Case Report

Osteoid Osteoma of the Body of the Vertebrae Causing Painful Scoliosis

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Abstract

Osteoid osteoma (OO) affecting the spine is one of the common causes of painful scoliosis in the growing age group. The involvement is usually in the posterior elements involving the lumbar and cervical spine. We report a case of OO affecting the body of the thoracic vertebral body. A 15-year-old male presented with painful left thoracolumbar scoliosis. Computed tomography (CT) and magnetic resonance imaging (MRI) and MRI showed a lucent area with central dense focus (nidus) suggesting OO. Surgical excision was done under image intensifier and void filled with a mesh cage having bone graft reinforced posteriorly with pedicle screws. Postoperatively, the patient was relieved of his diffuse pain and CT scan revealed complete excision of the lesion. At the follow-up, the patient has an active, unconstrained life. OO in the spine presents as scoliosis which can be painful or painless. The diagnosis can be missed on a plain radiograph and complete radiographic evaluation includes a CT scan and MRI. Spinal management includes curettage or radiofrequency ablation. Recurrence is a known but rare complication.

Keywords: *Osteoid osteoma body of vertebrae, scoliosis, thoracic spine*

Introduction

Osteoid osteoma (OO) affecting the spine is one of the common causes of painful scoliosis in the growing age group.[1] The majority of them are located in the posterior elements of the vertebrae and affection of the body of the vertebrae is rare. In the vertebral region, the lumbar and cervical spine are commonly affected and the thoracic location is also sparse accounting for about 10%.[2-4] As such, the diagnosis can easily be missed on simple X-rays if the pain is not severe enough to warrant further investigations.[5] Here, we describe an OO affection the body of a thoracic spinal vertebrae causing painful scoliosis in a teenager and discuss the diagnostic and management challenges.

Case Report

A 15-year-old male presented with diffuse pain for 9 months in the thoracolumbar spine with nocturnal exacerbations that was relieved with painkillers. He was neurologically intact. Plain X-ray revealed a left thoracolumbar scoliosis with a Cobb's angle of 30° [Figure 1]. A computerized tomography (CT) showed a lucent area in the right posterolateral corner (zone IVA) of the dorsal vertebral body (<2 cm) with central dense focus – nidus suggestive of OO [Figure 1]. Sagittal and axial T2 magnetic resonance images showed edema in the region with reactive sclerosis seen on CT without any associated anomalies [Figure 1]. With the clinical and radiological diagnosis of OO, the parents were counseled for the surgery. Through a midline posterior approach, a right of D12-L1 hemilaminectomy and facetectomy was contemplated after securing pedicle screws of D11, L1, and left-sided D12 and the lesion was curetted and burred under fluoroscopic guidance [Figure 2]. A mesh cage with bone graft was placed in the void created and rods were fixed [Figure 2]. Postoperatively, the patient was relieved of his diffuse pain and night cries. Histopathological examination showed fragments of bony trabeculae with one of the fragments showing central nidus and surrounding sclerosis suggestive of an OO [Figure 3]. Repeat CT scan confirmed the excision of the lesion [Figure 2]. At 6 months follow-up, the patient is doing and now lives an active, unconstrained life.

Discussion

OO presents in the adolescence as benign primary osteoid producing tumor of the

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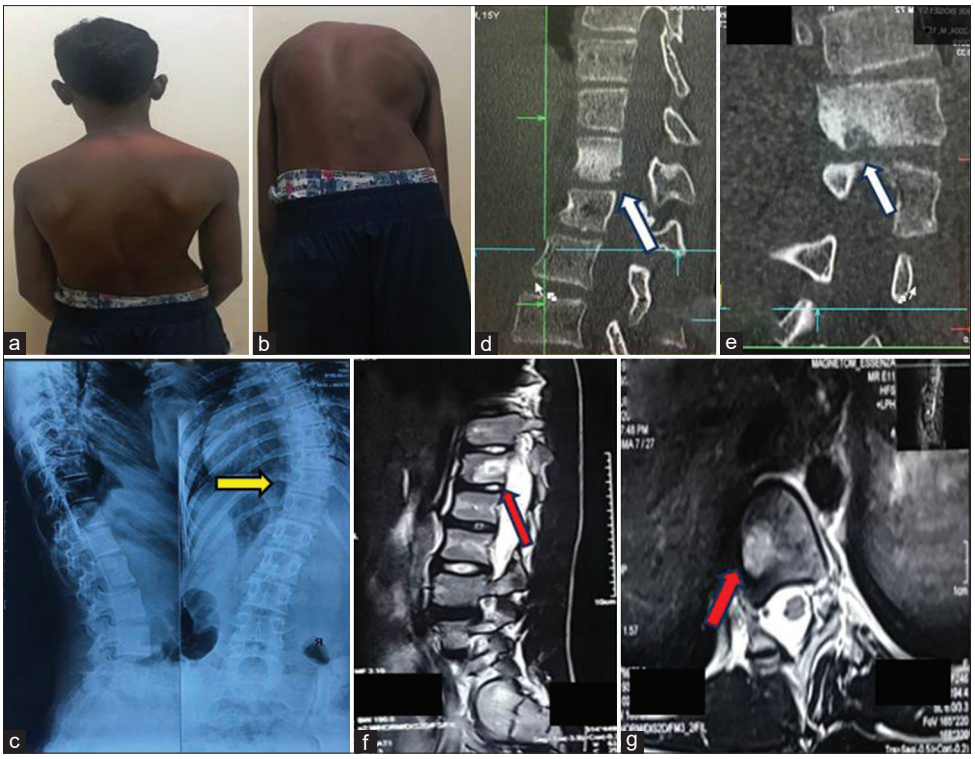

Figure 1: Clinical picture demonstrating left-sided scoliosis in a young patient (a and b). Posteroanterior and lateral radiographs of the same patent shows S-shaped scoliosis with concavity toward the right (yellow arrow). No lesion could be appreciated on the radiographs (c). Reformatted sagittal and coronal computed tomography image demonstrating a lucent area in the posterolateral corner of the dorsal vertebral body (white arrow) with central dense focus – nidus (d and e). Sagittal and axial T2 magnetic resonance image show edema (red arrow) in the region of the lesion seen on computed tomography (f and g)

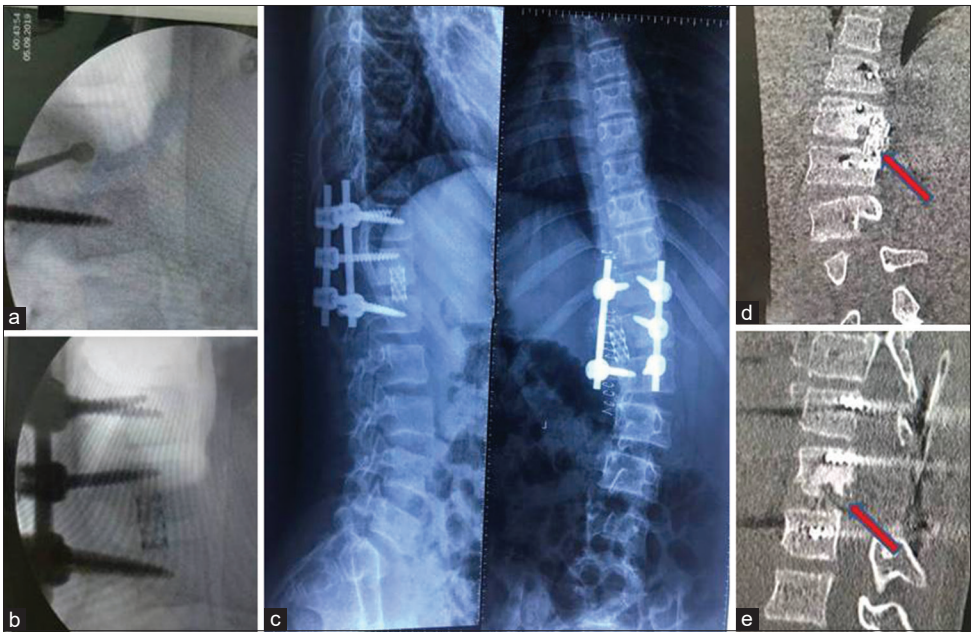

Figure 2: Intraoperative fluoroscopy images showing curette and cage placement (a and b). Postoperative posteroanterior and lateral radiographs showing a slight improvement in the alignment of the spinal curvature with implants in place (c). Postoperative reformatted coronal and sagittal computed tomography images (red arrows) confirming the excision of the lesion (d and e)

bone characterized by small size, limited growth, and disproportionate pain.[2,6] It affects the spine in 7%–20% of cases.[1,5] Although it manifests as painful scoliosis, yet the disease could be a painless condition. The diagnosis is very likely to be missed on a plain radiograph if one is not oriented due to their small size and complex anatomy of the spine.[5,7] A complete radiographic evaluation for scoliosis is necessary before stamping as adolescence

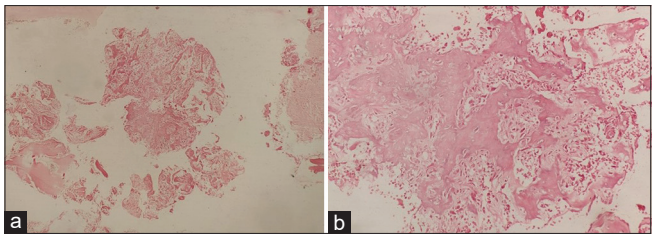

Figure 3: Low power photomicrograph of the lesion showing a central nidus surrounded by bony trabeculae, H and E stain, ×100 (a). High power view of the central nidus showing woven bone with osteoblastic and fibroblastic proliferation, H and E Stain, ×400 (b)

idiopathic scoliosis, including a CT scan and magnetic resonance imaging (MRI).[8]

Most studies have found posterior elements, namely, the neural arches to be affected (33% involved lamina, 20% involve articular facets, and 15% involve pedicles) with rarely (7%) involvement of the vertebral bodies.[3,4,9-11]

Despite innovations in diagnostic expertise, there is a lag period average onset of symptoms and establishing a diagnosis. People have found this could vary between a year to 5 years or even more.[5,12] On top of it, there is a 54% chance of a misdiagnosis.[13] The classic MRI findings include calcification within the nidus enclosed by sclerosis which appears as low signal intensity on T1- and T2-weighted images and enhancement of the nidus contrast. Bone scan (Scintigraphy using technetium-99 m) has proven to be more specific for the diagnosis of small lesions particularly with spinal involvement.[14] The differential diagnosis comprises osteoblastoma, aneurysmal bone cyst, giant cell tumor, and osteomyelitis.[15] Malignant tumors are rare in children and adolescents. These can be differentiated with their characteristic clinical, imaging, and histopathological features.[15]

Spinal OO needs surgical treatment in the form of curettage.[2,10] Sapkas *et al*. and Zhang *et al*. did and excision and stabilization in their respective cases due to the creation of iatrogenic instability in their respective cases.[3,5] Sasani *et al*. could simply excise an OO involving the D8 body that also involved the pedicle.[11] However, sometimes the OO is deep, and reaching to it creates a void as in our case, then a bone graft for structural support is needed to prevent further kyphosis reinforced with added instrumentation. Ransford *et al*. suggest that early surgery is recommended for the complete resolution of scoliosis.[16] Sasani *et al*. did a Rosenthal *et al*. introduced the image-guided radiofrequency ablation for treatment of OO that has been extrapolated to be used successfully in the spine Wang *et al*.[17,18] The facility is sophisticated and sparse in many places where surgery offers a cheaper and complete removal. Recurrence is a known but rare complication.[5]

Conclusion

OO affecting the body of the spine rare cause of scoliosis. It may be painless but needs to be differentiated from the adolescent idiopathic scoliosis to prevent misdiagnosis as surgical management is different in both of them.

Declaration of patient consent

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

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Conflicts of interest

There are no conflicts of interest.

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