Neurooncological Observation

Intracisternal neurinoma of the C1 posterior root

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Received November 23, 2004; accepted July 14, 2005; published online September 12, 2005
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Summary

We report a rare intracisternal C1 posterior root neurinoma in a 35-year-old man without neurofibromatosis who presented with headache, nuchal pain, bilateral motor weakness of the upper extremities, and numbness in the right distal upper extremity. CT and MRI study showed a 20-mm intracisternal lesion at the foramen magnum. At surgery, there was an anastomosis between the C1 posterior root and a spinal accessory nerve at the site of the tumor; the root from the collateral sulcus of this C1 root was absent. Postoperatively, the patient remains free of symptoms. Foramen magnum neurinomas have been described as accessory nerve tumors. We present new anatomical consideration regarding this lesion.

Keywords: Neurinoma; C1 posterior root; spinal root; foramen magnum.

Introduction

Intracranial neurinomas represent 8.9% of all primary intracranial tumors and lower cranial nerve Schwannomas constitute 21.4% of all ‘non-acoustic’ intracranial neurinomas. While advances in magnetic resonance imaging (MRI) technology made possible the detection of more and smaller neurinomas, foramen magnum neurinomas are still rare. We present a 35-year-old man with a rare C1 dorsal root neurinoma.

Case report

This 35-year-old man who initially visited another institution with the complaint of headache was referred to our outpatient clinic and admitted. He reported suffering from nuchal pain and headache for the preceding 6 months. Neurological examination on admission revealed minimal bilateral motor weakness in the distal upper limbs with numbness in the right upper limb. Physical examination disclosed no major anomalies; he had no family history of neurofibromatosis. An MRI scan revealed a well-demarcated, mixed-intensity, extra-axial mass at the craniovertebral junction. Postcontrast MRI showed heterogeneous enhancement (Fig. 1). There was no enlargement of the spinal canal or extension of the mass into the extradural space. The skull was free of tumor involvement. Digital subtraction angiography showed no tumor vascularity.

The tumor was completely resected by the postero-lateral approach. The operative finding was an intradural extra-axial C1 posterior root neurinoma. There was an anastomosis between the C1 posterior root and a spinal accessory nerve at the tumor site. The C1 posterior root from the medial sulcus of the spinal cord was absent. The spinal accessory nerve was compressed by, but without attachment to, the tumor. There was attachment at the intra-arachnoid portion of the C1 posterior root where it exited just below the entry of the vertebral artery (Fig. 2). The site of attachment was located between the C1 posterior root and the spinal accessory nerve. The root from the collateral sulcus was absent. The tumor was fed by a vessel between the C1 root and the vertebral artery (Fig. 2). During tumor resection, this branch from the right posterior spinal artery was cut; the posterior spinal artery was preserved. The tumor was totally excised; there was no attachment to other neural structures.

The histological diagnosis was Schwannoma. By H–E staining of the resected specimen showed a neurinoma, predominantly Antoni type A (Fig. 3). Immunohistochemically it was positive for S-100 and vimentin; GFAP staining was negative. His motor deficits completely disappeared 1 week after the operation. On 4-year follow-up there was no tumor regrowth, no atrophy of the medulla oblongata, and no dystrophy or dysfunction of the trapezius muscle.

Discussion

Non-neurofibromatosis (NF) intracisternal C1 Schwannomas are extremely rare. Most previously re-
Fig. 1. MRI images displaying the intra-cisternal mass. Left, enhanced T1 image, coronal; right, T2 image, axial. The vertebral arteries are not involved with the tumor in the extracisternal spaces. There is no extradural lesion.

Fig. 2. Operative microscopic view. (T Tumor): (a) The tumor, located at the cervico-medullary junction, is seen through the dentate ligament. (b) The tumor compresses the spinal accessory nerve (arrowhead) medially. (c) The tumor is attached (red arrow) at a site just before the C1 dorsal root (black arrowhead) exits the dura mater. Posterior spinal artery is seen (blue arrowhead).