Case Report

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

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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.[1] Presacral schwannomas comprise <5% of all spinal schwannomas. [2] Larger tumors may be approached anteriorly, posteriorly, or may require a combined approach.[3]

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).[3]

Posterior approaches reduces 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]
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 transfemoral 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).
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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Conflicts of interest

There are no conflicts of interest.

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