Osteoid Osteoma of Spine: An Unusual Cause of Back Pain

Ram K Barakoti, MBBS, MS; Rajesh K Chaudhary, MBBS, MS; Babu K Shrestha, MBBS, MS; Ashok K Banskota MD, FACS
Department of Orthopedics, B & B Hospital, Gwarko, Lalitpur, Nepal
Hospital and Rehabilitation Center for Disabled Children (HRDC), Janagal, Kavre, Nepal

Address for Correspondence:
Ram K Barakoti, MBBS, MS
Department of Orthopedics, B & B Hospital, Gwarko, Lalitpur, Nepal
Hospital and Rehabilitation Center for Disabled Children (HRDC), Janagal, Kavre, Nepal
Email: drkbarakoti@gmail.com

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Osteoid osteoma is a benign skeletal neoplasm composed of osteoid and woven bone. Osteoid osteoma of the spine is a rare primary spine tumor and those located at the thoracal spine are even rarer. The usual treatment involves complete resection, including the nidus, or alternatively radiofrequency percutaneous ablation is performed. The authors present a 29-year-old male with an unusual localization of the osteoid osteoma in the thoracal spine for 7 years presented as mechanical back pain and treated with analgesics. The D12 vertebra lesion was successfully resected via a posterior approach with D12 laminectomy and ipsilateral short segment instrumented fusion were performed. Histopathology reported the lesion as an osteoid osteoma.

Keywords: nidus, osteoid osteoma, spine.

Osteoid osteoma is a term coined by Jaffe in 1935 to describe benign bony tumor characterized by presence of a nidus of osteoid vascular bone with dense sclerotic bone in its periphery.[1] Osteoid osteomas comprise 10% of all benign bone tumors and 1% of all spinal tumors. Lumbar spine is the commonest site (59%) with the neural arch being the usual location (75%). Posterior elements of spine are most common site and because of their approximity to neural tissue, neurological involvement is seen in 6.5% cases.[2,3]

A spinal osteoid osteoma usually present as back pain localized around level of lesion, more at night, which increase in intensity with activity and shows equivocal response to salicylates.[2,4,5] Osteoid osteoma is one of the most common cause of painful scoliosis

which is common finding in adolescents (63% to 70%) associated with back pain secondary to muscular spasm. It is difficult to diagnose osteoid osteoma on routine radiographs and exact diagnosis require further imaging.[4]

Case Report

A 29-year-old boy presented with 7 years history of slowly progressive back pain with increase in intensity for last 3 months and associated with night time worsening. There was no history of fever, night sweats, weight loss, trauma or radicular symptoms. He was diagnosed as mechanical backache and was on analgesics on and off for years by treating physician. There was no family history of scoliosis and any other vertebral anomalies.

On examination, tenderness was present at dorso-lumbar junction level with increase in intensity on twisting movement. There was no obvious scoliotic deformity and neurological involvement. His thorough blood investigations were within normal limits. Radiographs of dorsolumbar spine, revealed list on one side with hyper-opacity at pedicle of D12 level, which was confirmed by CT scan and MRI **(Figure 1)**.

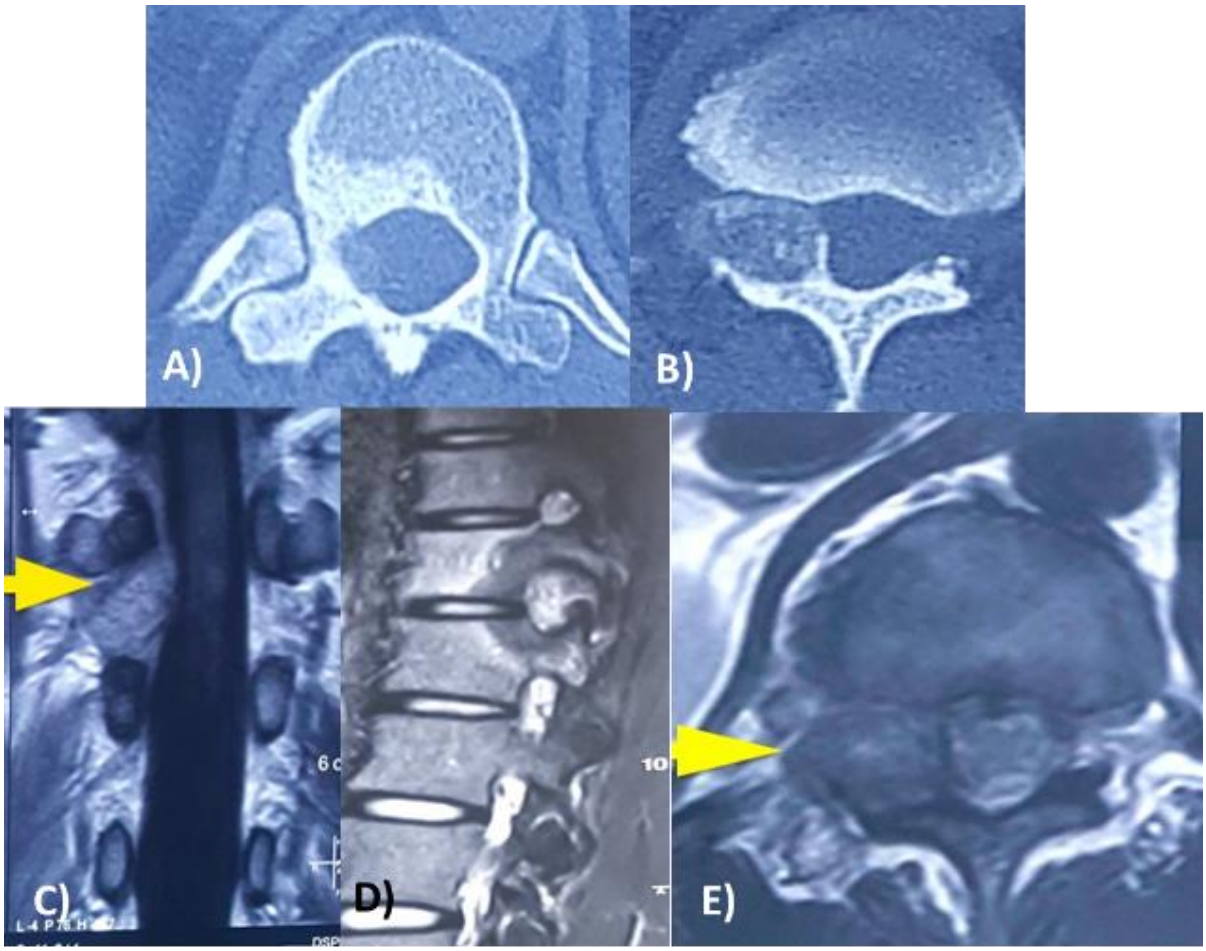

Figure 1: A, B) CT scan of D12 verterbra, lesion in right pedicle with sclerosis, C, D, E) MRI scan of same lesion with zone of sclerosis

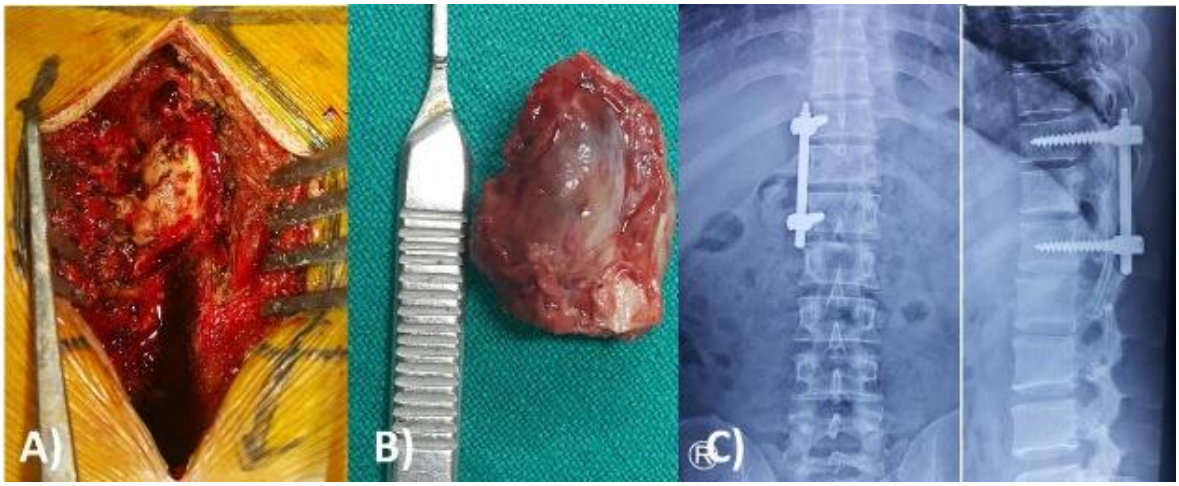

Figure 2: A, B) Lesion before and after excision, C) Post op X-rays after excision

Procedure

Prone position with midline incision exposing the lamina and facet joint of right side of dorsal 11 to lumbar one vertebrae. Sclerotic lamina and pars was identified visually and confirmed under fluoroscopy. Lesion was excised with the help of high speed burr and additional curettage of the pedicle and the vertebral body was done. Pedicle screws kept at dorsal 11 and lumbar one vertebrae and connected with rod **(Figure 2)**. Bone grafting was done and wound closed in layer.

Histology demonstrated a circumscribed focus of vascularized fibro-connective tissue containing ossification, consistent with osteoid osteoma **(Figure 3)**.

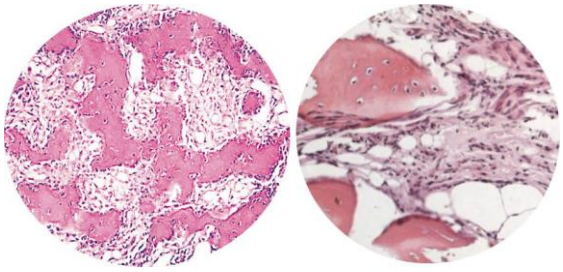

Figure 3: Histopathological picture of the nidus showing vascularized fibro-connective tissue containing ossification, consistent with osteoid osteoma.

Discussion

Osteoid osteoma comprises 10% of all benign bone tumors and only 1% of all spinal tumors. Jackson reviewed 860 cases of osteoid osteoma and found that 10% occurred in the spine: 59% occurred in the lumbar spine, 27% in the cervical spine, 12% in the thoracic spine and 2% in the sacrum. The posterior element was involved in 75% of cases and only 7% occurred in the vertebral body.[6]

Patients with osteoid osteoma are usually younger and rarely present after 30years of age. Approximately half of all cases present between the ages of 10 and 20 years. The male: female ratio is 2-4:1. Local pain and tenderness is the presenting symptom in over 95% of cases. Scoliosis and torticollis may be presenting features in thoraco-lumbar and cervical spine regions.[5]

The complex spinal anatomy may make osteoid osteoma almost impossible to visualize on conventional radiography.[7] Radionuclide bone scanning is more reliable than conventional radiography. The intense osteoblastic activity within the nidus results in a focal uptake surrounded

by a decreased uptake owing to the sclerotic bone creating the 'Double density' sign that is typical.[8]

Radiographs are routinely done, but CT scan and bone scan are better imaging modalities compared to magnetic resonance imaging (MRI) as it delineates exact origin, size, location of tumor and is helpful in surgical excision.[9] On CT, the nidus appears as a well-defined, low density area with smooth borders and a mineralized center, often surrounded by reactive sclerosis.[2]

MRI usually shows edema in bone marrow and due to it, nidus is not well appreciated. It helps in assessment of tumor encroachment on spinal cord, nerve root and canal itself.4 On MRI, osteoid osteoma demonstrates a heterogeneous appearance. The calcification within the nidus and surrounding bony sclerosis are of low signal intensity on short TR and long TR images.[10] Hence, the nidus is usually less conspicuous on MR images than CT scans depending on the extent of calcification. In contrast, marrow edema and soft tissue inflammation are usually well depicted by MR imaging as high signal intensity on long TR images .[11]

Although the natural history of spinal osteoid osteoma may be one of spontaneous remission, early surgical intervention ensures immediate relief of pain, an early return of the spinal mobility and a return to daily activities within three months. Delay in treatment in the growing child resulted in a progressive scoliosis with significant vertebral rotation which resulted in a permanent structural scoliosis in some patients.[12]

Conclusion

An Osteoid osteoma of the spine must be strongly suspected in all young patients presenting with long standing back pain. CT scan ensures precise location of the lesion. Hence Surgical Removal of the lesion results in immediate relief of pain and early return of spinal mobility.

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