

## Trigeminal Landmarks for Identification of the Internal Acoustic Canal During an Anterior Petrosectomy: A Morphometric Cadaveric Study.

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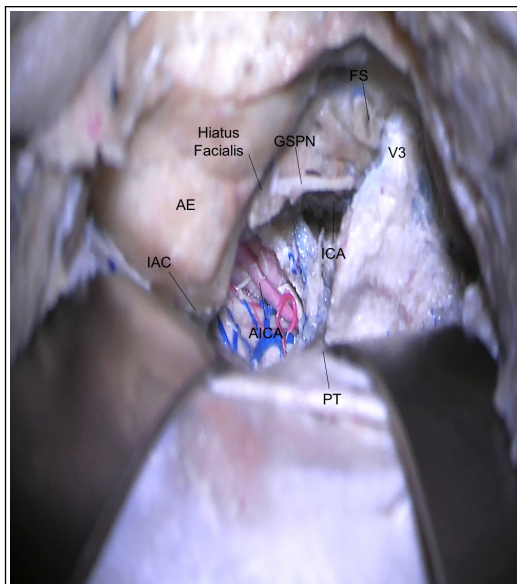
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### Introduction

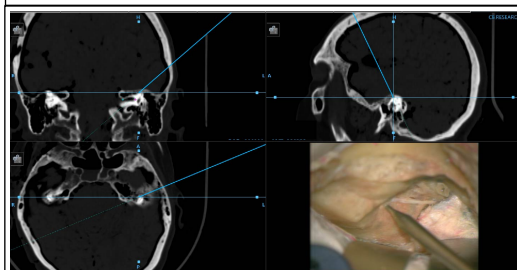
The anterior petrosectomy approach (APA) has been widely described for petroclival, cerebellopontine, and meatal pathologies. Identification of the internal auditory canal (IAC) is a critical step while performing this approach, either for an adequate posterior anatomical expansion of the surgical window or to treat an intracanalicular lesion. Several anatomic landmarks have been described to identify the IAC, none of them using the trigeminal nerve, which is encountered during the early stages of an APA. Our study aimed at providing safe and specific anatomic landmarks using trigeminal structures as a reference, to aid in the early identification of the IAC.

### Methods

A conventional extradural APA was performed on ten specimens. Upon completion of the APA, we used an anterolateral anatomical trigeminal landmark- the junction of the mandibular nerve (V3) and the greater superficial petrosal nerve (GSPN); and an anteromedial landmark- the porus trigeminus (PT). Linear measurements using a stereotactic navigation system were recorded from V3/GSPN to relevant lateral structures such as the posterior edge of petrous ICA, the facial hiatus, and the midpoint of IAC; and medially from PT to IAC.



AE: arcuate eminence; AICA: antero-inferior cerebellar artery; FS: foramen spinosum; GSPN: great superficial petrosal nerve; IAC: internal acoustic canal; ICA: internal carotid artery; PT: porus trigemini; V3: mandibular nerve



### Results

The medial linear distance from V3/GSPN to the ICA was  $6.8 \pm 1.3$  mm, to the FH was  $11.6 \pm 2.1$  mm and to the lateral IAC was  $17.9 \pm 1.8$  mm. The average distance from PT to the medial IAC was  $18.8 \pm 1.6$  mm.

### Conclusions

Trigeminal nerve boundaries are visualized early-on during an APA and can help with the prompt identification of IAC. The morphometric relationship of neurovascular structures of the middle fossa during petrous bone drilling are of vital importance. They create a visuospatial structural orientation to avoid damage to the vestibulocochlear system and for guiding towards a safe posterior expansion of the APA. Translation to the clinical setting will be necessary to confirm our findings.

### Learning Objectives

1. Specific trigeminal landmarks to identify the internal acoustic canal
2. Morphometrical description of lateral and medial structures in an anterior petrosectomy
3. Relation of the regional neurovascular structures

### References

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