An Extensive Anatomosurgical Analysis of Exposure of the Upper Petroclival Region in Different Surgical Approaches

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Introduction

• The upper petroclival (UPC) region, including the retrosellar area and interpeduncular fossa, contains complex neurovascular anatomy

• Lesions involving this region, including meningiomas, vascular malformations, chordomas, chondrosarcomas, and plasmacytomas, can be approached through a number of different operative windows

• We describe the surgical anatomy of the UPC region and present an analytical evaluation of the degree of exposure provided by several different surgical approaches
Methods

Anterior, anterolateral, lateral, posterior transpetrosal, and retro-sigmoid surgical approaches were performed on 12 cadaver specimens (24 sides)

• UPC was divided into 4 compartments via:
  • An axial plane through the tentorium
  • Sagittal plane through the lateral border of the posterior clinoid process

• Anatomical Compartments:
  • Medial supratentorial (MST)
    • PCA P1, basilar artery apex, SCA origin
  • Lateral supratentorial (LST)
    • PcommA, intradural CN III, PCA P2
  • Medial infratentorial (MIT)
    • Basilar artery trunk, AICA
  • Lateral infratentorial (LIT)
    • Intradural CN IV, intradural CN V, intradural CN VI, SCA, AICA
Unifrontal Approach

Anterior approaches provided wide exposure, but the deep trajectory and structures encountered limited maneuverability.
Anterolateral approaches offered adequate visualization and maneuverability of supratentorial structures, but required additional maneuvers to visualize the infratentorial structures.
Subtemporal Approach

Lateral approaches required significant cerebral retraction, but offered the most direct corridor.
The posterior transpetrosal approaches did not provide access to this region unless combined with a subtemporal approach.
The retrosigmoid approach did not provide visualization of the interpeduncular fossa, but allowed for good visualization lateral to CN III.
Summary Points

• There are numerous approaches to the complex neurovascular anatomy of the UPC region

• Surgical approach selection to the UPC depends on the size, location, and extension of the lesion

• Adequate preparation and dissection of the surgical corridors is crucial for maximizing exposure and maneuverability while minimizing damage to surrounding structures