

Introduction

The perisellar region is the anatomical area surrounding the sella and housing the greatest concentration of neurovascular structures in the middle cranial fossa. In this paper, we compare the seven transcranial approaches to each of the six perisellar compartments and discuss the surgical maneuverability of each approach, both ipsi- and contra-laterally.

Methods

Seven cadaveric perisellar regions were evaluated using the following transcranial approaches: anterior (anterior interhemispheric and transbasal), antero-lateral (supraorbital, pterional and cranio-orbitozygomatic) and lateral approaches (subtemporal and anterior petrosectomy). Each perisellar region has been subdivided into 6 compartments using five arbitrary anatomico-radiological planes: two coronal, two sagittal and one axial plane.

- The anterior coronal plane passes through the optic strut.
- The posterior coronal plane passes through the dorsum sellae.
- The sagittal plane connects the anterior and posterior clinoid processes, per laterality.
- The axial plane passes through the diaphragma sella.

Thereby dividing the perisellar region into 6 compartments: anterior superior, middle superior, posterior superior, anterior inferior, middle inferior and posterior inferior. Refer to Figure 1.

The corresponding anatomical structures in each perisellar region are listed in Table 1.

Results

The detailed comparative surgical maneuverability and structural visualization of each of the seven transcranial approaches to the six perisellar compartments has been undertaken.

At Weill Cornell Surgical Innovations and Skull Base Laboratory, we consistently use the surgical maneuverability score developed here for the exposure and accessibility of structures within the perisellar region:

- 0: No exposure
 1: Limited exposure with limited maneuverability
 2: Exposure possible with limited maneuverability
 3: Limited maneuverability, not every key structure is accessed
 4: Full surgical maneuverability.
- The seven transcranial approaches are listed with the corresponding surgical maneuverability in Table 2 and 3.

Conclusions

This premise of this paper is based on detailed cadaveric and anatomical dissection, with the acknowledgement of the complexity of the perisellar region and thus, to provide a simplified roadmap based on clear anatomical and radiological planes. In conjunction with the Neurosurgeon's clinical acumen and the surgical target characteristic, this paper intends to provide a current 'go to' reference of choice of the optimal transcranial approach to the targeted perisellar compartment.

Learning Objectives

By the conclusion of this session, participants should be able to

- 1) Describe the six compartments and anatomical relationships of the perisellar region
- 2) Discuss the seven transcranial approaches to the perisellar region, with discussion of the merits and surgical maneuverability of each approach.

References

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Figure 2



Visualization of the perisellar region and 6 perisellar compartments