

Tumors of the paranasal sinuses

Endoscopic Approaches

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Educational objectives

Endoscopic approaches ...

- Definition & classification of approaches
 - transcribriform
 - expanded transsphenoidal
 - transclival
 - transpterygoid



Educational objectives

Endoscopic approaches ...

- Indication
 - small tumors
 - limited dural invasion
 - rather low-grade (?)

- Few data on outcome (i.e. comparative studies)



Overview

- Development of endoscopic approaches
- Classification
- Set-up & Equipment
- Indication for endoscopic approaches
- Craniofacial resection vs. endoscopic approach
→ consequences on outcome ?

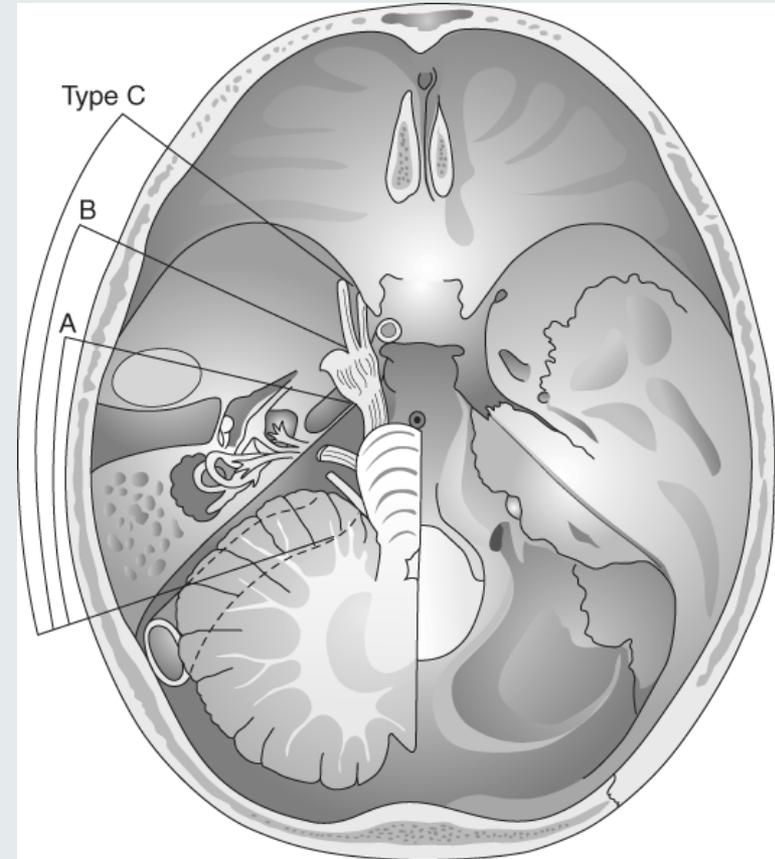
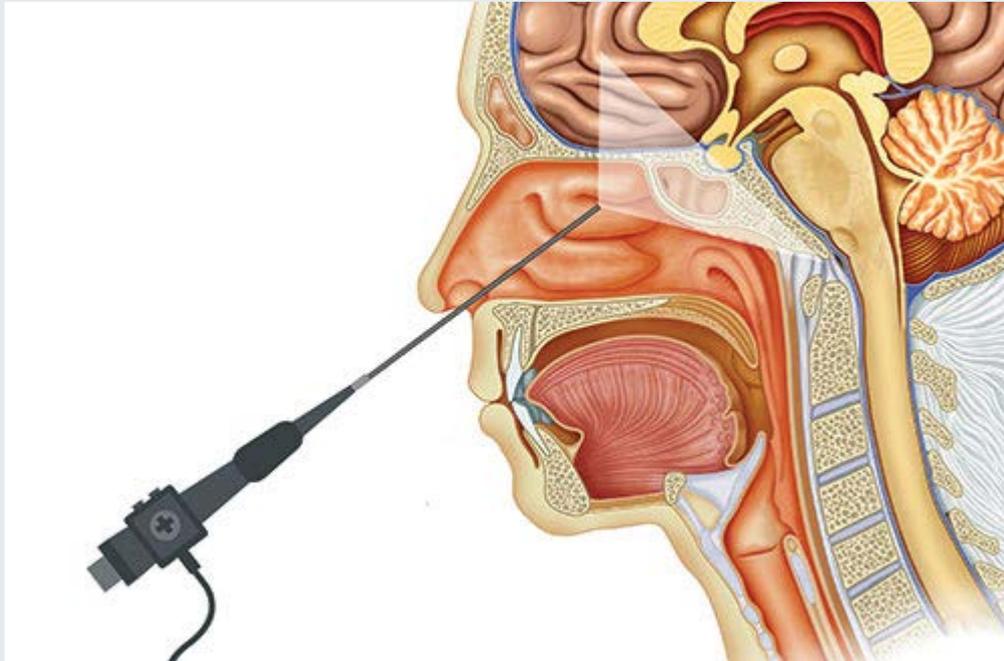


Development

- Increasing experience
- Anatomy from a new perspective
- Step by step concept
- Facing challenging structures:
 - Dura (incl. middle fossa)
 - ICA



Cone or inverted cone principle ?



Source: Lalwani AK: *CURRENT Diagnosis & Treatment in Otolaryngology – Head & Neck Surgery*, 3rd Edition: www.accesssurgery.com
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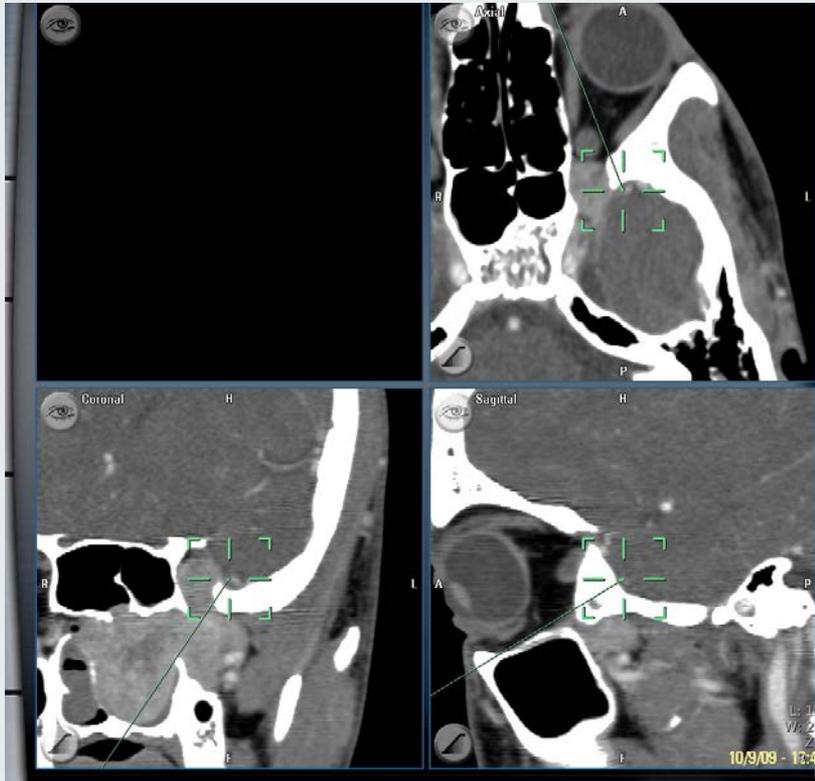
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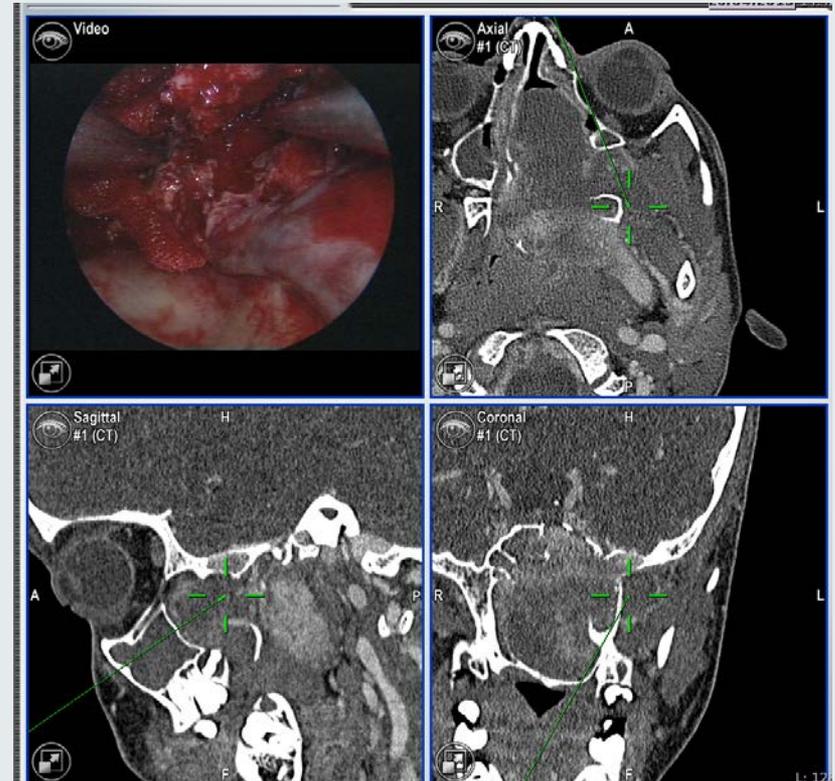


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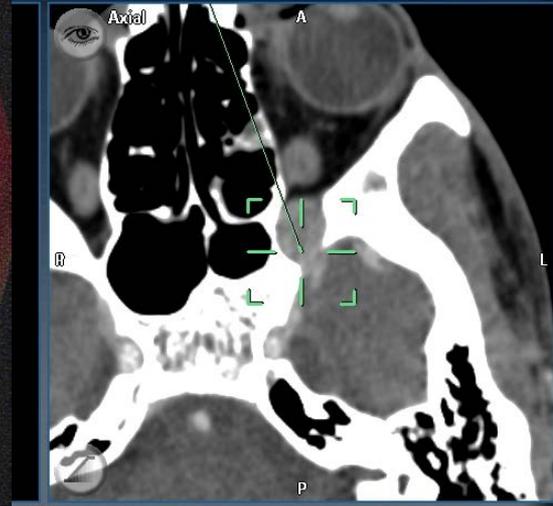
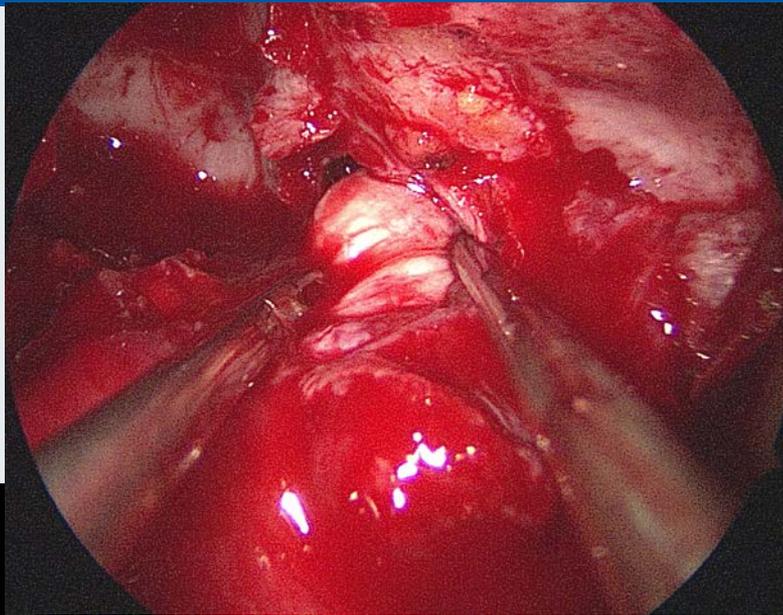
Target to reach/expose



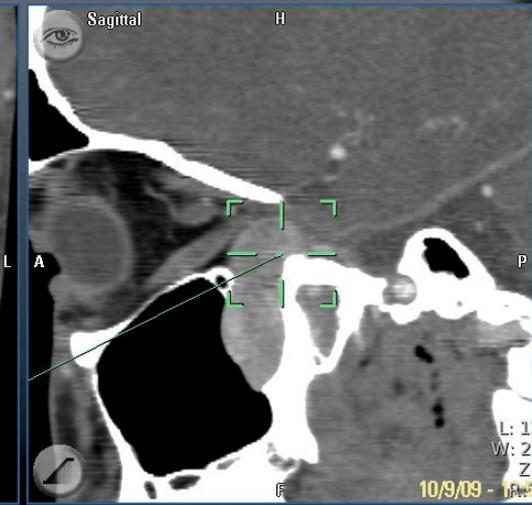
infratemporal



Far lateral

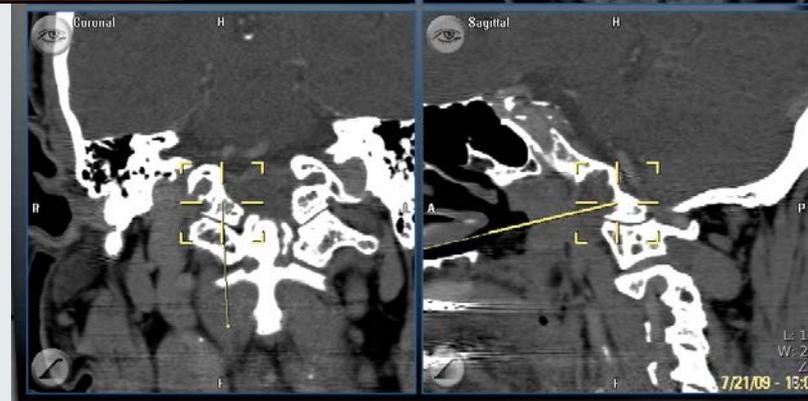
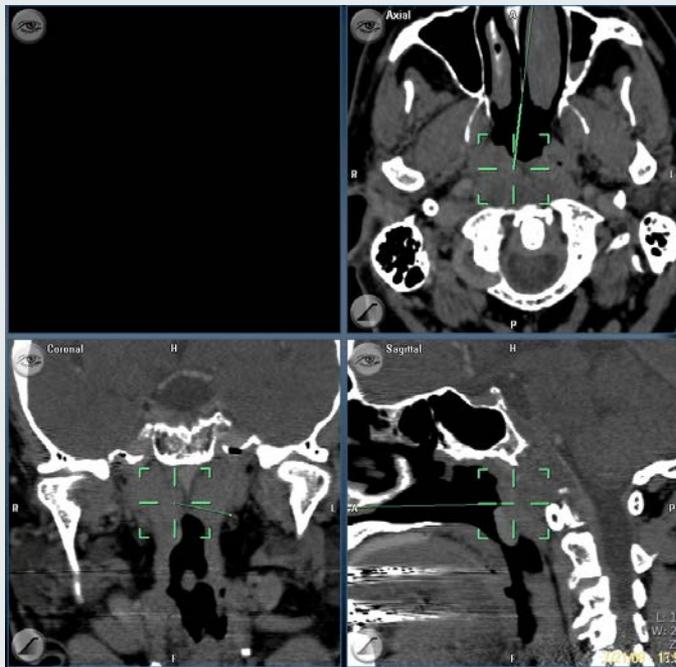
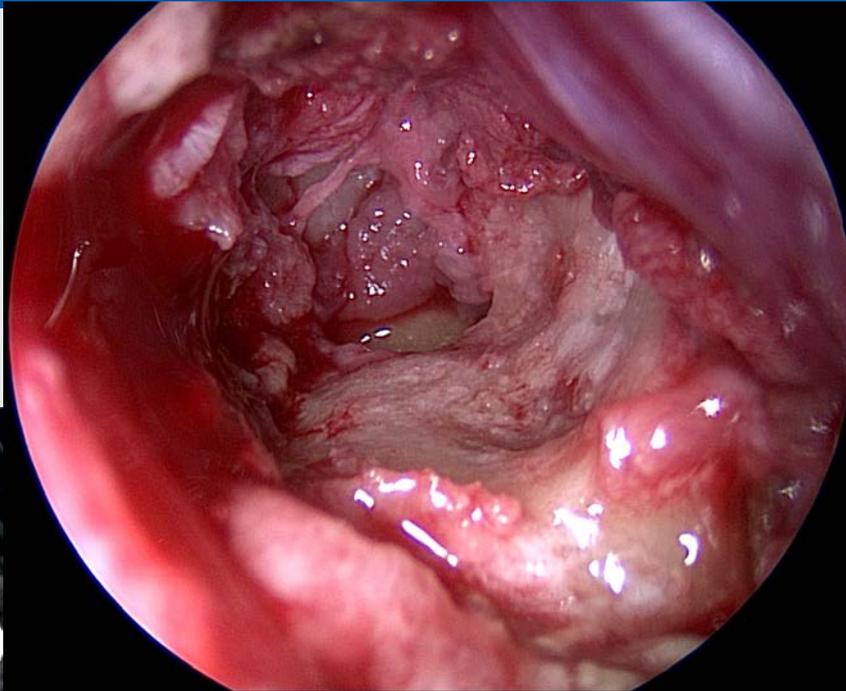


Infratemporal fossa



Cavernous sinus

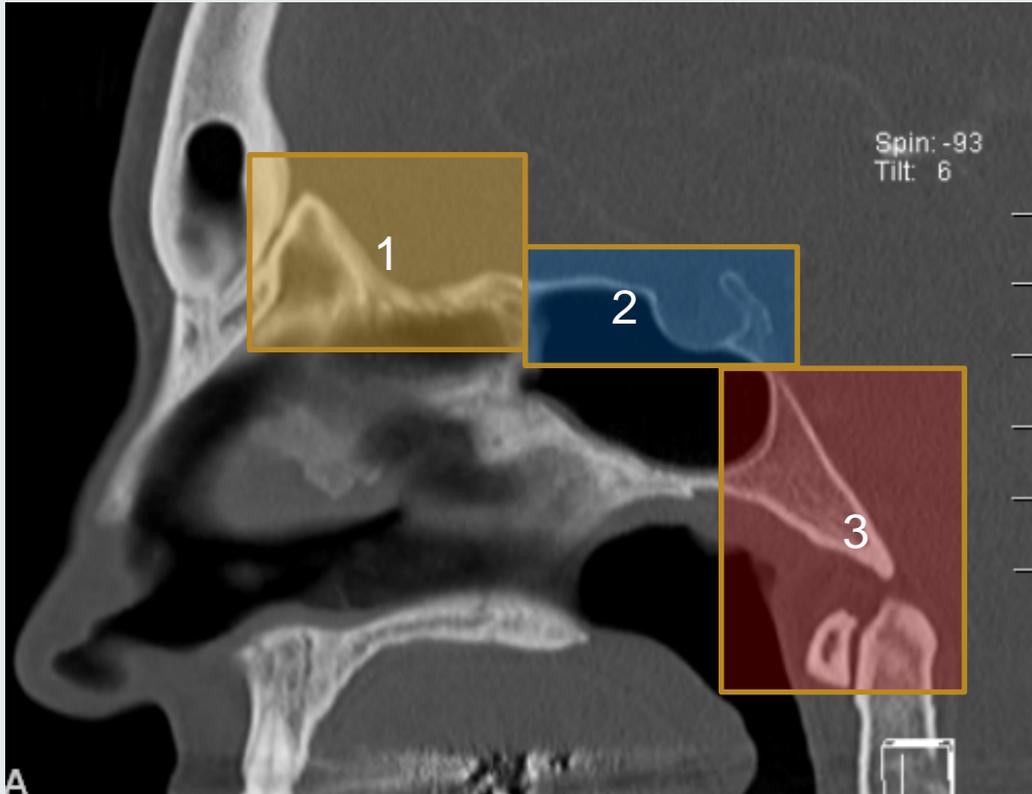




Nasal floor → foramen magnum

Occipital condyle

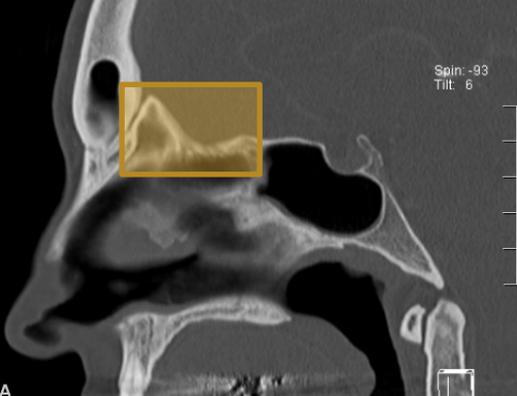
Definition & Classification



1. transcribriform

2. expanded
transsphenoidal

3. transclival

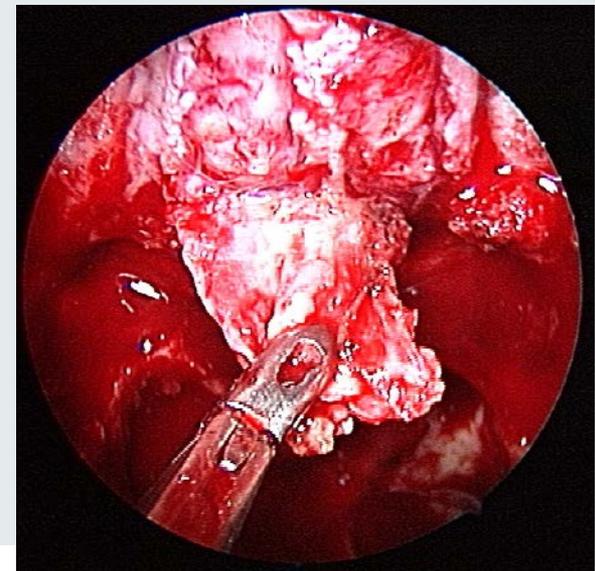
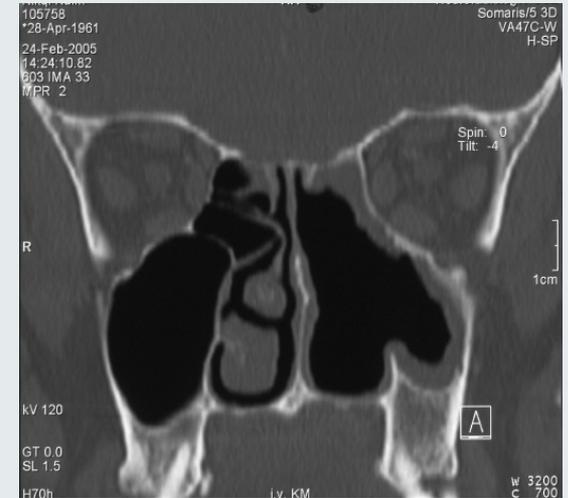


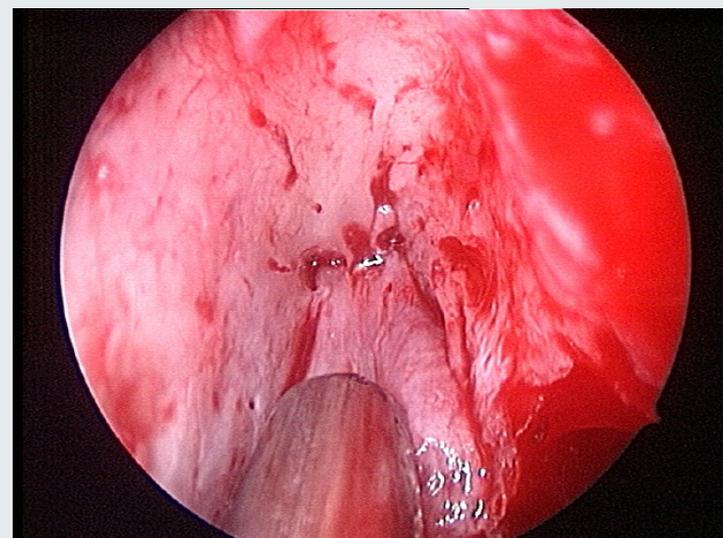
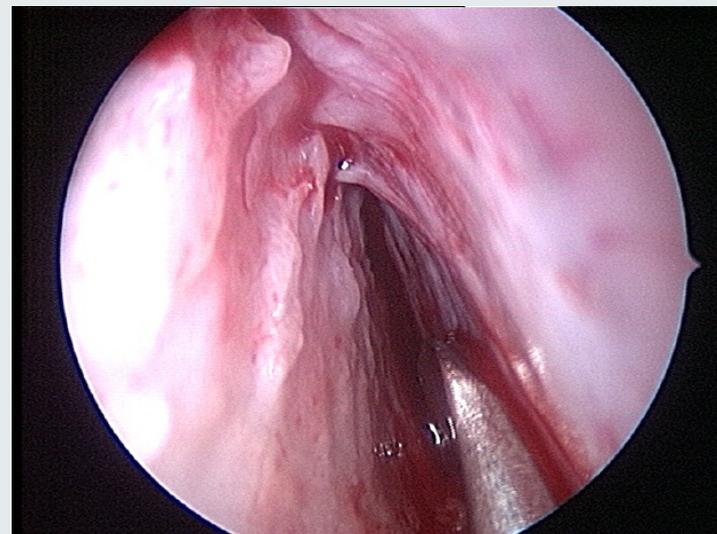
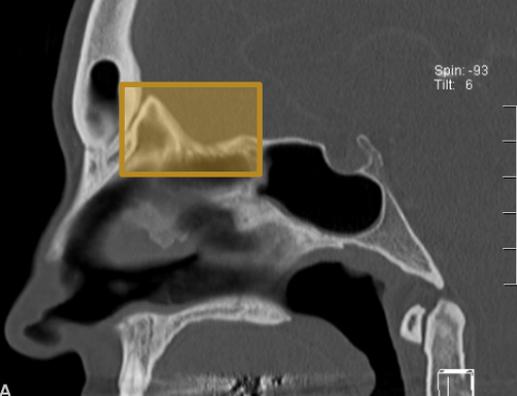
Transcribriform

F. Coecum → sphenoidal plain

1. Endonasal medial Maxillectomy¹
2. Cribriform plate
3. Fovea ethmoidalis
4. Dura

¹ Soyka M, Holzmann D *Am J Rhinol* 2005





Dural course along the olfactory fibres

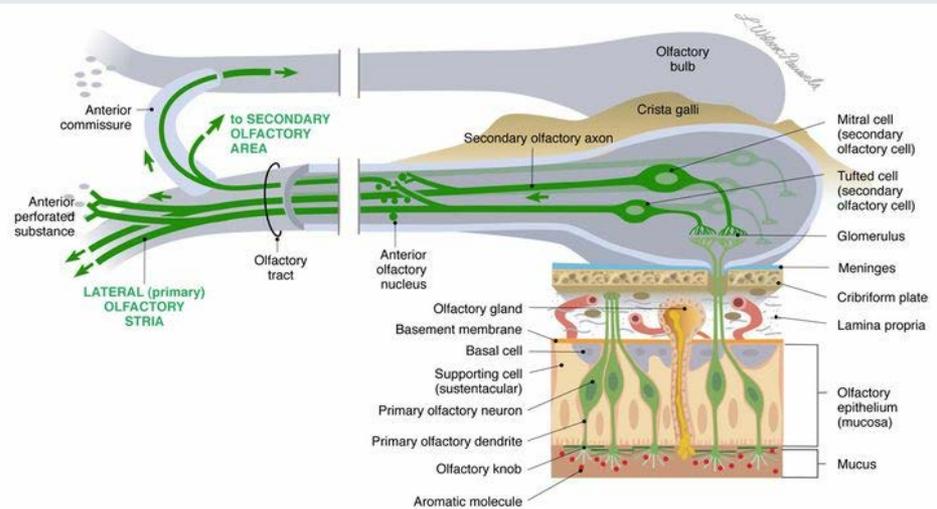
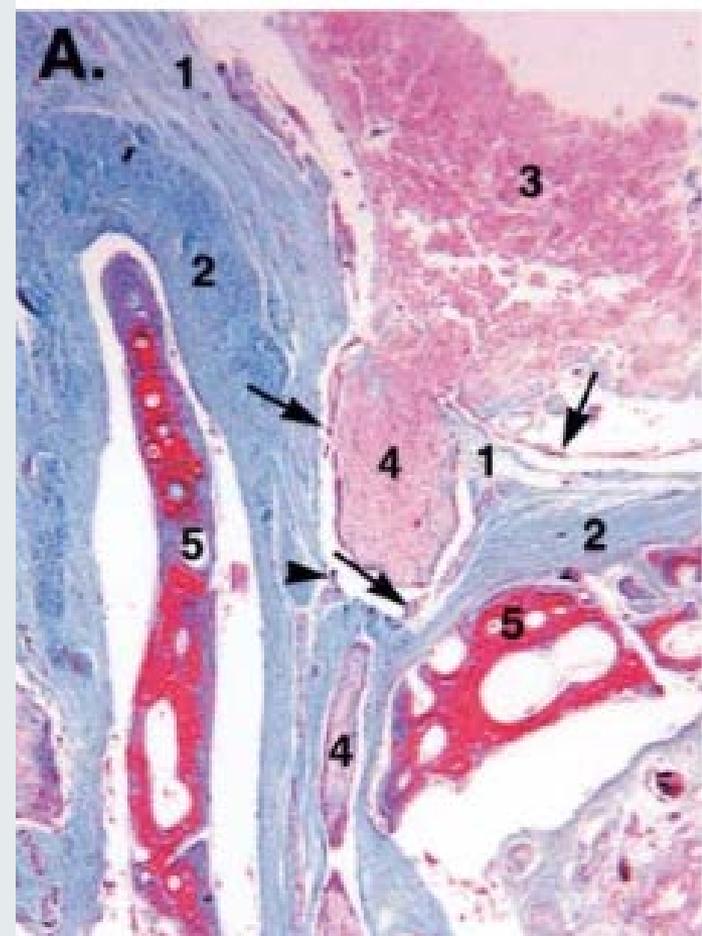
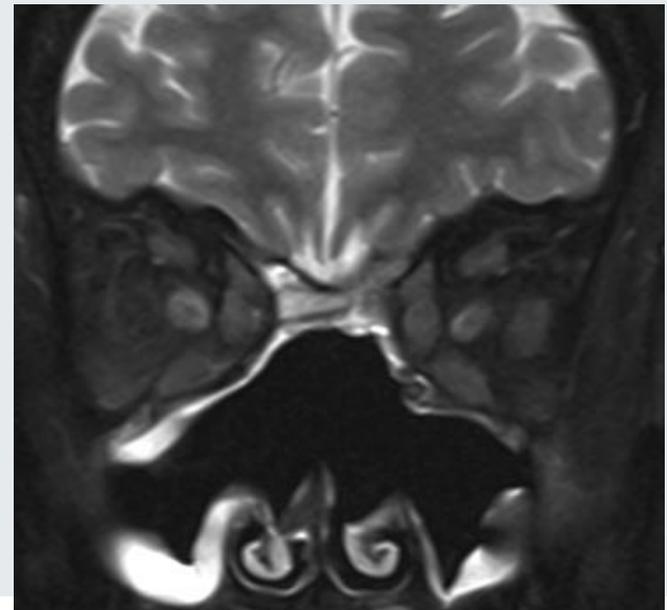
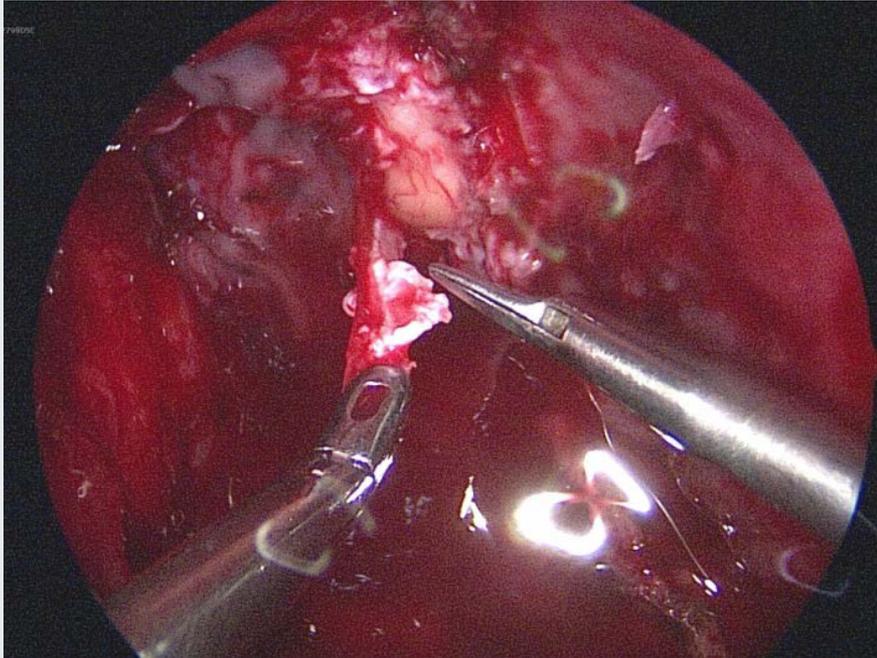


Figure 1-2 Olfactory epithelium, bulb, and tracts (structures are enlarged for clarity).

From Cranial Nerves 3rd Ed. ©2010 Wilson-Pauwels, Stewart, Akesson, Spacey, PMPH-USA



Dare AO et al J Neurosurg 2003



Indications:

- Squamous cell carcinoma
- Adenocarcinoma
- Olfactory neuroblastoma

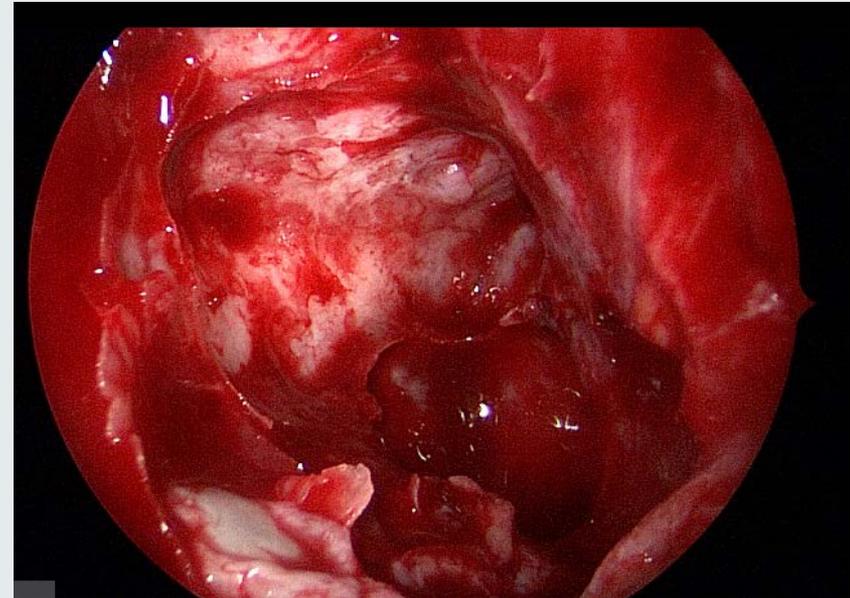




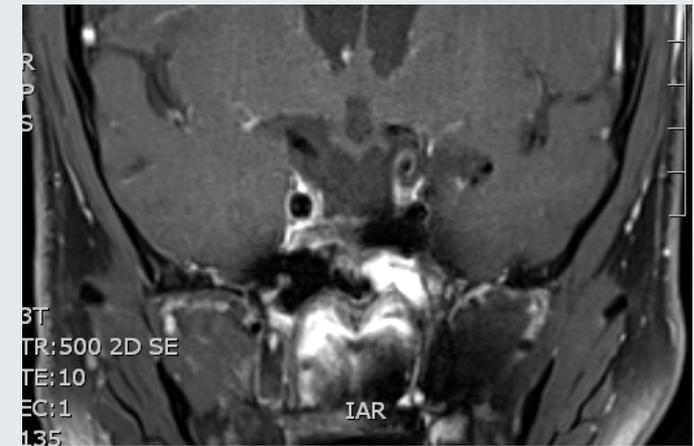
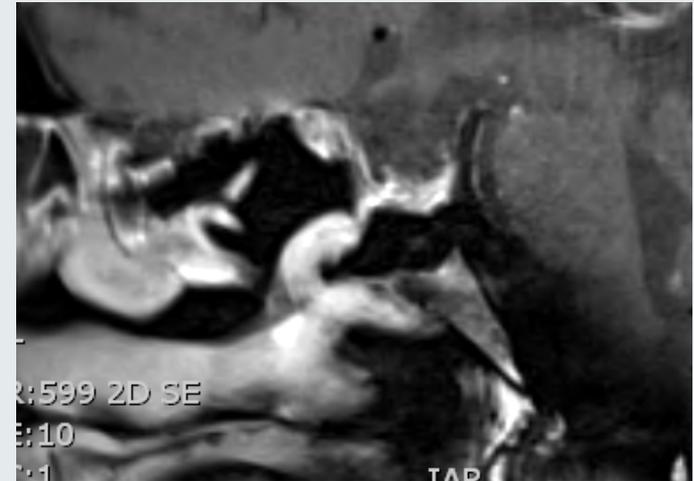
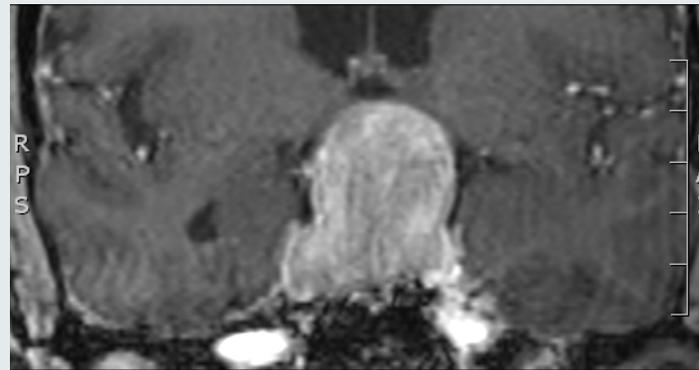
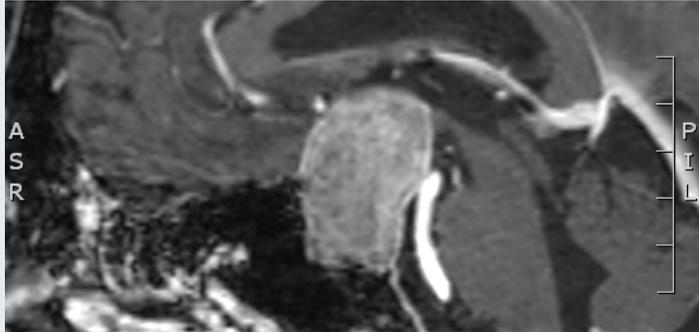
Expanded transsphenoidal

Sphenoid plain → Sella floor

1. Sphenoidectomy
2. Vomer base
3. Opticocarotid recess
4. Ev. sphenoidectomy
5. Ev. nasoseptal Flap



Expanded transsphenoidal



Indications:

- Pituitary adenoma,
- craniopharyngeoma

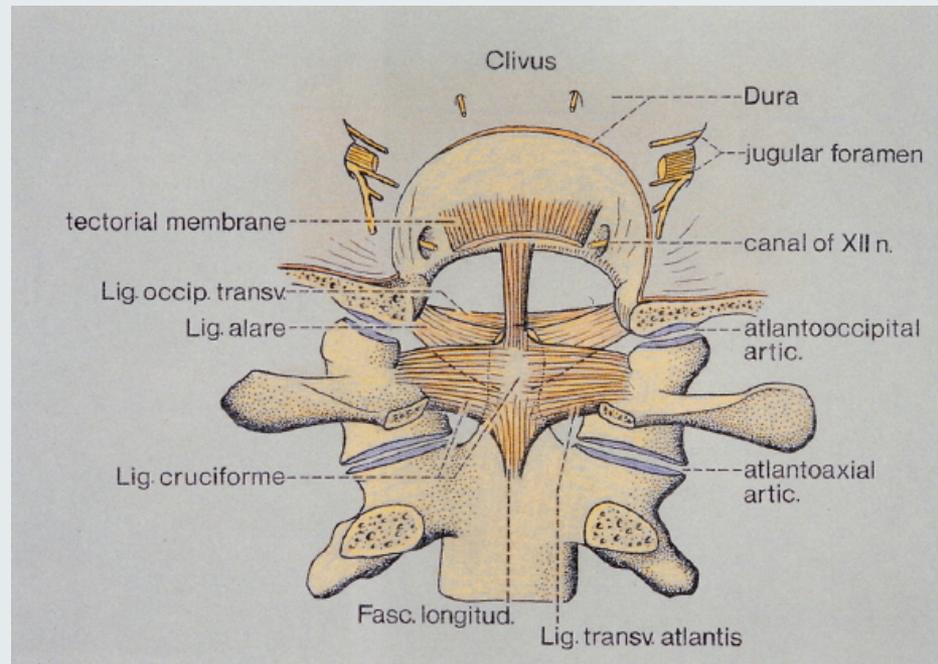




Transclival

Sella floor → odontoid

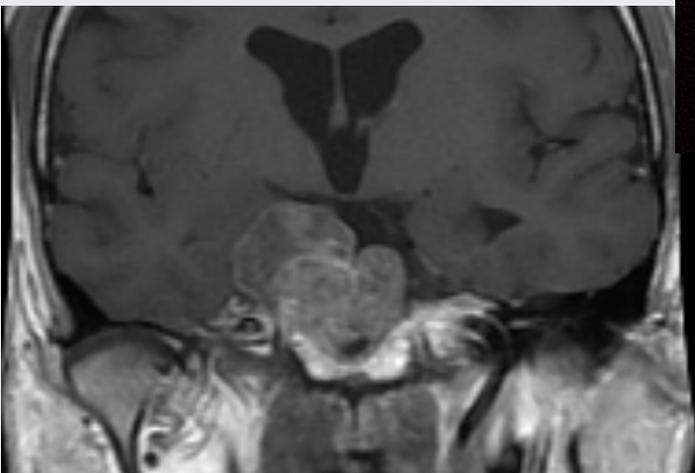
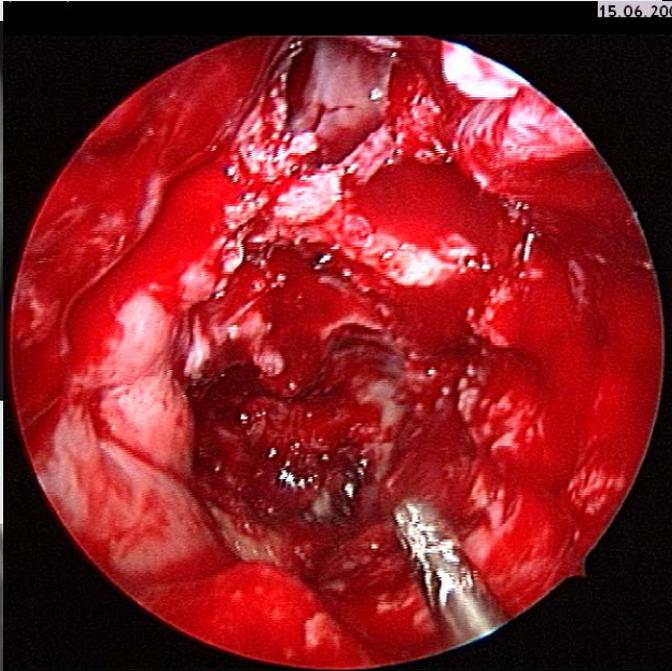
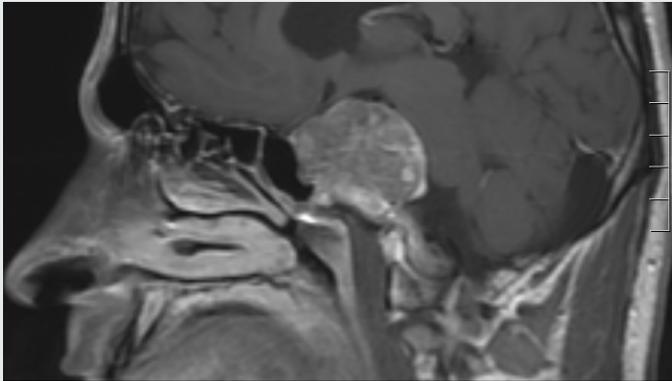
1. Sphenoidectomy (bilateral)
2. cruciforme ligament/ tectorian membrane
3. C1 / C2 (odontoid)
4. Brain stem dura



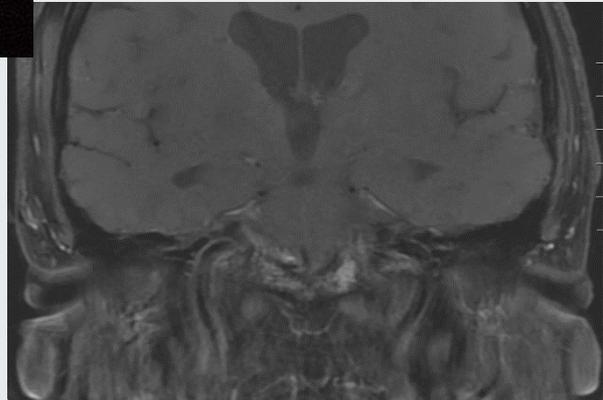
Holzmann D, Krayenbühl N, Reisch R, Bernays RL *Min Invas Neurosurg* 2010



Transclival



Indications:
Chordoma
Chondrosarcoma



Holzmann D, Kraysenbühl N, Reisch R, Bernays RL *Min Invas Neurosurg* 2010



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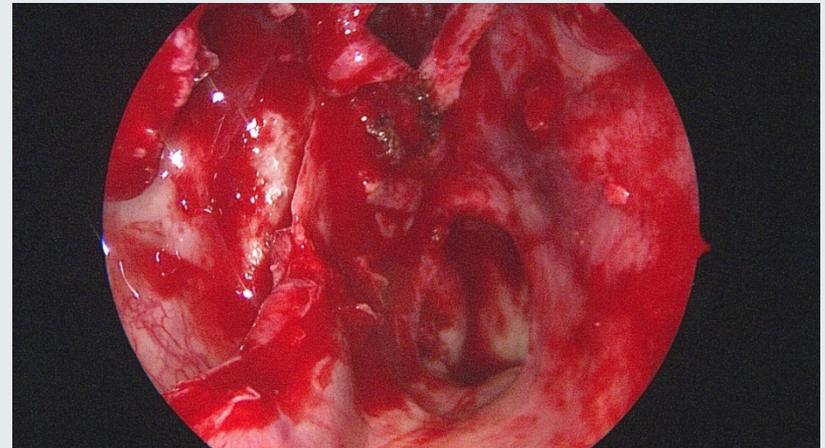
Transpterygoid



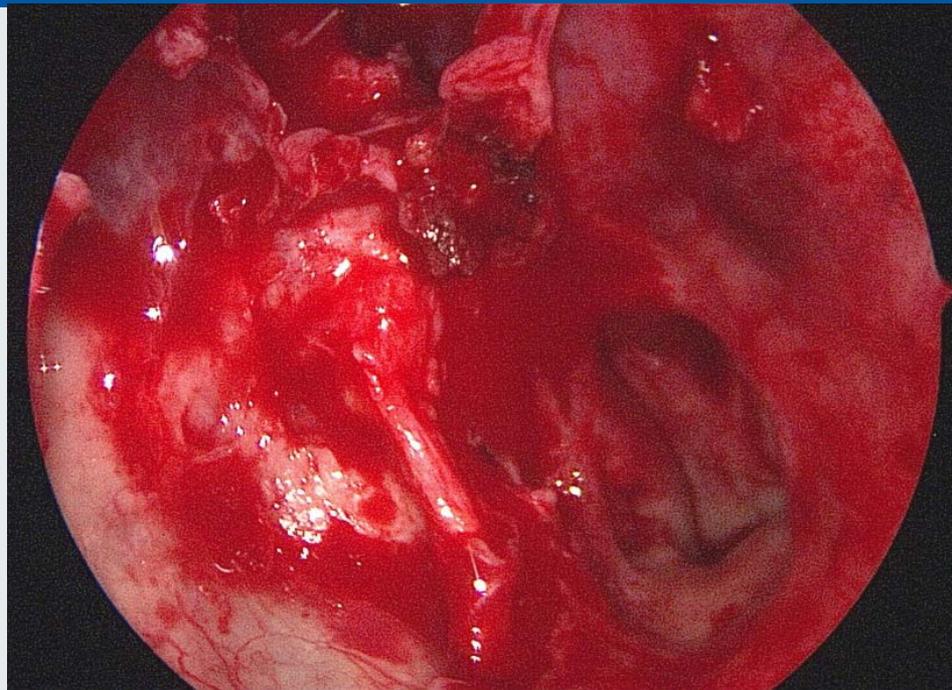
Proc. Pterygoideus → F. ovale



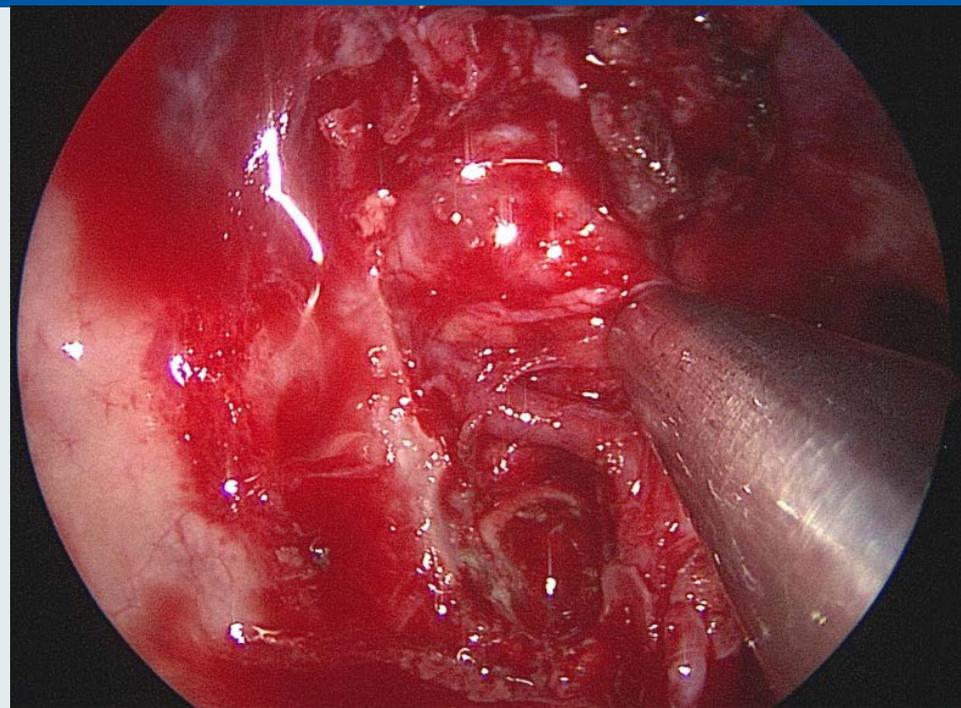
Mucoepidermoid Ca



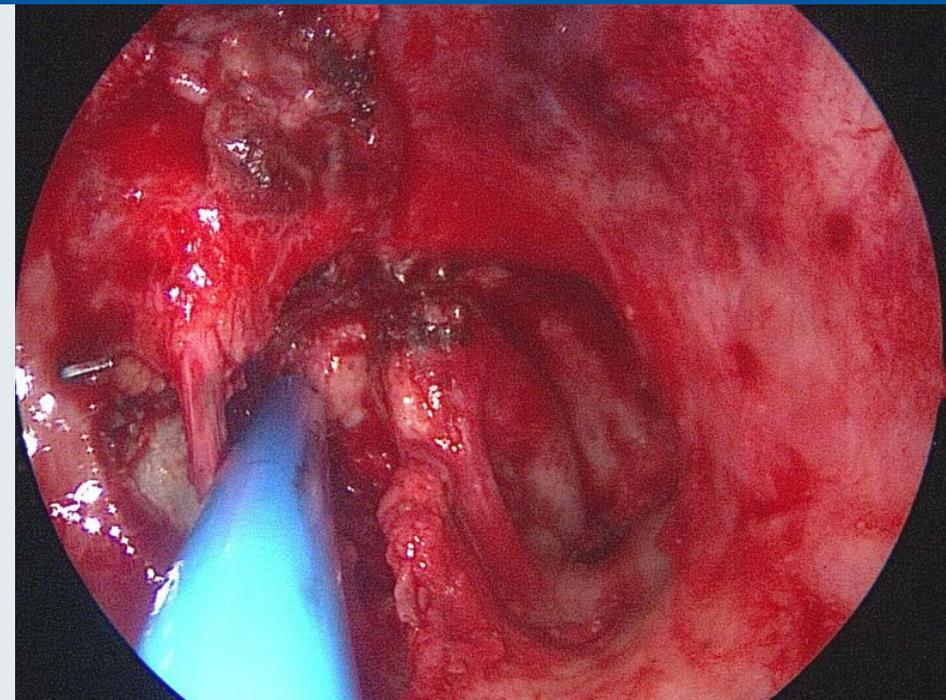
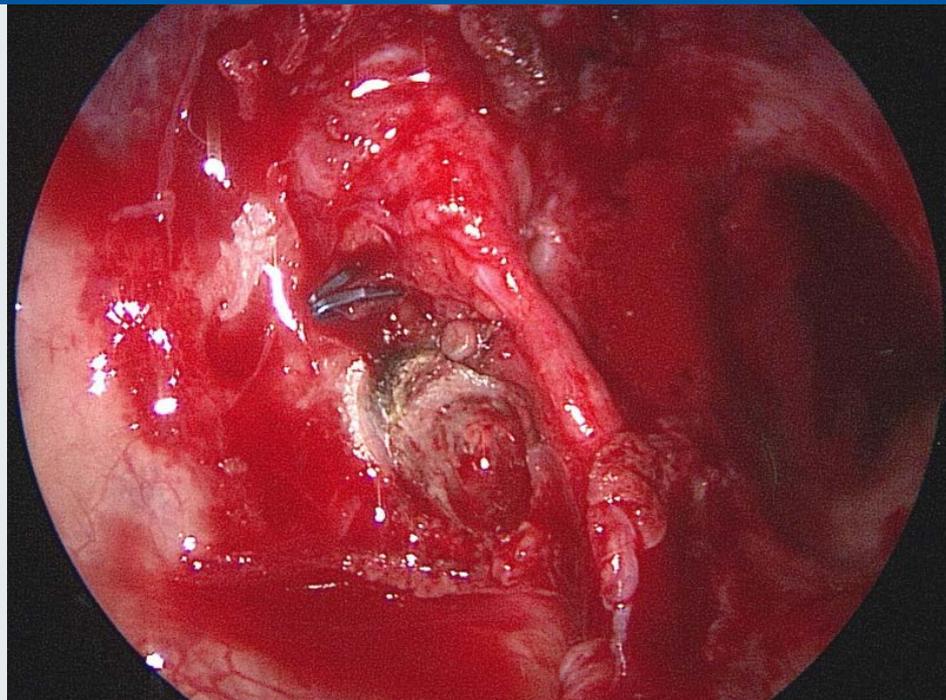
Sphenoethmoidectomy



- Backwall maxillary sinus
- Pterygopalatine ganglion
- Greater palatine nerve

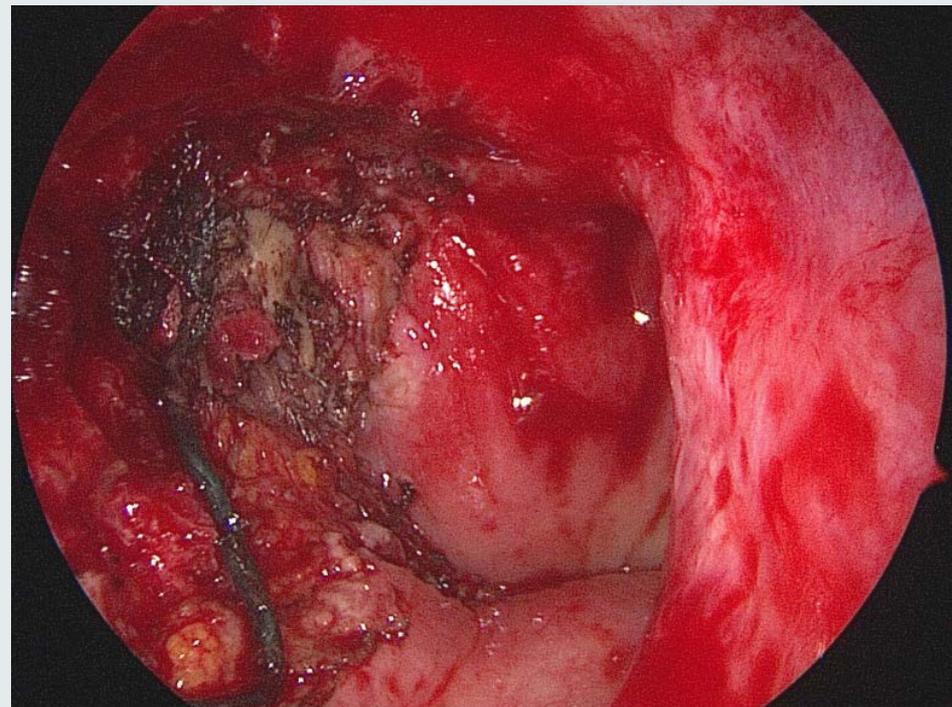
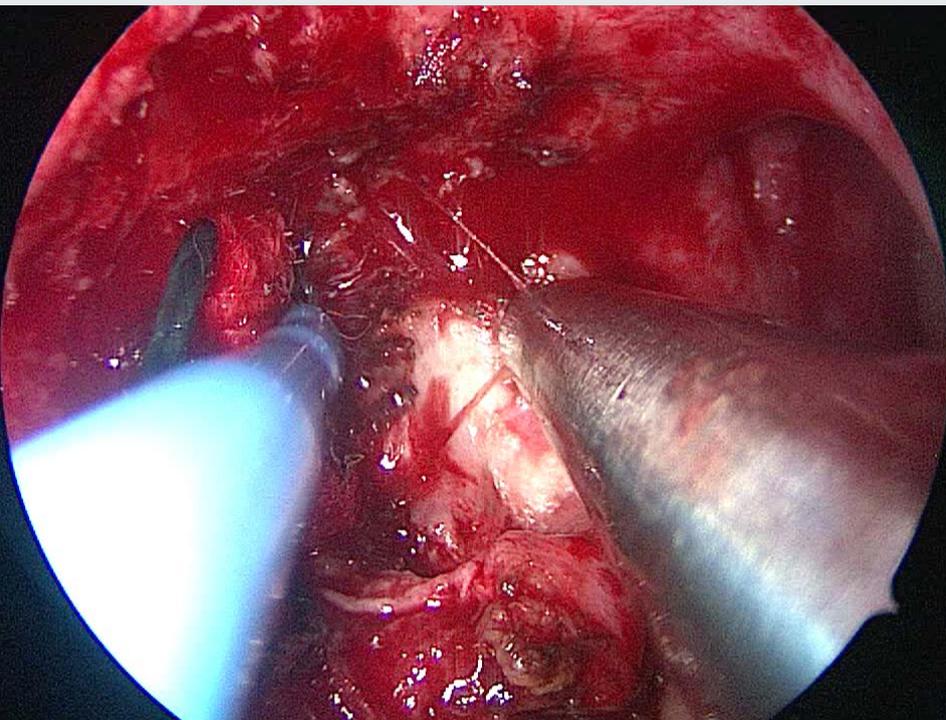


- Maxillary artery



Cut/clip ... the IMA

Drill the pterygoid process

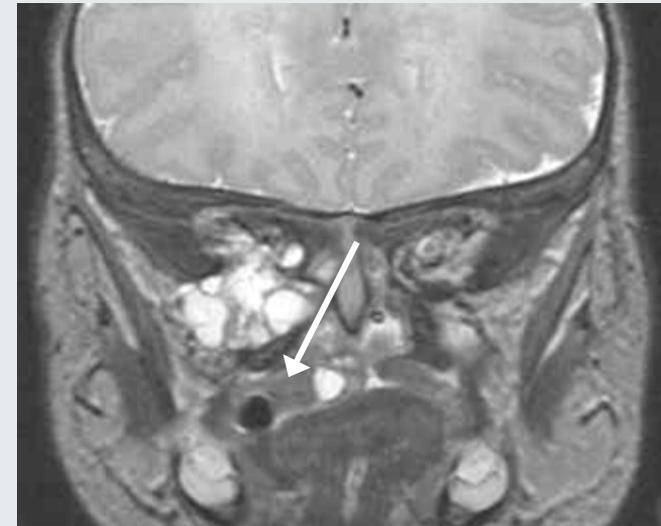
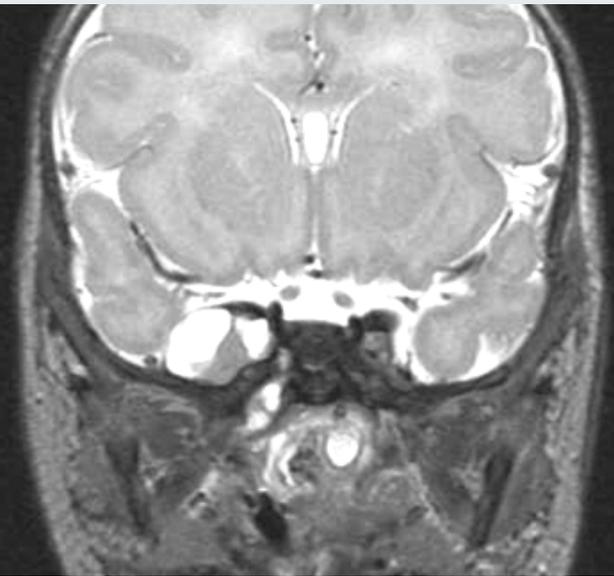


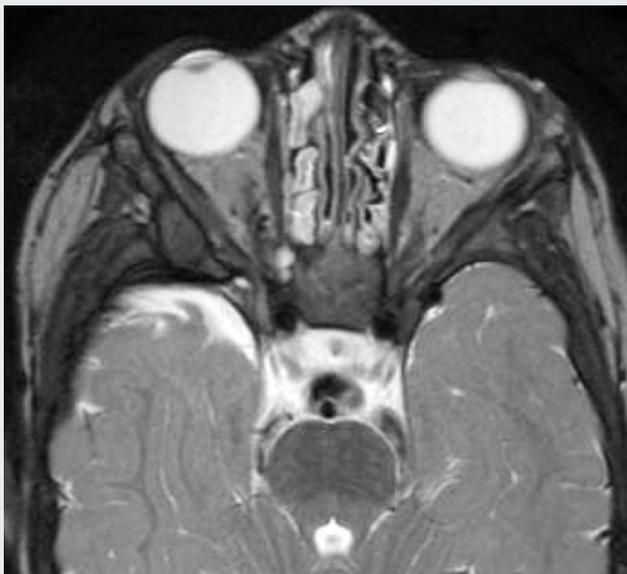
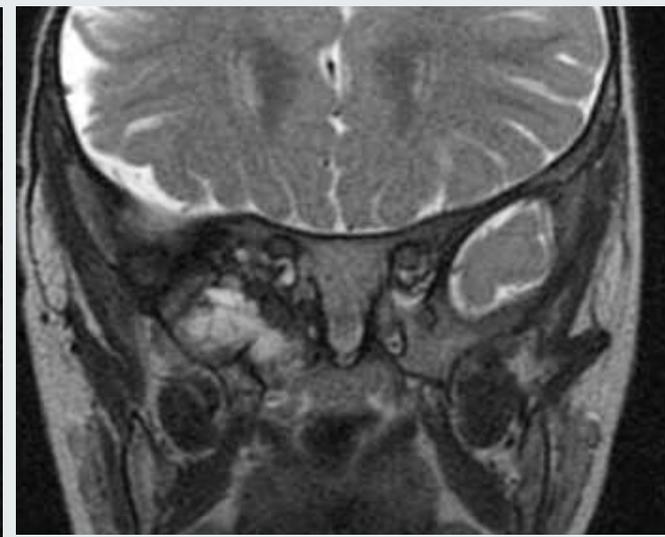
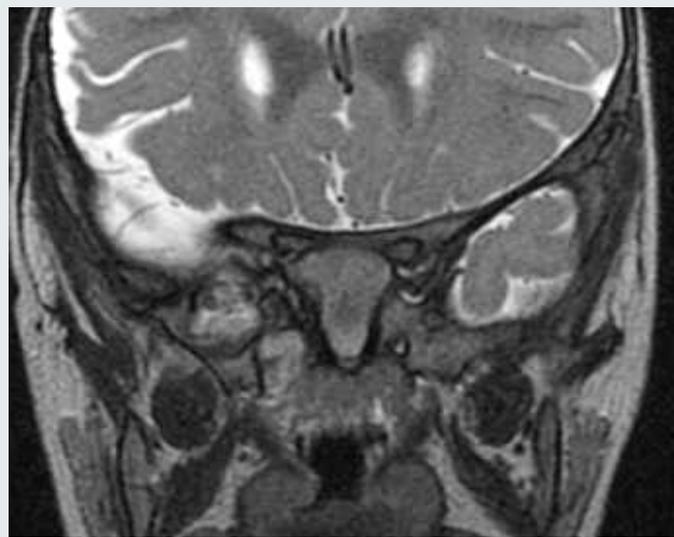
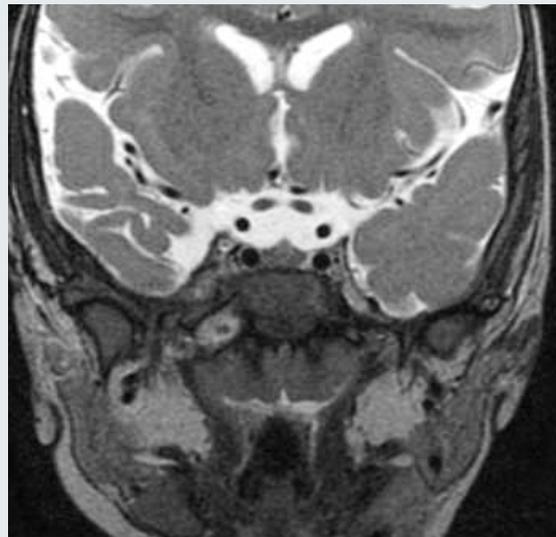
Remove the cartilaginous portion of the E.T.

Exposure:

- lateral: F. ovale
- superior: petrous segment of ICA
- inferior: soft palate

Newborn with theratoma afferent deficit right eye





Indications:

- Angiofibroma
- Adenoidcystic carcinoma
- Tumors along the Eustachian tube
- Tumors in masticator space

Holzmann D, Bozinov O, Kranyenbühl N *JNS* 2012



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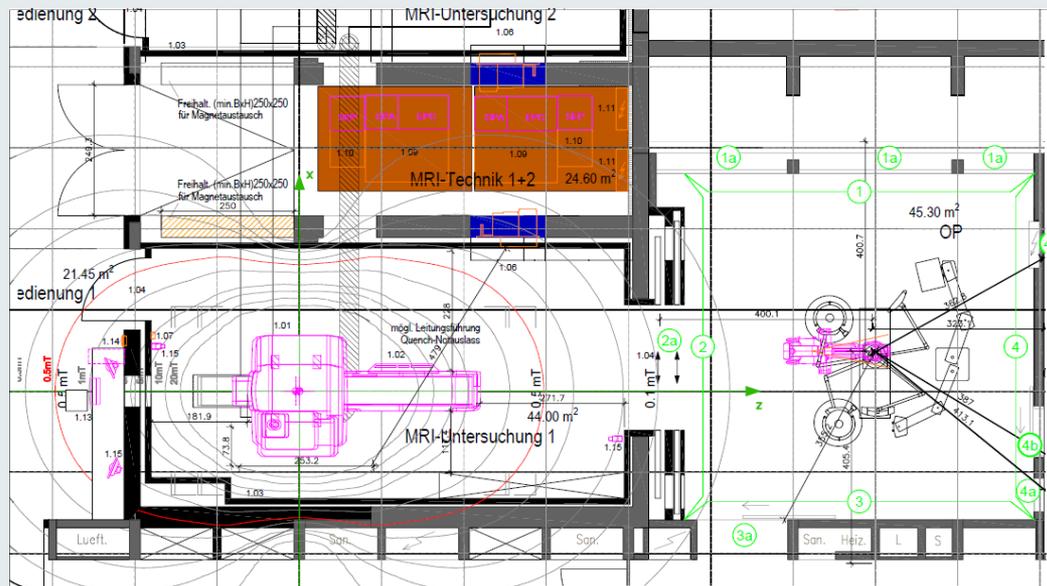
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Set-up & technical equipment

- Image guidance
- instrumentation



Intraoperative MRI:



Dinevski N et al World Neurosurg 2017
 Serra C et al Neusurg Focus 2016

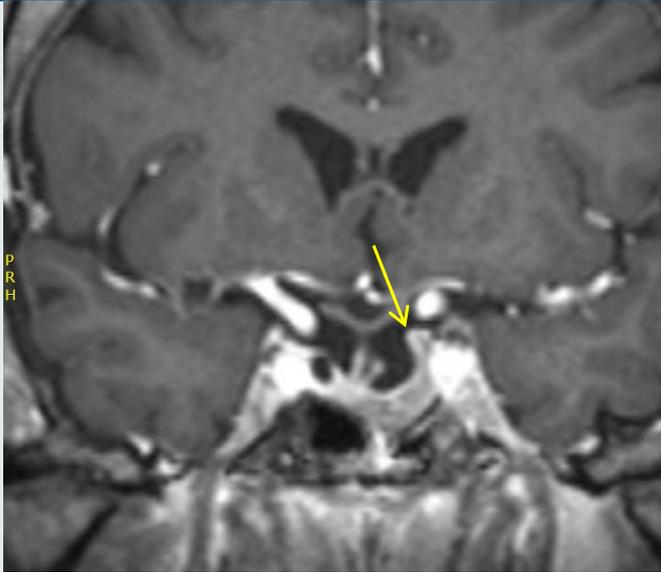


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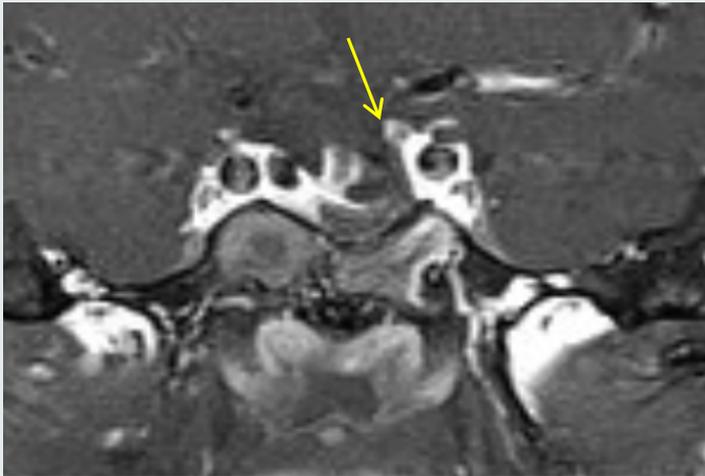
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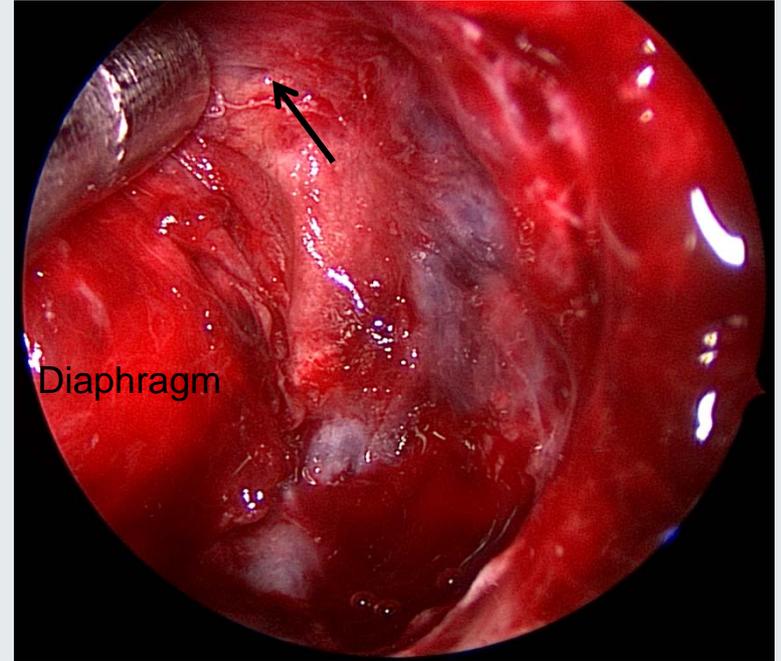
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preop. MRI



intraop. MRI



Intraoperative CT:



Summary of current studies

Endoscopic approaches ...

- ... less morbidity
- ... helps to stem rising healthcare costs (hospital stay)
- ... no comparative outcome studies



Summary of current studies

No proved influence on the outcome

- ... working through the tumor
- ... piecemeal resection

(exception: Sarcomas)



Basic principle

Every novel treatment

has to provide

similar or better results

before it can be considered as standard of care



Despite the feasibility ...

... we need more data

Thank you for your attention

