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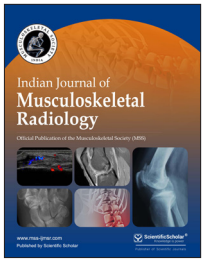

Case Report

Xanthoma of the Thoracic Spine: A Case Report and Review of Literature

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ABSTRACT

Xanthoma arising in bone is a very rare occurrence with only a few case reports in literature. Xanthoma arising in the spine is extremely rare with only four cases previously reported. We report a case of xanthoma of the thoracic spine in a 75-year-old male with hyperlipidemia. The imaging appearances and a review of literature will also be provided.

Keywords: Xanthoma, Thoracic, Spine

INTRODUCTION

There are few case reports of osseous involvement in hyperlipidemia. Spinal involvement is extremely rare with only 2 cases reports in literature. We report a case of xanthoma of thoracic spine in a 75 year old male and discuss the imaging features.

CASE REPORT

A 75-year-old previously fit and well male patient presented with a 6-month history of insidious onset mid-thoracic back pain. There was no preceding history of trauma or malignancy or medical history of note. Clinical examination was normal with no neurological abnormality identified.

Imaging

A magnetic resonance imaging (MRI) of the whole spine was performed which demonstrated a lesion involving the T7 vertebral body with extension into the right pedicle and transverse process. Extension across the T6/7 intervertebral disc to the inferior endplate of T6 was also seen. No epidural extension was noted and there was normal signal in the cord. The neural foramina were patent. The lesion was of low signal on T1- and T2-weighted sequences with heterogeneous but predominantly high signal on short-tau inversion recovery (compared to skeletal muscle) [Figures 1 and 2].

Computed tomography (CT) chest, abdomen, and pelvis demonstrated a lytic lesion with cortical destruction in the T7 vertebral bod, suggesting an aggressive process [Figure 3]. No additional lesions were identified in the spine, chest, abdomen, or pelvis.

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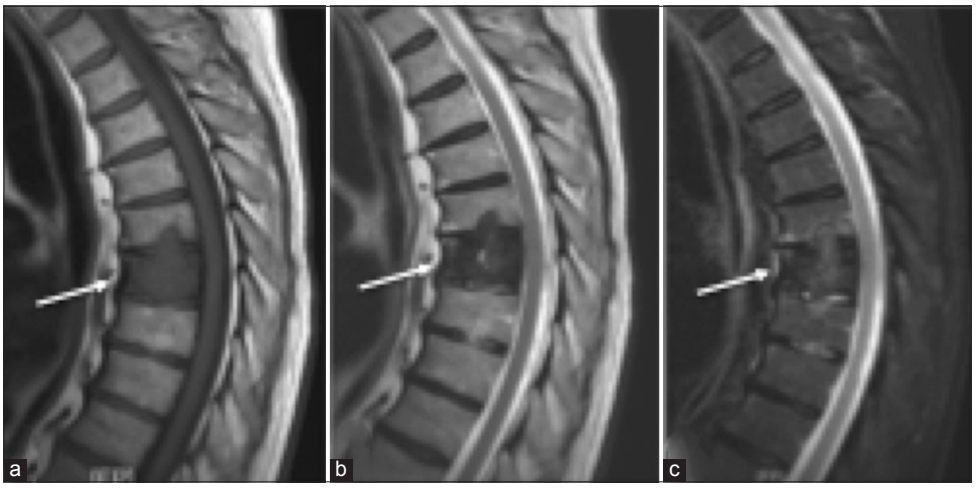

Figure 1: Sagittal T1 (a), T2 (b), and short-tau inversion recovery (c) show diffuse T1 and T2 low-signal lesion (arrow) in T7 with extension across the T6/7 disc into vertebral body of T6.

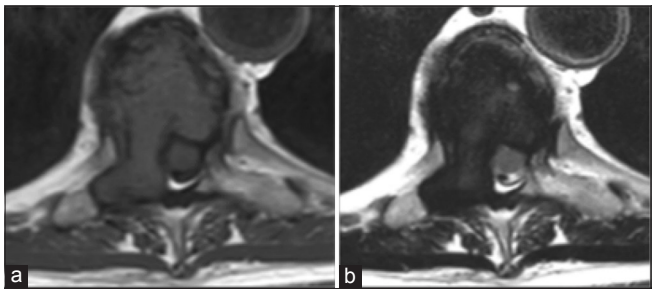

Figure 2: Axial T1 (a) and T2 (b) show T1 and T2 low-signal lesion in the vertebral body of T7 with extension into the right pedicle and right transverse process.

Table 1: Serum lipid profile of the patient with the abnormal readings highlighted in red.

Lipid profile	Result	Normal range
Lipids cholesterol	6.4 mmol/l	<5.2 mmol/l
HDL cholesterol	1.86 mmol/l	0.94–1.48 mmol/l
Non-HDL cholesterol	4.5 mmol/l	<3.4 mmol/l
Cholesterol/HDL ratio	3.4	
Triglycerides	1.1	0.5–2.0 mmol/l
Calculated LDL	4.0 mmol/l	1.5–4.5 mmol/l

LDL: Low-density lipoprotein, HDL: High-density lipoprotein

Treatment

The patient underwent a fluoroscopic guided open biopsy of the vertebral lesion. Histology revealed foamy histiocytes and macrophages with focal cholesterol cleft formation. There were several multinucleated giant cells as well as extensive solid sheets of mononuclear spindle cells. There was no cellular atypia [Figure 4].

The serum calcium was normal and lipid profile showed mild hypercholesterolemia [Table 1]. Clinical examination did not reveal any soft tissue xanthomas.

The radiological, histological, and biochemical findings helped to clinch the diagnosis of xanthoma. He was managed symptomatically and commenced on a lipid-lowering statin with a significant reduction in pain at 6-week follow-up.

DISCUSSION

Xanthomas are benign soft tissue lesions, which typically occur as nodules in the skin, subcutaneous tissues, and tendon sheaths of patients with hyperlipidemia.[1] They form in the setting of abnormal cholesterol deposition which results in an inflammatory cell infiltrate. Xanthoma arising in the bone is a relatively rare entity with approximately 40 cases described in literature.[2-4] The most commonly reported location of bone xanthomas is in the diaphysis of long bones but can also arise in the facial bones, skull, mastoid air cells, and spine.[2] Four cases of bone xanthoma involving the spine have previously been described.[3-7] Two of these cases have resulted in spinal cord compression secondary to epidural extension of the xanthoma.[3,5]

Bone xanthomas can be classified as primary or secondary: Primary xanthomas occur in patients with a normal lipid profile and secondary xanthomas arise in hyperlipidemic patients.[2] Histologically, xanthomas can have a variable composition, typically consisting of foamy histiocytes and macrophages, cholesterol clefts, and multinucleated giant cells as well as collagenous fibers in varying quantities.[1] Consequently, imaging appearances can vary on MRI. The histology specimen, in this case, had a large proportion of fibrous spindle cells compared to other histology specimens described in the previous case reports which were thought to account for the very low T2 signal on MRI.[8] This is in

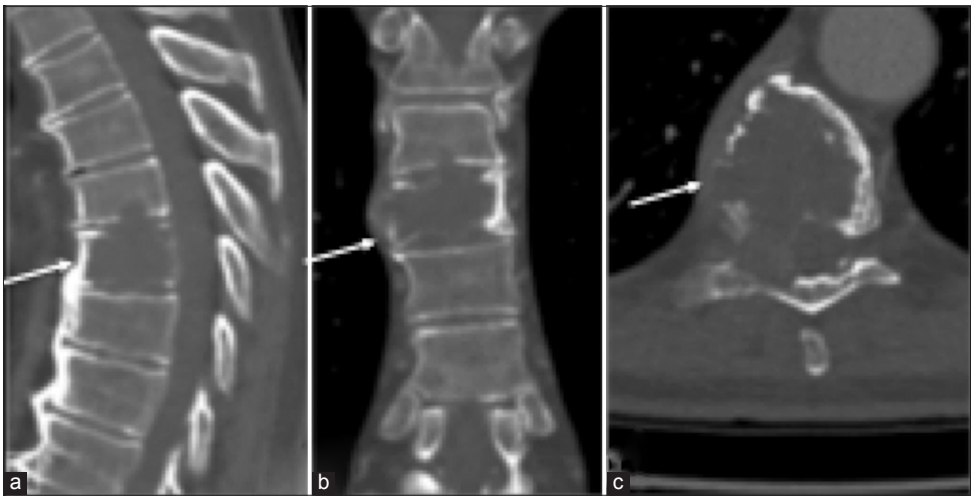

Figure 3: Sagittal (a), coronal (b), and axial (c) show large lucent lesion (arrow) in the vertebral body of T7 with extension into the right pedicle.

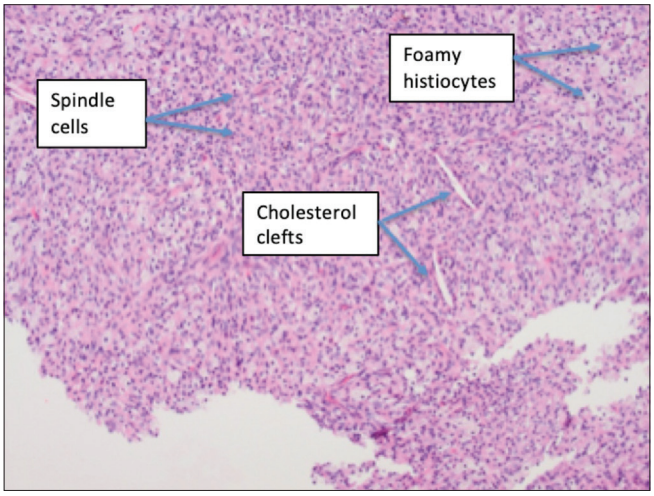

Figure 4: Histology specimen demonstrating cholesterol clefts as well as foamy histiocytes and spindle cells.

contrast to the high T2 signal reported on MRI in the previous case reports.[5,9,10] On CT, bone xanthomas appear as lytic lesions.

The differential diagnosis of a lytic bony lesion in adults is wide and common causes such as myeloma and bone metastases should be excluded in the first instance. Myeloma is low on T1 and high on fluid-sensitive sequence. The MRI features of metastasis can be variable, but most of these are low on T1 and mixed to high signal on fluid-sensitive sequences. In this case, given the MRI finding of a low-signal lesion on T1- and T2-weighted sequences, alternative diagnoses such as hemorrhagic lesions, amyloidoma, or a densely fibrous lesion need to be considered. To clinch the diagnosis of bone xanthoma, the patient's lipid profile should be tested, and a clinical examination performed to identify any subcutaneous nodules, as these have a high correlation with a positive finding of bone xanthoma. The previous studies have shown that hyperlipidemia is found in 69% of patients with a bone xanthoma and 53% of patients with bone xanthoma have cutaneous xanthoma.[7]

Due to symptoms and potential for growth and pathological fracture risk, primary bone xanthoma is treated with curettage and bone grafting or resection. Patients with secondary bone xanthoma should be commenced on lipid-lower medication and advised on diet modification.[2] No recurrences have been reported in literature following appropriate treatment.

Teaching point

Bone xanthoma should be considered in the differential diagnosis of an adult patient with a lytic bone lesion which is of low signal on T1- and T2-weighted MRI sequences, particularly, there is a history of hyperlipidemia and soft tissue xanthomas are noted on clinical examination.

CONCLUSION

Bone xanthoma should be considered in the differential diagnosis of an adult patient with a lytic bone lesion.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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