



Case Report

Resection of a large presacral schwannoma from an all-posterior trans-sacral approach

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ABSTRACT

Background: Presacral schwannomas vary greatly in size, and symptomatology. Resections may utilize anterior, posterior, or combined 360-degree approaches.

Case Description: A 67-year-old female presented with a progressively enlarging presacral schwannoma originating from the S1 nerve root. Here, we utilized a unique all-posterior, trans-sacral tumor resection technique that did not result in any increased neurological deficit, or warrant fusion (e.g., including operative video). Further, we avoided potential urogenital, vascular, and bowel injuries that are associated with anterior approaches to such lesions.

Conclusion: Here, we described and demonstrated successful resection of a large presacral schwannoma originating from the S1 nerve root that was safely resected utilizing an all-posterior resection without fusion.

Keywords: Presacral schwannoma, Presacral tumor, Schwannoma, Spine oncology

INTRODUCTION

Spinal nerve sheath tumors comprise approximately 30% of the intradural extramedullary tumors and have the capacity to grow to large sizes in the retroperitoneal presacral space.^[3] Presacral schwannomas comprise <5% of all spinal schwannomas.^[5] Larger tumors may be approached anteriorly, posteriorly, or may require a combined approach.^[1]

The optimal approaches should depend on the size, anatomic location, body habitus, and comorbidities of the patients.^[4] Given the nearby gastrointestinal, genitourinary, as well as vascular anatomical relationships, anterior surgical resection can be challenging and may require multidisciplinary teams of surgeons (e.g., general, colorectal, vascular, urological, orthopedic, and neurosurgical).^[1]

Posterior approaches reduce the risk of injury to bowel, allow for more direct resection of presacral tumors with clearer operative visualization, but reduce the ability to control potential large-vessel injury.^[7] Further, posterior approaches may require sacral resection, sacroiliac, or sacrococcygeal disarticulation leading to greater functional/symptomatic morbidity, and the necessity for fusion.^[4]

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CLINICAL PRESENTATION

A 67-year-old female, with a history of schwannomatosis, had been followed for 8 years with a left S1 foraminal schwannoma. She had developed progressive symptoms (e.g., left S1 distribution: pain, plantar flexor weakness, and sensory loss) with the evidence of increased growth into the presacral space on enhanced MR studies (e.g., 2.2 × 3.0 × 5.0 cm) [Figure 1].

Surgery

Utilizing intraoperative neuromonitoring, a traditional midline incision was accompanied by subperiosteal dissection of the paraspinal musculature off the L5, S1, and S1 laminae. The inferior L5 lamina was removed to expose the origin of the tumor, while the dorsal S1 foramen was enlarged with the drill. The tumor capsule was then incised, and tumor was debulked, and dissected away from the surrounding structures [Figure 2]. For added protection, an Alloderm overlay/dural sealant was placed over the exposed retroperitoneum. No intraoperative neuromonitoring changes occurred. No instrumented fusion was necessary, and there was no violation of the sacral-iliac joints [Video 1].

Postoperatively the patient had no new motor/sensory deficits, and the preoperative pain was significantly reduced. Postoperative imaging demonstrated gross total resection of the tumor, and she was discharged home uneventfully after a short hospital stay [Figure 3].

DISCUSSION

There are many operative alternatives for resecting presacral schwannomas; anterior, posterior, or combined 360-degree approaches.

Anterior approaches require minimal muscle dissection, do not violate the sacroiliac joint, do not require laminectomy or arthrodesis, and are less painful. However, there is an increased risk of injury to adjacent urogenital, vascular, and bowel structures, and they additionally require an access surgeon.^[6]

We utilized a posterior transforaminal approach to minimize the risk of injury to the presacral structures, while also carefully avoiding compromise the sacroiliac joint. Cipolleschi *et al.* similarly successfully utilized a posterior extraforaminal approach and avoided fusion in their patient who was discharged on postoperative day 3.^[2] Notably, if the posterior approach necessitates instrumentation the patient should be counseled regarding the additional risks versus an anterior approach.

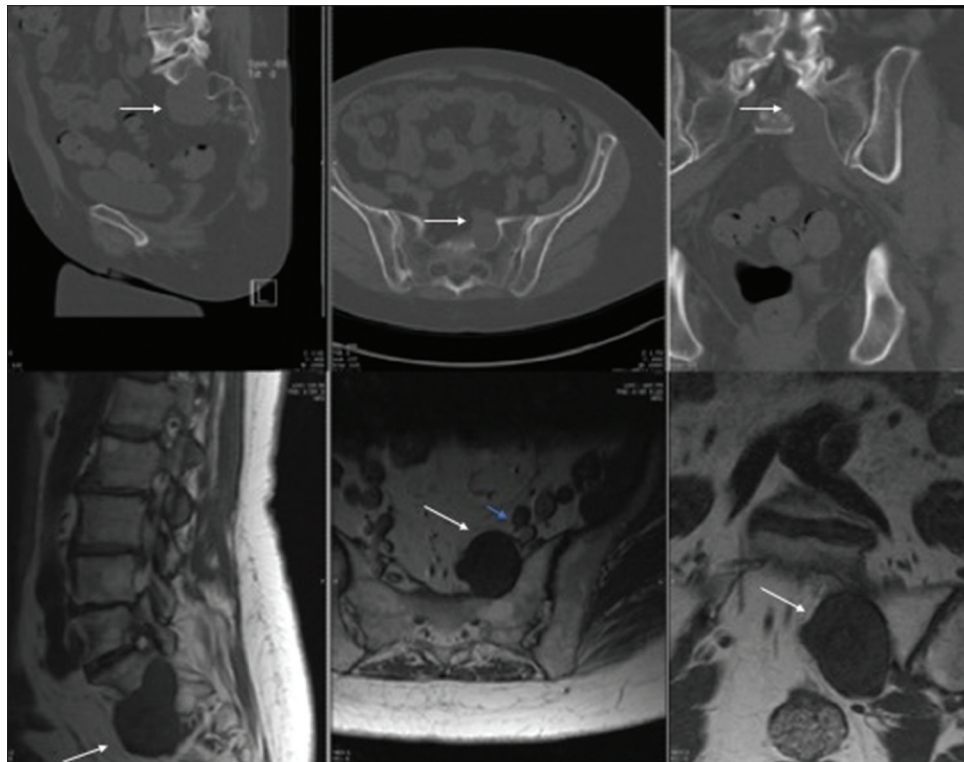


Figure 1: Preoperative non-contrast CT (top) and MR (bottom) sagittal, axial, and coronal images demonstrating a large presacral schwannoma (white arrow) extending from the left S1 neuroforamen. Axial MR image demonstrates close proximity of iliac vessels (short blue arrow).

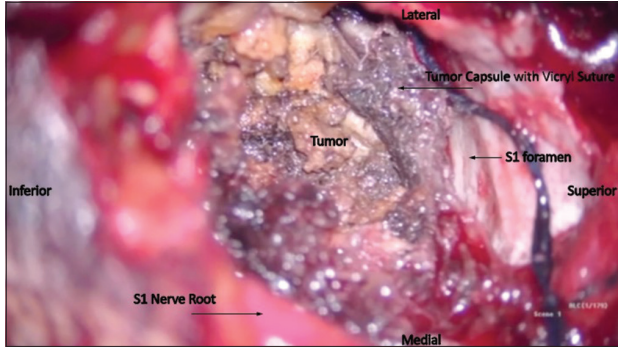


Figure 2: Intraoperative photomicrograph of the surgical field during posterior resection of a presacral schwannoma demonstrating the tumor, S1 nerve root, S1 foramen, and tumor capsule.

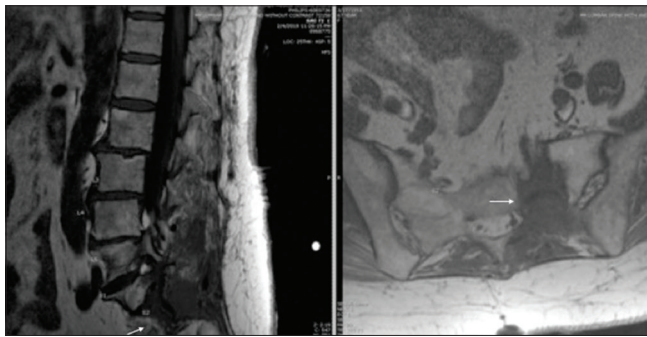


Figure 3: Postoperative sagittal and coronal non-contrast MR images demonstrating total resection of the pre-sacral schwannoma as well as postoperative changes. White arrow points to resection cavity.

Utilizing a traditional midline incision and transforaminal approach allowed for internal debulking of the S1 presacral schwannoma while minimizing blood loss, avoiding destabilization, and decreasing the perioperative risks.

CONCLUSION

Our patient had an excellent following a posterior-only resection of a S1 presacral schwannoma.

Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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