



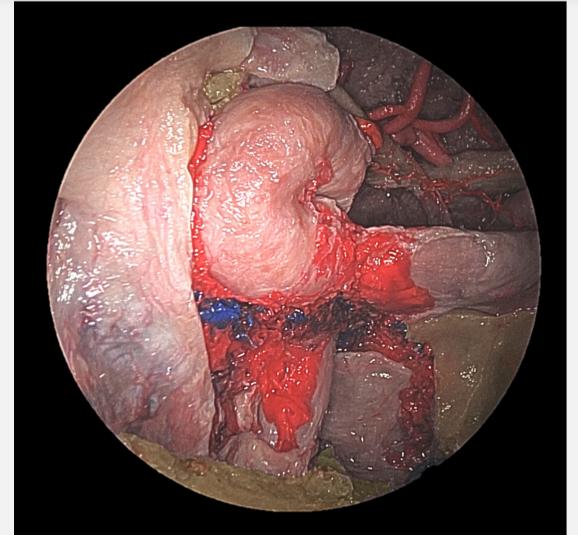
Relations of the Anterior Cavernous Sinus and Internal Carotid Artery in an Endoscopic Perspective; Anatomical and Surgical Implications

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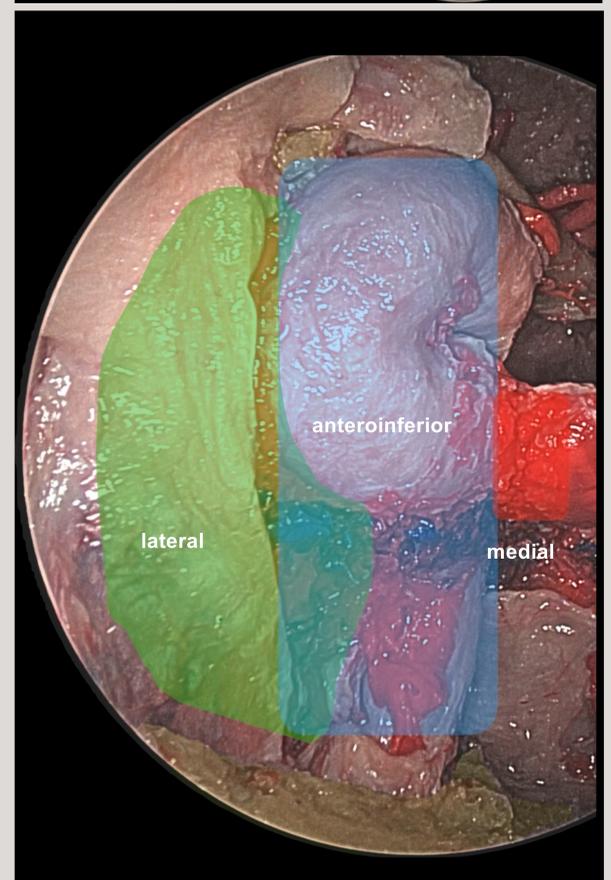
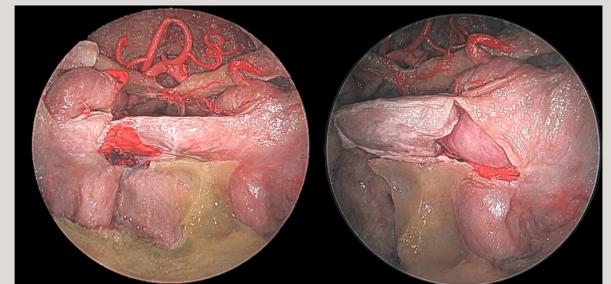
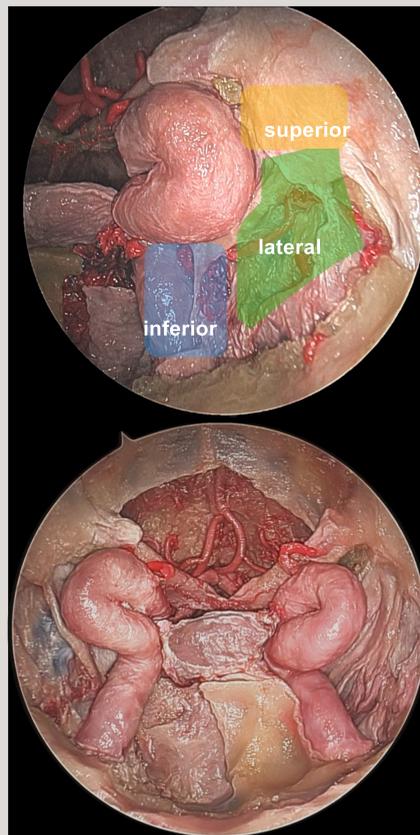
INTRODUCTION:

This anatomical study focuses on the anterior wall of the cavernous sinus, anterior cavernous space and its intricate relationship with the internal carotid artery and surrounding structures from an endoscopic perspective through dissections of colored silicone-injected human postmortem head specimens.



METHODS:

Dissections were performed on four formaldehyde-fixed colored silicone-injected human postmortem head specimens in a skull base laboratory, using microdissection techniques, Storz endoscopes with 0°, 30°, and 45° optics, and Medtronic Midas Rex high-speed drills for bony work. The dissections were performed in sequential manner for all specimens and were examined in three stages; nasal stage, exposure of the skull base floor and opening of the dura.



RESULTS:

Through a transpterygoid approach, the pterygopalatine and infratemporal fossa were exposed, and the cavernous segment of internal carotid artery along with the cranial nerves were directly visualized. The boundaries of the anterior cavernous sinus were defined in agreement with the literature as the lateral opticocarotid recess, medial opticocarotid recess, the posterior portion of the maxillary strut, and the superior angle of the clival recess. In addition, the dural folds accompanying the cavernous segment of the internal carotid artery and key arterial branches, particularly the meningo-hypophyseal trunk, were meticulously demonstrated, providing critical anatomical data for endoscopic endonasal surgery.

SUMMARY: Understanding the detailed anatomical relationships of the anterior cavernous sinus and internal carotid artery is crucial for successful surgical navigation. This anatomical study reinforces the critical importance of understanding the anterior wall of the cavernous sinus within the context of endoscopic endonasal surgery offering practical insights for skull base surgeons and supporting the refinement of endoscopic techniques for accessing parasellar and cavernous sinus pathology