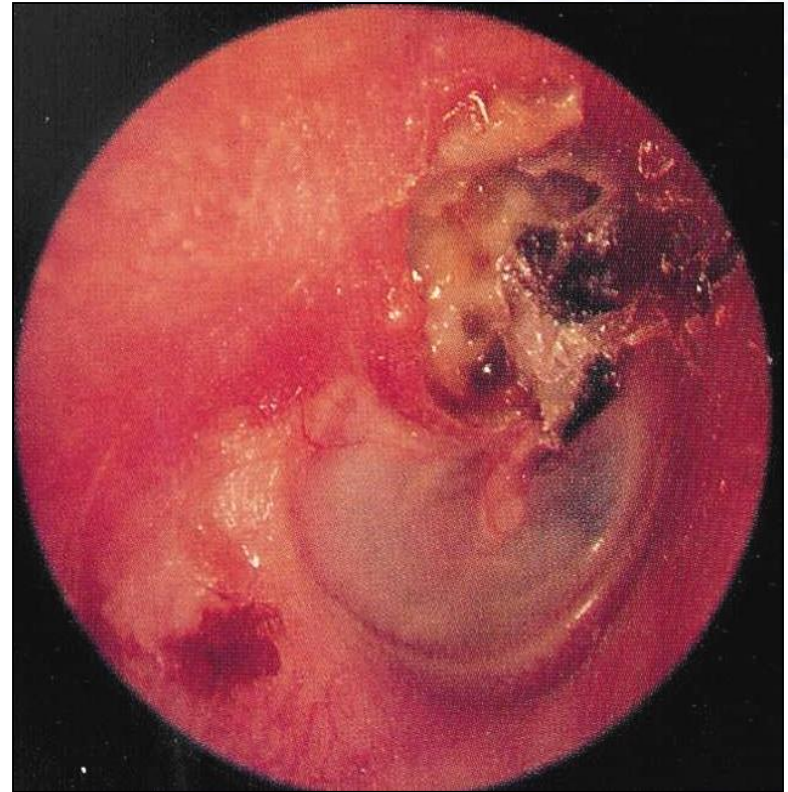
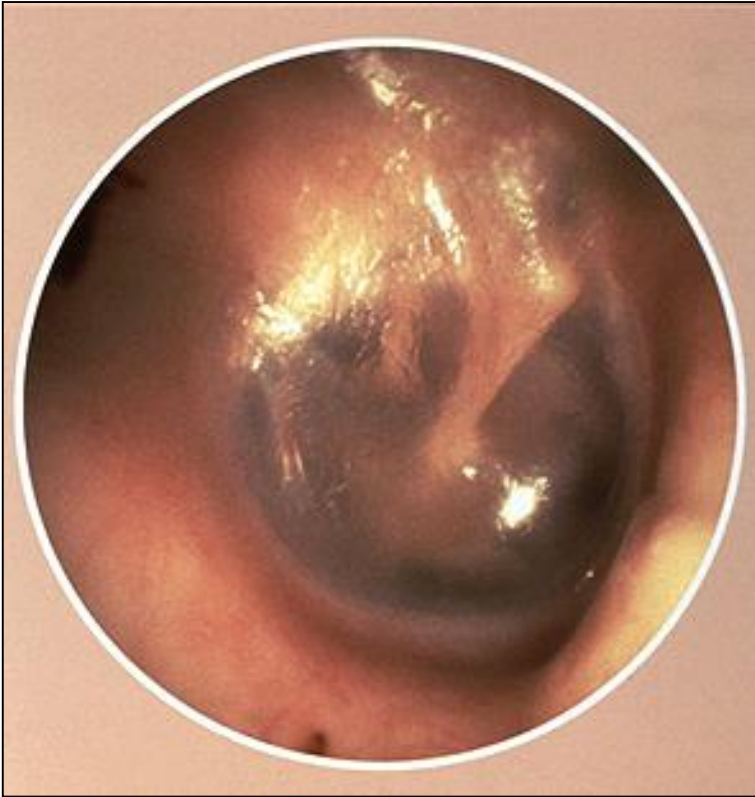
Ear lobe

otohematoma



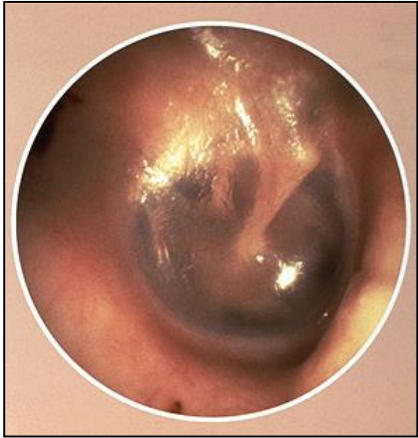
„cauliflower ear“

Otoscopy



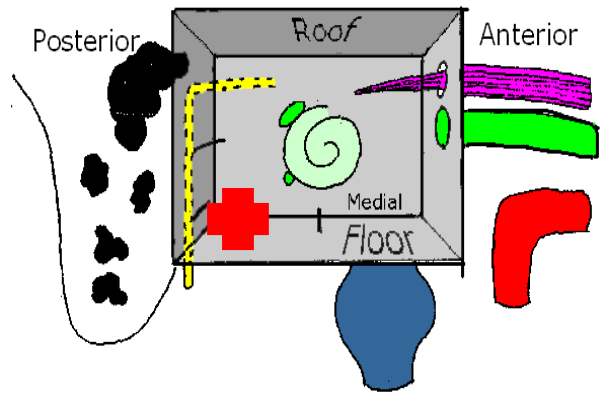
Cholesteatoma

Otoscopy

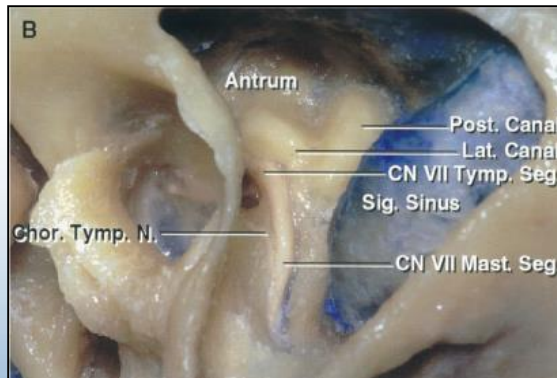
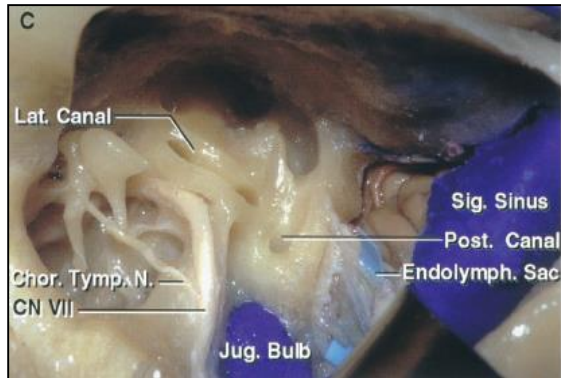
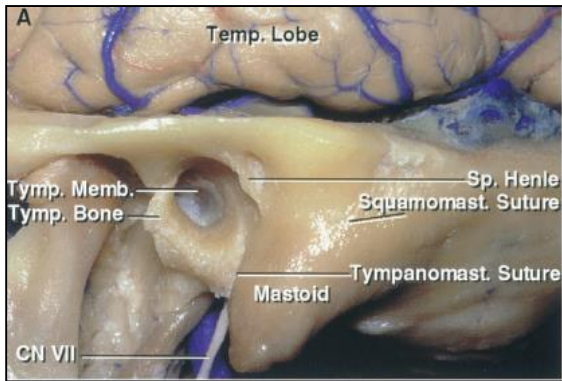


ac. middle ear infection

paracentesis



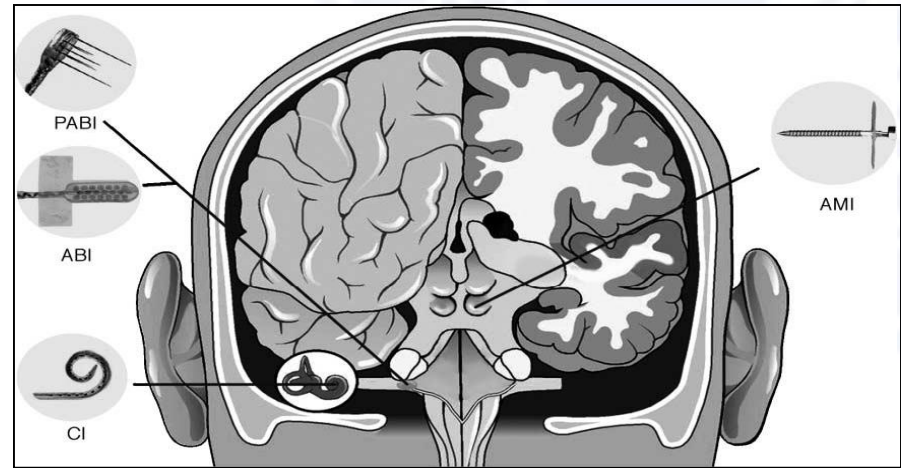
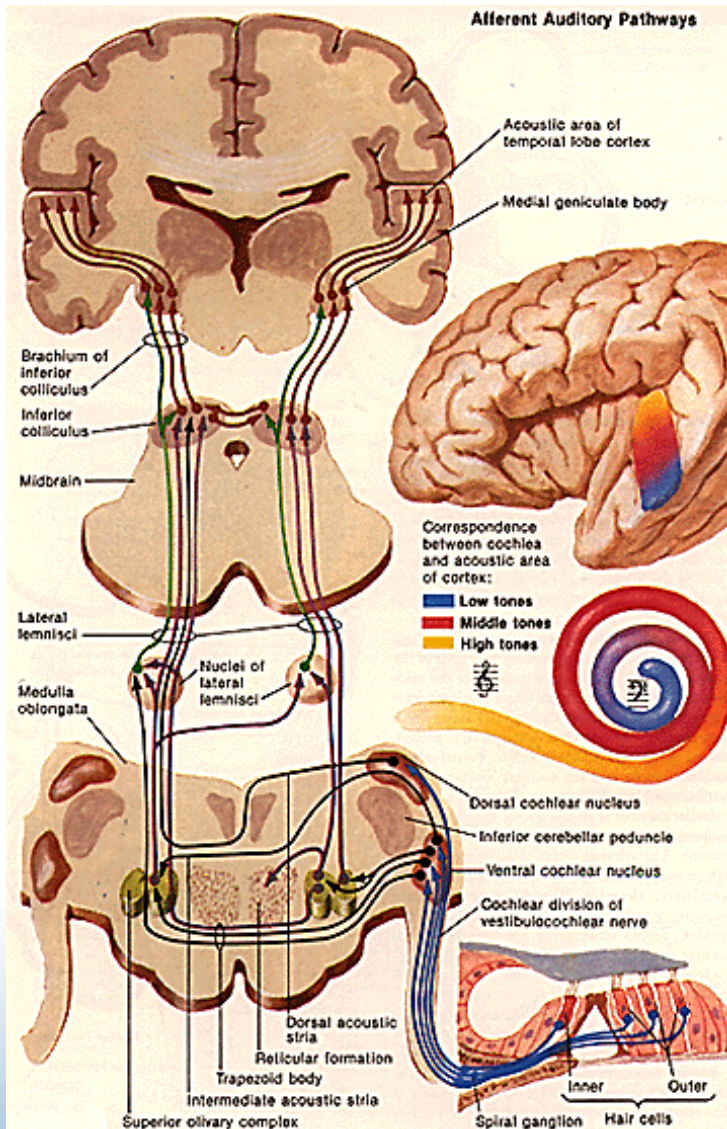
Complications of middle ear infection



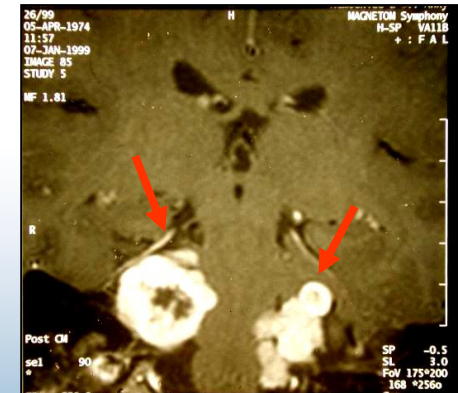
Temporal
mastoiditis
subperiosteal abscess
CN VII paresis
labyrinthitis
petrositis

Intracranial
meningitis
subdural empyema
epidural abscess
brain abscess
trombofelbitis of sigmoid s.
hydrocephalus

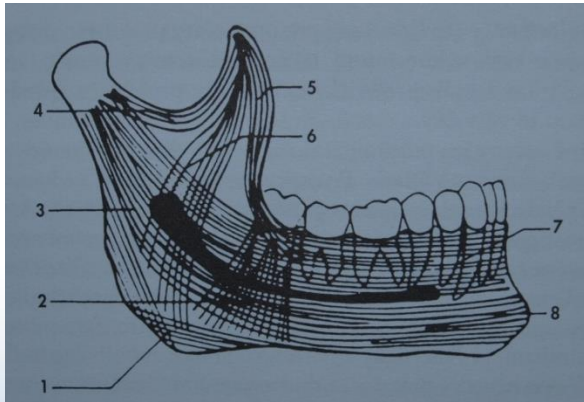
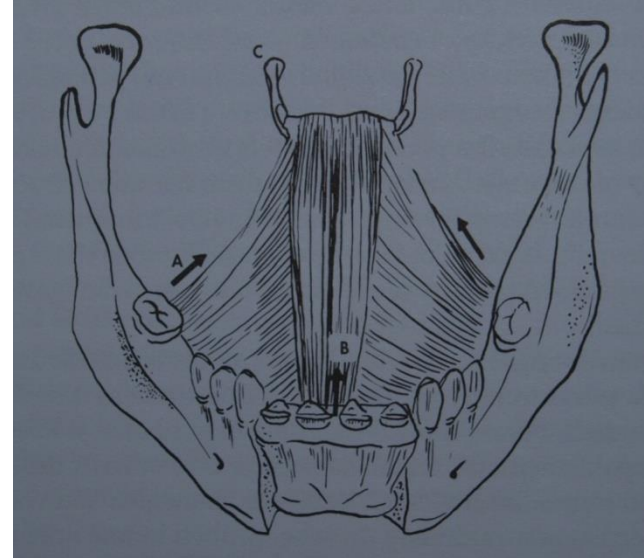
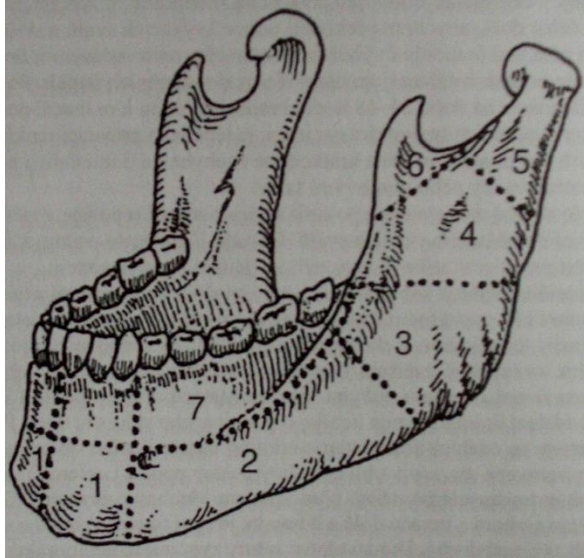
Rehabilitation of deafness



cochlear implant
auditory brainstem i.
auditory midbrain i.

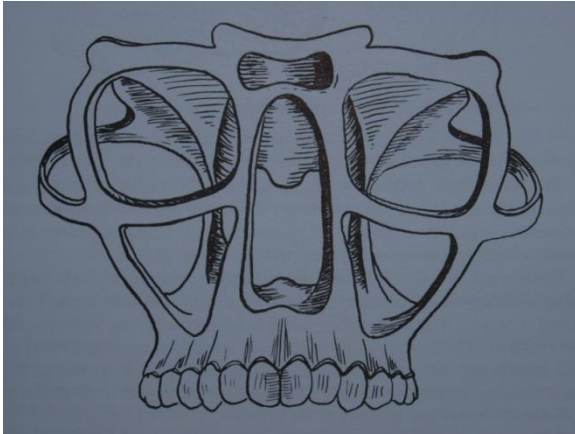


Mandibular fractures

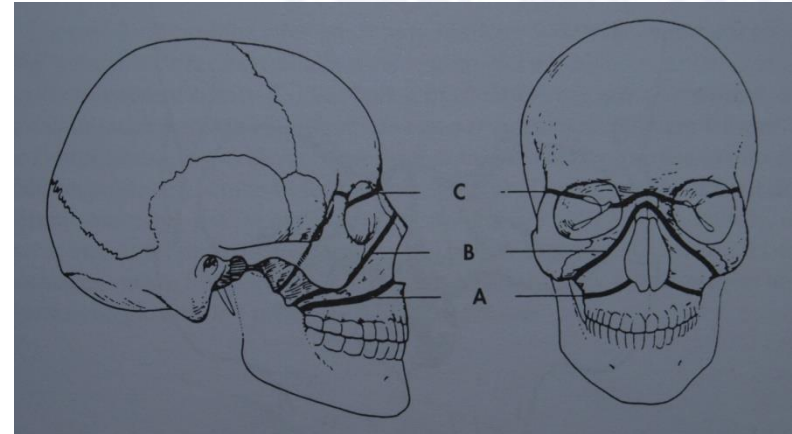


architecture of cancellous bone

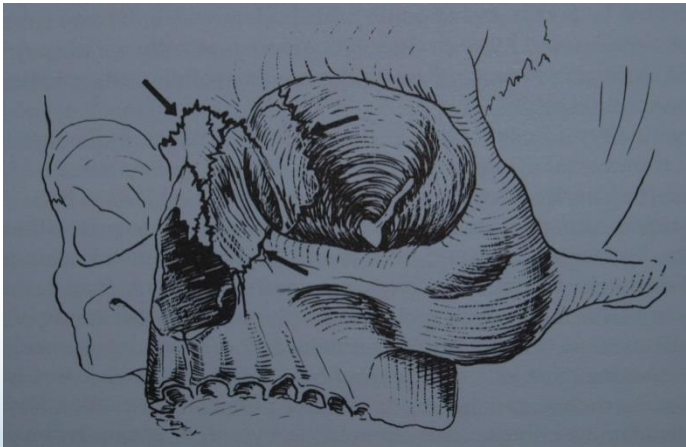
Midface fractures



bony pillars



Le Fort I, II, III

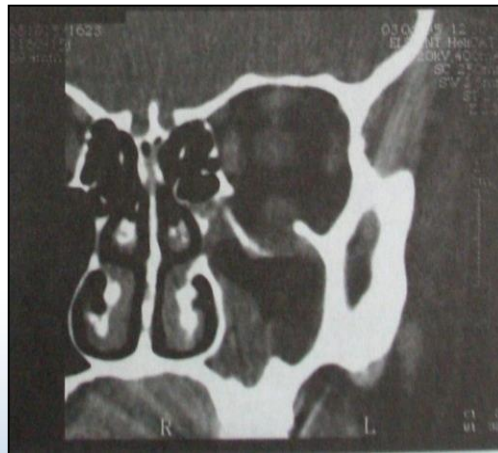
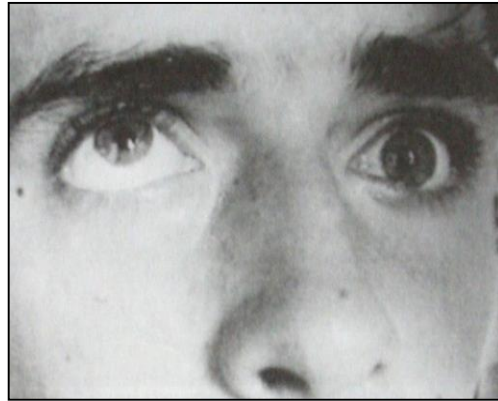
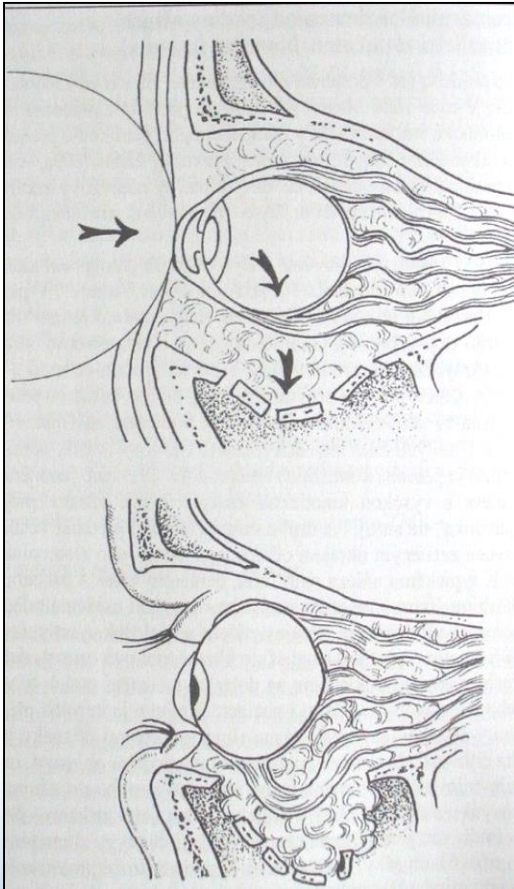


fr. of nasomaxillary complex



fr. of zygomaticomaxillary complex

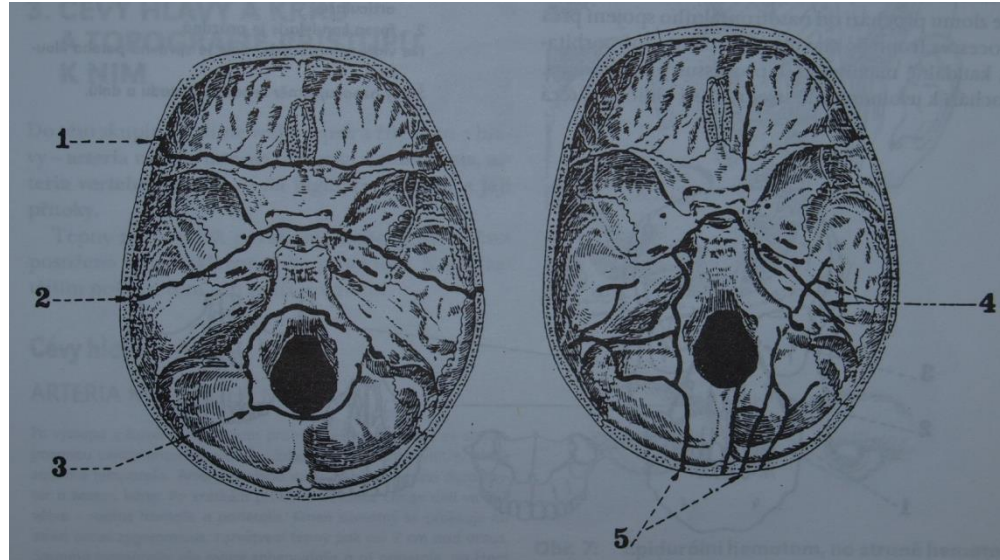
Blow-out fracture



inf. rectus m.

infraorbital n., a., v.

Skull base fractures



- 1 - transv. fr. of ant. cr. base
- 2 - transv. fr. of middle cr. base
- 3 - fr. encircl. f. magnum
- 4 - fr. of temporal bone
- 5 - longitudinal fr. of post. cr. base



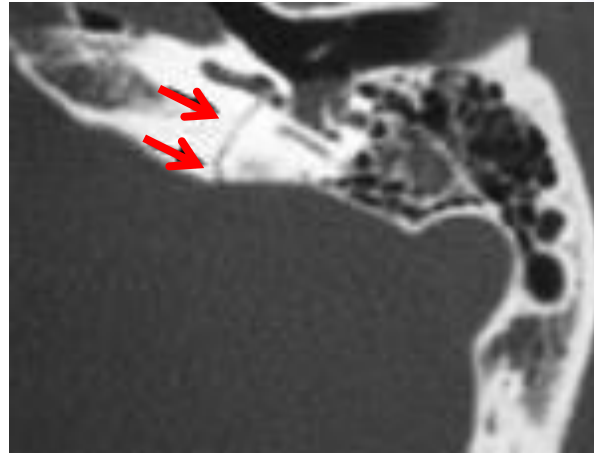
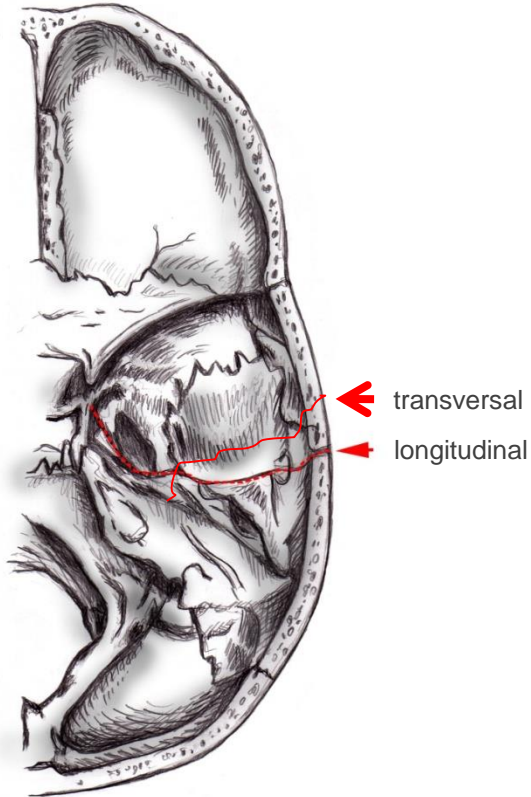
„raccoon eyes“



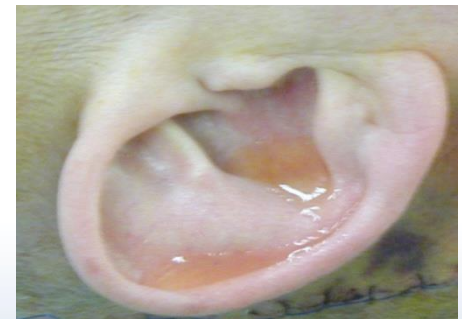
CSF-leak

Fr. of temporal bone

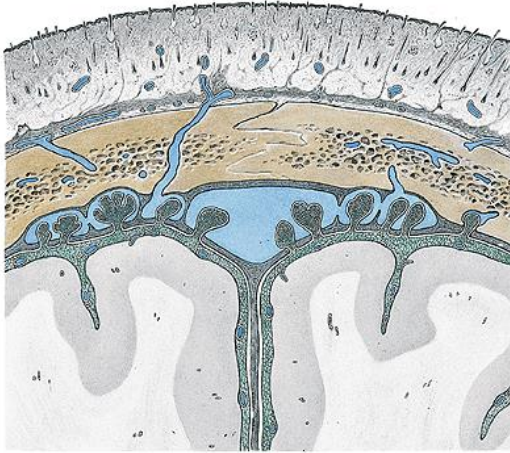
transversal



longitudinal

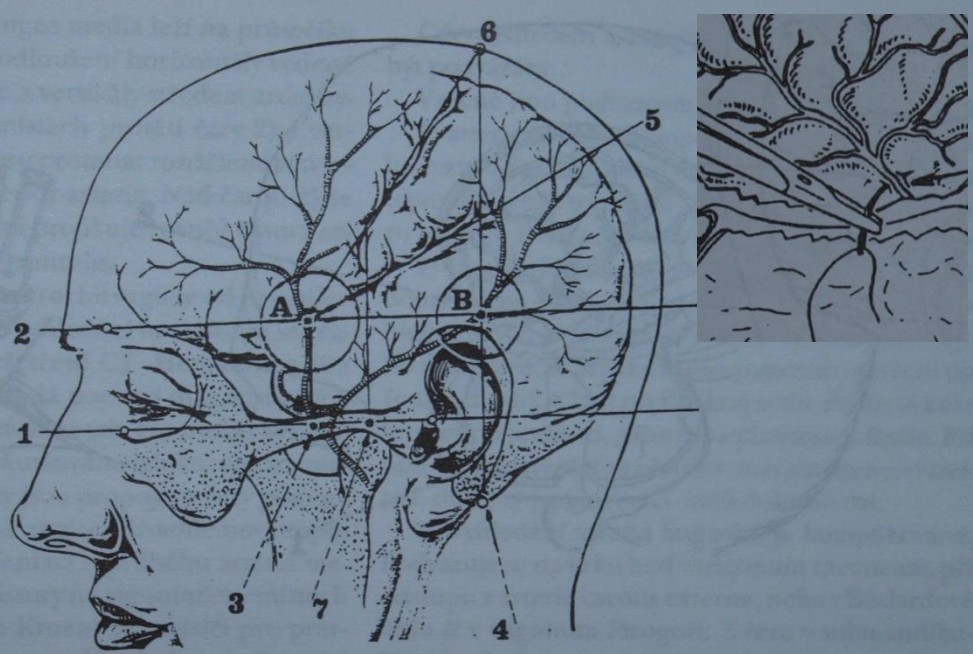


Epidural hematoma



middle meningeal a.

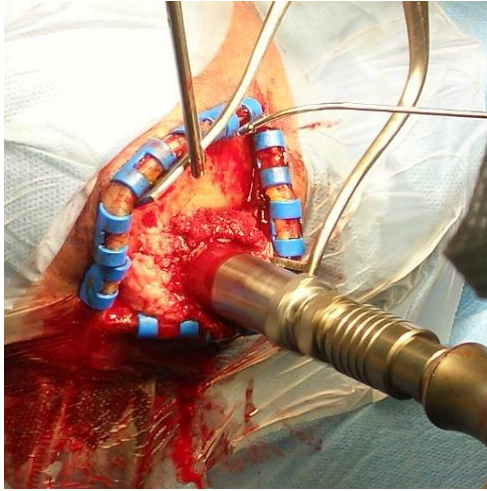
ant. and post. meningeal aa.
diploic vv.



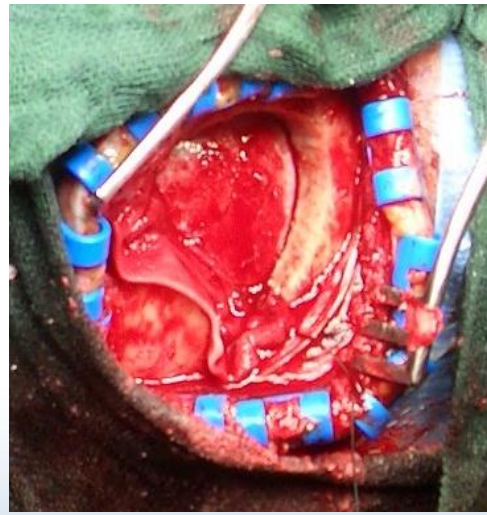
Arteria meningea media v KROENLEIN-ově projekci

- | | |
|---|--|
| 1 - horizontála, vedená dolním okrajem orbity | 6 - projekce sulcus centralis |
| 2 - horizontála, vedená horním okrajem orbity | 7 - bod na arcus zygomaticus, do kterého se promítá hlavička mandibuly |
| 3 - kolmice na střed arcus zygomaticus | A - projekce přední větve arteria meningea media |
| 4 - kolmice na zadní okraj processus mastoideus | B - projekce zadní větve arteria meningea media |
| 5 - projekce fissura cerebri lateralis | |

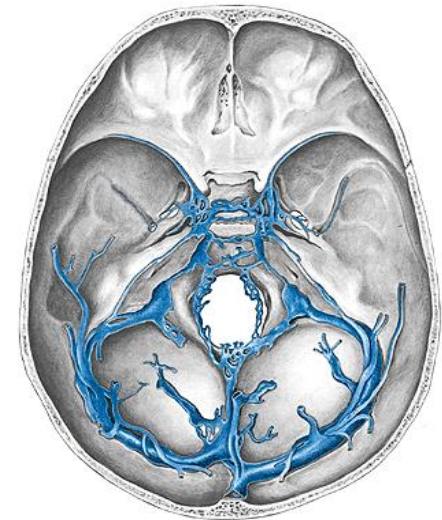
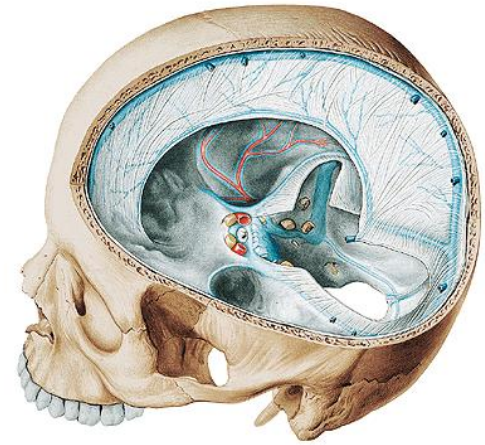
Transcranial approaches



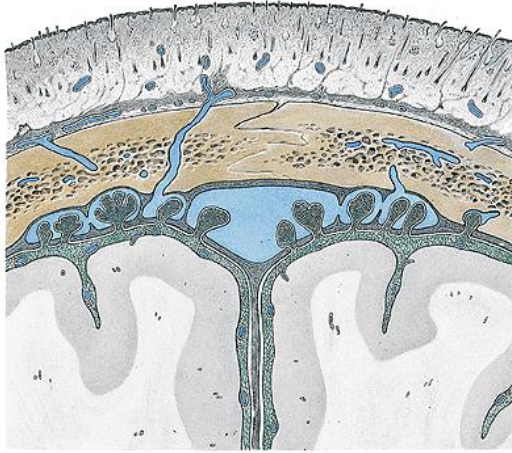
trephination



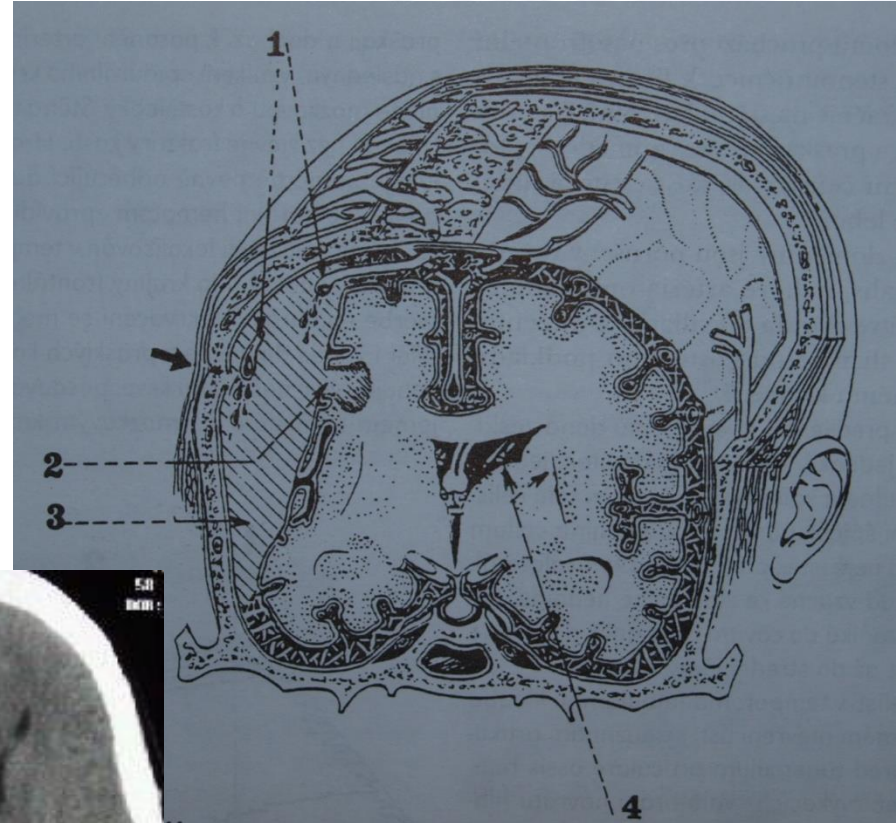
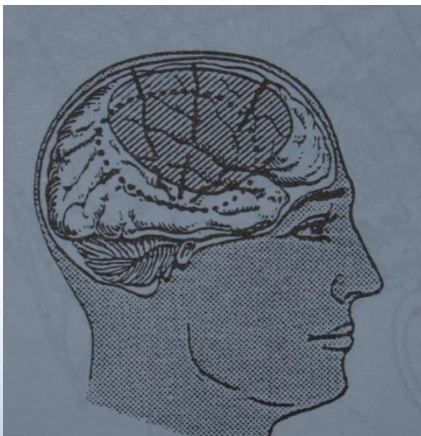
craniotomy



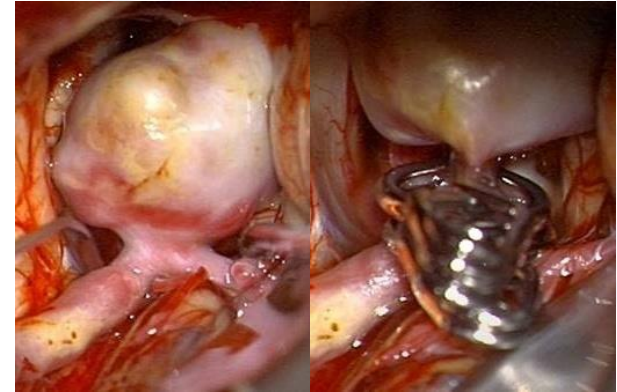
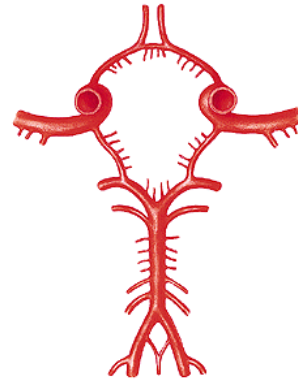
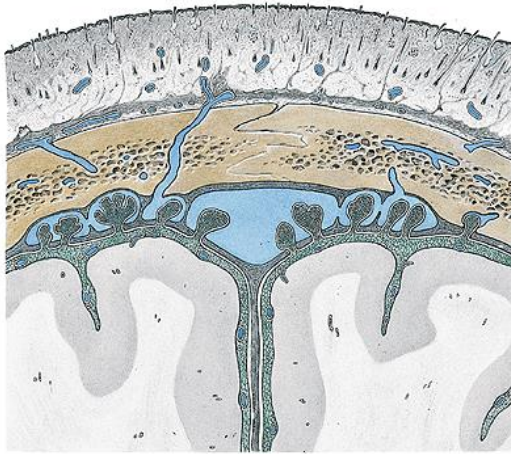
Subdural hematoma



bridging vv.

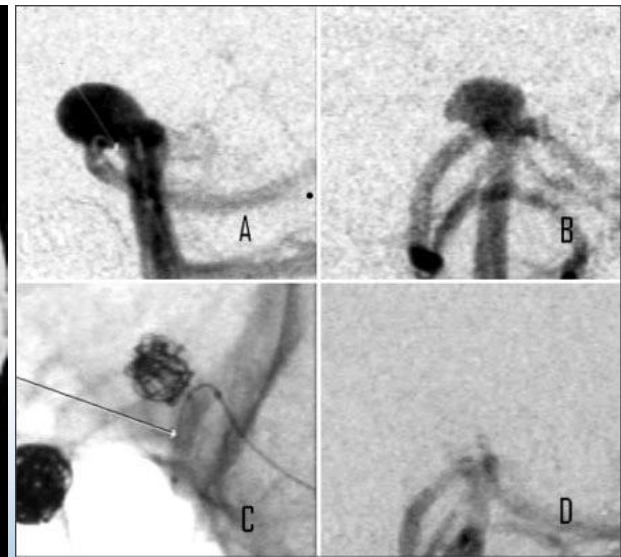


Subarachnoidal hematoma



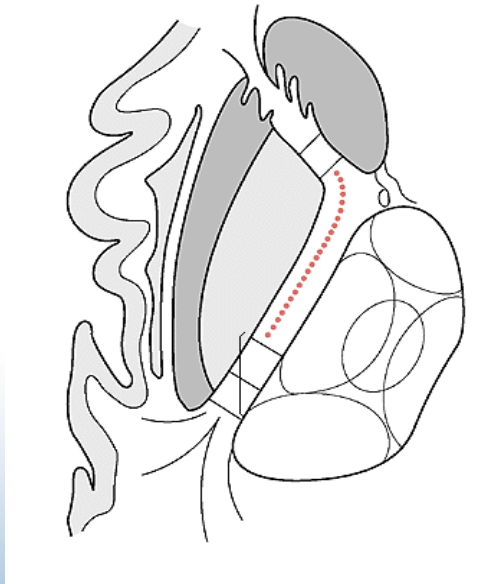
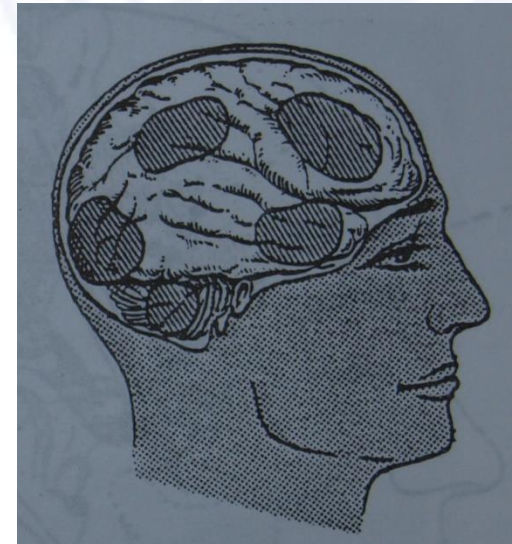
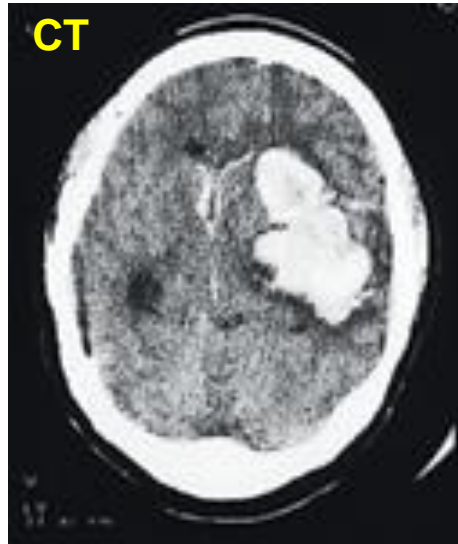
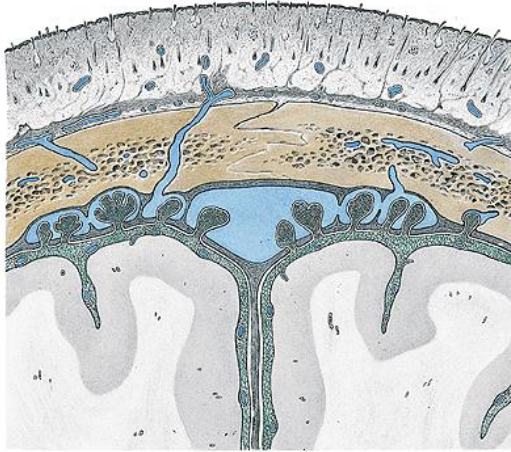
aneurysm - clipping

trauma
aneurysm
AV malformation



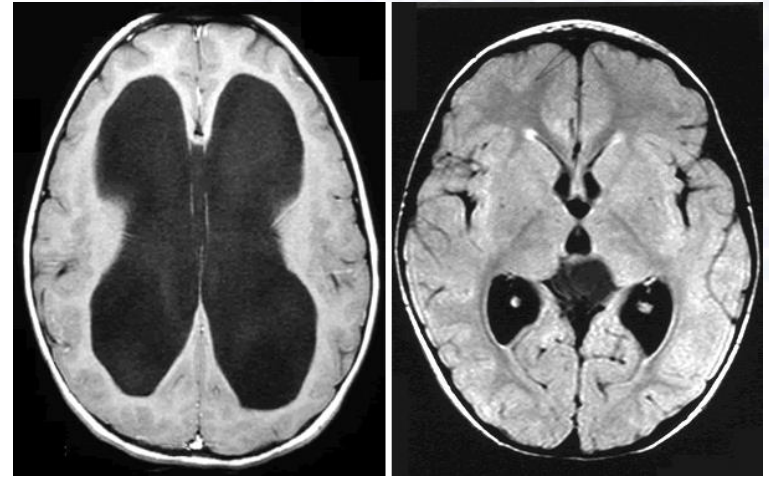
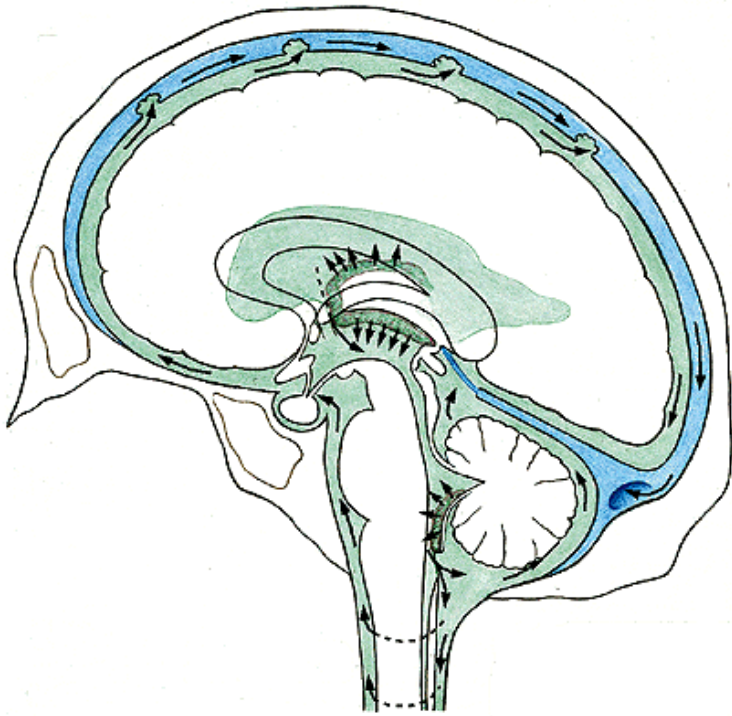
aneurysm - coiling

Intracerebral hematoma

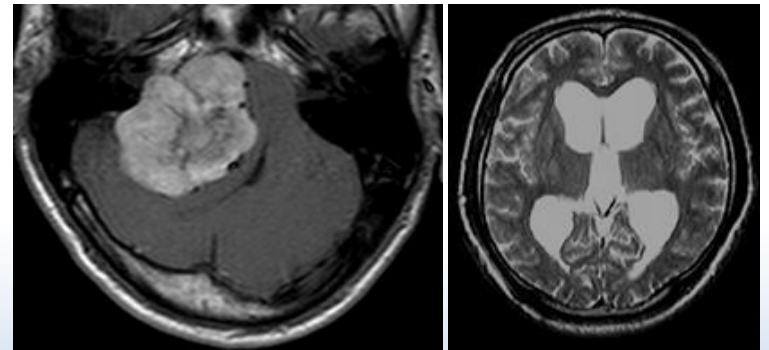


hemocephalus

Hydrocephalus

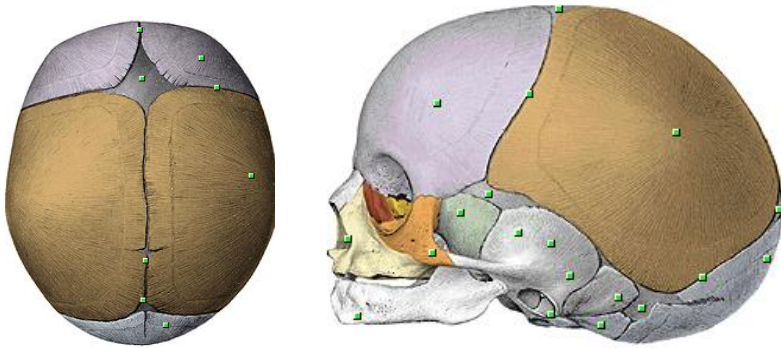


communicating (meningitis)

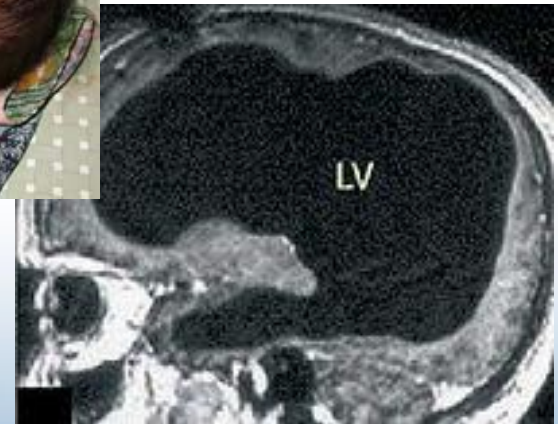


non-communicating (CPA TU)

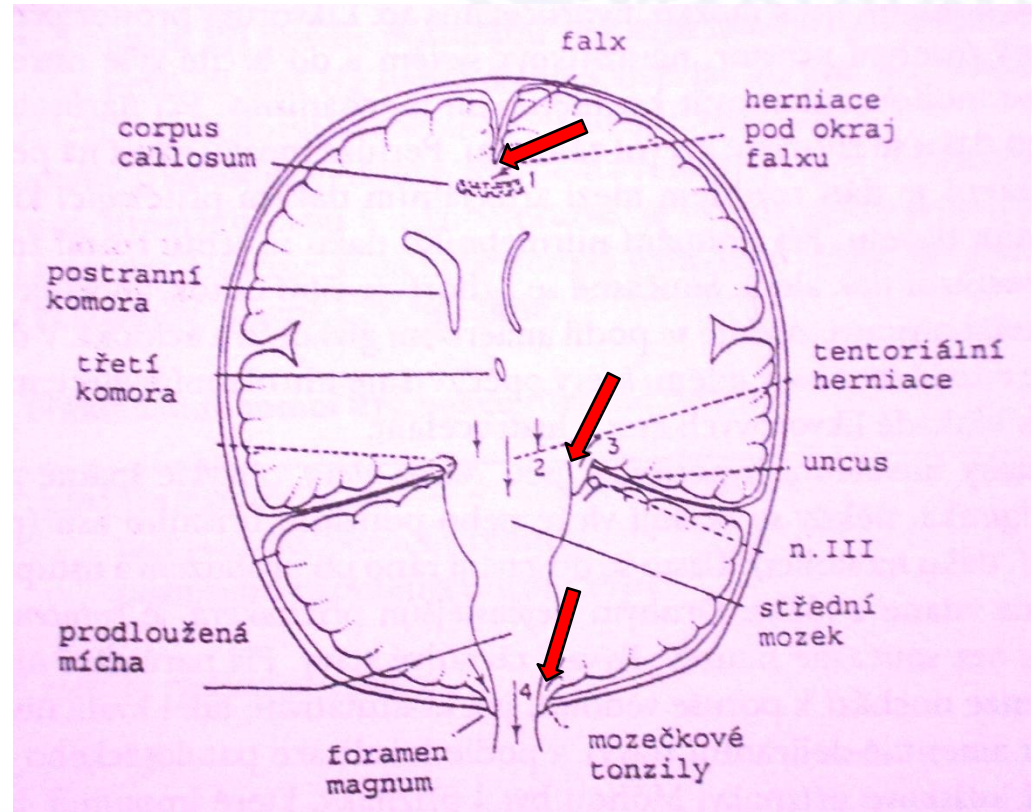
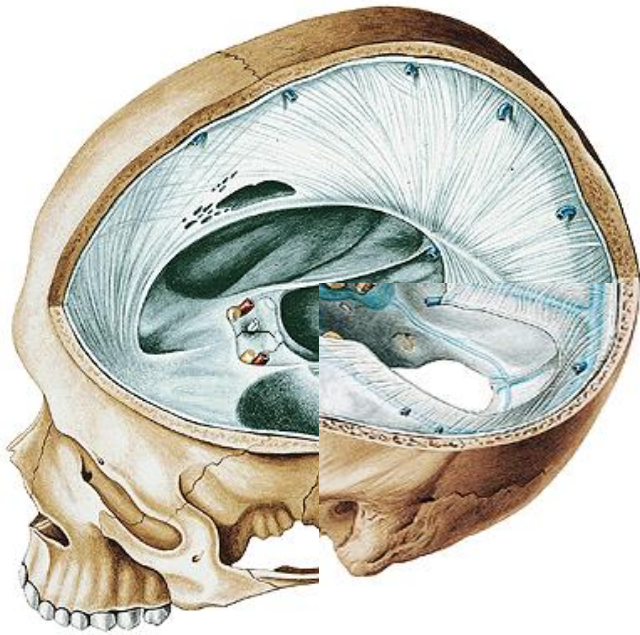
Fontanelles



orientation - child delivery
hydrocephalus
dehydration
transcranial US
puncture

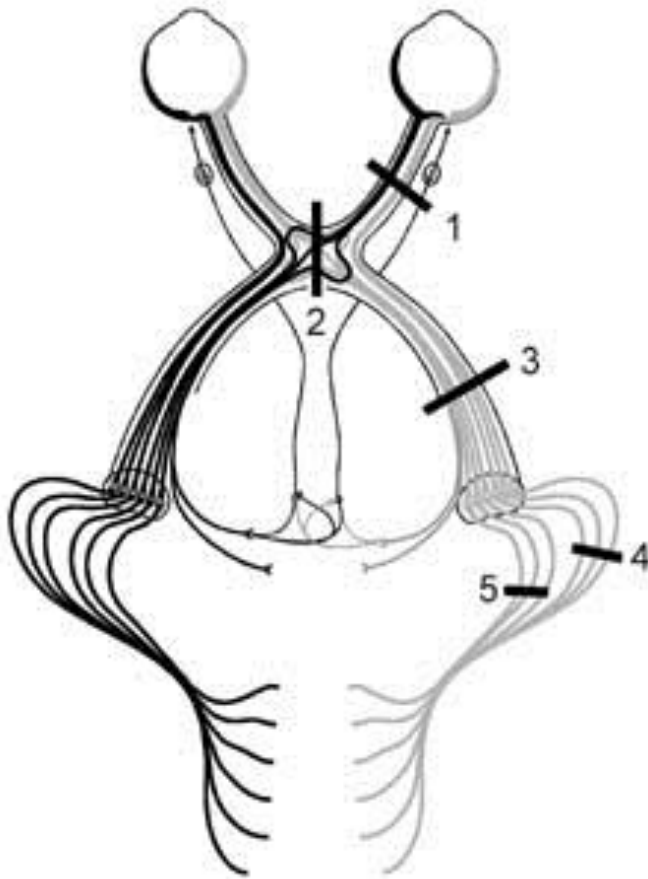


Intracranial hypertension



intracranial herniation
conuses

CN II



amaurosis



bitemp. heteronym.
hemianopsia



contralat. homonym.
hemianopsia



contralat. homonym.
quadrantopsia inf.



contralat. homonym.
quadrantopsia sup.

CN III, IV, VI

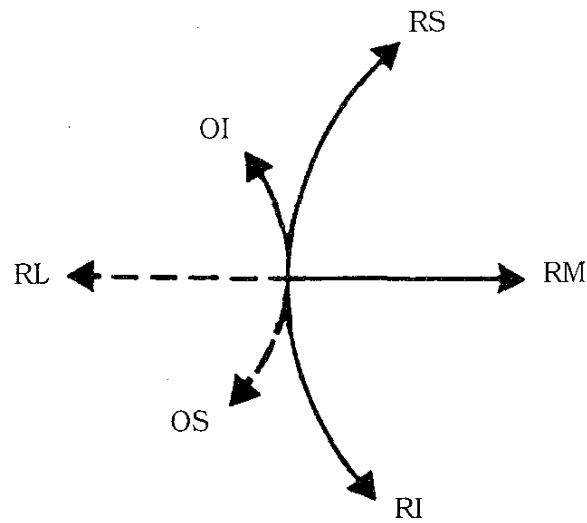
Směr a velikost šipek ukazují pohyb bulbem při kontrakci příslušného svalu.

OI – m. obliquus inferior
OS – m. obliquus superior
RI – m. rectus inferior
RL – m. rectus lateralis
RM – m. rectus medialis
RS – m. rectus superior.

U svalů znázorňují použité čáry: silná plná – n. III.,
čárkovaná – n. IV., tenká přerušovaná – n. VI.



CN VI palsy

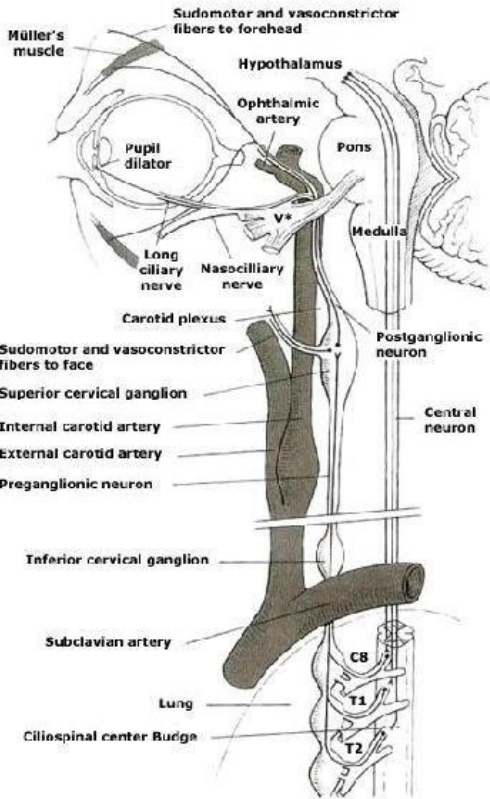


CN IV palsy

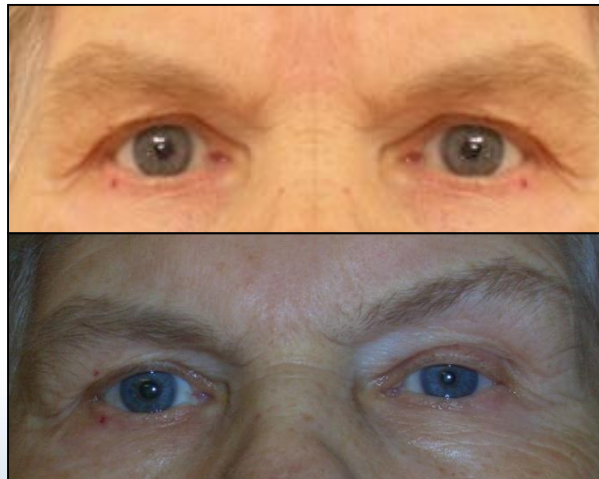


CN III palsy

Horner's syndrome



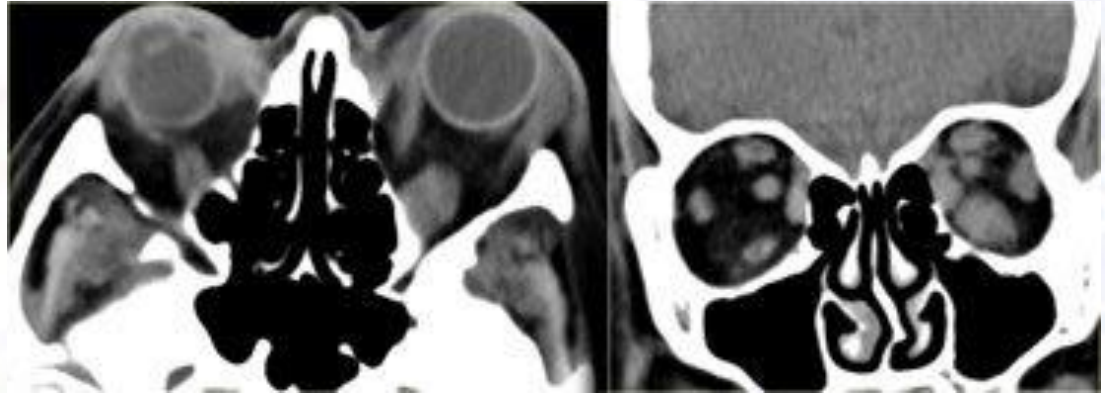
Sympathetic trunk lesion
 miosis
 ptosis
 enoftalmos
 hemifacial anhidrosis



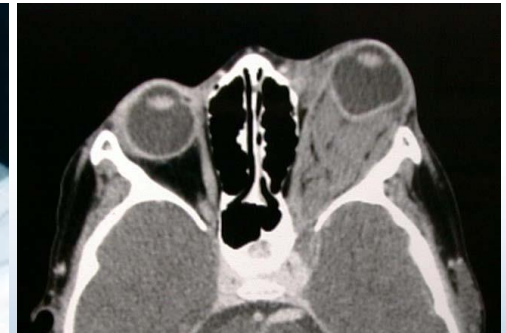
cong. Horner's syn.

schwannoma of sympathetic tr. – postop

Exoftalmos and proptosis

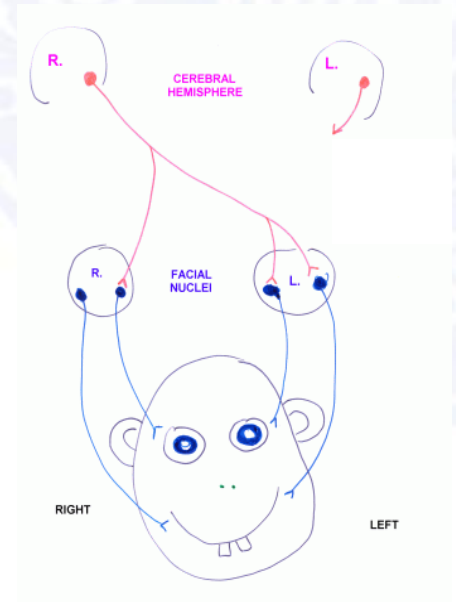
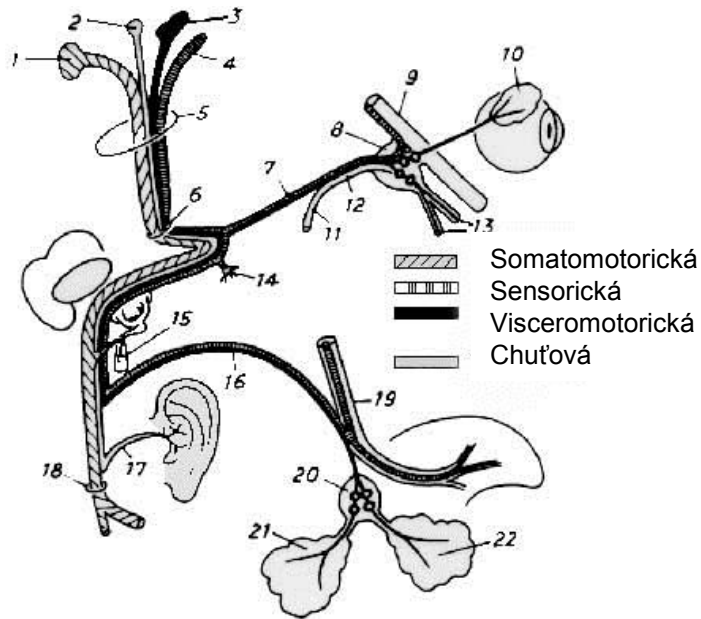


thyroid ophtalmopathy



granulocytar sarcoma

CN VII



perif. paresis of CN VII (CPA lesion)

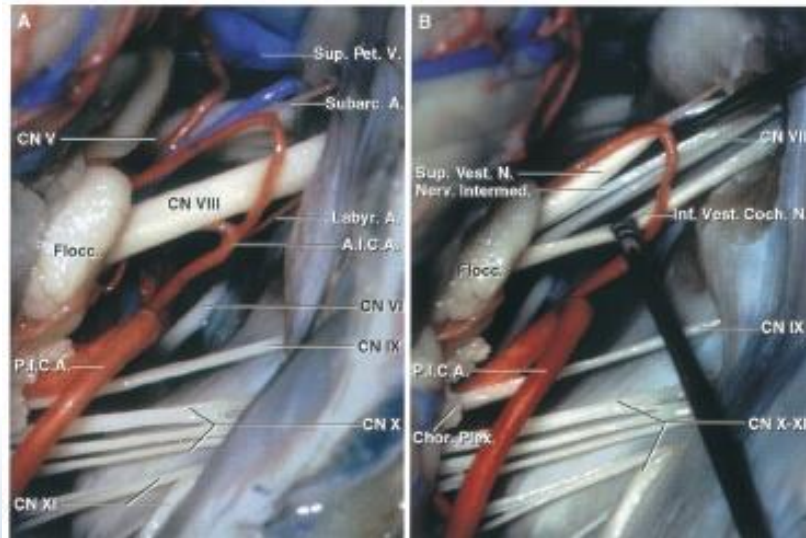


cong. CN. VII palsy

CN VIII



fundus of right int. auditory meatus



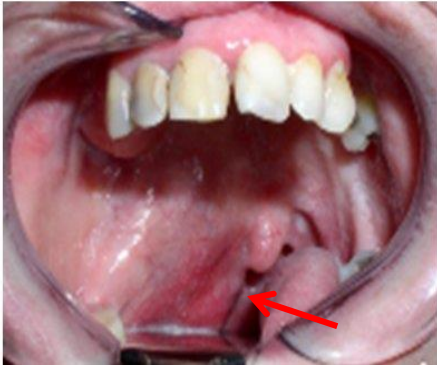
right CPA

hypacusis
tinnitus
perif. vestibular syndrome

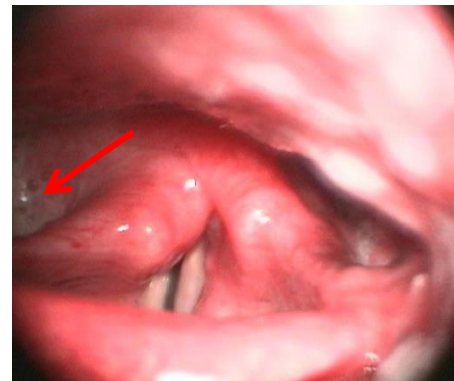
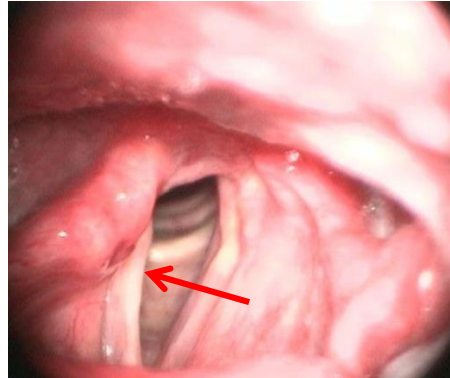


nystagmus

CN IX, X, XI



palsy of CN IX



palsy of CN X

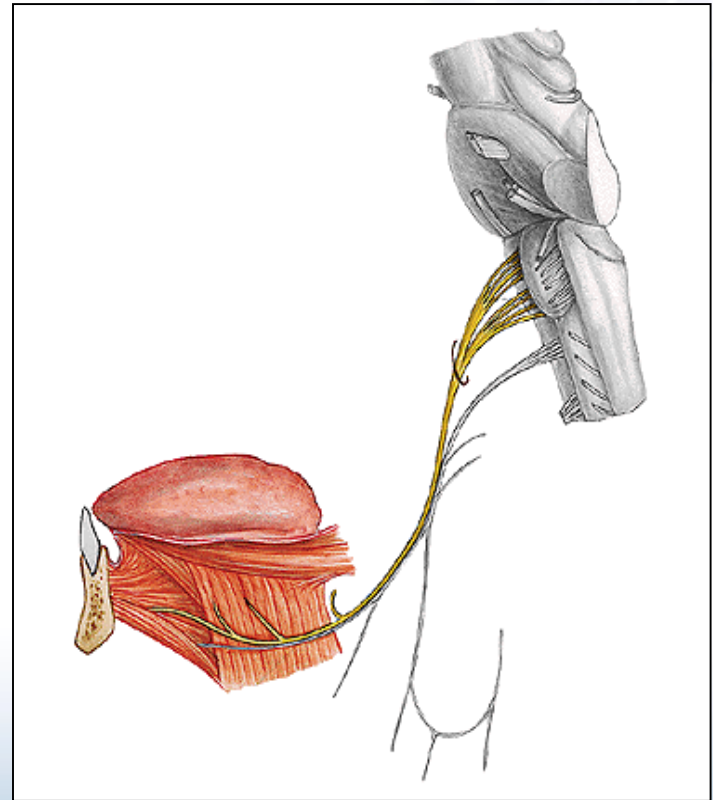


palsy of CN XI

CN XII



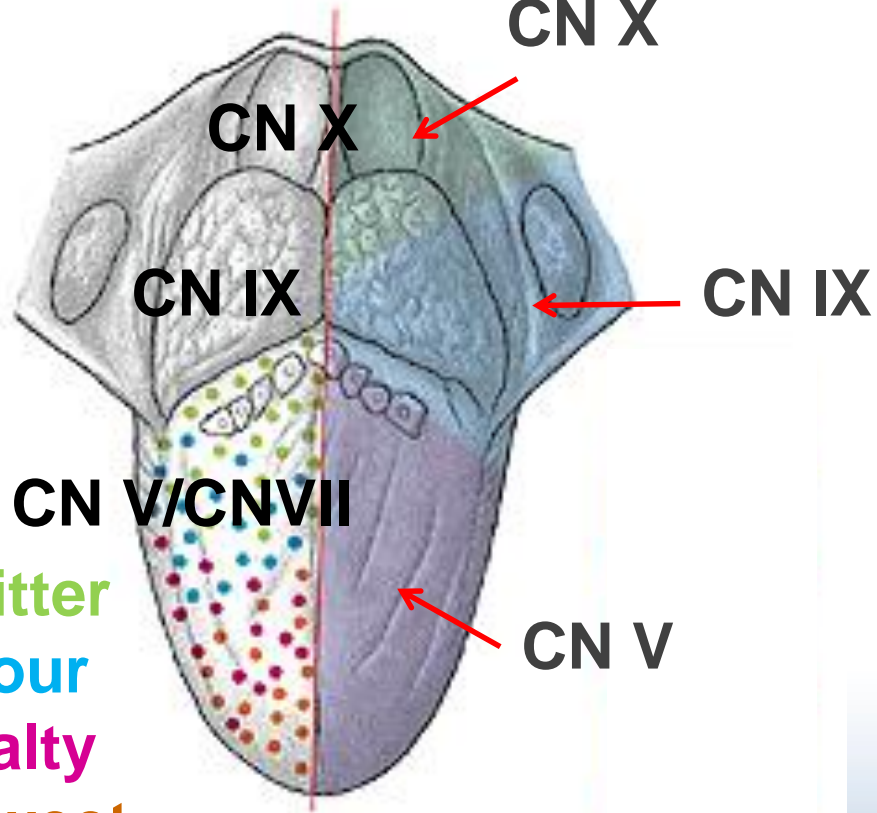
schwannoma of left CN XII



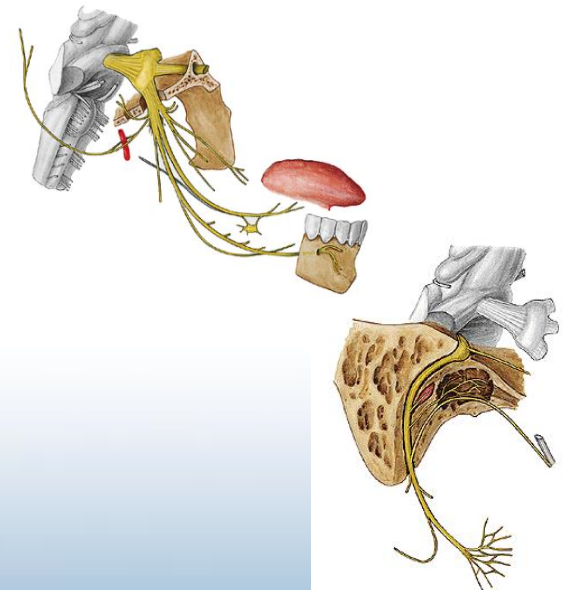
Tongue innervation

taste

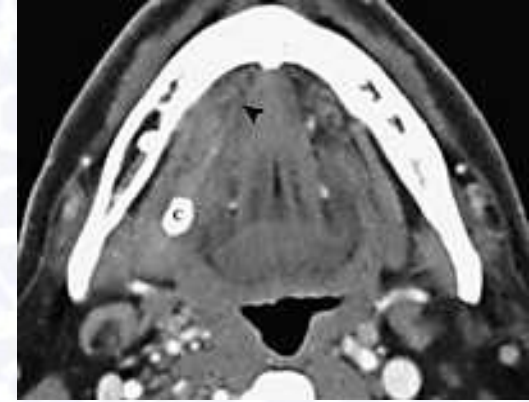
sensitivity



bitter
sour
salty
sweet



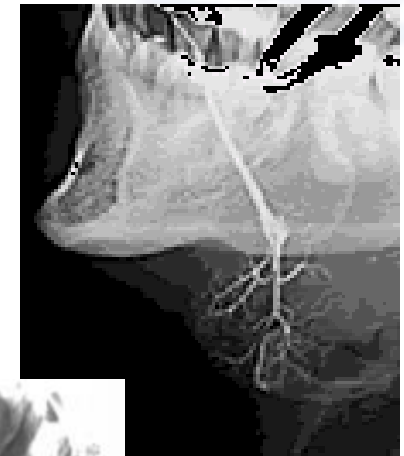
Major salivary glands



sialolithiasis



sialoendoscopy



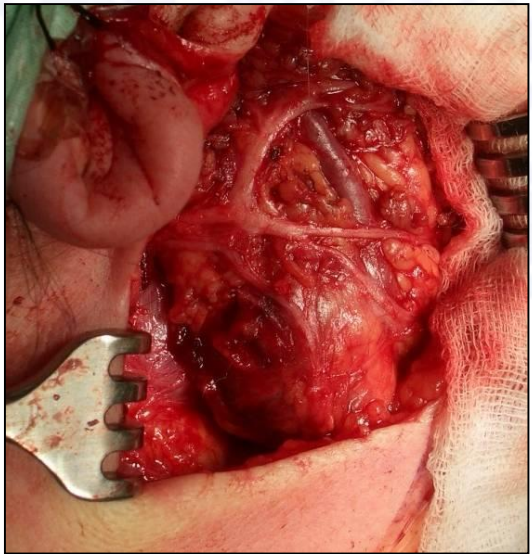
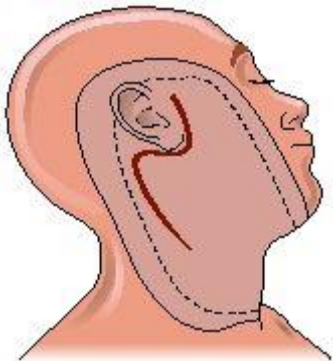
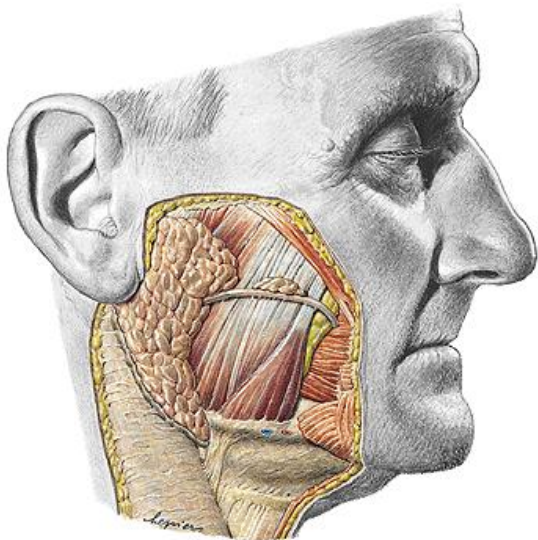
submand. gl



parotid gl.

sialography

Parotid gland



superf. parotidectomy

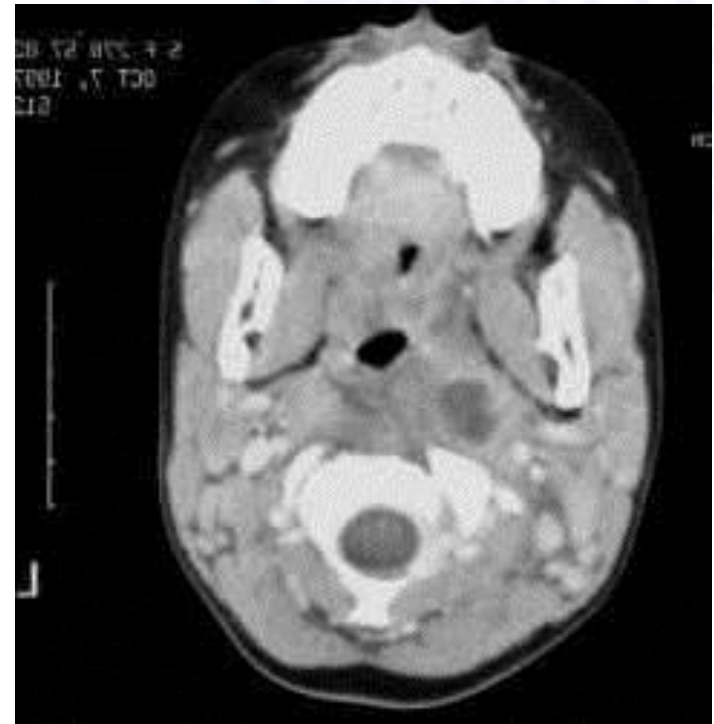
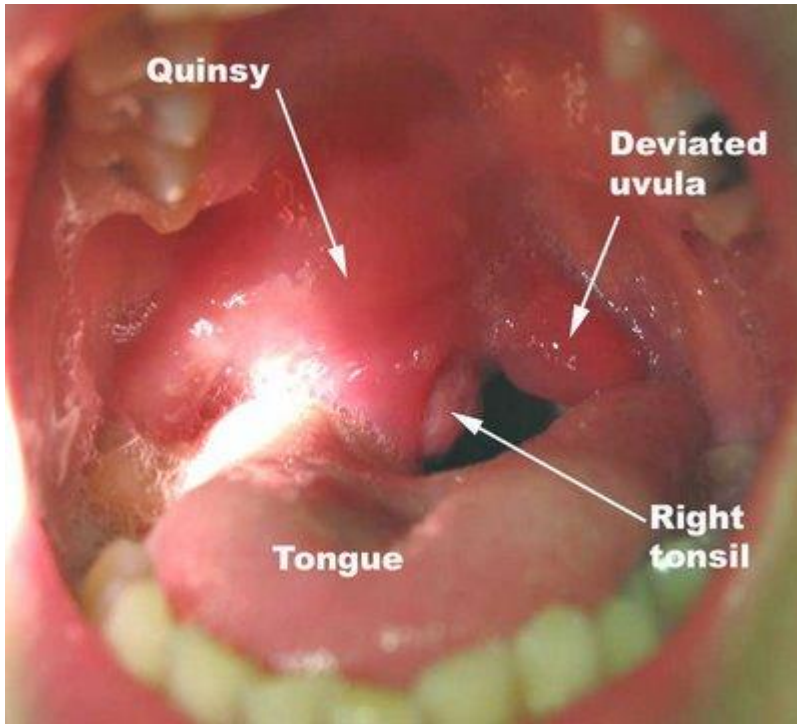
metastasis to parotid LNs

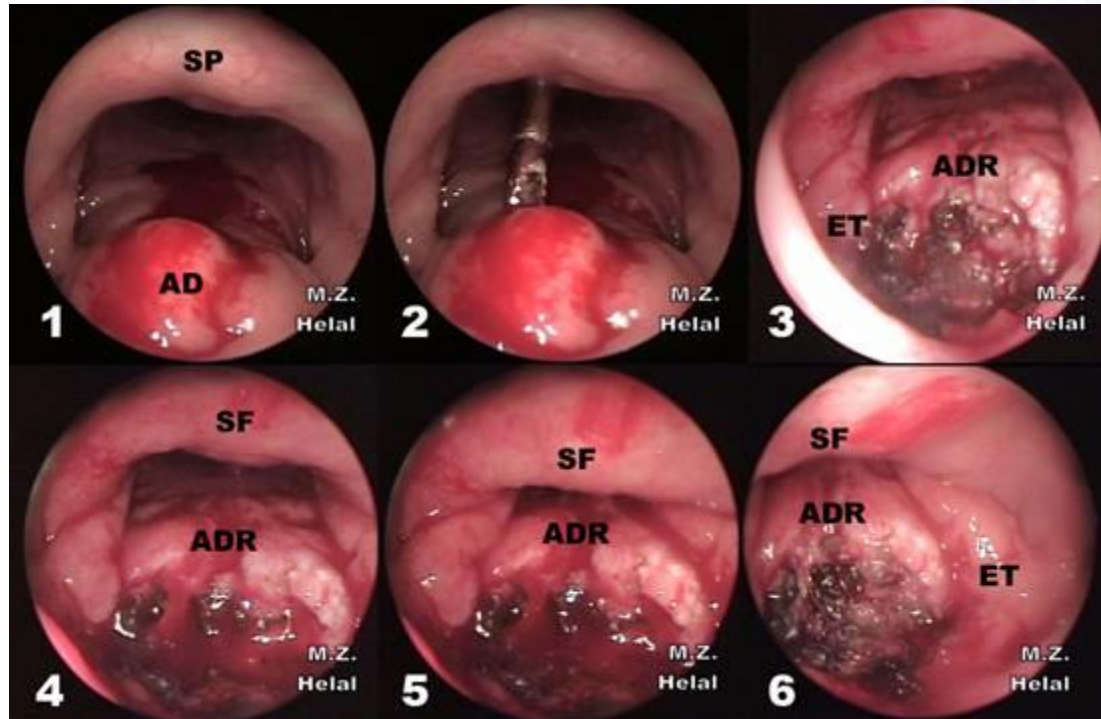


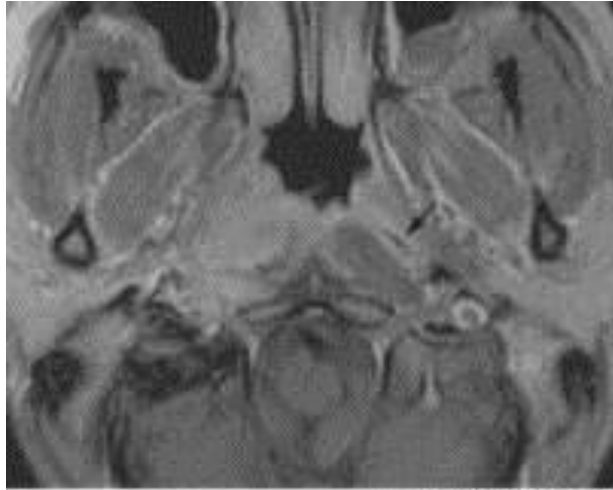
THANK YOU FOR YOUR ATTENTION











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