Sacral Pure Spinal Epidural Cavernoma Mimicking Schwannoma: Case Report

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Summary

Pure spinal epidural cavernomas are very rare pathologies. They constitute only 4% of all spinal epidural tumors. Their radiologic appearance may mimic many other spinal epidural pathologies such as schwannoma, meningioma, lymphoma, Ewing's sarcoma, chordoma, ependymoma, spinal angiolipoma, perineural cysts and disc herniation. Complete surgical resection is the preferred treatment. But unfortunately they usually bleed heavily during surgery that makes complete surgical resection difficult.

Here we report a case of sacral pure spinal epidural cavernoma mimicking S1 root schwannoma. A 37 years old female patient presented with low back pain and radiculopathic symptoms. After MRI scans, the lesion was prediagnosed as S1 root schwannoma. Patient was operated and pathologic examination revealed that the lesion was a cavernoma. After surgical resection the patient’s symptoms completely disappeared and did not recur for 15 months.

Key words: Spinal epidural cavernoma, sacral schwannoma, sacral schwannoma differential diagnosis

INTRODUCTION

Cavernomas are vascular malformations of the central nervous system (CNS). Although they frequently appear in cerebrum, cerebellum or brainstem, they are rarely seen in spine². Approximately 80% of them are supratentorial, 15% of them are infratentorial and only 5% of them are localized in spine⁵,⁸.
Cavernomas of spine are frequently seen in the vertebral bodies (5). Intradural lesions of spinal axis are uncommon and epidural cavernomas are very rare. Most of the epidural cavernomas are secondary extensions from the vertebral lesion (8). The pure spinal epidural cavernomas (PSEC) not originating from the vertebral bodies are constitute only 4% of all spinal epidural tumors (10).

CASE PRESENTATION

A 37 years old woman admitted to the hospital complaining of low back pain radiating to the sole of left foot. The patient denied any problem in bladder and bowel functions. The neurological examination revealed grade 1/5 weakness in plantar flexion of left foot. The Achilles reflex was absent on left foot. Straight leg raising test was positive at 30 degrees. Other neurologic examination was completely intact. On T2 weighted images there was 31x26x41 mm hiperintense lesion in sacral spinal canal at the S1-2 level. It started from left side of the spinal canal traveled through S1 neural foramen and extended into the presacral region. On T1 weighted images the lesion was isointense in comparison to spinal cord. Neither a dark signal on T2 weighted images suggesting hemosiderin nor a white signal on T1-weighted sequences suggesting acute hemorrhage was detectable. After intravenous contrast injection, the lesion was homogeneously contrast enhancing and it was radiologically diagnosed as schwannoma (Figure 1,2).

The patient was operated through midline skin incision between L5-S2 levels. After paraspinal muscles were dissected and left S1 hemilaminectomy was performed we encountered the lesion. It was purple in color and it was firm. It displaced S1 root and main dura medially without invading them. It was completely extradural. There was no connection between the lesion and the root or the main dura. The hemilaminectomy was widened till to the edge of S1 pedicle to follow the lesion, which was continuing, through S1 foramen to the presacral area. We made a 5mm incision through its capsule. Just after the incision there was massive bleeding from the lesion. After satisfying amount of biopsy for pathology we resected the lesion by continuous ultrasonic aspirator (CUSA). We continued the resection with CUSA through the dilated S1 foramen by staying inside the lesion capsule. Its consistency and hemodynamic parameters of the patient did not allow us for further resection. The capsule of the lesion was left behind. The total bleeding was 1600 cc in 40 minutes. The patient transfused with 2 bags of blood. After through hemostasis we finished the operation.

The postoperative course of the patient was uneventful. Low back pain radiating to left leg and motor weakness in plantar flexion of left foot was completely resolved. Postoperative MRI showed a 9mm x5mm, contrast enhancing residual lesion (Figure 3). Histopathological analysis revealed that the lesion was a cavernoma (Figure 4).
**Figure 1:** a) Pre-operative midline sagittal T2 weighted MR image showing hyperintense mass lesion. b) The lesion appears isointense on T1 weighted images. c) There is homogenous contrast enhancement and erosion of the dorsal part of S1 vertebral body on contrasted MRIs.

**Figure 2:** a, b, c, d shows axial contrasted T1 weighted images from S1 level to S2 level respectively. There is homogenously contrast enhancing mass lesion, which dilates S1 foramen (a). The lesion travels through left S1 neural foramen (b), exits from foramen (c) and travels downwards on presacral region (d).
Figure 3: a) Postoperative sagittal T1 weighted contrasted image showing residual lesion with minimal contrast enhancement on behind of the S1 vertebral body.
b, c) Axial contrasted T1 weighted image showing residual lesion in neural foramen and on presacral area.

Figure 4: a) Histopathological analysis revealed a lot of thin walled, various sized blood vessels with single, attenuated endothelial cell layer. These vessels configured back-to-back pattern in stromal connective tissue. Some of them filled with red blood cells. b) All blood vessels were stained strongly with CD 34, which is the endothelial cell marker. The pathological diagnosis is cavernoma.
DISCUSSION

Cavernomas are benign vascular malformations under the group of hemangiomas. They are also considered as benign tumor because they have no mitotic activity but they can grow during life and do not regress spontaneously(6).

Cavernoma located in the spinal epidural space is extremely rare which is responsible for 4% of all spinal epidural tumors(1,10). Spinal epidural cavernomas are usually located at the lumbar or thoracic and less frequently at cervical level. They can grow thorough neural foramina and erode bony structures like a schwannoma(1).

Magnetic resonance imaging (MRI) is the most commonly used radiologic technique for PSECs. Other imaging modalities such as plain X-rays, myelography and spinal computerized tomography are also helpful for diagnosis of these lesions(3).

Magnetic resonance appearance of PSECs is different from that of intramedullary ones. Pure spinal epidural cavernomas normally appear isointense on T1 weighted images and hyperintense on T2 weighted images. They show enhancement upon contrast injection on T1 images(1). Hyperintense signal on both T1 and T2 images may be seen in lesions with hemorrhagic changes. The main radiologic difference between PSECs and spinal intramedullary cavernomas is the absence of hypointense hemosiderin ring on both T1 and T2 weighted images of PSECs. The absence of hemosiderin ring in PSECs is most probably due to easy clearance of blood degradation products outside the CNS(1). Absence of hemosiderin ring on T1 and T2 weighted MR images in our case supports the radiologic differences between PSECs and intramedullary cavernomas as previously reported in the literature.

Many other lesions such as schwannoma, meningioma, lymphoma, Ewing's sarcoma, chordoma, ependymoma, spinal angiolipoma, perineural cysts and disc herniation may mimic radiologic appearance and symptomatology of PSECs(1,4,7). These lesions must be kept in mind in differential diagnosis of PSECs.

We misdiagnosed the lesion as schwannoma because they usually appear isointense on T1 weighted images and hyperintense on T2 weighted ones like PSECs. They frequently appear as a hyperintense ring surrounding hypointense center on T2 weighted and contrasted T1 weighted images. This is called as target appearance(9). Schwannomas may also widen the neural foramina(1).

In our case the patient was presented with low back pain and radiculopathy. On T1 weighted MR images the lesion was isointense according to spinal cord and on T2 weighted images it was hyperintense. There is no hypointense hemosiderin ring around the lesion or hyperintens signal on T1 weighted images suggesting hemorrhage. After contrast injection the lesion showed homogenous contrast enhancement. Because of contrast enhancement, presence of bony erosion and widening of neural foramina the lesion was radiologically diagnosed as schwannoma.

Conclusion

Pure spinal epidural cavernomas must be kept in mind in differential diagnosis of contrast enhancing spinal epidural lesions. If there is a suspicion of the PSEC, operating room team must be informed by the surgeon about the possibility of massive hemorrhage during surgery.

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