Endoscope-Assisted Microsurgical Removal of an Epidermoid Tumor within the Cavernous Sinus

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INTRODUCTION

Epidermoid tumors are rare lesions, accounting for 0.7-1.8% of all intracranial tumors.1,2 They are believed to be non-neoplastic lesions and to arise from ectopic ectodermal cells. Although the vast majority of epidermoid tumors are intradural, extradural locations have also been reported.3 The most common locations are the cerebellopontine angle, parasellar area, and middle cranial fossa.1,4 Cavernous sinus (CS) involvement is rare. To the best of our knowledge, there have been only 18 cases in the literature describing the microsurgical management of epidermoid tumors located in the CS.1,5 We present herein a case in which we used an endoscope to assist microsurgical removal of an epidermoid tumor from the cavernous sinus.

CASE REPORT

A 21-year-old male presented with progressive headache, diplopia, and visual disturbance. He exhibited ptosis of the eyelid as well as limited movement of the right eye.

Epidermoid tumor of the cavernous sinus is rare. The aim of this case report is to discuss the role of neuroendoscopes in the removal of such lesions. A 21-year-old man presented with 6-year history of progressive headache, diplopia, and visual disturbance. Work-up revealed an epidermoid tumor located in the right cavernous sinus. An extradural transcavernous approach was utilized via a traditional frontotemporal craniotomy with endoscopic assistance. The postoperative course was uneventful with immediate improvement of the patient’s headache. Postoperative magnetic resonance imaging demonstrated complete removal of the tumor. There were no signs of recurrence during a 2-year follow-up period. The endoscope is a useful tool for removing epidermoid tumors from the cavernous sinus and enhances visualization of areas that would otherwise be difficult to visualize with microscopes alone. Endoscopes also help minimize the retraction of neurovascular structures.

Key Words: Epidermoid tumor, cavernous sinus, endoscope-assisted microsurgery
Magnetic resonance (MR) imaging showed a well demarcated mass (28×21×21 mm) that was slightly hypointense on T1-weighted images, hyperintense on T2-weighted images, and hyperintense on diffusion-weighted images. MR spectroscopy showed an increased lactate peak. The patient had undergone gamma knife radiosurgery two years previously at another institution for the treatment of his lesion without a tissue diagnosis.

A right frontotemporal craniotomy was performed. An extradural approach to the cavernous sinus was followed after mobilization of the lateral wall of the cavernous sinus. The mass was visualized to protrude laterally through the thickened and fibrotic cavernous sinus wall. The identification of the cranial nerves within the cavernous sinus was challenging despite the use of an intraoperative microscope. Therefore, a very small incision was made between what we believed to be the trochlear nerve and the ophthalmic branch of the trigeminal nerve. A yellowish-white liquid was egressed and suctioned out from the incision (Fig. 1). Then, a neuroendoscope, which measured 18 cm in length and 4 mm in diameter with 30° rod lenses (Karl Storz, Tuttingen, Germany) was advanced through the small opening. Using the endoscope, a glistening white cauliflower-like mass adherent to the inner layer of the wall of the cavernous sinus was identified. Under a 0° rod endoscopic view, a micro cup pituitary forcep 1 mm in diameter (Cod-
ed intradurally above the tentorial hiatus, and was removed with a micro-pituitary forceps without necessitating further incision. The arachnoid was not violated.

The patient’s postoperative course was uneventful with immediate improvement of his headache. MR imaging performed on the first postoperative day showed complete removal and signal change, especially in diffusion-weighted MR images (Fig. 2). However, the patient’s oculomotor nerve palsy did not improve. Histopathologic examination of the surgical specimen revealed a cystic tumor lined with simple stratified keratinizing squamous epithelium, confirming the diagnosis of epidermoid tumor (Fig. 3). There were no signs of recurrence during a 2-year follow-up.

DISCUSSION

Epidermoid tumors are benign pearly cystic lesions lined with simple stratified keratinizing squamous epithelium. According to Kaido, et al., during closure of the neural tube, ectodermal cells are sometimes left within the neural tube, and remain entrapped in the meninges around the nerves and grow gradually by spreading in the cisterns enveloping neurovascular structures of the skull base.

Epidermoid tumors are rarely located in the cavernous sinus. Gharabaghi, et al. describe three different types of epidermoid tumors of the cavernous sinus. The first is extracavernous in origin and invades or compresses the cavernous sinus. The second originates in the lateral wall of the cavernous sinus and is located interdurally between the inner and outer layers of the lateral wall of the cavernous sinus. The third consists of the true intracavernous epidermoid tumors, which tend to encase the ICA, encircling and displacing the cranial nerves laterally. Our case falls into the third group. In general, surgical management of the third type of
Epidermoid tumors are benign lesions, however, when located in the cavernous sinus, they pose a number of challenges from the standpoint of surgical management. In this context, endoscopes may assist in achieving adequate exposure, minimizing surgical trauma and improving the extent of resection.

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