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Case Report

A rare case of lumbar intraspinal osteolipoma presenting with a sciatic pain

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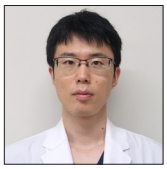

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ABSTRACT

Background: Osteolipoma constitutes <1% of all lipomas. They are only rarely located in the spine. Here, we report an extremely rare lumbar intraspinal osteolipoma, along with a review of its clinical and radiological features.

Case Description: A 57-year-old male presented with a 1-year history of progressively worsening of his sciatica. The magnetic resonance imaging (MRI) revealed a right-sided extradural lesion compressing the cauda equina at the L3/L4 level. The lesion was hyperintense with a hypointense rim on both T1- and T2-weighted images, while the computed tomography (CT) showed that it was hyperdense (i.e., osseous). Following operative resection, the patient's symptoms resolved. Pathologically, it proved to be a benign osteolipoma.

Conclusion: MRI and CT studies documented a L3/4 extradural, osseous lesion causing cauda equina compression. Following surgical removal, the patient's symptoms fully resolved.

Keywords: Intraspinal lesions, Lumbar spine, Osteolipoma, Radiological findings, Sciatic pain

INTRODUCTION

Osteolipomas account for <1% of all lipomas.[8] We were only able to identify four reports of intraspinal osteolipomas with intraspinal osseous components.[1,6,7,8] Here, a 57-year-old male presented with a magnetic resonance (MR)/computed tomography (CT) documented a right-sided, ossified, extradural, L3/4 lesion causing cauda equina compression. Following the removal of an osteolipoma, the patient's symptoms resolved.

CASE PRESENTATION

A 57-year-old male presented with a 1-year history of progressively worsening right-sided sciatica. The MR imaging (MRI) revealed a 14-mm × 9-mm × 14-mm right-sided extradural lesion at the L3/4 level, compressing the cauda equina. The lesion was hyperintense on MR with a hypointense T1/2 rim [Figures 1a-d]. The CT showed the lesion was hyperdense (i.e., ossified) and attached to the right L3 inferior articular process [Figures 1e and f].

Surgery

Following a right hemilaminectomy, an extradural lesion was attached to the L3 inferior articular process and severely adherent to the dura. We performed a subtotal resection to

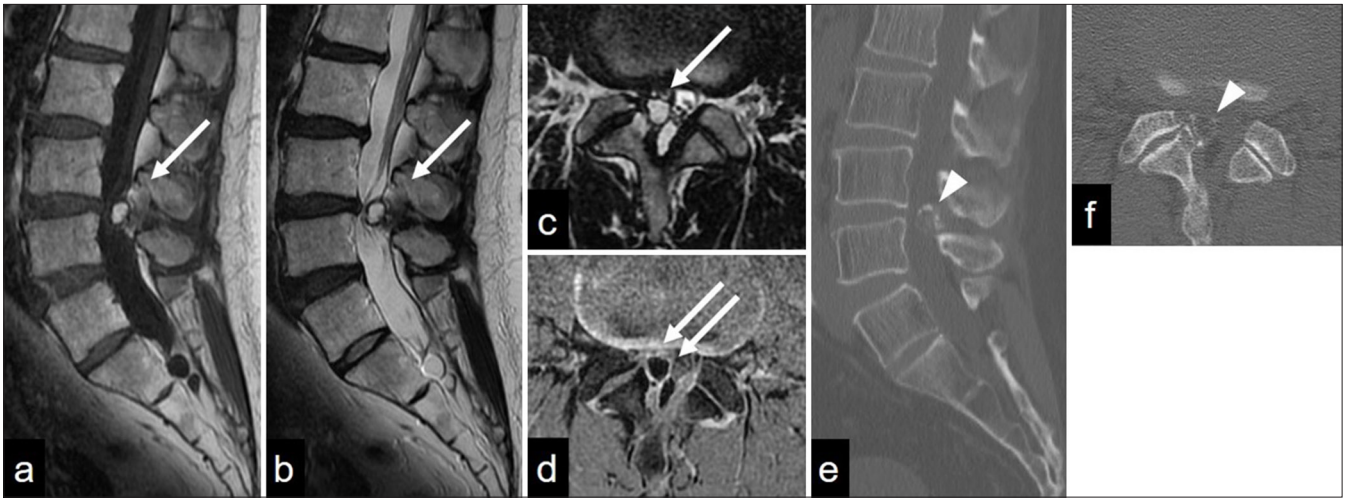

Figure 1: Lumbosacral (a) sagittal T1-weighted and (b) T2-weighted magnetic resonance imaging (MRI) and (c) an axial T2-weighted MRI showing the L3/L4 extradural mass (arrow); hyperintense and hypointense rim (T1- and T2-weighted MRI scans). (d) Hyperintensity in the lesion is not evident on the T1 fat-suppressed sequence (double arrows). (e) Sagittal and (f) axial computed tomography images showing an ossified nodular lesion attached to the right L3 inferior articular process (arrowhead).

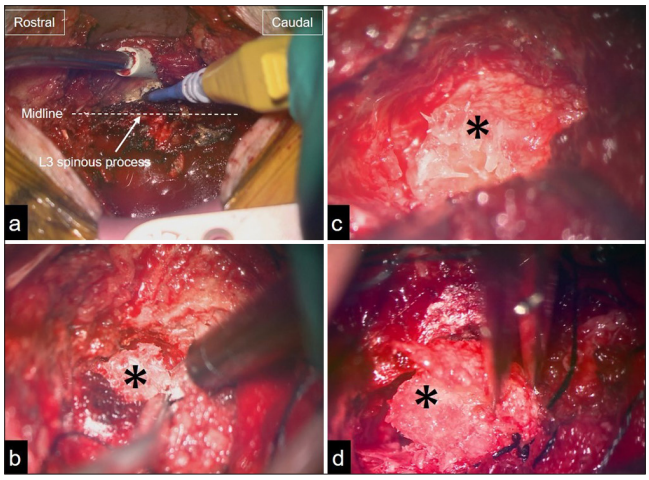

Figure 2: (a) Operative images of the right L3 lamina during right L3 hemilaminectomy. L3 spinous process (arrow) exposed. (b-d) The extradural bony lesion (*) a well-defined, elastic, hard, fat-like, and adherent to the dura.

avoid the risk of a cerebrospinal fluid leak. The tumor consisted of thick, bony tissue and fatty marrow; it was well-defined, elastic, hard, fat-like, and contained sparse bony structures [Figures 2 and 3]. The histopathological analysis revealed a benign osteolipoma [Figure 4]. On postoperative day 1, the patient's right sciatica resolved; he remains asymptomatic 2 years later. Further, follow-up MR/CT studies confirm no additional enlargement of the residual lesion.

DISCUSSION

Pathogenesis of osteolipomas

There are three main theories regarding the pathogenesis of osteolipomas: 1, tumors arising from multipotent mesenchymal cells;[3] 2, fibroblast metaplasia that consists of secondary ossification attributable to repetitive trauma or mechanical stress;[5] and 3, transformation of fibroblasts into osteoblasts.[2] Fritchie *et al*. reported the cytogenetic findings (type 2); the translocation of osteolipomas was consistent with the karyotypic features of simple lipomas.[4] Seelam and Beeram reported an osteolipoma in the retromolar trigone involving continuous trauma from opposing molars (type 2, 3s).[9] As our patient was Japanese, and the prior cases were Chinese and Indian,[1,6,7,8] racial differences and genetic factors may contribute to these lesions (i.e., increased frequency in Asians).

Osteolipomas of the spine

Osteolipomas rarely involve the spine.[8] We only identified four prior reports of intraspinal osteolipomas; two were in the cervical, and two were in the lumbar spine [Table 1].[1,6,7,8] Jain *et al*. diagnosed osteolipoma using MRI and CT studies.[6] The imaging findings of the present case were similar to those of the three other previously reported cases [Table 1].[1,6,8] On MR, the lesions were hyperintense, while the margins were hypointense on both T1- and T2-weighted images. On CT, tumors were hyperdense/ossified. The

Table 1: Summary of reported cases of intraspinal osteolipoma with intraspinal osseous component.

Author year	Age/sex	Country	Local	T1	T2	CT	Surgery	Outcome	Recurrence	F/U
Lin *et al.* 2001[7]	20 y/f	China	C6/C7	Hypo	N/A	H	Yes	I	N/A	N/A
Aiyer *et al.* 2016[1]	61 y/m	India	C5	Hyper	Hyper	D	Yes	C	N/A	2 y
Raja *et al.* 2018[8]	36 y/f	India	L2/L3	Hyper	Hyper	D	Yes	I	No	2 y
Jain *et al.* 2019[6]	67 y/m	India	L2/L3	Hyper	Hyper	D	No	N/A	N/A	N/A
Case 2023	57 y/m	Japan	L3/L4	Hyper	Hyper	D	Yes	C	No	2 y

C: Cured, D: Delineated, f: Female, F/U: Follow-up, H: Homogeneous, Hyper: Hyperintense, Hypo: Hypointense, I: Improved, m: Male, N/A: Not available, y: Years

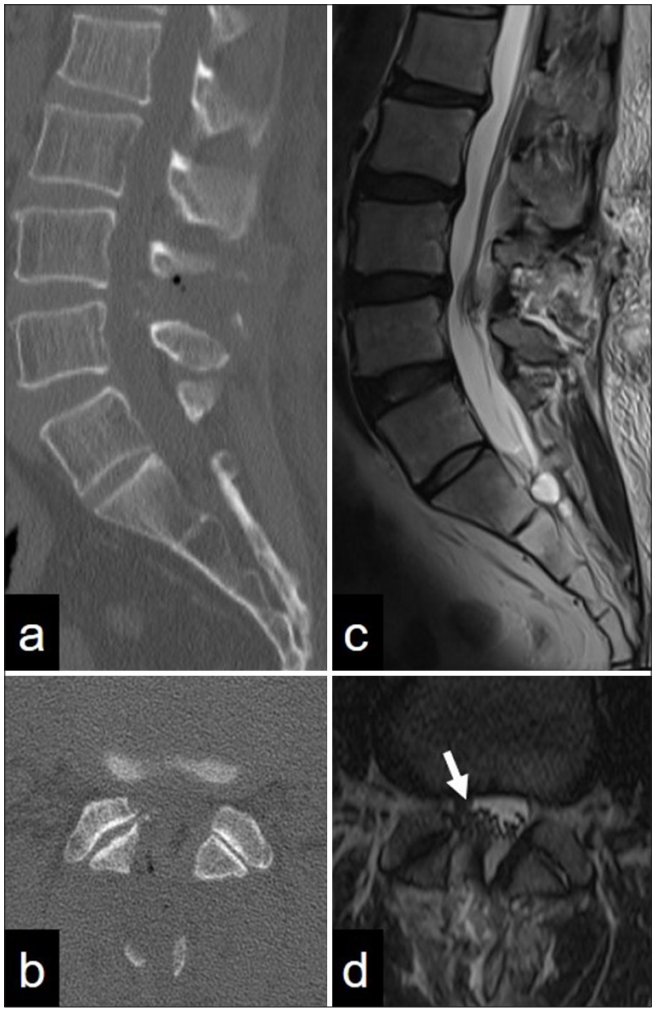

Figure 3: Postoperative computed tomography (a) sagittal and (b) axial images and T2-weighted magnetic resonance (c) sagittal and (d) axial images confirming the lesion was subtotally removed. Compression of the cauda equina was improved (arrow).

differential diagnosis for intraspinal osteolipomas includes calcified synovial cysts, dermoids, teratomas, tumoral calcinoses, extraosseous osteochondromas, myositis ossificans, ossifying fibromas, and osteosarcomas.[1,6] Gross total tumor resections are the optimal treatment for these

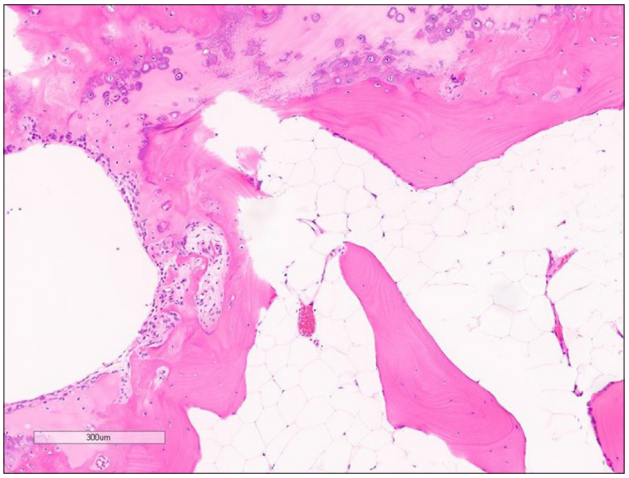

Figure 4: Hematoxylin and eosin staining of the pathology specimen showing benign tissue consisting of bone, cartilage, and adipose tissue. Magnification 72x; Scale bar: 300 μm.

benign tumors, allowing for pathological confirmation. However, partial resections may also result in long-term success, as demonstrated in this case.

CONCLUSION

Intraspinal osteolipomas are rare benign tumors found in the spine. Both MRI and CT studies are useful for differentiating osteolipomas from other tumors. Gross total or even partial surgical resection (i.e., with increased risk to adjacent critical neural/dura/vascular structures) is recommended.

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