

Retroperitoneal Schwannoma: A Surgical Challenge in an Unusual Location

Dr. Jameel Akhter¹, Dr. Veni N²

¹MS, FIAGES, FMAS Senior Consultant Laparoscopic Surgeon

²MBBS, DNB General Surgery resident

Abstract

Background: Schwannomas are benign nerve sheath tumours that rarely occur in the retroperitoneum, where their deep and confined anatomical location can make preoperative diagnosis and surgical access challenging.

Case presentation: A 38-year-old woman presented with left-flank abdominal pain and intermittent dyspepsia, with left-flank tenderness on examination and no palpable mass.

Investigations/diagnosis: Magnetic resonance imaging demonstrated a well-defined, heterogeneous, T2-hyperintense presacral soft-tissue lesion at the S1–S2 level, and contrast-enhanced computed tomography similarly identified a presacral mass; a neoplastic soft-tissue mass lesion was considered, and the preoperative diagnosis was a retroperitoneal mass of the presacral region.

Management: The patient underwent laparoscopic excision, which revealed a 6×5×5 cm highly vascular retroperitoneal mass at the mesorectum abutting the presacral fascia, dissected through difficult tissue planes after lateralising the rectum; the mass was retrieved via a small Pfannenstiel incision. Histopathology showed a cellular spindle-cell lesion with interlacing fascicles, hyalinised vessels, and rare mitoses, favouring schwannoma, and immunohistochemistry confirmed diffuse S100 and SOX10 positivity with retained H3K27me3 expression, consistent with a benign schwannoma.

Outcome: The postoperative course was uneventful, and the patient was discharged on the third postoperative day.

Conclusion: This case highlights the diagnostic and technical challenges posed by a presacral retroperitoneal schwannoma closely related to the mesorectum, and demonstrates that laparoscopic excision is feasible with careful identification of tissue planes and rectal lateralisation.

Keywords: Retroperitoneal schwannoma, schwannoma, retroperitoneal tumor, presacral space, laparoscopic excision, immunohistochemistry.

1. Introduction

Schwannomas are benign tumours arising from the Schwann cells of peripheral nerve sheaths, most commonly encountered in the head, neck, and limbs [1]. Retroperitoneal involvement is uncommon, and the presacral space in particular represents a deep, narrow compartment where such tumours may remain clinically silent until they cause nonspecific pain or pressure symptoms [2, 7]. Because retroperitoneal schwannomas lack pathognomonic clinical features, diagnosis frequently relies on cross-sectional imaging, which can suggest a neoplastic soft-tissue mass without reliably distinguishing schwannoma from other nerve sheath or mesenchymal tumours [7, 8]. Their proximity to pelvic vasculature, ureter,

rectum, and presacral fascia can make complete surgical excision technically demanding, particularly when the tumour is markedly vascular or densely adherent to adjacent structures [3, 6]. This case is reported because it demonstrates a presacral schwannoma closely applied to the mesorectum and presacral fascia, managed successfully by laparoscopic excision despite difficult dissection planes, illustrating both the diagnostic ambiguity typical of this entity and the technical strategies required for its safe removal.

2. Case Report

Patient Presentation. A 38-year-old woman presented with pain in the left flank of the abdomen and intermittent dyspepsia. She denied vomiting and reported normal bowel and bladder habits. The exact duration of her symptoms prior to presentation is not documented in the available records. Her surgical history included two prior lower-segment caesarean sections and a diagnostic laparoscopy with bilateral salpingectomy. She had no history of diabetes mellitus, hypertension, coronary artery disease, or asthma. On examination, the abdomen was soft with no palpable mass or organomegaly, but tenderness was elicited in the left flank; systemic examination, including neurological assessment, was unremarkable.

3. Investigations / Imaging

Magnetic resonance imaging of the abdomen demonstrated a well-defined, right-sided and midline, heterogeneous, T2-hyperintense presacral soft-tissue lesion at the S1–S2 vertebral level, with the radiological impression that a neoplastic soft-tissue mass lesion may be considered. Contrast-enhanced computed tomography of the abdomen also identified a mass in the presacral region. No specific radiological differential diagnosis list was documented. Routine laboratory investigations were normal. Based on the imaging findings of a presacral mass with neoplastic features, the patient was advised surgical excision. The preoperative working diagnosis was a retroperitoneal mass of the presacral region.

4. Management / Surgical Procedure

The patient underwent laparoscopic excision of the presacral retroperitoneal mass under general anaesthesia. Pneumoperitoneum was established via a Veress needle, and five ports were placed: a 5 mm Palmer's port, a 10 mm right supraumbilical port, a 5 mm right iliac fossa port, a 5 mm left iliac fossa port, and a 5 mm infraumbilical port. Intraoperatively, a 6×5×5 cm retroperitoneal mass was identified at the mesorectum, abutting the presacral fascia. The mass was noted to be highly vascular, and the surrounding dissection planes were difficult. The rectum was lateralised to gain safe access, and the peritoneum overlying the mass was incised. The mass was then dissected free from the surrounding tissue and from the presacral fascia. Following excision, haemostasis was secured, and the specimen was retrieved through a small Pfannenstiel incision. A 20 Fr drain was placed in the pelvis and fixed to the skin, the sheath was closed, and the skin was closed with staples.

Figure 1: Laparoscopic View Of The Presacral Retroperitoneal Bulge Prior To Dissection

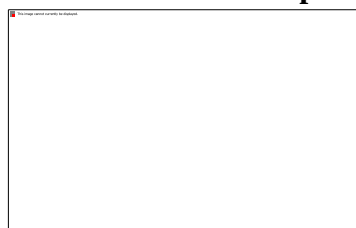


Figure 2: Intraoperative Photograph Showing The Vascular Surface Of The Presacral Mass During Dissection



The patient's postoperative course was uneventful. She remained haemodynamically stable, was ambulant, and tolerated oral intake, and was discharged on the third postoperative day with a Foley's catheter in situ, scheduled for removal at follow-up.

5. Histopathological Findings

Gross examination of the excised specimen showed an unoriented, irregular nodular soft-tissue mass measuring 7.1×5.7×4.6 cm, with a circumscribed cut surface showing pale white and pale yellow areas abutting the inked margin; no necrosis was identified grossly.

Microscopic examination revealed a cellular spindle-cell lesion composed of interlacing bundles and fascicles of spindle cells, with hypercellular areas alternating with zones of fibrosis and hyalinisation. Numerous ectatic, hyalinised vessels and areas of stromal haemorrhage were noted. Mitotic activity was occasional (fewer than 1 per 10 high-power fields), and no necrosis was seen. The initial impression favoured schwannoma, with immunohistochemistry recommended for confirmation.

Immunohistochemistry showed diffuse positivity for synaptophysin, S100, and SOX10, with negative staining for smooth muscle actin, desmin, CD34, CKIT, and CDK4. H3K27me3 expression was retained, the Ki-67 proliferation index was 8–10%, P16 was diffusely positive, and MDM2 showed patchy positivity. The final impression was schwannoma of the presacral retroperitoneal region.

6. Discussion

Diagnostic difficulty. Retroperitoneal schwannomas typically present with nonspecific symptoms, as in this patient, whose flank pain and dyspepsia carried no features specific to a nerve sheath tumour. Case reports of presacral schwannomas similarly describe vague pelvic or flank discomfort as the presenting complaint, with the diagnosis established only after imaging and histopathology [2, 4, 5].

Imaging and preoperative planning. MRI in this case demonstrated a well-defined, heterogeneous, T2-hyperintense presacral lesion, findings consistent with reported imaging characteristics of retroperitoneal schwannoma, which typically appears hypointense on T1 and heterogeneously hyperintense on T2, though these features are not specific to schwannoma and overlap with other retroperitoneal soft-tissue tumours

[7, 8]. Contrast-enhanced CT similarly localised the mass to the presacral space but, as in many reported cases, could only suggest a neoplastic lesion rather than establish a definitive diagnosis [7, 8]. This underscores that imaging in retroperitoneal masses serves chiefly to define anatomical extent and plan surgical access, while definitive diagnosis rests on histopathology [7].

The unusual anatomical location. What distinguishes this case is the tumour's location at the mesorectum, directly abutting the presacral fascia, a site where schwannomas are recognised but uncommon, and where their proximity to the rectum and presacral venous plexus adds particular technical difficulty compared with more laterally situated retroperitoneal or psoas-region schwannomas [2, 4].

The surgical challenge. The “difficult planes” and a “highly vascular mass,” findings that align with published experience of presacral schwannoma excision, where dense adherence to the presacral fascia and rich local vascularity have been cited as reasons for prolonged dissection time and technical difficulty [2, 3]. Safe access in this case required lateralisation of the rectum before the peritoneum overlying the mass could be divided and the tumour dissected free, a sequence consistent with the stepwise dissection strategies described in other laparoscopic presacral schwannoma excisions, where careful separation from adjacent bowel and vascular structures was emphasised to avoid injury [4, 5, 6]. Several published series and case reports have similarly demonstrated that laparoscopic excision of presacral and pelvic retroperitoneal schwannomas is technically feasible, offering the benefits of minimally invasive surgery even in anatomically constrained locations, provided the surgeon anticipates vascularity and plans meticulous, plane-based dissection [3, 4, 5, 6]. In the present case, complete gross excision was achieved and the specimen retrieved intact through a small Pfannenstiel incision.

Histopathological confirmation. The final diagnosis rested on histopathology and immunohistochemistry rather than imaging alone. The spindle-cell morphology with hyalinised vessels and low mitotic activity supported a benign nerve sheath tumour, and diffuse S100 and SOX10 positivity are well-recognised markers of Schwann-cell differentiation [2, 7]. Retained H3K27me3 expression is a recognised feature that argues against a malignant peripheral nerve sheath tumour, as loss of this marker has been described as a relatively specific, though only moderately sensitive, finding in that malignancy [9].

Clinical implications. For the general surgeon encountering a presacral or deep pelvic retroperitoneal mass, this case reinforces that imaging can localise and characterise the lesion but rarely provides a definitive preoperative diagnosis, that anticipation of vascularity and adherence to the presacral fascia is essential for operative planning, and that structured dissection, including deliberate lateralisation of adjacent bowel, can permit safe laparoscopic excision even in technically difficult presacral locations.

7. Conclusion

This case illustrates that a presacral retroperitoneal schwannoma closely related to the mesorectum can be difficult to diagnose preoperatively and technically challenging to excise because of dense adherence to the presacral fascia and marked vascularity. Careful anatomical dissection with rectal lateralisation allowed safe laparoscopic excision, underscoring the value of a systematic, plane-based surgical approach in this anatomically constrained space.

References

1. Al-Dasuqi K, Irshaid L, Mathur M. Radiologic-Pathologic Correlation of Primary Retroperitoneal Neoplasms. *Radiographics*. 2020;40(6):1631-1657. doi:10.1148/rg.2020200015

2. Carvalho BJ, Medeiros KAA, Martines DR, Nii F, Pipek LZ, Mesquita GHA, D'Albuquerque LAC, Meyer A, Andraus W. Laparoscopically excised retroperitoneal presacral Schwannoma: atypical pre and postoperative manifestations – case report. *BMC Surg.* 2019;19:143.
3. Jatal S, Pai VD, Rakhi B, Saklani AP. Presacral schwannoma: laparoscopic resection, a viable option. *Ann Transl Med.* 2016;4(9):176. doi:10.21037/atm.2016.04.07
4. Okuyama T, Tagaya N, Saito K, Takahashi S, Shibusawa H, Oya M. Laparoscopic resection of a retroperitoneal pelvic schwannoma. *J Surg Case Rep.* 2014;2014(1):rjt122. doi:10.1093/jscr/rjt122
5. Di Furia M, Salvatorelli A, Della Penna A, Vicentini V, Sista F, Chiominto A, Guadagni S, Clementi M. Advantage of laparoscopic resection for pelvic Schwannoma: Case report and review of the literature. *Int J Surg Case Rep.* 2018;45:38-41. doi:10.1016/j.ijscr.2018.03.006
6. Ruoso ML, Feranti LS, Andriguetto PC, Andriguetto LD, Fidalski SZK, Aguiar LR. Laparoscopic Resection of Retroperitoneal Presacral Schwannoma: A Case Report. *Arq Bras Neurocir.* 2018;37(4):326-329. doi:10.1055/s-0038-1676528
7. Jácome-Pérez N, Charry Jiménez L, Arias-Durán C, et al. Retroperitoneal Schwannoma: A Case Report and Diagnostic Approach to Retroperitoneal Masses. *Cureus.* 2025;17(10):e95658. doi:10.7759/cureus.95658
8. Porrello G, Cannella R, Randazzo A, Badalamenti G, Brancatelli G, Vernuccio F. CT and MR Imaging of Retroperitoneal Sarcomas: A Practical Guide for the Radiologist. *Cancers (Basel).* 2023;15(11):2985. doi:10.3390/cancers15112985
9. Schaefer IM, Fletcher CD, Hornick JL. Loss of H3K27 trimethylation distinguishes malignant peripheral nerve sheath tumors from histologic mimics. *Mod Pathol.* 2016;29(1):4-13. doi:10.1038/modpathol2015134