International Clinical and Medical Case Reports Journal
Case Report (ISSN: 2832-5788)

Atypical Giant Retroperitoneal Schwannoma with Vertebral Erosion without Malignant Transformation: A Case Report and Learnings from an Interdisciplinary Approach

Parwez Alam*, Amit R Sharma, Deepak Biswal, Satydev Sharma

Department of Urology, All India Institute of Medical Science, Raipur, 492010, Chhattisgarh, India

Citation: Parwez Alam*, Amit R Sharma, Deepak Biswal, Satydev Sharma. Atypical Giant Retroperitoneal Schwannoma with Vertebral Erosion without Malignant Transformation: A Case Report and Learnings from an Interdisciplinary Approach. Int Clinc Med Case Rep Jour. 2025;4(11):1-6.

Received Date: 30 September 2025; **Accepted Date:** 04 October 2025; **Published Date:** 05 October 2025

***Corresponding author:** Parwez Alam, Department of Urology, All India Institute of Medical Science, Raipur, 492010, Chhattisgarh, India

ABSTRACT

Benign nerve sheath tumors rarely present as giant retroperitoneal masses with vertebral erosion. Their preoperative diagnosis is often challenging due to non-specific clinical and radiologic features. Despite their size, these tumors are usually well encapsulated, and recurrence is rare following complete excision. Reported cases have mostly been managed by single-specialty surgical teams. We present a case of a large retroperitoneal schwannoma with vertebral erosion managed through a collaborative approach between urology and neurosurgery, enabling safe and nerve-sparing tumor resection.

Keywords: Giant retroperitoneal tumour; Retroperitoneal schwannoma; Vertebral erosion; Nerve-sparing surgery; Microsurgical resection

INTRODUCTION

Benign nerve sheath tumors originate from Schwann cells or perineural fibroblasts and are usually enclosed within the peripheral nervous system (Dodd et al, 2000; Jakubowski et al., 2012). Giant retroperitoneal mass lesions are extraordinarily rare, yet these tumors typically appear in peripheral nerves such cranial nerves or the brachial or lumbosacral plexuses. These tumors show as large masses in the retroperitoneal area and cause erosion of the vertebrae, which creates complications for diagnosis and treatment for clinicians

(Dodd et al., 2000; Buetow et al., 1995). Traditionally, retroperitoneal tumors have been diagnosed primarily by imaging techniques including computed tomography (CT) and magnetic resonance imaging (MRI). The vague radiological data make it challenging to differentiate between benign and malignant tumors and precisely determine their anatomical extent (Lo et al., 2006l; Kang et al., 2015). Furthermore, the infrequency of these tumors hinders a comprehensive understanding of their natural progression, best diagnostic methods, and treatment plans. Although total surgical removal is the mainstay of treatment, accurately diagnosing the condition before surgery is typically

difficult. Therefore, patients often have surgery without a clear preoperative diagnosis, which requires making decisions during the surgery based on examining the tissue samples.

Historically, general surgeons, onco-surgeons, or urologists have traditionally handled the surgical treatment of retroperitoneal tumors. The complex anatomical connections of these tumors with nearby nerve structures require a detailed surgical strategy. Collaboration between urologists and neurosurgeons is essential for achieving optimal outcomes due to the precise microsurgical dissection required around nerve roots. The proposed case report intends to offer a thorough examination of the clinical features, diagnostic difficulties, and surgical treatment of large retroperitoneal benign nerve sheath tumors. This study aims to increase understanding and improve outcomes for individuals with these rare and complex lesions by highlighting their rarity and complexity and promoting a multidisciplinary treatment strategy.

CASE REPORT

Patient Information:

A 29-year-old male presented with a 4-month history of right abdominal fullness and a visible lump. He reported a 2-week history of tingling and limping in the right leg. He had no comorbidities or prior surgeries.

Clinical Findings:

On examination, a firm, non-tender, non-mobile 10 x 10 cm mass was palpable in the right lumbar region.

Diagnostic Assessment:

Contrast-enhanced computed tomography (CECT) of the abdomen and pelvis revealed an 11.9 x 8.8 x 8.3 cm well-defined, solid-cystic mass in the right retroperitoneum extending into the paraspinal region and involving the right L3–L4 neural foramina. An initial ultrasound-guided biopsy was inconclusive. Magnetic resonance imaging (MRI) confirmed the mass with cystic degeneration. A laparoscopic-guided core biopsy was performed, which suggested a benign nerve sheath tumor.

Therapeutic Intervention:

Preoperative right ureteric stenting was performed to protect the ureter. Through a right flank incision, the mass was accessed and dissected. Significant difficulty was encountered due to tumor adherence to the vertebral body. Given the benign pathology and neurological symptoms, neurosurgical assistance was enlisted.

The neurosurgery team performed intracapsular piecemeal resection of the tumor using microsurgical techniques under magnification with the assistance of a Cavitron Ultrasonic Surgical Aspirator (CUSA). The tumor was meticulously dissected from adjacent neural elements and vertebral structures.

Outcome and Follow-up:

The patient had an uneventful postoperative recovery with no new neurological deficits. He was discharged on postoperative day two. Final histopathology confirmed a benign schwannoma with Antoni A and B areas and Verocay bodies.

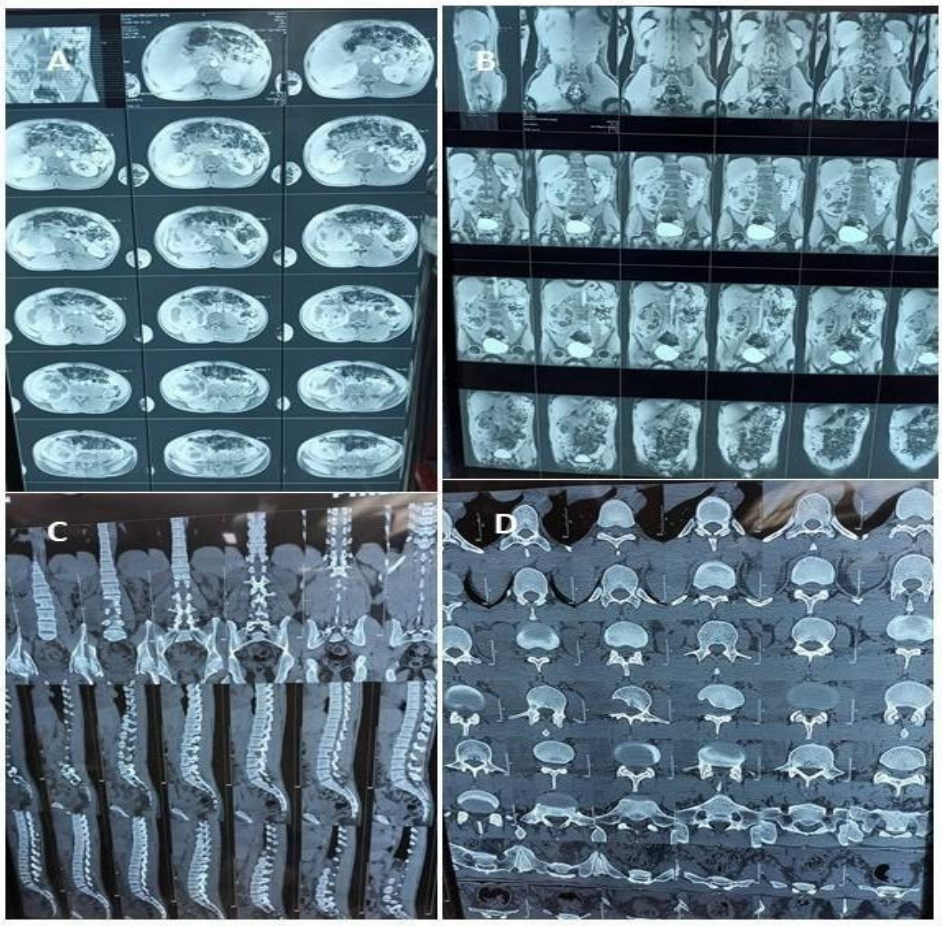

Figure 1: Preoperative CT scan showing well-capsulated cystic retroperitoneal mass with vertebral erosion.

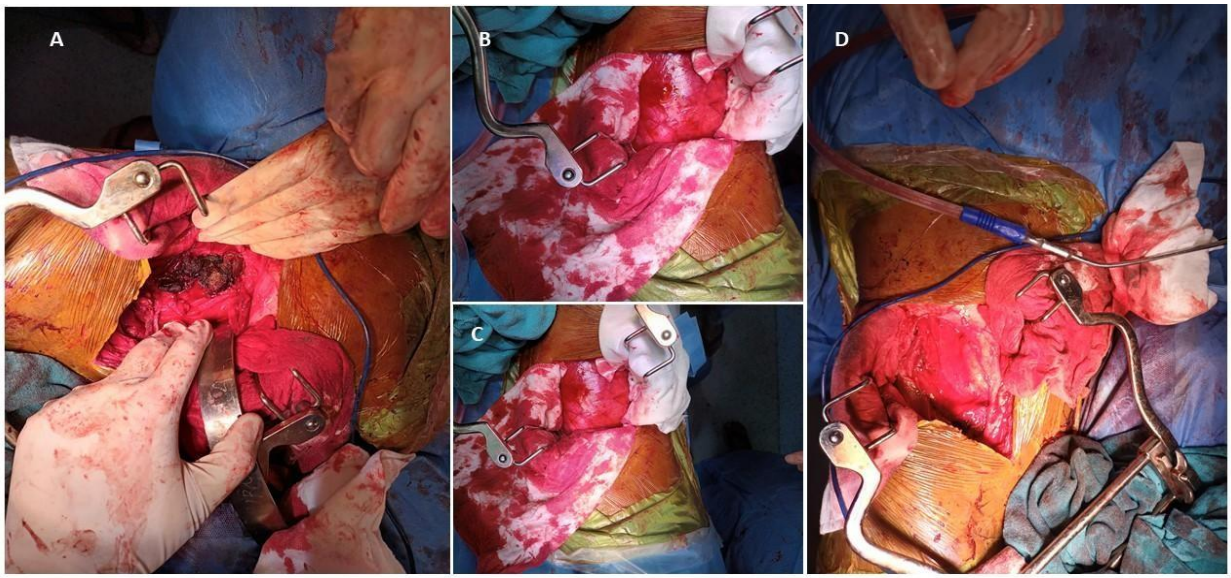

Figure 2: MRI images showing heterogeneous lesion and neural foraminal extension.

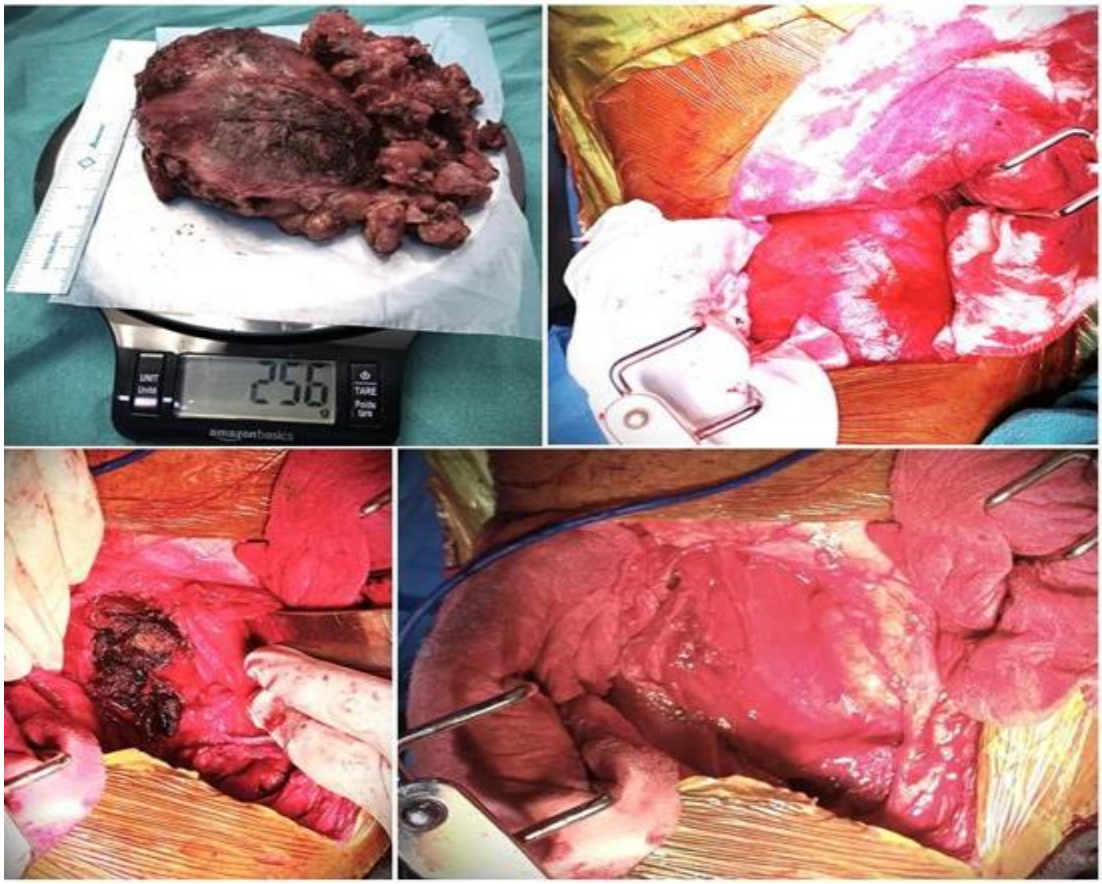

Figure 3: Intraoperative photographs demonstrating microscopic tumor dissection.

DISCUSSION

The case demonstrates key clinical and diagnostic characteristics related to large retroperitoneal benign nerve sheath tumors. A 29-year-old male patient arrived with a past of abdominal fullness and a detectable lump in the right lumbar region, along with recent tingling feelings and weakness in the right leg. The symptoms, together with the physical examination revealing a firm lump that is neither soft or movable, led to concerns about a retroperitoneal mass.

In a study with 82 cases of retroperitoneal schwannoma, only in (15.9 %) cases a correct preoperative diagnosis was made by either ultrasound-guided biopsy, computed tomography scanning or magnetic resonance imaging (Li et al., 2007). A CECT scan identified a distinct solid cystic mass in the right retroperitoneum and paraspinal area, centered around the right L3-4 neural foramina. The role of CT scan and CT-guided needle biopsy is emphasised, in that ultrasonography and fine needle aspiration alone do not provide sufficient information regarding aetiology and malignancy (Sofia et al., 2008). The existence of several non-enhancing cystic lesions in the bulk complicated the diagnosis. Early biopsy attempts, albeit not definitive, highlighted the difficulty of making a diagnosis in these situations. Obtaining a preoperative tissue biopsy may be problematic. Percutaneous biopsy is not recommended because of the risk of neoplastic dissemination in the event of a malignant tumor and the hemorrhagic risk (Skaini et al., 2015). The overall sensitivity of core biopsy in diagnosing soft tissue tumours was 83.6%. It has a sensitivity of 91.3% and specificity of 100% for malignant STS (Woon and Serpell 2008).

Diagnostic accuracy was improved by using MRI and laparoscopic-guided core cut biopsy, which confirmed the diagnosis of a benign nerve sheath tumor. This highlights the relevance of using several diagnostic methods and the need for specialist skills in collecting precise tissue samples for histological examination. The treatment involved placing a stent in the right ureter before surgically removing the retroperitoneal tumor through an incision on the right side of the abdomen. During surgery, the difficult dissection in the paravertebral region caused by vertebral erosion required a careful surgical technique. An intracapsular piecemeal removal approach was used to remove the benign nerve sheath tumor while focusing on preserving nerve bundles, based on the preoperative diagnosis.

We debulked the lesion using the ultrasonic surgical aspirator clearly maintaining the capsular surface to keep the correct margins of resection allowing a complete removal of the tumor. Such approach allowed us not to sacrifice completely the nerve root, and after debulking, the mass was removed from the vertebral foramen up to the psoas muscle and the bony resection was minimal (Strauss et al., 2011). Once the tumor pseudocapsule had been identified, the neurosurgeon continued the operation, incised the pseudocapsule, and extirpated the tumor, thus reducing the risk of intraoperative hemorrhag.

Working together with neurosurgery specialists allowed for the precise microsurgical technique, enhanced by the use of CUSA ultrasonic dissector, to ensure careful dissection and protection of important neurological components.

After the surgery, the patient did not have any new neurological issues and had a smooth hospital stay, being discharged on the second day after the operation. The histopathological examination of the removed specimen supported the diagnosis of a benign nerve sheath schwannoma, identified by the presence of Antoni A/B regions and Verocay bodies.

CONCLUSION

Giant retroperitoneal schwannomas with vertebral involvement pose diagnostic and therapeutic challenges. A multidisciplinary approach incorporating preoperative imaging, selective biopsy, ureteric protection, and microsurgical tumor resection ensures optimal outcomes. Our case underscores the importance of collaborative care in preserving neurological function and achieving oncologic safety.

REFERENCES

1. Strauss DC, Hayes AJ, Thomas JM. Retroperitoneal tumours: review of management. Am J Surg. 2011;202(2):194-198.
2. Li Q, Gao C, Juzi JT, Hao X. Analysis of 82 cases of retroperitoneal schwannoma. ANZ J Surg. 2007;77(4):237-240.
3. Skaini MSA, El Sebai H, Izzidien AY, et al. Retroperitoneal schwannoma mimicking psoas abscess: a diagnostic challenge. Int J Surg Case Rep. 2015;6:233- 236.
4. Woon DTS, Serpell JW. Biopsy of retroperitoneal masses: indications and diagnostic yield. ANZ J Surg. 2008;78(11):977–981.
5. Hajiabadi M, Samii M, Gharabaghi A. Microsurgical resection of giant retroperitoneal schwannoma: technical nuances. World Neurosurg. 2013;80(5):e307-e313.

6. Ohene-Yeboah M. Schwannoma of the retroperitoneum. J Med Case Rep. 2007;1:74.
7. Sofia L, Mangialardi N, Sbarigia E, et al. Benign retroperitoneal schwannoma with vertebral invasion. J Chir Ital. 2008;60(1):141-146.
8. Das Gupta TK, Brasfield RD. Solitary malignant schwannoma. Ann Surg. 1970;171(3):419-428.
9. Nonaka M, Nakayama Y, Satake H, et al. MR imaging of retroperitoneal schwannoma: correlation with histopathologic findings. Eur Radiol. 2007;17(8):2103-2109.
10. Pilavaki M, Chourmouzi D, Kiziridou A, et al. Imaging of peripheral nerve sheath tumors with pathologic correlation: pictorial review. Eur J Radiol. 2004;52(3):229-239.