

# Endoscopic skull base surgery

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There are several main topics in endoscopic skull base surgery. Endonasal corridor, which means the way that the approach through the nose is performed is the first step to be evaluated. It provides direct access to the lesion, it facilitates working away from neurovascular structures. A multidisciplinary teamwork by a neurosurgeon and an ENT surgeon via uni/bi nasal apertures with an additional advantage of the second surgeon facilitates the use of endoscopy and provides increased image quality resulting in better outcomes than other approaches.

Skull base cases should be evaluated for clinical, radiological, surgical, anatomical and sometimes endocrinological aspects. These are mainly as follows:

Is the lesion removable by endoscopic approach ?

What is the relationship with neurovascular structures ?

What should be the extent of the lesion removal?

Is the extent of removal the same with open access?

Can the dural defect be repaired endoscopically?

How are the results compared to open surgery?

There are benign and malignant tumors located mainly in the anterior fossa besides sellar lesions. The most common malignant lesions are;

Squamous cell carcinoma

Adenocarcinoma

Adenoid cystic carcinoma

Neuroendocrin carcinoma

Undifferentiated carcinoma

Esthesioneuroblastoma

Melanoma

Metastasis

Surgical options include the transcranial approach, open cranoifacial resection (CFR), endoscope assisted CFR and endoscopic CFR. The endoscopic approaches are based on anatomy and modular including combined approaches. They are also flexible that is if needed expandable and new approaches may be added and useful for all patient groups.

The main area of interest during endoscopic skull base surgery is shown in Fig. 1.

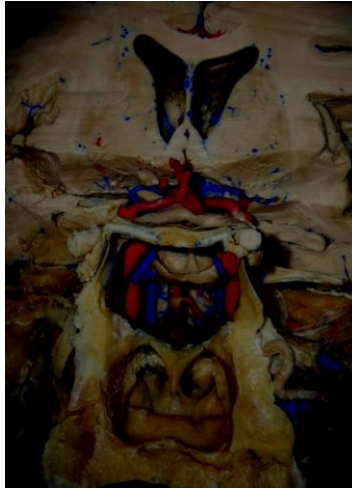


Fig 1.

Endoscopic approaches use two main surgical planes; sagittal and coronal. Figures show these planes (Fig. 2a sagittal plane, Fig. 2B coronal plane.)

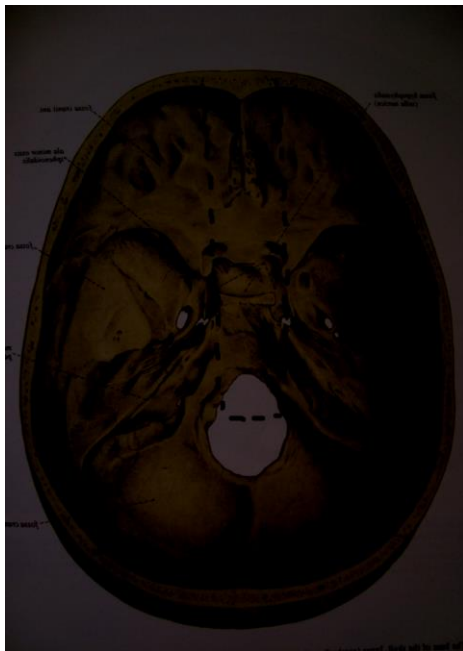


Fig 2a

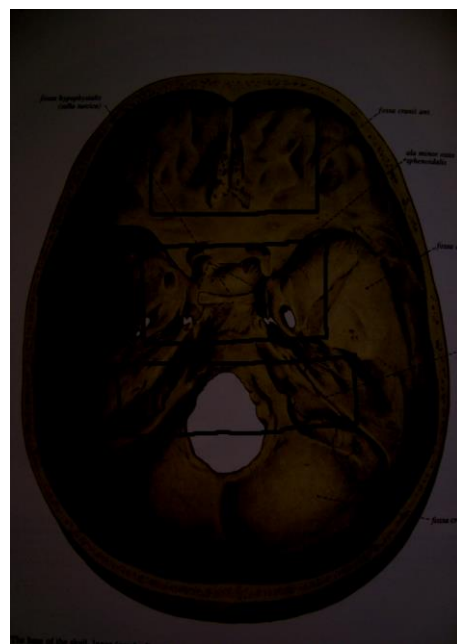


Fig 2b

There are some boundaries limiting the use of endoscopic approaches.

Selection of patients

Selection of approach (endoscopic vs open)

Lesion characteristics (extension of the lesion, vascularity, invasion)

Total removal ve partial removal

Prevention of complications

Management of complications

Length of surgery

Staff education (teamwork)

Resources

Endoscopic surgery has a long learning curve and needs endoscopic dexterity. There is always a possibility for neural and vascular injury and management of these injuries during surgery is more difficult than the open approaches. There is also a high risk of cerebrospinal fluid leak and repair of the dural defect is more complicated than the open surgery.

There are limitations for endoscopic surgery patho-anatomically. These limitations are listed below:

Marked suprasellar extension

Lateral extension

Retrosellar extension

Brain invasion with edema

Stiff tumor

Encasement of the Willis arteries/vazospasm

Encasement of optic apparatus

Tumor extending to the optic foramina

Nevertheless, endoscopic surgery replaced the open surgery in most skull base cases based on new techniques and also newer hardware making the visualization far more better.

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