Role of Extradural Clinoidectomy and Optic Unroofing in Resection of an Anterior Clinoidal Meningioma with Encasement of the Internal Carotid Artery and Its Branches

Sima Sayyahmelli1  Zhaoliang Sun1  Emel Avci1  Mustafa K. Başkaya1

1 Department of Neurological Surgery, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin, United States

Address for correspondence Mustafa K. Başkaya, MD, Department of Neurological Surgery, University of Wisconsin School of Medicine and Public Health, Madison, WI 53792, United States (e-mail: m.baskaya@neurosurgery.wisc.edu).

Abstract

Anterior clinoidal meningiomas (ACMs) remain a major neurosurgical challenge. The skull base techniques, including extradural clinoidectomy and optic unroofing performed at the early stage of surgery, provide advantages for improving the extent of resection, and thereby enhancing overall outcome, and particularly visual function. Additionally, when the anterior clinoidal meningiomas encase neurovascular structures, particularly the supraclinoid internal carotid artery and its branches, this further increases morbidity and decreases the extent of resection. Although it might be possible to remove the tumor from the artery wall despite complete encasement or narrowing, the decision of whether the tumor can be safely separated from the arterial wall ultimately must be made intraoperatively.

The patient is a 75-year-old woman with right-sided progressive vision loss. In the neurological examination, she only had light perception in the right eye without any visual acuity or peripheral loss in the left eye. MRI showed a homogeneously enhancing right-sided anterior clinoidal mass with encasing and narrowing of the supraclinoid internal carotid artery (ICA). Computed tomography (CT) angiography showed a mild narrowing of the right supraclinoid ICA with associated a 360-degree encasement. The decision was made to proceed using a pterional approach with extradural anterior clinoidectomy and optic unroofing. The surgery and postoperative course were uneventful. MRI confirmed gross total resection (Figs. 1 and 2). The histopathology

Conflict of Interest
None declared.

www.thieme.com/skullbasevideos
www.thieme.com/jnlsbvideos

received April 28, 2020
accepted after revision January 9, 2021
ISSN 2193-6331.

© 2021. The Author(s).
This is an open access article published by Thieme under the terms of the Creative Commons Attribution-NonDerivative-NonCommercial-License, permitting copying and reproduction so long as the original work is given appropriate credit. Contents may not be used for commercial purposes, or adapted, remixed, transformed or built upon. (https://creativecommons.org/licenses/by-nc-nd/4.0/)
Georg Thieme Verlag KG, Rüdigerstraße 14, 70469 Stuttgart, Germany
was a meningothelial meningioma, World Health Organization (WHO) grade I. The patient continues to do well without any recurrence and has shown improved vision at 15-month follow-up.

This video demonstrates important steps of the microsurgical skull base techniques for resection of these challenging tumors.

The link to the video can be found at https://youtu.be/vt3o1c2o8Z0

![Preoperative and postoperative MRI images. MRI, magnetic resonance imaging.](image)
Fig. 2 Cadaveric dissection and intraoperative images. ACP, anterior clinoid process; A1, proximal segment of anterior cerebral artery; DS, dorsum sellae; HF, hypophyseal fossa; ICA, internal carotid artery; II, optic nerve; III, oculomotor nerve; IV, trochlear nerve; M1, proximal segment of middle cerebral artery; OC, optic canal; OS, optic strut; Pcom, posterior communicating artery; PCP, posterior clinoid process; SOF, superior orbital fissure; TS, tuberculum sella; V1, ophthalmic division of trigeminal nerve; V2, maxillary division of trigeminal nerve; V3, mandibular division of trigeminal nerve; VI, abducens nerve.