Intramedullary lumbar lesion mimicking spinal cord tumor: a case of non-neoplastic intramedullary spinal cord lesion

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Received: 9 April 2009 / Revised: 2 October 2009 / Accepted: 23 December 2009 / Published online: 5 January 2010
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Abstract Non-neoplastic intramedullary spinal lesion cases are rarely seen in the literature. We would like to present this case for differential diagnosis of intramedullary spinal tumors. The aim of this case report is to attract attention on the MRI findings with lack of contrast enhancement and long syrinx formation which differs these types of lesions from the intramedullary spinal tumors. Intraoperative, pathological and immunohistochemical findings of non-neoplastic intramedullary spinal lesion were discussed.

Keywords Spinal tumor · Non-neoplastic · Intramedullary

Introduction

Spinal cord tumors include almost 10–20% of all primary nervous system tumors; and only 20–30% of these are intramedullary [11]; so, we can easily say that they are uncommon lesions accounting for only 5–10% of all spinal tumors [8, 10]. In spite of this, when they grow, the result is the compression of the spinal cord which most commonly causes motor and sensory loss.

While there are large series of intramedullary spinal cord tumors in the literature, a few reports can be seen about the non-neoplastic intramedullary spinal lesions mimicking tumors. These reports include sarcoidosis,

amyloid angiopathy, tuberculoma and demyelinated lesions in rare series. Among these reports, a few one is non-neoplastic inflammatory intramedullary spinal cord lesions [5, 6].

In addition, the differential diagnosis and also the benefit of operating the non-neoplastic lesions are not known yet. We decided to report our case with clinical, radiological and pathological findings in both preoperative and postoperative period.

Case report

A 63-year-old male admitted to our hospital with severe back pain radiating through his right leg. On admission, his neurological examination revealed L3, L4 and L5 hypoesthesia and motor weakness of grade 2+/5 in right ankle plantar and dorsal flexion. Laseque sign was positive at 20° on the right side and at 30° on the left (crossed laseque). Extensor reflexes and clonus were both found, and also hyperreflexiveness of both lower extremities seen in the physical examination.

MRI imaging of the lumbar area revealed right side L4–L5 disc herniation and expanded conus medullaris (Figs. 1a, b, 2a, b). Cervical and thoracic vertebral MRI scans are also performed. The intradural mass at the level of L1 was isointense to the spinal cord on T1-weighted images and mildly hyperintense on T2-weighted sequences with lack of contrast agent enhancement. The appearance of expanded cord was suspected an intramedullary tumor such as astrocytoma. The central canal was seen as enlarged from the level of T7 to L2 (Figs. 3, 4).

He underwent emergency surgery consisting of right L4 laminectomy, L4–5 herniated disc removal and right L5 foraminotomy. Also, T12–L2 incision performed at the

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Fig. 1 **a** Preoperative sagittal lumbar T1-weighted image showing an expanded conus medullaris. **b** Preoperative sagittal lumbar T2-weighted image. **c** Preoperative post-contrast sagittal lumbar T1-weighted image. **d** Preoperative post-contrast axial lumbar T1-weighted image

Fig. 2 Axial lumbar T2-weighted image showing right sided L4–L5 disc herniation

same time and following myelotomy, yellowish colored mass adherent to surrounding tissue was resected gross totally. Postoperatively, his motor weakness improved

rapidly to 4/5 but the hypoesthesia was still present. Post-operative MRI images 1 month after the operation showed no local signs of the lesion except presence of syrinx cavity (Fig. 5a, b).

Pathology report was gliosis and chronic inflammation as non-neoplastic intramedullary lesion. It probably belongs to an intramedullary inflammatory process of the spinal cord. The ultrastructural study of the specimen composed of lymphocytes, plasma cells and histiocytes. The bacterial and fungal studies were all negative. Immunohistochemical studies showed macrophages and also T and B lymphocytes (Figs. 6, 7, 8).

Histopathologic examination of the specimen showed non-neoplastic lesion with necrotic areas. Macrophages were observed inside and around the necrotic areas. Focal microvascular hyperplasia with scant inflammatory cells surrounding microvasculature was identified. Gliosis was present in parenchyma around the lesion.

Immunohistochemically, macrophages were immunoreactive for CD-68. Neurofilament stain showed destructed

Fig. 3 Sagittal T2-weighted thoracic MR image showing T7–T12 syrinx formation

Fig. 4 Axial T2-weighted thoracic MR image showing the syrinx formation

axons in the lesion, while they were preserved in vicinity of lesion. Glial fibrillary acidic protein expression was identified diffusely in the lesion with accentuation in gliotic

tissue except blood vessels. Through microscopic examination, no atypical cells were observed in the lesion.

Steroids were used to decrease the mass and the surgery associated spinal cord edema in the perioperative and early postoperative period. The follow-up period of the patient was 9 months. During this time, there was no change in postoperative neurological examination of the patient.

Discussion

Frequently seen intramedullary spinal cord tumors in the adults are glial subtypes at 85–90% of which the most common ones are the astrocytomas, followed by ependymomas nearly at 60–70% [2, 3]. Also, hemangioblastomas, oligodendrogliomas, gangliogliomas and paragangliomas can be seen intramedullary.

Patients usually complain back pain spread out from the lesion level, and also worsening function and sensory changes. Motor weakness, abnormal sensation below the level of the lesion, hyperreflexia including clonus and Babinski sign and also Hoffman sign for cervical lesions or spasticity and the urinary system findings can be seen as the physical examination findings [4].

Non-neoplastic intramedullary spinal lesion cases are rarely seen in the literature. One of the important pathologies which are distinctive with non-neoplastic proliferation of plasma cells called plasma cell granulomas is also seen in the differential diagnosis with the intramedullary neoplastic tumors [1].

Lee et al. reported non-neoplastic intramedullary spinal cord lesions in which one of the cases was an intramedullary non-neoplastic inflammatory tumor similar to our case. They decided to specialize these tumors with lack of minimal spinal cord expansion on the MRI scans; although the pathology of our case was the same, there was also a clear cord expansion in the preoperative MRI scans [5]. However, during the operation period, the cord was palpated gently, and it was hard like fibrotic tissue which required to use the ultrasonic surgical aspirator. Also in the preoperative MR images showed a tumor with a long central canal syrinx, as we are not used to see with astrocytomas. Among intramedullary tumors, ependymomas and hemangioblastomas are the most common tumor types to be associated with syringes. Astrocytomas tended to demonstrate syringes less often. Regardless of histology, the higher the spinal level, the more likely a syrinx was encountered. In general, the presence of an associated syrinx favored the resectability of the tumor, because it indicates a displacing rather than an infiltrating tumor [7]. Sun et al. reported 60 intramedullary ependymoma cases in which all tumors had slightly hyperintense signals on

Fig. 5 **a** Postoperative sagittal T2-weighted MR image showing the regressed syrinx formation after the removal of the tumor. **b** Postoperative axial T2-weighted MR images showing decreased syrinx cavity after the procedure

Fig. 6 Focal necrotic area with inflammatory cells around the lesion (hematoxylin–eosin stain $\times 200$)

T2-weighted MR images. Clear tumor margins and uniform contrast enhancement were seen in 75% of patients. 90% of all patients' cysts were caudally or rostrally located and were hyperintense on T2-weighted images [9].

In the central nervous system, contrast enhancement of the pathological lesions is usual because of the increased permeability of blood–brain barrier. Unlike the brain tumors, the contrast material enhancement is independent

Fig. 7 Lack of neurofilament in the lesion (immunohistochemistry $\times 100$)

to the tumor grade or its invasiveness in the spinal cord. Also in spinal cord tumors, contrast enhancement is shown in all tumor types except a rare percentage of astrocytomas in contrast to the brain tumors [12].

Fig. 8 Abundant macrophages in the lesion (immunohistochemistry $\times 200$)

Conclusion

We emphasize that non-neoplastic inflammatory intramedullary spinal cord lesions are very rare and usually it is not possible to distinguish them from other tumoral lesions of spinal cord. Differential diagnosis should be done between these lesions and the astrocytomas with the syrinx existence and the ependymomas with the lack of contrast enhancement.

The long segment syrinx formation and contrast material enhancement properties may help for diagnosis but our case should be supported by further reports. In the patients

with these kinds of MRI findings, inflammatory intramedullary spinal cord lesions should also be suspected.

Conflict of interest statement None of the authors has any potential conflict of interest.

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