



# Retrosigmoid approach—With or without endoscopic assistance

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## KEYWORDS

Acoustic neuroma;  
Retrosigmoid  
approach;  
Posterior fossa  
approach;  
Endoscopy assisted  
surgery

The retrosigmoid approach is a direct route to the tumors arising in the posterior cranial fossa. This approach allows the surgeon to control the lateral and medial Cerebello pontine angle and if needed the supratentorial area through the section of the tentorium. The approach provides a good exposure of the surgical field and can be endoscopically assisted in order to improve the visualization of most of the neurovascular structures related to the lesion. The surgical technique of the retrosigmoid approach is described and the complications as well.

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## Introduction

The retrosigmoid approach is a procedure to access the cerebellopontine angle (CPA). It is widely used in the treatment of diseases, such as schwannomas of the VIII nerve and lower cranial nerves, meningiomas of the posterior surface of the petrous bone, endolymphatic sac tumors, epidermoid tumors, papillomas of the choroid plexus, arachnoid cysts, petroclival chondromas and chondrosarcomas, neurovascular conflicts, and to enable insertion of auditory brainstem implants. Traditionally performed to enable binocular microscopic visualization of the posterior fossa, the retrosigmoid approach is a common neurosurgical approach. This article describes our technique, highlighting salient points, and includes a discussion of endoscopic assistance as an adjunct to the approach.

The retrosigmoid approach is a commonly performed procedure to enable access to the posterior cranial fossa. We describe the approach and include a discussion of the benefits of endoscopic assistance.

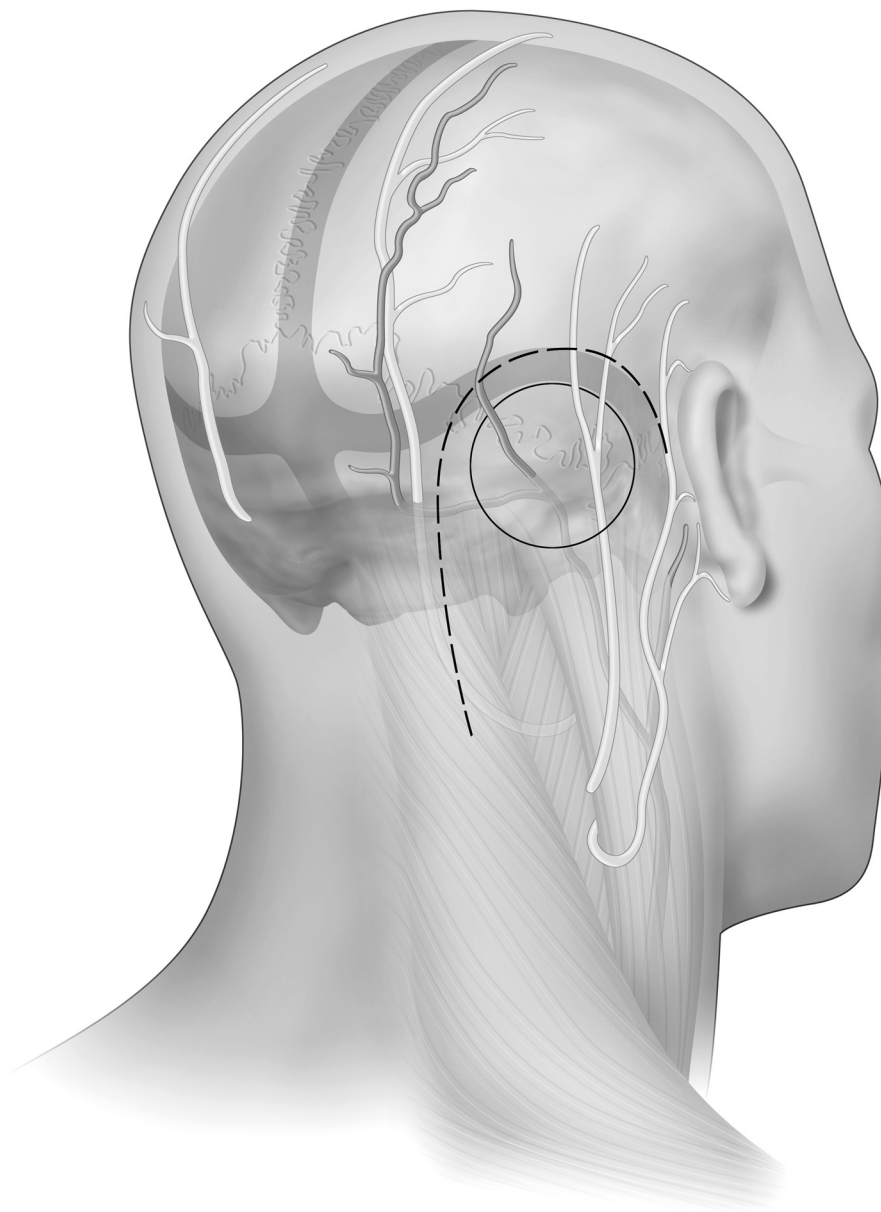
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## Surgical technique

Under general anesthesia, the patient is positioned supine with the head turned away, resting on a headring and fixed securely. Electrodes to enable monitoring of the facial nerve are placed in the ipsilateral facial musculature. After standard preparation of the surgical field, local anesthetic with epinephrine is infiltrated. A “C-shaped” skin incision is placed 4 cm from the retroauricular sulcus (Figure 1). The subcutaneous tissues are elevated anteriorly and retraction sutures are placed. A U-shaped inferiorly based fibromuscular flap is harvested. It is detached from the cranial bone with the aid of a rasp and monopolar fine-needle diathermy. The occipital artery and nerve are preserved to maintain good vascular supply of this flap and to reduce the risk of postoperative headache. The mastoid and suboccipital bone must be fully exposed, with the flap reflected inferiorly and sutured to the adjacent soft tissues. Posteriorly, the soft tissues are raised using the monopolar diathermy for around 1 cm along the incision line so as to allow the positioning of Raney scalp clips enabling hemostasis and to allow anchoring of the irrigation collector or pouch. At this time, bleeding often occurs from the mastoid emissary vein, which can be controlled with bone wax (Figure 2).

Subsequently a 4 × 3 cm (long dimension anteroposteriorly) craniotomy is performed. It is important to keep



**Figure 1** The circular area in the retroauricular region represent the amount of bone to be removed by the craniotomy. The anterior limit of the craniotomy is the sigmoid sinus and the superior limit is the inferior border of the transverse sinus. Its inferior limit is the superior nuchal line.

in mind the imaginary lines over which the sigmoid (SS), transverse sinuses, and their junction lie. This landmark is known as the asterion and is found at the junction of the lambdoid, parietomastoid, and occipitomastoid sutures. It is a concave area placed posterosuperiorly to the mastoid at about 5 cm behind the root of the zygomatic process. The SS and transverse sinuses define, respectively, the anterior and superior limits of the craniotomy. The SS runs deep to the line that connects the asterion to the tip of the mastoid. The transverse sinus, instead, lies deep to the line extending from the root of the zygomatic process to theinion (corresponding to the nuchal line in the midline). Starting inferiorly to the asterion, using a cutting burr, the SS is observed and the underlying dura is elevated. After which, a craniotome is used to develop a

free bone flap. This is kept safe for replacement during closing.

Under vision with a binocular microscope, a curvilinear dural incision is made, starting inferiorly, curving posteriorly away from the SS and is completed by curving anteriorly toward the junction of the transverse and SSs. The incision is performed caudally initially to gain access to the cisterna magna to allow cerebrospinal fluid (CSF) to be run off.<sup>1</sup> This permits relaxation of the brain. By allowing the cerebellum to fall away with gravity, we can avoid fixed-brain retraction. Placement of nonadherent neurosurgical lintines enables protection of the cerebellar parenchyma as instruments are passed into and out of the surgical field. At this point, the exploration of the CPA and dissection of the tumoral mass may start.

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