

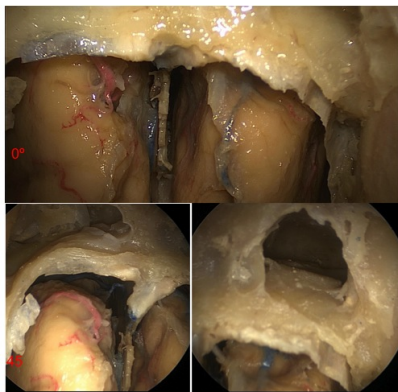
Introduction

To review the indications and applications of the 45° endoscope in skull base surgery, compare the visualization advantages over the 0° endoscope, and describe the technical nuances of its surgical use

Methods

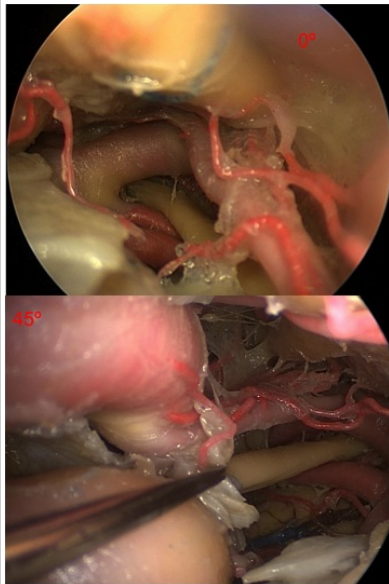
Five latex injected high-quality specimens were used to perform expanded endonasal approaches and compare the anatomical structures viewed with the 0° and 45° endoscopes. The results were correlated with the accumulated experience of +400 endoscopic skull base cases performed in the last 2 years.

Figure 1. Transcribiform Approach



Above 0° endoscope. Below 45° Endoscope. Improve visualization of anterior surface of frontal lobes and frontal sinus with the 45° endoscope.

Figure 2. Suprasellar Infrachiasmatic Approach



Above 0° endoscope. Below 45° Endoscope placed between the right intracavernous internal carotid and the pituitary stalk.

Results

In the transcribiform approach, the 45° endoscope allows for visualization of the anterior surface of the frontal lobe and bridging veins, and for lateral expansion of the surgical field through a supero-medial orbitotomy. At the level of the planum sphenoidale, it facilitates the access to the medial, inferior, and superior aspects of the optic canal. In the suprasellar infrachiasmatic region the angled endoscope improves the identification of oculomotor nerve, posterior communicating artery, and perforating branches;

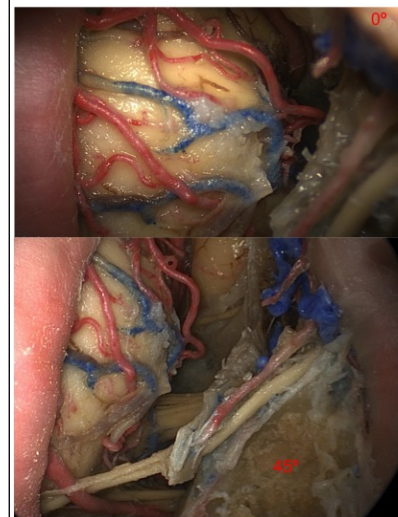
In the retrosellar retroinfundibular region it provides direct view of the posterior perforated substance and ventral hypothalamic surface. Within the sella, the 45° endoscope augments medio-lateral inspection and access to the cavernous sinus. When approaching the gland from an infrasellar trajectory, it provides direct access to the intermediate and posterior pituitary lobes without crossing the anterior lobe.

Figure 3. Infrasellar Approach



Above 0° endoscope. Below 45° endoscope allowing visualization of the posterior lobe of the pituitary gland.

Figure 4. Transclival Approach



Above 0° endoscope. Below 45° endoscope improving visualization of Dorello's canal and medial petrous apex.

The transclival approach can be expanded laterally behind the paraclival carotid artery to identify the petroclival fissure and medial petrous apex, Dorello's canal, and the abducens nerve entrance into the cavernous sinus.

Conclusions

The 45° endoscope implements the visualization of structures that are at the limit of the wide-angle view provided by 0° endoscope. This improvement, when combined with extensive bony resection for instrumental access, allows for safer and more effective dissection, and provides the basis for the extension of the endonasal endoscopic approaches beyond current limitations.

Learning Objectives

Indications of the use of the 45° endoscope compared with the 0° endoscope