Paratrigeminal, Paraclival, Precavernous, or All of the Above?
Circumferential anatomic study of the C3-C4 transitional segment of the internal carotid artery

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Background Our cadaveric study used an integrated anatomic approach to reconcile various internal carotid artery (ICA) nomenclature schemas, from both transcranial and endonasal perspectives. Our aims were two-fold: 1) describe a distinct precavernous, or C3-C4 transitional segment of the ICA and 2) establish a circumferential anatomical correlation of the loosely described paraclival ICA with its surrounding relevant anatomical structures.

Materials & Methods In 13 adult cadaveric formalin-fixed heads injected with colored silicone, bilateral transcranial extradural and endonasal endoscopic CT-guided dissections were performed. Transcranial: defined a quadrilateral area medial to Meckel’s cave (MC) between CN VI, antero- and posterolateral borders of the ICA, and posterior longitudinal ligament (PLL). Endoscopic: exposed the area through the “door” between MC and ICA using an angled 45-degree endoscope. Measurements: made in situ for both approaches. Anatomical correlations were made using 6-μm coronal histological sections of the sellar region and neuroradiological images.

Results
• A meningeal membrane covering the superior border of V2 was consistently identified as the lateral aspect of the cavernous sinus floor.
• In 18 (69%) of 26 sides, venous channels were absent on the paratrigeminal quadrilateral area. Area averaged 25.8 ± 9.6 mm² and 23.8 ± 9.1 mm² by transcranial and endonasal perspectives, respectively.
• Medially, the precavernous ICA corresponded with the paraclival ICA.

Conclusions
CIRCUMFERENTIAL ANATOMIC ANALYSIS: showed the paraclival ICA represents the medial aspect of the precavernous, or C3-4 transitional segment of the ICA. It is not a distinct segment by itself.
NEW C3-C4 TRANSITIONAL ICA SEGMENT: our revised classic antegrade ICA classification introduces this new transitional segment. It corresponds to the paratrigeminal ICA (seen transcranially and endonasally) whereas the paraclival ICA is seen only endonasally.