

Microsurgical and Endoscopic Anatomy of the Retrosigmoid Inframeatal Infratemporal Approach

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Introduction: Different and often complex routes are available to deal with jugular foramen tumors with extracranial extension. This study presents a novel extension of the retrosigmoid approach useful to expose the extracranial area abutting the posterior fossa skull base.

Methods: A navigation-guided, endoscope-assisted retrosigmoid inframeatal approach was performed on six cadaveric heads in the semisitting position, displaying an area from the internal acoustic meatus to the lower cranial nerves, and exposing the intrapetrous internal carotid artery (ICA). We then continued removing the temporal bone located between the sigmoid sinus and the hearing apparatus, reaching the infratemporal area just lateral to the jugular fossa. This drilling, that we refer to as *postero-lateral* inframeatal drilling has not been previously described. Drilling of the horizontal segment of the occipital squama allowed good visualization of the uppermost cervical ICA, internal jugular vein and of the lower extracranial cranial nerves.

Results: We were able to provide excellent exposure of the inframeatal area and of the posterior infratemporal fossa from different operative angles preserving the neurovascular structures and the labyrinth in all the specimens. The intradural operative window on the extracranial compartement was limited by the venous sinuses and the hearing apparatus, and presented a mean width of 8.52 mm.

Sigmoid sinus transection led to better visualization of the lateral half of the jugular foramen, and of the uppermost cervical ICA.

Conclusion: The navigation guided endoscope-assisted extended retrosigmoid inframeatal infratemporal approach provides an efficient and versatile route for resection of jugular foramen tumors with extracranial extension.

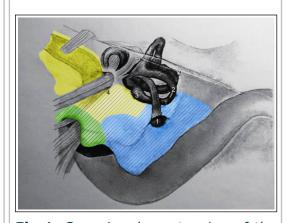


Fig.1. Suprajugular extension of the retrosigmoid approach (green area); retrosigmoid intradural inframeatal approach (green and yellow areas); postero-lateral inframeatal drilling (blue area); retrosigmoid intradural operative window on the posterior infratemporal fossa (hatched area). 1 = endolymphatic sac; 2 = most posterior portion of the posterior semicircular canal; 3 = ampulla of the posterior semicircular canal; 4 = inferior lip of the internal acoustic meatus.

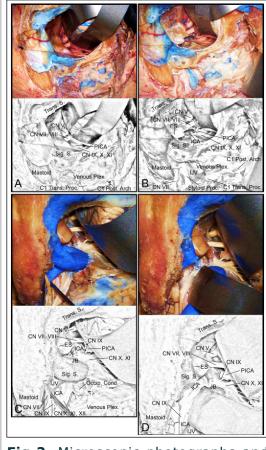


Fig.2. Microscopic photographs and corresponding drawings illustrating the stepwise exposure of the inframeatal region, and posterior infratemporal fossa.

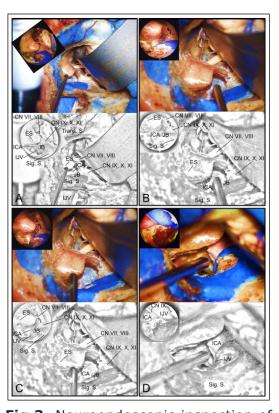


Fig.3. Neuroendoscopic inspection of the inframeatal region.

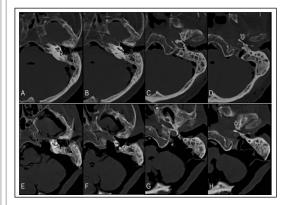


Fig.4. Pre- (A-D) and post-dissection (E-H) axial CT images illustrating the surgical space exposed by the extended retrosigmoid inframeatal infratemporal approach.