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Case Report

360 Cervical Approach with Endoscopic Assistance in Patient with Cervical Schwannoma

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Abstract

Introduction: Schwannomas are neoplasms of neural origin, derived from the sheath of Schawnn. Its cervical location is very rare. They appear as slow-growing expansive masses most frequently in the carotid space. Surgical resection is the treatment of choice and is often complex due to the extent of the lesion and its relationship with nerve roots, which are difficult to preserve.

Clinical case: A 50-year-old female patient is presented, referring to cervical pain of gradual onset and progressive worsening, unrelated to physical effort, of moderate intensity with three years of evolution, and irradiated towards the occipital and left scapular region. which later extended to the entire upper left limb. In Magnetic Resonance Imaging (MRI), an occupational lesion was observed at the level of C5-C6 that occupied the left conjunct foramen, intensely captured contrast and compromised the medullary canal, producing compressive ischemic myelopathy. A 360-degree cervical approach with endoscopic support was performed in two surgical stages with tumor excision plus discectomy and C5-C6 arthrodesis with placement of a PEEK box.

Conclusions: Cervical spinal schwannomas are rare conditions and their treatment represents a challenge. Total surgical resection is the treatment of choice. The 360-degree combined approach with endoscopic support is an effective tool for the management of these injuries.

***Keywords:** cervical schwannoma, 360 degree approach, endoscopy.*

Introduction

Schwannomas are neoplasms of neural origin, derived from the sheath of Schawnn (1). Its cervical location is very rare. They appear as slow-growing expansive masses most frequently in the carotid space. They are usually asymptomatic at the beginning, so at the time of diagnosis they reach a large size. Preoperative diagnosis is difficult as they are often confused with manifestations of cervical spondylotic radiculopathy(2). Surgical resection is the treatment of choice and is often complex due to the extent of the lesion and its relationship with nerve roots whose preservation is difficult(3).

The objective of this article is to describe the successful surgical management of a case with cervical schwannoma operated by a combined anterior and posterior approach, with endoscopic support.

Clinical Case

A 50-year-old female patient is presented, of skilled craftsmanship and of urban origin. She went to the Neurosurgery Service of the Institute of Neurology and Neurosurgery, referring to cervical pain of gradual onset and progressive worsening, unrelated to physical effort, of moderate intensity with three years of evolution, and irradiated to the occipital and left scapular region, which later spread to the entire left upper limb, lancinating characteristic and relieved with common painkillers. Said symptoms were associated with dizziness when he made sudden movements of the cervical spine and a burning and tingling sensation throughout the entire left upper limb. He also reported a progressive decrease in muscle strength and difficulty walking.

The neurological examination showed signs of muscle atrophy in the upper and lower left limb; decreased muscle strength in upper and lower left limbs predominantly distal; hypoaesthesia in the upper and lower left limb, hypoaesthesia in the upper and lower left limb; bicipital, tricipital, stylorradial, patellar and left achillea hyperreflexia; bilateral cutaneous abdominal hyporeflexia; left extensor cutaneous plantar reflex (Babinski positive), Lhermitte's sign; Spurling's sign and a myelopathic gait. Laboratory studies showed no alterations.

In Magnetic Resonance Imaging (MRI), an occupational lesion was observed at the level of C5-C6 that occupied the left conjunct foramen, intensely captured contrast and compromised the medullary canal, producing compressive ischemic myelopathy. Rectification of the physiological lordosis was evidenced (Figure 1, AC).

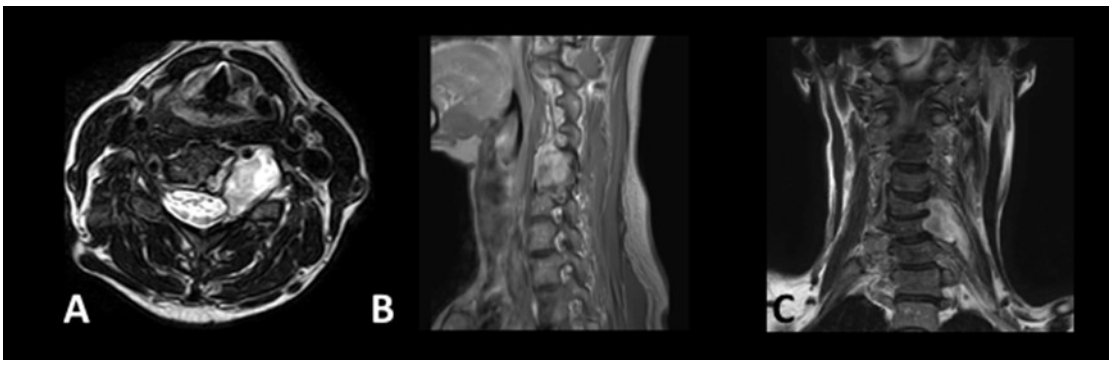

Figure 1: *Pre and postoperative images. AC: preoperative MRI in T1 sequence with gadolinium in axial, sagittal and coronal sections.*

A 360-degree cervical approach with endoscopic support was performed in two surgical stages with tumor excision plus discectomy and C5-C6 arthrodesis with placement of a PEEK box.

First surgical stage

With the patient in the prone position, a thoraco-pelvic wedge was placed. The incision was marked taking into account the right arcuate level. Skin and subcutaneous tissue dissection was performed. The skin was retracted vertically with an autostatic Adson retractor, the trapezius was carefully opened in the direction along its vertical fibers with scissors. The C4, C5 and C6 sheets were exposed. Bilateral C5 laminectomy was performed to expose the cranial and caudal limits of the lesion. Durotomy was performed in the midline respecting the limits of the lesion. We proceeded with the widest and safest possible tumor excision, respecting the adjacent neurovascular structures, and hermetic closure of the dura mater was performed by planes (Figure 2).

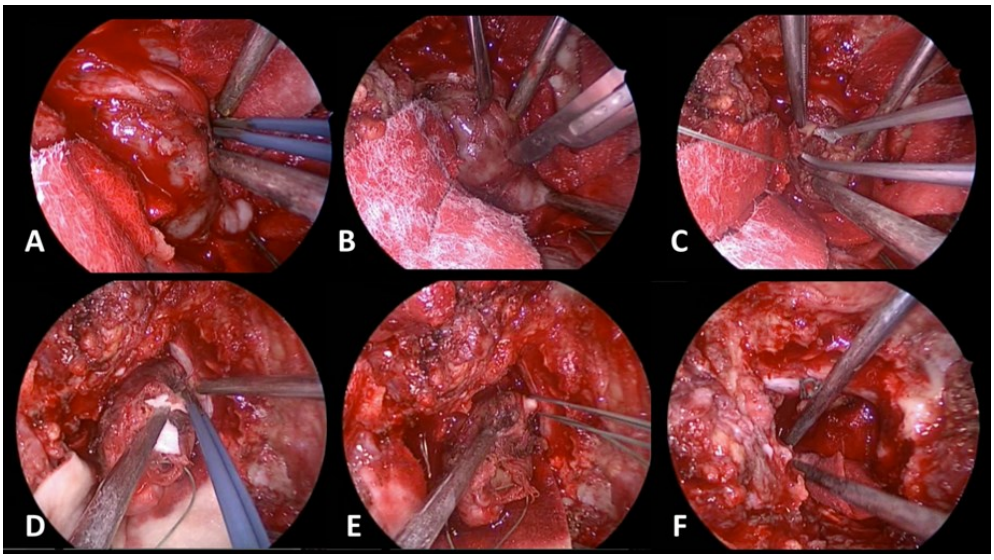

Figure 2: *Intraoperative captures of the posterior cervical approach (first surgical stage). A: exposure of the tumor. BC: during intratumoral weakening. D: identification and dissection of the dural sac. E: identification and ligation of the spinal root of origin. F: surgical bed.*

Second time

It was performed with the patient in the supine position. A right horizontal incision was made in the second skin fold. A superficial incision was made, only at the cutaneous level and dissection of the skin and the subcutaneous tissue of the platysma. The skin was vertically retracted with an autostatic Adson or Gelpi retractor. The platysma was carefully cut open along its vertical fibers with scissors. Using fine dissection, the avascular plane of the cervical fascia was traversed medially and parallel to the carotid sheath. The carotid and sternocleidomastoid were laterally separated and the esophagus / pharynx and trachea / larynx medially. The prevertebral fascia was exposed and cauterized and cut longitudinally in the midline in an extension corresponding to the levels to be worked on. The medial edges of the long neck muscles were exposed and cauterized, and then the muscle ties were isolated from the vertebral bodies with a sharp periosteal elevator to the medial part of the transverse processes. Cervical Caspar retractors were placed under the long muscles of the neck. The intervertebral space was marked with a fine needle and fluoroscopic control was performed. The edges of the disc to be removed were cauterized and then incised with a No. 15 scalpel. Fusion was performed with a PEEK box and fixation with sheets and titanium screws (Figure 3). Cervical Caspar retractors were placed under the long muscles of the neck. The intervertebral space was marked with a fine needle and fluoroscopic control was performed. The edges of the disc to be removed were cauterized and then incised with a No. 15 scalpel. Fusion was performed with a PEEK box and fixation with sheets and titanium screws (Figure 3). Cervical Caspar retractors were placed under the long muscles of the neck. The intervertebral space was marked with a fine needle and fluoroscopic control was performed. The edges of the disc to be removed were cauterized and then incised with a No. 15 scalpel. Fusion was performed with a PEEK box and fixation with sheets and titanium screws (Figure 3).

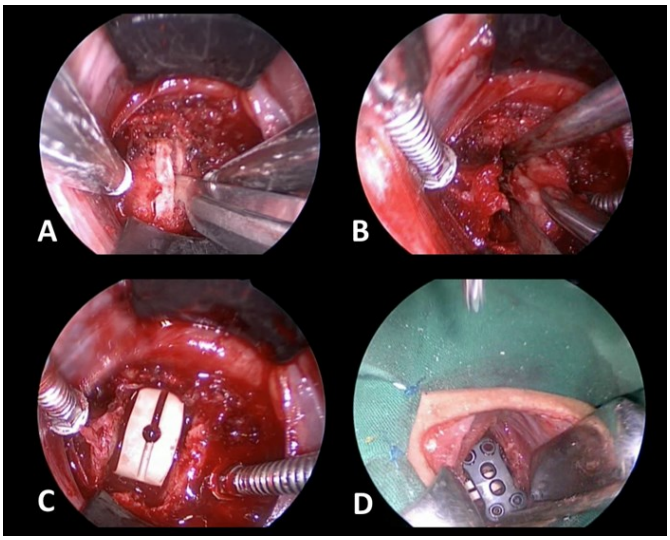

Figure 3: *Intraoperative captures of the anteromedial cervical approach (second surgical stage). A: during discectomy. B: resection of the cervical component. C: placement of the interbody graft (PEEK). D: after arthrodesis with blades and screws.*

Postoperative biopsy confirmed a schwannoma. In the sections stained with hematoxylin and eosin, spindle cells with elongated nuclei were observed in compact areas that form Antoni A palisade and looser areas with lipidized Antoni B cells. Verocay bodies and hemosiderin deposit and foamy histiocytes were observed (Figure 4).

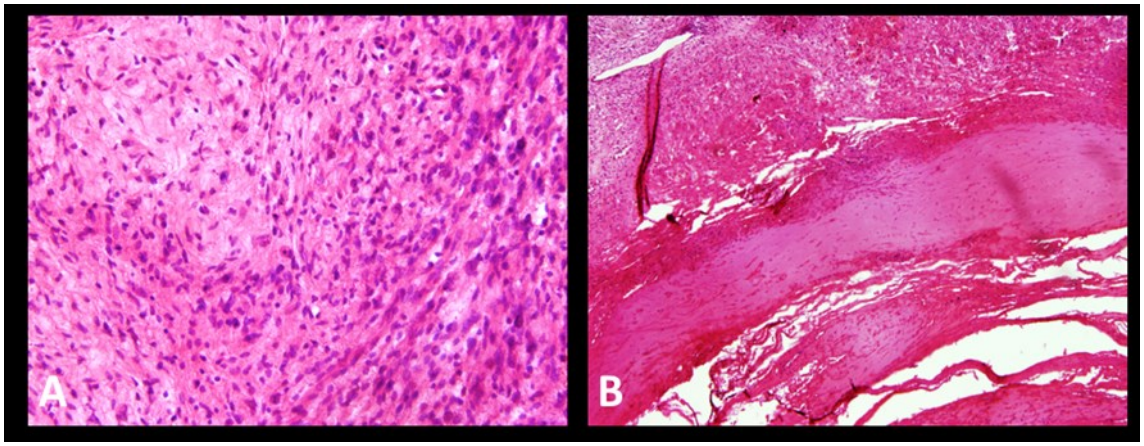

Figure 4: *Electronic photographs showing the histological characteristics of the tumor in preparation with hematoxylin and eosin, with a predominance of Antoni A fibers with 400X magnification (A) as well as their origin in the nerve root sheath with 200X magnification (B).*

Discussion

Spinal schwannomas represent 30% of all primary spinal tumors (4). They originate in 70% of cases from sensory roots, in 20% from motor roots, and in 10% of both.(5). Most of these injuries are spinal. Although the extradural location is infrequent, it corresponded to the case presented. The location in the cervical spine is the most frequent as in the case that is presented, although they can be located in any other region of the spine(1).

Schwannomas with hourglass morphology have been reported, which constitute a distinctive group, with an intradural component and an extradural component, communicated through the conjunctival foramen, which is dilated on radiographic studies. (6, 7).

Macroscopically, they are encapsulated, solid or cystic tumors and are composed of two cell populations: Antoni A fibers (responsible for the solid component) and Antoni B fibers (responsible for the cystic component due to the presence of the myxoid component)(8).

These lesions are most commonly seen in adults between 40 and 50 years of age and have an incidence of 0.3 to 0.4 cases per 100,000 people per year. The location in the cervical spine corresponds to 0.2% of schwannomas. Although they are usually asymptomatic, patients may present with radicular pain, motor or sensory deficits, or paresthesias. Finally, they may present with different degrees of cord compression myelopathy. The latency period can range from 1 to 84 months (2).

Eden in 1941 described the first anatomical classification of spinal schwannomas when even CT and MRI had not been discovered(9). This classification has been the most widely used for years, but it is not as useful in surgical planning. In 2001 Sridhar et al.(7) described a classification of schwannomas characterized by type I (intraspinal tumors with less than 2 vertebral segments in extension), a type II (intraspinal tumors with more than 2 vertebral segments in extension), a type III (intraspinal tumors with extension to the foramen of conjunction, a type IV (intraspinal tumors with an extraspinal or hourglass component less than 2.5 cm in diameter, and a type V (intraspinal tumors with an extraspinal component greater than 2.5 cm in diameter). With this classification, the presenting patient corresponds to type V, which makes it a complex case Asazuma et al. (10)in 2004 they suggested another more complete classification, with 9 subtypes, based on the anatomical extension of these lesions. Giant spinal schwannoma is considered to be the presence of an intraspinal schwannoma and an extraspinal component of more than 2.5 cm in diameter, as the case presented here.(7).

Surgical treatment of these lesions includes posterior and anterior approaches depending on the tumor growth vector(5, 11, 12). In the case presented, a combined approach was decided to obtain better control of the lesion due to its anterolateral extension. Instability is common in the postoperative period, taking into account the necessary bone resection. For this reason, the authors considered performing a cervical fusion with an interbody graft and blades and screws.

Endoscopic support in the resection of cervical schwannomas has been described (13), and constitutes a useful visualization tool because the "corners" can be observed and helps with a more radical resection, which is the cornerstone in the treatment of these patients.

Conclusions

Cervical spinal schwannomas are rare conditions and their treatment is challenging. Total surgical resection is the treatment of choice. The 360-degree combined approach with endoscopic support is an effective tool for the management of these injuries.

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