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Neoplasm

Oculomotor nerve schwannoma located in the oculomotor cistern

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Abstract

Background: OSs are extremely rare tumors, most often located in the interpeduncular cistern or the CS. We report an OS located predominantly within the oculomotor cistern, the arachnoid sac that surrounds the nerve for a short distance in the roof of the CS. We discuss a possible growth pattern for cavernous OSs.

Case Description: We report the case of a 34-year-old woman presenting with a right oculomotor nerve palsy. Magnetic resonance imaging revealed a mass within the borders of the roof of the CS extending forward toward the superior orbital fissure. A right pterional approach was undertaken, and the roof of the CS was opened just above the oculomotor nerve toward the superior orbital fissure. Although the part of the OS inside the oculomotor cistern was excised completely while preserving the anatomical continuity of the nerve, a subtotal removal was performed for the more anterior part of the tumor toward the superior orbital fissure. At 5 months follow-up, her third nerve paresis had improved dramatically.

Conclusions: Resection of cavernous OSs within the oculomotor cistern, where the third nerve is clearly separated from the adjacent neurovascular structures, is feasible with functional preservation of the nerve. The chance of occurrence of the nerve palsy may increase as the resection proceeds more anteriorly toward the superior orbital fissure.

Keywords: Cavernous sinus; Oculomotor cistern; Oculomotor nerve; Schwannoma

1. Introduction

Schwannomas constitute about 7% of all intracranial tumors and commonly arise from vestibulocochlear and trigeminal nerves [17,22,32,33]. The sensory division of cranial nerves is most likely to be affected [32]. Motor nerve schwannomas arising from ocular nerves are very rare in the absence of neurofibromatosis type II [13]. Only 32 cases of isolated schwannomas arising from the oculomotor nerve have been reported in the literature [1-5,8-10,12-19,21-30,33-35,37-40]. The most common site of occurrence for these lesions is the neuronal segment within the interpeduncular cistern and the CS. We report the case of an OS located predominantly within the oculomotor cistern, the arachnoid sac that surrounds the nerve for a short distance in the roof of the CS and extends forward to where the nerve passes under the anterior clinoid process.

2. Case report

A 34-year-old woman presented to our clinic with intermittent headaches for the last 6 months. She had developed ptosis, an enlarged pupil on the right side, and experienced lateral deviation of her right eye 3 weeks before her admission. Examination of the extraocular muscles revealed right oculomotor nerve palsy. The right pupil was irregularly shaped and mydriatic. The right optic disc appeared pale upon ophthalmoscopic examination. Examination of her left eye was normal.

Abbreviations: CS, cavernous sinus; ICA, internal carotid artery; MRI, magnetic resonance imaging; OS, oculomotor schwannoma.

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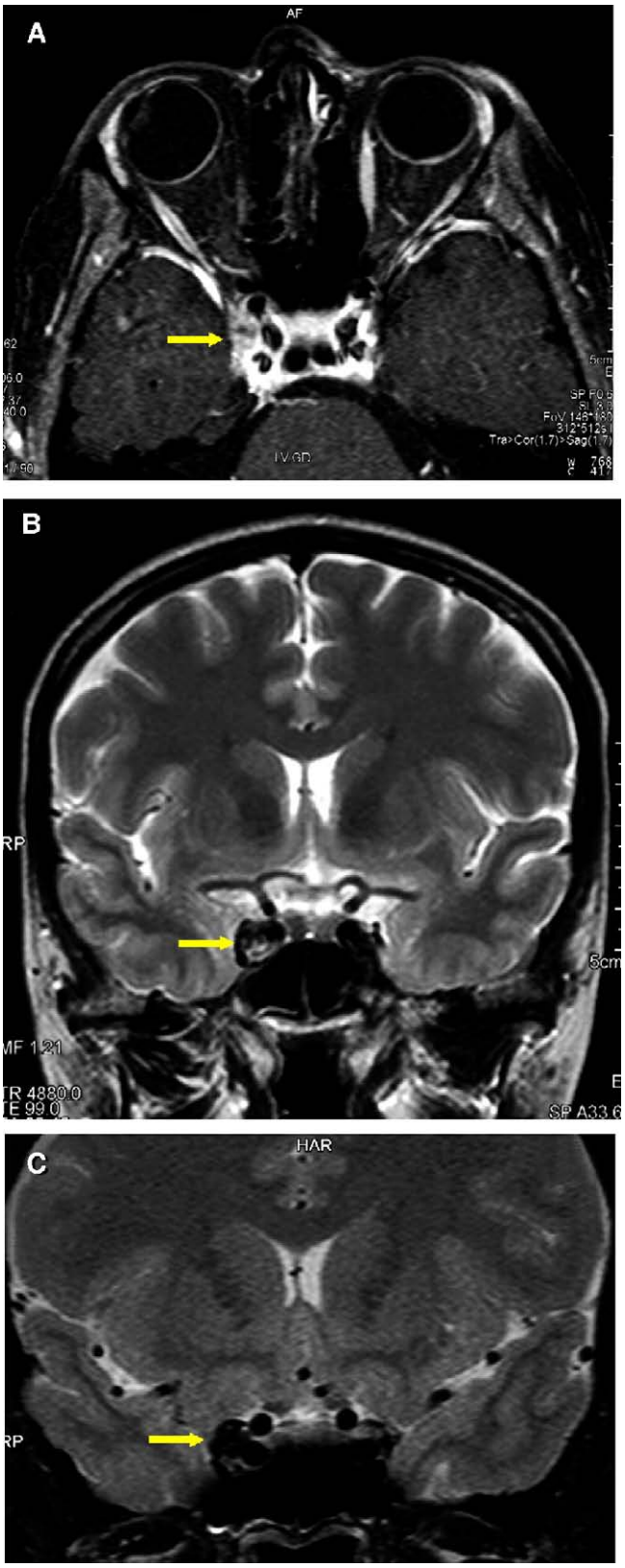

Fig. 1. A: Gadolinium-enhanced axial MRI view showing enhancing mass (yellow arrow) within the oculomotor cistern located in the right CS and lateral deviation of the eye. B and C: Coronal T2-weighted MRI images at different levels demonstrating location of the tumor (yellow arrow) in relation to the ICA and the roof of the CS.

An MRI scan demonstrated a mass lesion predominantly within the roof of the CS and extending up into the superior orbital fissure. The lesion filled part of the roof of the CS lateral to the clinoid and supraclinoid segments of the ICA (Fig. 1). The lesion was hypointense in T1- and T2-weighted images and showed some enhancement after

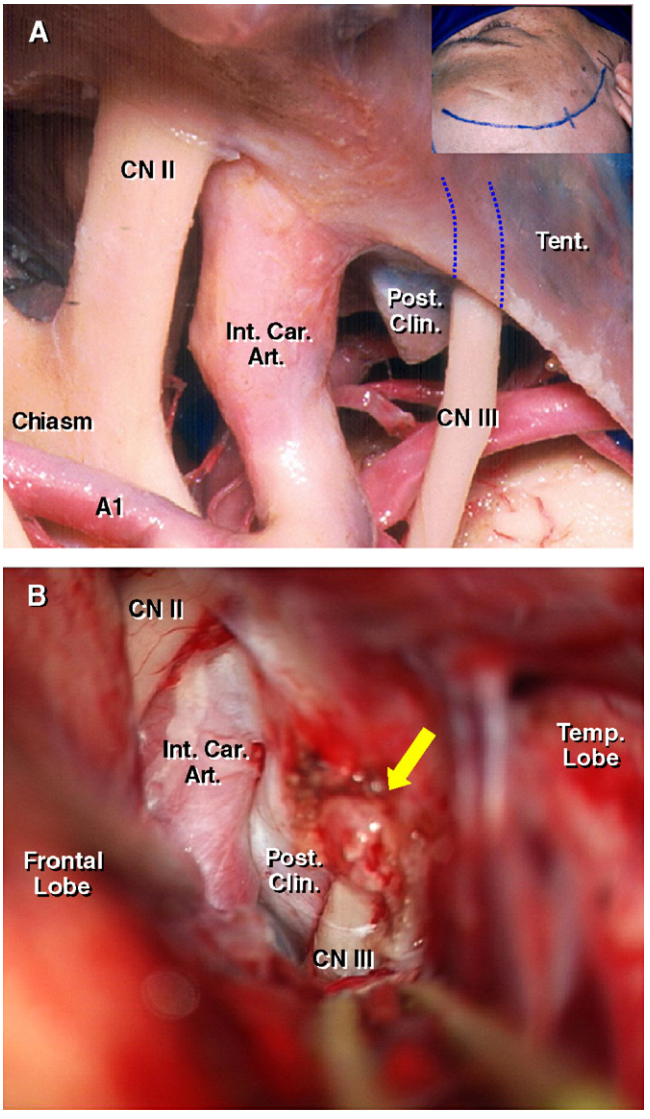

Fig. 2. A: A cadaveric dissection photograph obtained during a right pterional exposure. The inset shows the position of the head and skin incision for the frontotemporal craniotomy. The sylvian fissure has been widely opened, and the frontal and temporal opercula have been retracted. The oculomotor nerve enters the roof of the CS within a distance of 1 cm or less posterior to the initial supraclinoid ICA and slightly lateral to the posterior clinoid process. The approximate location of the oculomotor cistern is delineated by blue broken lines. B: Intraoperative photograph of the right pterional exposure. The proximal part of the sylvian fissure has been opened, and the right optic nerve, the supraclinoid segment of the ICA, and the oculomotor nerve have been exposed. The roof of the CS has been opened above the oculomotor nerve, and the schwannoma located in the oculomotor cistern has been exposed (yellow arrow). A1 indicates A1 segment of the anterior cerebral artery; Art., artery; Car., carotid; Clin., clinoid; CN, cranial nerve; Int., internal; Post., posterior; Temp., temporal; Tent., tentorium.