Endoscopic skull base surgery

There has been a paradigm shift linked to developing endoscopic technologies with the introduction of completely endoscopic endonasal approaches to the ventral skull base.

Advantages

see Endoscopic skull base surgery advantages.

see Endoscopic endonasal approach.

see Lumbar Drain in Endoscopic Endonasal Skull Base Surgery.

Requirements

Endoscopic skull base surgery requirements

Indications

A PubMed search for articles published between January 1990 and January 2014 about “endoscopic skull base surgery”, “endoscopic transsphenoidal approach”, “endoscopic treatment of parasellar tumors” and “suprasellar lesions” was performed.

According to the current data, endoscopic surgery seems to be superior to open and transsphenoidal surgery microscopic removal of giant pituitary adenomas. Endoscopy is at least as successful as transsphenoidal microsurgery for the removal of pituitary adenomas and craniopharyngiomas. Transcranial open approaches, in the context of anterior midline skull base meningiomas, present higher rates of gross total resection, fewer complications and better clinical results than endoscopy approaches. The rate of postoperative CSF leakage has been significantly reduced with the introduction of new techniques such as the Hadad-Bassagasteguy flap but still represent one of the most important complications of this technique.

Currently, selected tumors located at the anterior, middle and posterior fossa can be adequately assessed using the endoscope with low rates of postoperative CSF leaks. Endoscopic surgery has substantially evolved in the last decades through the collaboration of different teams around the world. The endoscope is now an essential tool in the neurosurgery armamentarium with great potential for new applications in the nearby future.

Complications

see Cerebrospinal fluid leak after endoscopic skull base surgery.
The most feared complications following endoscopic endonasal skull base surgery are arterial vascular injuries. Previously published literature is restricted to internal carotid artery injuries. The ideal method for controlling arterial bleeding during this kind of procedure is debated, and a variety of techniques have been advocated.

A retrospective review of a prospectively acquired database of consecutive endonasal endoscopic surgeries at the New York-Presbyterian Hospital/Weill Cornell Medical Center from December 2003 to June 2015 and identified all cases of arterial injury.

Of 800 cases, there were 4 arterial injuries (0.5%), of which only one involved the internal carotid artery (ICA), for a risk of 0.125%. The other 3 involved the ophthalmic artery, anterior communicating artery, and A1 segment of the anterior cerebral artery. In all cases, definitive treatment involved occlusion of the artery either through endovascular means (3 cases) or direct surgical ligation (1 case). Neurological examinations were unchanged after arterial repair with only 1 small asymptomatic stroke. Literature review identified 7336 patients, of which there were 25 arterial injuries, of which 19 were of the ICA. Hence, the total rate of arterial injury was 0.34% and the rate of ICA injury was 0.26%. Arterial sacrifice was the only reliable method for managing arterial injury.

Arterial injury is an uncommon event after endoscopic endonasal surgery. Attempts at arterial repair are rarely successful, and vessel sacrifice is the most reliable technique at this point.¹


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