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Progressive Paraparesis Revealing a Spinal Schwannoma: A Case Report

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Abstract

Background: Spinal schwannomas are uncommon, benign tumors arising from the Schwann cells that form the nerve sheaths within the spinal canal. They constitute approximately 2% of all primary spinal tumors. We present the case of a young woman with a thoracic intradural schwannoma (representing a compressive myelopathy), who achieved complete neurological recovery following surgical resection. **Case Report:** A 30-year-old woman was admitted for progressive, asymmetric functional impairment of the lower limbs evolving over two months. Her symptoms had begun three months earlier with low back pain radiating to the left thigh, accompanied by paresthesia in the left foot. These paresthesias ascended progressively and became bilateral after one month. She reported no notable medical, surgical, or family history, and there was no history of spinal trauma. The neurological examination revealed signs of acute transverse myelitis at the T12 level and uro-fecal incontinence. Gadolinium-enhanced spinal Magnetic Resonance Imaging (MRI) demonstrated an oval-shaped, compressive intradural extramedullary mass extending from T12 to the mid-L1 level, which showed homogeneous contrast enhancement. Total surgical excision was performed six months after symptom onset, resulting in complete recovery of neurological deficits within ten days postoperatively. Histopathological analysis of the surgical specimen confirmed the diagnosis of schwannoma. **Conclusion:** Although rare, spinal schwannomas should be considered in the differential diagnosis of progressive myelopathy in young adults. Spinal MRI is the cornerstone of diagnostic evaluation. Complete surgical re-

section is the primary treatment and generally permits excellent neurological recovery.

Keywords

Madagascar, Schwannoma, Spinal MRI, Surgery

1. Introduction

Spinal schwannoma, or neurinoma, is an intradural extramedullary tumor, meaning it develops within the thecal sac but outside the spinal cord parenchyma [1]. It is a benign, slow-growing tumor originating from the Schwann cells, which form the myelin sheath of peripheral nerve fibers [2]. These tumors can be found in all regions of the spinal cord, with a predilection for the cervical segment, followed by the thoracic and lumbosacral regions [3]. They are relatively rare, accounting for about 2% of all spinal tumors, with no gender predilection [4] [5]. In Madagascar, the estimated annual incidence is 0.89 cases [6]. Diagnosis relies primarily on imaging, with MRI being the modality of choice, and postoperative histopathological examination provides definitive confirmation [5]. We report a case of a compressive myelopathy represented by a thoracic spinal schwannoma with complete neurological recovery after surgical excision.

2. Case Report

A 30-year-old woman was admitted to our institution for asymmetric functional impairment of both lower limbs, which had progressed over two months, starting in January 2025. She reported a history of low back pain radiating to the left thigh that had begun three months prior. The pain was persistent and worsened by trunk flexion. Two weeks later, paresthesias developed in her left foot, followed by a progressive ascending sensory disturbance that eventually involved both lower limbs by December 2024. In January 2025, the patient experienced heaviness in her legs and difficulty walking, progressing to complete functional impairment of the lower limbs by February, without any subsequent improvement. In March 2025, she had a brief episode of urinary and fecal retention, followed by incontinence. No febrile episodes were reported during the course of her illness, and the rest of the physical examination was unremarkable. She had no significant medical or surgical history and no similar family history. There was no reported history of spinal trauma.

On neurological examination, she presented with paraplegia, hyperreflexia in the lower limbs, and bilateral extensor plantar responses. A tactile and thermoalgic anesthesia was noted below the T12 dermatome, associated with decreased sphincter tone and saddle anesthesia. This constellation of signs was consistent with a diagnosis of transverse myelitis with a lesion level at T12. A stage I sacral pressure sore was also observed. Lymph node areas were free. Dermatological ex-

amination and routine laboratory tests showed no abnormalities.

Spinal Magnetic Resonance Imaging (MRI) revealed an intradural extramedullary lesion located between T12 and the mid-L1 level, measuring 40.8 mm in the vertical axis. The lesion appeared isointense on T1-weighted sequences and heterogeneously hyperintense on T2-weighted sequences. It was left-sided, compressing and displacing the spinal cord to the right (**Figure 1**). Emergency surgery was recommended for total tumor excision to decompress the spinal cord and determine the histological nature of the mass. The operative procedure was performed as follows: the surgical level was identified with fluoroscopic guidance. A midline skin incision was made, followed by dissection through the musculature and aponeurosis and a laminectomy. The dura mater was incised and temporarily suspended. Microsurgical dissection was performed with a spatula, surgical cottonoids, and microcoagulation, which enabled excision of the tumor en bloc. The tumor was ovoid and pinkish, located at the T10-T11 level (**Figure 2**).

The definitive histopathological examination was consistent with a schwannoma. Significant improvement in the neurological deficit was noted by the tenth

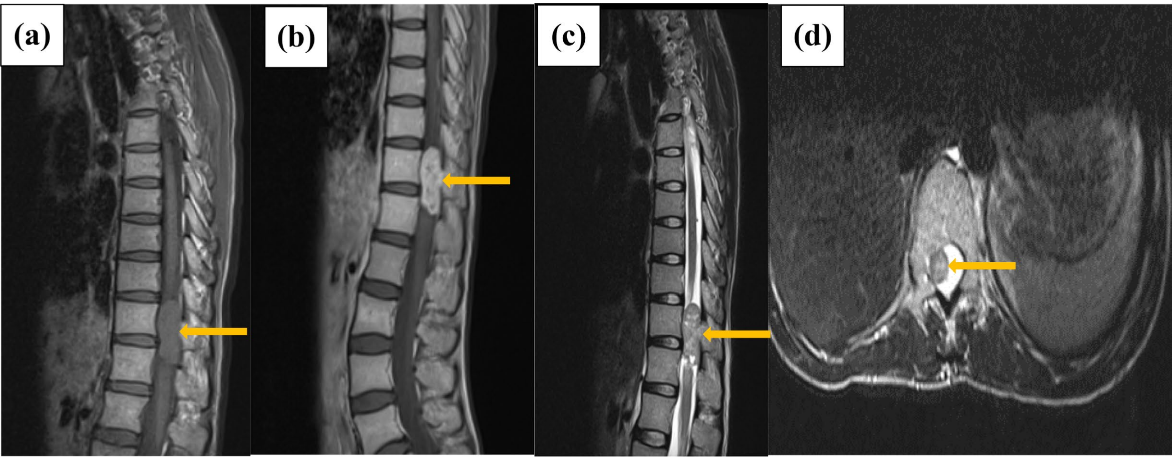

Figure 1. Spinal MRI with gadolinium contrast. (a) Sagittal T1-weighted image showing an ovoid, isointense lesion at the T12-L1 level. (b) Sagittal T1 with gadolinium. (c) Sagittal T2-weighted image showing the lesion as heterogeneously hyperintense. (d) Axial T2-weighted image demonstrating displacement of the spinal cord to the right, compressed by the left-sided tumor.

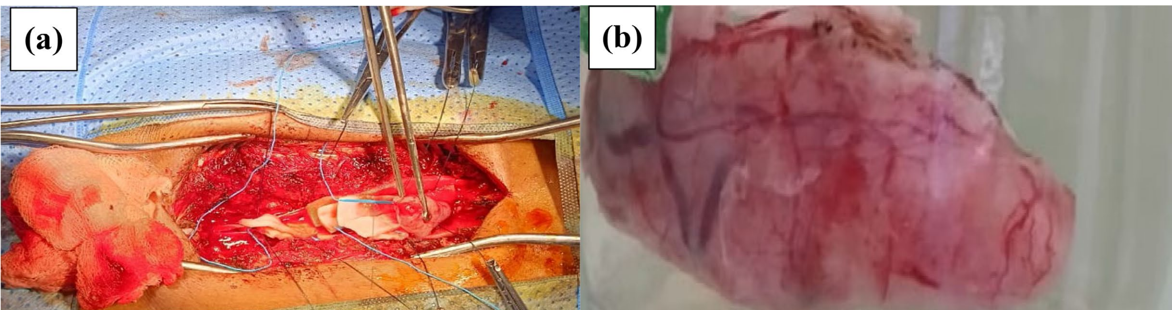

Figure 2. Intraoperative view and surgical specimen. (a) Intraoperative visualization of a pinkish, ovoid mass within the dura mater. (b) Macroscopic appearance of the tumor after total excision, showing a smooth, encapsulated, and vascularized surface.

postoperative day.

Recovery of muscle strength was assessed clinically by evaluating individual muscles with the Medical Research Council (MRC) 5-point scale; assessments were performed in the recovery room, during hospitalization, and at the 3-month follow-up visit. In the immediate postoperative period, muscle strength was graded MRC 3 ± 5. After a course of physical rehabilitation, the patient was able to walk independently without assistive devices and had regained full strength (MRC 5/5) at the 3-month evaluation.

3. Discussion

Spinal schwannoma most frequently occurs between the fourth and fifth decades of life [2]. However, earlier presentations have been described. In Madagascar, Tsiaremby M. G. *et al.* (2019) reported a mean age at symptom onset of 34.4 years, with a peak incidence between 20 and 29 years [6], which aligns with our patient, a 30-year-old woman who presented with acute transverse myelitis and sphincter disturbances evolving over six months. Similar clinical presentations have been reported by Salamah *et al.* [1]. Symptom onset is generally insidious, sometimes evolving over several years. It often begins with dorsal or lumbar pain radiating to the lower limbs, followed by motor weakness and, in some cases, sphincteric dysfunction.

The neurological examination of our patient revealed paraplegia with hyperreflexia, tactile and thermo-algic anesthesia below T12, and sphincter disturbances. These neurological abnormalities are partially described in the literature, notably by Nayak *et al.* [2]. The clinical presentation varies depending on the location and size of the tumor, explaining the symptomatic polymorphism and the diversity of signs upon clinical examination.

Magnetic Resonance Imaging (MRI) is the diagnostic modality of choice, allowing for precise structural and topographic analysis of the lesion [7]. In our case, MRI revealed an intradural extramedullary mass, isointense on T1 and heterogeneously hyperintense on T2, with radiological characteristics similar to those described by Lim *et al.* [3]. The definitive diagnosis, however, rests on the histopathological examination of the surgical specimen, which typically shows Antoni A areas, Verocay bodies, and strong immunopositivity for S-100 protein [7].

The standard management for spinal schwannomas is complete surgical excision, with careful preservation of adjacent neurovascular structures [4]. In the present case, although the intervention was performed after a relatively prolonged symptomatic period, the patient achieved complete recovery by the second postoperative week. According to Seppälä *et al.*, patients operated on early (less than six months after symptom onset) have a better functional prognosis [5]. However, these authors also highlight the possibility of partial or even complete recovery, even in cases with delayed surgery, provided there is no evidence of myelomalacia on MRI [5].

In our case, postoperative follow-up was limited because contrast-enhanced spinal MRI was not performed to document the extent of delayed spinal cord de-

compression after surgery.

4. Conclusion

Spinal schwannoma is a benign, slow-growing tumor, most often sporadic. Its clinical expression is primarily determined by its location and volume, explaining the variability in presentations. Magnetic resonance imaging, coupled with histopathological examination, constitutes the cornerstone of diagnosis, allowing for precise lesion characterization. Treatment is based on complete surgical excision, followed by appropriate functional rehabilitation. The prognosis is closely linked to the timeliness of surgical management and the absence of irreversible spinal cord damage (myelomalacia).

Ethical Considerations

Verbal informed consent was obtained from the patient for the publication of this case report. All ethical standards, including the protection of patient anonymity, were maintained in accordance with standard publication guidelines.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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