

Osteoid Osteoma of L4 Pedicle: A Novel Technique Of Intralesional Excision Without Creating Instability

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Citation

C Singh, A Shankar. *Osteoid Osteoma of L4 Pedicle: A Novel Technique Of Intralesional Excision Without Creating Instability*. The Internet Journal of Spine Surgery. 2006 Volume 3 Number 2.

Abstract

Study Design: A case report is being presented to highlight the fact that in cases of Osteoid osteoma of spine where RF ablation is not possible conventional surgery applied with concept of minimal invasive technique and preserving the structures give equally gratifying results

Objectives: To prove that in cases of tumor being close to neural tissue, Radio frequency ablation is ruled out, but intra lesional excision without fusion of spinal segment is possible

Summary of Background Data: Radiofrequency Ablation is now a standard treatment in case of osteoid osteoma in case where en- block resection is not possible, but even it has limitations and conventional surgery applied with concept of minimal invasive technique and preserving the structures give equally gratifying results

Methods: A review of literature and a case report is presented of a 16year-old girl with Osteoid osteoma of pedicle of L4 vertebra of spine, which was excised without creating instability at involved spinal segment, thus avoiding fusion and maintaining mobility at the segment.

Results: Excision of the nidus was confirmed by relief of symptoms, post excision computed tomography scans, and histologic evaluation on clinical and radiographic follow-up observation

Conclusions: The excision for osteoid osteoma of the pedicle of L4 with minimal bone resection and preservation of the posterior spinal structures helps in preserving the motion segment

INTRODUCTION

Osteoid Osteoma is a benign bone lesion with a nidus of less than 2 cm surrounded by a zone of reactive bone. Tumor may be found in any bone in the body. 10% of cases involve the spine. Lumbar spine is the commonest site (59%) with the neural arch being the usual location (75%). Osteoid osteoma has a distinct clinical picture of dull pain that is worse at night and disappears within 20 to 30 minutes of treatment with non-steroidal anti-inflammatory medication (normally Aspirin). The classic radiological presentation of an osteoid osteoma is a radiolucent nidus surrounded by a dramatic reactive sclerosis in the cortex of the bone. Radiography is the initial examination of choice and may not be the only examination required. CT is used for precise localization of the nidus and may be used for guiding percutaneous ablation. MRI is a useful imaging technique,

but CT appears superior for precise localization.

Radionuclide scanning for technetium-99m diphosphonate uptake shows fairly intense activity at the tumor site. The tumors may regress spontaneously. The mechanism of this involution is not known, but tumor infarction is a possibility. When the spinal column is involved, muscle spasms may cause abnormal alignment. A painful scoliosis may be concave toward the lesion. Kyphoscoliosis, torticollis, and exaggerated lordosis may also be seen. Osteoid osteoma has been called the most common cause of painful scoliosis. Definite neurological abnormalities are seen in 6.5% of patients with spinal osteoid osteomas. Although the natural course of osteoid osteoma is one of potential spontaneous remission over a period of two to eight years, spinal tumors usually are treated with en bloc excision because of the risk that the compensatory scoliosis will become structural. The purpose of the present report is to describe the case of a

patient who had a lumbar osteoid osteoma with a fairly typical presentation that was treated with a novel surgical approach

MATERIALS AND METHODS

CASE REPORT

A sixteen year-old girl presented with a six-month history of low-back pain that worsened with activity. She reported no history of trauma, weight loss, fevers, chills, sweats, or night pain. She had no neurological symptoms. Prior to presentation, she had been seen by two different physicians and one orthopedic surgeon for evaluation of her complaints. The medical and surgical histories were unremarkable. The patient had a negative family history for scoliosis and other vertebral deformities. The use of nonsteroidal anti-inflammatory medications had resulted in substantial pain relief in initial phase but now were of not much help.

Neurological examination was unremarkable with normal muscle strength. The laboratory findings were within normal limits. Radiographic evaluation of lumbosacral spine was essentially normal. (Fig. 1) MRI with T1 weighting (Fig. 2) demonstrated diffuse low signal intensity within the pedicle and lamina of L4 vertebra on the left side in the axial sections, No abnormal soft tissue component was seen. CT demonstrated sclerosis of the left pedicle surrounding a lytic lesion

Figure 1

Legend 1: Fig 1: X-ray of the Lumbo sacral spine, did not show any abnormality

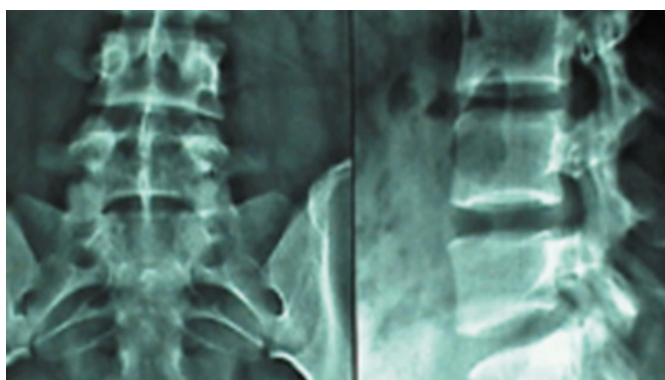
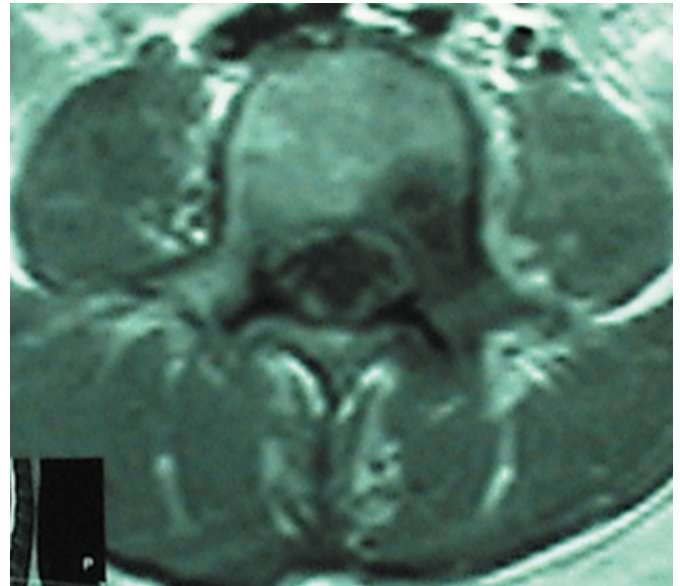


Figure 2

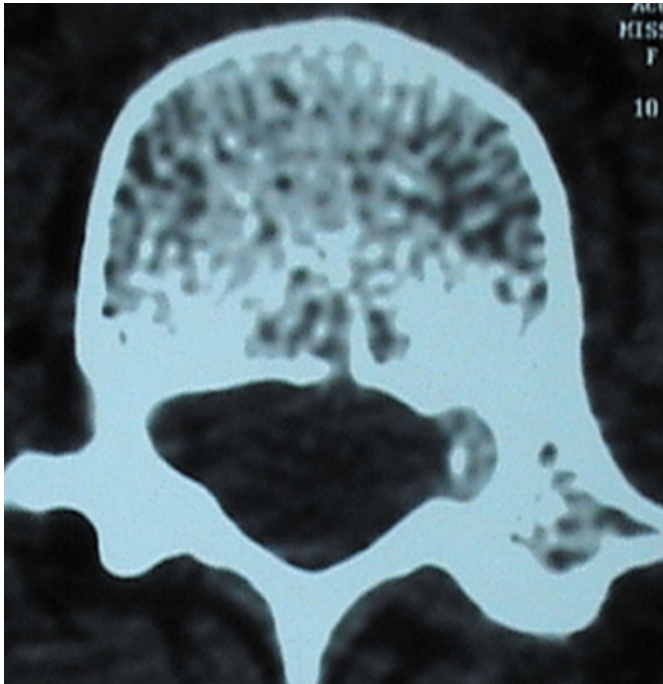
Legend 2: Fig2: MRI with T1 weighting demonstrated diffuse low signal intensity within the pedicle and lamina of L4 vertebra on the left side in the axial sections, No abnormal soft tissue component was seen.



Breaching the medial cortex into the canal with central calcific nidus (Fig. 3). The radiological diagnosis was osteoid osteoma. Since tumor was close to neural tissue Radio frequency ablation was ruled out and surgical excision was planned.

Figure 3

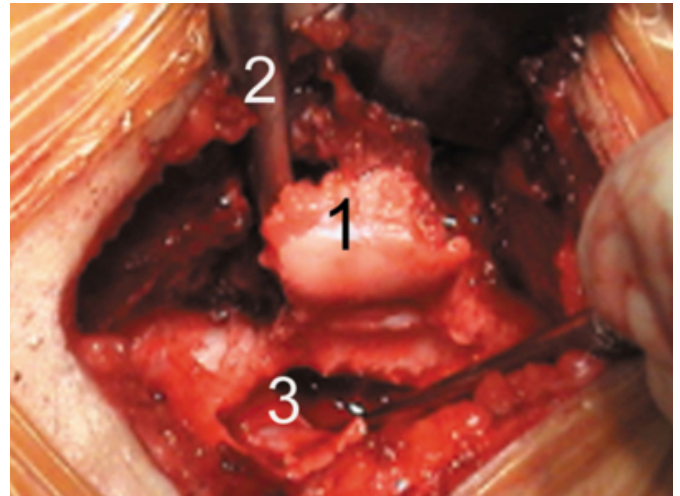
Legend 3: Fig 3: CT demonstrated sclerosis of the left pedicle surrounding a lytic lesion breaching the medial cortex into the spinal canal



Various options were discussed including drilling the pedicle, pedicle excision with fusion of segment, it was decided that drilling may not result in complete excision and fusion in a growing child will be an overkill. So we decided for excision without fusion. In prone position through a midline approach, the left L3-L4 space was identified and the facet joint exposed. The superior facet of L4 was partially detached and reflected laterally, exposing the left L4 pedicle. An interlaminar fenestration was done at the left L3-L4 space, the dura was retracted medially, and the medial cortex of the left L4 pedicle (tumor) was approached. Using a small curette, the tumor tissue was curetted out. At the same time, using a pedicle awl, a hole was made into the pedicle, and the medial hole and superior hole were interconnected. All the tumor tissue was taken out and sent for histopathological examination. The superior facet of L4 was brought back and sutured with Vicryl in its original place. (Fig 4) The patient was ambulated on the 2nd postoperative day with the help of a lumbosacral corset.

Figure 4

Legend 4: Fig 4: Showing the decompression 1: Superior facet of L4 reflected laterally 2: Pedicle awl in left L4 pedicle 3: Interlaminar space at L3-L4



RESULTS

Excision of the nidus was confirmed by complete relief of symptoms, post-excision computed tomography scans (Fig. 5), and histological evaluation. On clinical and radiographic follow-up observation, four months post-operative, the patient is completely pain-free and has a full range of spinal movement and is back to active sports.

Figure 5

Legend 5: Fig 5: Facet sutured back at its original place

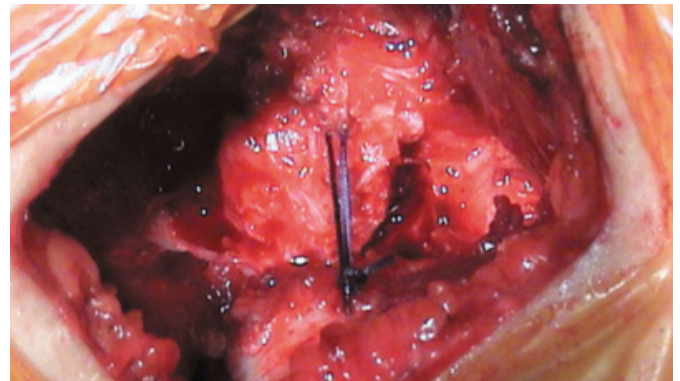


Figure 6

Legend 6: Fig 6: Post operative CT showing excised tumor and reconstructed facet joint



DISCUSSION

Described by Jaffe in 1935, osteoid osteoma is a benign skeletal neoplasm consisting of a highly vascularised nidus of connective tissue surrounded by sclerotic bone. The nidus is usually less than 15mm and when larger is classified as osteoblastoma. Osteoid osteoma comprises 10% of all benign bone tumors and only 1% of all spinal tumors [1]. 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. 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. The complex spinal anatomy may make osteoid osteoma almost impossible to visualize on conventional radiography [2]. 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 [3]. CT is the most reliable imaging modality in the diagnosis [4]. Typically dense sclerosis surrounding a lytic lesion that may have a central calcific nidus is noted. 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 [5]. In our opinion, removal of the nidus by open surgical technique remains a valid method of treatment for osteoid osteoma of the spine where Radio frequency ablation cannot be done. [6]. And in children preservation of spine segment is very important and thus with minimal exposure we can do away with fusion and instrumentation.

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