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The Lingual Process of the Sphenoid Bone and the Petrolingual Ligament: Surgical Anatomy, Landmarks, and Clinical Relevance

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Abstract

Background: The lingual process of the sphenoid bone (LP) and the petrolingual ligament (PLL) surround laterally the internal carotid artery within the middle cranial fossa (MCF).

Objective: To study the LP and the PLL and anatomical variations considering their relationships with different structures and landmarks within the MCF, especially oriented toward the endoscopic endonasal approaches.

Methods: Seventy-two sides of dry skulls and 20 sides of embalmed specimens were studied. The measurements of the LP and the PLL were obtained, considering important landmarks in the MCF.

Results: The LP had a mean length and height of 5 mm and 3 mm, respectively. Its distance from the foramen lacerum was 6 mm, from the foramen ovale 10 mm, foramen rotundum 15 mm, and petrous apex 9 mm. In 44 sides (61.11%), the LP partially closed the lateral aspect of the carotid sulcus; in 17 sides (23.61%), it was found as a near-ring; and in 11 sides (15.2%), it was considered rudimentary. Considering the PLL, its length and height were, respectively, 9 mm, and 4 mm.

Conclusion: The LP and PLL separate the carotid artery at the inferior aspect of Meckel's cave and constitute important landmarks for endoscopic endonasal approaches to Meckel's cave and MCF, and their identification and removal is essential for internal carotid artery mobilization in this area