

Petroclival Meningiomas: Midline (Endonasal) or Lateral Approach?

Maria Koutourousiou MD; Francisco Vaz Guimaraes Filho MD; Juan Carlos Fernandez-Miranda MD; Eric Wang; Carl Snyderman MD; Paul A. Gardner MD
 Center for Cranial Base Surgery
 University of Pittsburgh Medical Center

Introduction

Multiple surgical approaches have been designed to reach the complex anatomy of the petroclival region and optimize the surgical outcome. Retromastoid craniectomy (RMC), far lateral approach (FLA) and endoscopic endonasal surgery (EES) can all be employed in the treatment of petroclival meningiomas.

Methods

From August 2008 to December 2012, 32 patients (62.5% female) with petroclival meningiomas were operated in our Department. We evaluated the surgical outcome based on the selected midline (EES) or lateral (RMC/FLA) surgical approach.

Results

Seventeen patients (53%) underwent EES, 11 RMC/FLA (34%) and 4 (13%) combination of EES with RMC/FLA. The overall gross total resection rate was 19% and it was higher among the RMC cases (27%); near total resection (>90% of tumor) was achieved in 28%, subtotal (>50%) in 37% and partial in 16%. Even patients with partial tumor resection had successful brainstem decompression and relief of associated initial symptoms. Among the EES cases, 9 patients (53%) developed new cranial neuropathies (CN VI palsy in 8); 6 (35%) had CSF leak and 3 (18%) developed meningitis. Postoperative hydrocephalus occurred in 2 cases (12%). Two patients died; one due to systemic complications following rupture of a delayed basilar pseudoaneurysm and one due to multisystem impairment. Among the RMC/FLA cases, 6 patients (54.5%) developed new cranial neuropathies; 2 (18%) had CSF leaks; 1 required shunting for hydrocephalus (9%). One patient died (9%) due to massive posterior fossa edema. Among the combined EES with RMC/FLA cases, 2 patients (50%) developed new cranial neuropathies; 2 developed hydrocephalus. No CSF leaks or deaths occurred in this group.

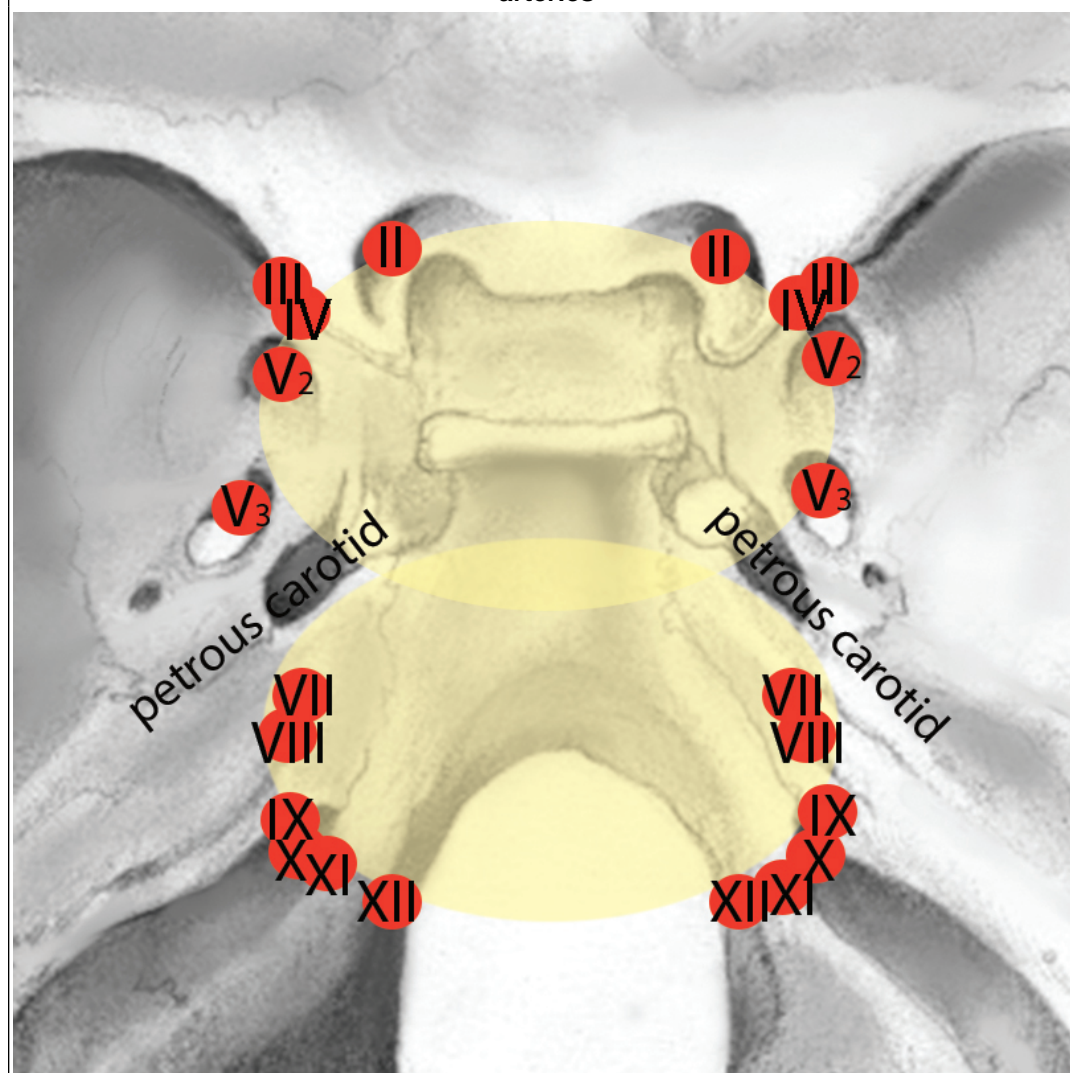
Conclusions

Besides the higher CSF leak rates following EES, midline (EES) and lateral (RMC/FLA) surgical approaches have similar complications and outcome and they both can be employed in the management of petroclival meningiomas based on surgeon experience and tumor projection and relationship to neural structures.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of different skull base approaches for the treatment of petroclival meningiomas. 2) Discuss the advent of midline (endoscopic) and lateral (open craniotomies) and the criteria for choosing the best one to achieve the maximum possible tumor resection with less complications. 3) Identify the importance of different surgical approaches for the treatment of meningiomas of the petroclival synchondrosis.

Illustration of the skull base foramina and the passing cranial nerves and carotid arteries



The yellow areas drawn between the cranial nerves represent the central skull base which is accessible through the EEA. Meningiomas with their base lateral to this area are subjects for open approaches.