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VERTEBRAL BODY LIPOMA: AN UNUSUAL PATHOLOGY TREATED WITH KYPHOPLASTY

Fikret Sahinturk M.D¹, Umit Akin Dere M.D¹, Erkin Sonmez, M.D¹, Nur Altinors, M.D¹, Ayşen Terzi M.D²

¹Department of Neurosurgery, Baskent University School of Medicine, Ankara, Turkey

²Department of Pathology, Baskent University School of Medicine, Ankara, Turkey

Corresponding Author

FikretŞahintürk M.D

Baskent University School of Medicine Department of Neurosurgery, Ankara Turkey

A: FevziCakmakCaddesi10.Sokak No:45 Bahçelievler 06490 Ankara, Turkey

T: +90 312 2126868/1080

F: +90 312 2125728

e-mail: fikretsahinturk@gmail.com

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Abstract

Study Design: Case report.

Objectives: This case report is unique since this is the first vertebral lipom case that was treated by kyphoplasty alone.

Summary of Background Data: Vertebral lipoma is extremely rare and our search of the English literature has revealed 20 patients in 16 reports

Methods: A 32-year-old female patient was admitted to our neurosurgery department with the chief complaint of low back pain that had lasted nearly one year. A lumbar MR suggested a hemangioma and the patient was operated on.

Results: On microscopic examination, the lesion was seen to have a widely infiltrating appearance of mature fat tissue between bone trabeculae diagnosis was intraosseous lipoma.

Conclusions: We believe that the management should be surgical total removal of the lesion even in incidentally found cases in order to obtain histologic diagnosis and pain relief.

Key Words: Back pain, vertebral lipoma, kyphoplasty

Level of Evidence: 5

Introduction

Vertebral tumors are basically primary or metastatic. Primary tumors are either benign or malignant. The frequent primary benign tumors of vertebra are hemangioma, osteoid osteoma, osteoblastoma, giant cell bone tumor, osteochondrom, Langerhans cell histiocytosis and aneursymal bone cyst. The primary malignant tumors of vertebra are chordoma, Ewing sarcoma, osteosarcoma, chondrosarcoma, lymphoma and multiple myeloma. Fibrosarcomas are rare among the malignant tumors.

The vertebral metastatic tumors compose nearly 40 % of all metastases to bones. Lung, breast and prostate constitute half of spinal metastases. Metastasis to spine frequently involve lower thoracal and lumbar segments. In the pediatric age group neuroblastoma and Ewing sarcoma are likely metastasize to the spine. Osseous lipomata are rare benign pathology.

Vertebral lipoma is extremely rare and our search of the English literature has revealed 20 patients in 16 reports (1-16). The summary of these cases are on Table 1. This Case report is unique since this is the first vertebral lipom case that was treated by kyphoplasty alone.

Case report

This 32-year-old female patient was admitted to our neurosurgery department with the chief complaint of low back pain that lasts nearly 1 year. Her pain was refractory to conservative treatment. Rheumatologic examination did not reveal any pathology also. The neurological examination was uneventful except lower lumbar region sensitivity with palpation.

The lumbar MR revealed features in L4 vertebra suggestive of a hemangioma. (Fig. 1A,1B,1C). The patient was operated for her pain. Biopsies were taken from the vertebral body of L4 and

bilateral 5 cc of cement was inserted. There was no peroperative complication. The patient was relieved of her pain. She was mobilized the next day and discharged. The postoperative x-ray confirmed the appropriate filling of the cement in the vertebra. (Fig 1D) On microscopic examination, the lesion was seen to have a widely infiltrating appearance of mature fat tissue between bone trabeculae diagnosis was intraosseous lipoma. (Fig. 2).

Discussion

Lipomatous lesions of the musculoskeletal system are grouped in to nine distinct entities: lipoma, lipomatosis, lipomatosis of nerve, lipoblastoma or lipomatosis, angiolioma, myolipoma of soft tissue, chondroid lipoma, spindle cell lipoma, plaemorphic lipoma and hibernoma.¹ Skeletal lipomatous lesions are. Only 16 patients have been reported harboring hibernoma occurring outside of a soft tissue location.²

Milgram³ has subdivided intraosseous lipomas depending on the degree of involution: 1. solid tumors of viable lipocytes; 2. transitional cases with partial fat necrosis and focal calcification but also regions of viable lipocytes; 3. late cases in which fat cells have died with variabale degree of cyst formation.

Intraosseous lipoma is a benign pathology in nature. The major clinical symptom of vertebral lipoma is nearly always pain. The initial painful region and its radiation depends on the vertebral segment. Some vertebral lipomas may be asymptomatic and found incidentally. Ramos et al.⁴ have reviewed the radiographic and CT characteristics of osseous lipoma. The authors mentioned that an osteolytic lesion with a well-defined thin sclerotic border is the characteristic finding on x-ray. They have also noted that although the presence of fat-equivalent density on CT scans is highly suggestive of osseous lipoma, comparable attenuation is described in cases of chronic

osteomyelitis and postnecrotic subchondral excavation. Low attenuation equivalent to fat density is seen on CT scans.

MR and CT are sensitive in detecting fatty tissue. The T1 and T2 relaxation times and spin density of benign lipomatous tumors were found to be in a range similar to those of normal subcutaneous fat.

Fat generally produces a high signal intensity on MRI and lesions composed primarily of fat can be diagnosed.⁵ Lipomas do not cause trabeculation and show no enhancement.

Blacksin et al.⁶ reported that lesions consisting of variable fat tissue had a high signal intensity on both T1W and T2W images. If there was extensive fat necrosis then low signal intensity on T1W scans and high intensity on T2W were observed. The authors commented that a severe degree of involution would cause diagnostic difficulty on MRI.

On MRI, iso-dense areas on T1W and T2W are observed. These correspond to subcutaneous fat.⁷

Some bony lesions may also undergo fatty necrosis but these can be differentiated from a lipoma because bony expansion, cystic change and resorption of pre-existing bone only occur in lipomata.⁸

The radiologic differential diagnosis includes hemangioma, aneurysmal bone cyst, chondrosarcoma, chordoma and bone infarct.

Our review of the literature has revealed 20 patients reported in 16 papers. The anatomic localization was lumbar segments in seven patients, sacral in four patients, cervical in three patients, thoracal in two patients, one in ileum, acetabulum and coccyx. In one patient, there was

multiple involvement. All patients but three had histopathologic diagnosis of lipoma. In the patients with no histopathologic verification the diagnosis was based on radiologic findings.⁹⁻¹¹

The surgical treatment in the 17 operated cases in the literature has been summarized on Table 1. In 5 cases only biopsies were obtained either percutaneously or with open surgery. Four cases have been biopsied and curettage has been performed while in two of those cases bone grafting was added. In two cases tumor excision was accomplished, in one case partial tumor removal was done. In two cases laminectomies were performed. In one case coccygectomy was performed and in one patient radiofrequency was performed for relief of pain. In one case, there was no information about surgery.

Conservative treatment has been recommended for asymptomatic lesions provided that they do not cause bone instability.

We believe that the management should be surgical total removal of the lesion even in incidentally found cases in order to obtain histologic diagnosis and pain relief.

Our case is the first example in the literature where vertebral cementing via kyphoplasty was performed successfully for pain relief in a patient harboring a vertebral lipoma.

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Figure Legends

Fig. 1 A Sagittal T₂ weighted MR images showing L4 vertebral body homogenous hyperintensity



Fig. 1 B Sagittal T₁ weighted MR images showing L4 vertebral body homogenous hyperintensity



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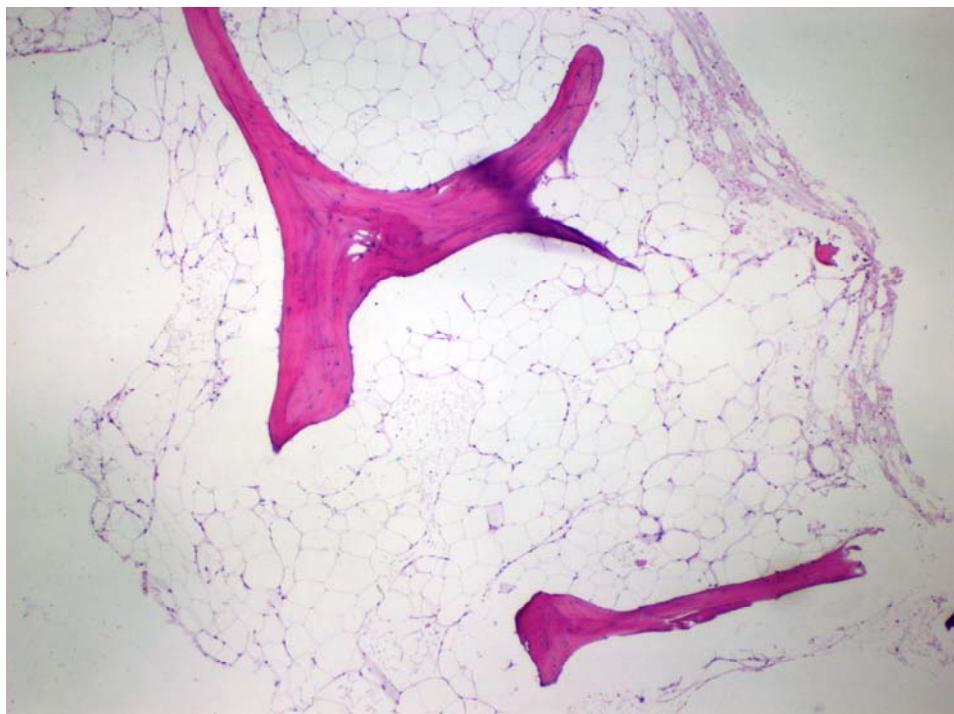
Fig. 1 C Sagittal T₁ weighted with MR images showing L4 vertebral body weak enhancement after contrast injection.



Fig. 1 D X-Ray AP images showing after surgery.



Fig 2:Haematoxylin and eosin, x40in the intertrabecular areas of bone. Photomicrographs showing the infiltration of mature fat tissue



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Table Legends

Table 1: Clinical summary of patients reported in the literature harboring vertebral lipoma.⁷⁻²²

AUTHOR	PATIENT	SYMPTOM	INVOLVED BONE	INTERVENTION
Zorn	21 F	Sciatica	Sacrum	Biopsy, curettage
Hanelin	33 M	Coccygeal pain	Coccyx	Coccygectomy
Matsubayashi	27 M	Back pain	L 4 spinous process	L 4 laminectomy
Ehara	53 M	Trauma history Presacral mass on examination	Sacrum	Incisional biopsy
Milgram	28 F	Left buttock and back pain	Sacrum	Surgery: not total removal
Williams First case	45 M	Low back pain, sciatica	L 1	Percutaneous biopsy
Williams Second case	32 M	Sciatica	Right ileum	Operative biopsy
Williams Third case	38 F	Sciatica	L4 right side	L4 laminectomy
Williams Fourth case	47 M	Low back pain radiating to perineum	L 4	No pathology
Pande	35 M	Low back pain	L 1, L2	Percutaneous biopsy
Kamekura	49 M	Back pain	Sacral 4and 5	Surgery: tumor

				excision
Chang	38 M	Neck pain after trauma	T1 left lamina	Excision
Lin First case	53 F	Pain at right hip	Right acetabulum	Curettage, bone grafting
Lin Second case	37 F	Swelling in the neck	C3 lamina, spinous process	Surgery-not detailed
Zhu	27 M	Cough	C 1 C2	Curettage of C2
Yang	53 M	Low back dull pain	Multiple vertebrae	Tissue biopsy
Teekhasaenee	35 M	Lumbar pain	L3 vertebral arch, spinous process	L3 curettage, filling with hydroxapatite bone
Sen	27 M	Low back pain	L4 body	No pathology
Özbek	53 M	Back pain on left costovertebral angle	T 12 left pedicle	Radiofrequency ablation
Kara	23 F	Cervical pain	C2	No surgery