Case Report

Osteoid osteoma of the dorsal spine in 13-year-old boy: A case report with review of the literature

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ABSTRACT

Osteoid osteoma is a benign bony tumor characterized by presence of a nidus of osteoid vascular bone with dense sclerotic bone in its periphery. Osteoid osteomas comprises 10% of all benign bone tumors and 1% of all spinal tumors, with lumbar spine (60%) as the most common site, followed by cervical (27%) and thoracic spine (12%). A spinal osteoid oesteoma usually present as back pain localized around level of lesion. We reported a case of osteoid osteoma involving the dorsal spine in 13-year-old boy who presented with progressive backache for last 6 months. Spine is an uncommon site for this benign tumor, and these patients are usually symptomatically treated for nonspecific back pain. Magnetic resonance imaging is useful investigation but computed tomography scan appears as better investigation modality to study the extent, size and location of the osteoid osteoma in the spine. Most patients require direct surgical excision, curettage or percutaneous radiofrequency ablation to remove the lesion.

Key words: Osteoid osteoma, pediatric age group, spine

INTRODUCTION

Osteoid osteoma is a term coined by Jaffe[1] in 1935 to describe benign bony tumor characterized by presence of a nidus of osteoid vascular bone with dense sclerotic bone in its periphery. Osteoid osteomas comprise 10% of all benign bone tumors and 1% of all spinal tumors. 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] Osteoid osteoma is one of the most common cause of painful scoliosis.[4] Scoliosis 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]

We reported a case of osteoid osteoma of the dorsal spine in 13-year-old boy.

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CASE REPORT

A 13-year-old boy presented with 6 months 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 for months by treating physician. There was no family history of scoliosis and any other vertebral anomalies.

On examination, tenderness was present at dorsal spine 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 hyperopacity at pedicle of D10 level.

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Computed tomography (CT) of the dorsal spine revealed bony lesion originating from right pedicle of D10 vertebrae encroaching on cord and nerve root. Lesion had well-defined nidus surrounded by dense sclerotic bone in its periphery [Figure 1].

Decompressive surgery with en block excision of tumor was planned without fusion or instrumentation as dorsal spine is stabilized by ribs. Through midline approach, paraspinal muscles on right side were retracted. Lesion present on inferior aspect of right pedicle was removed without any injury to nerve root or dura along with interlaminar decompression without hampering stability of spine. Patient was mobilized on next day of surgery.

Histopathology confirmed the lesion as osteoid osteoma [Figure 2].

Patient had immediate pain relief after surgery with no postoperative neurological complication. Child was able to perform all normal activities and there was no instability sign on dynamic X-ray at 6 months of follow-up.

DISCUSSION

Jaffe[5] and Lichtenstein[6] in 1956, described the osteoblastoma. Most of the authors now believe that both osteoid osteoma and osteoblastoma are variant manifestations of a benign osteoblastic process. Histologically, both the lesions have similar appearance and consist of osteoid nidus surrounded by sclerotic bone. The difference between the two is that osteoblastomas are less sclerotic, but more expansile whereas osteoid osteomas are more sclerotic, less expansile and became painful earlier in their development.[4]

Osteoid osteoma is benign tumor and spine being the uncommon site.[2,3] Most commonly it involves the posterior elements of spine.[2,3,7] It usually present in first three decades of life. Osteoid osteomas are small with size < 2 cm, well confined, and self-limited in growth potential. Spine contribute around 1% of all cases with lumbar spine (60%) as the most common site, followed by cervical (27%) and thoracic spine (12%).[2,3]

Due to its atypical location and aproximity to neural tissue, back pain is most common symptom and developing scoliosis may be there. Developing scoliosis is because of muscular spasm secondary to inflammatory reaction around nerve root.[4] osteoid osteomas may present with neural deficit, but Kirwan *et al*.[8] did not find any neural deficit in his series.

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.[2] 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]

Histopathologically, it consists of highly vascularised nidus of size <15 mm surrounded by dense zone of sclerosis. Osteoblastoma is main differential diagnoses other than giant cell tumor and aneurysmal bone cyst as these two are very similar to osteoid osteomas clinically and radiologically.[7]

The recommended treatment is complete excision of tumor. However, complex spinal anatomy and its atypical

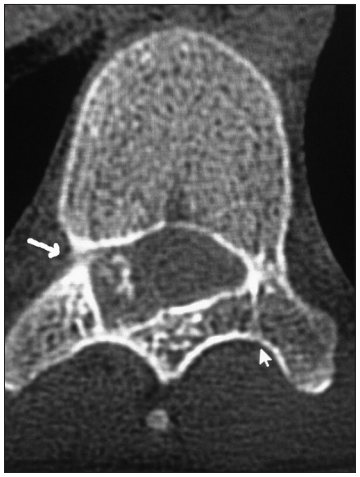

Figure 1: Computed tomography scan showing the lesion arising from right pedicle of D10 vertebrae, revealing well-defined nidus surrounded by dense sclerotic bone in its periphery (white arrow)

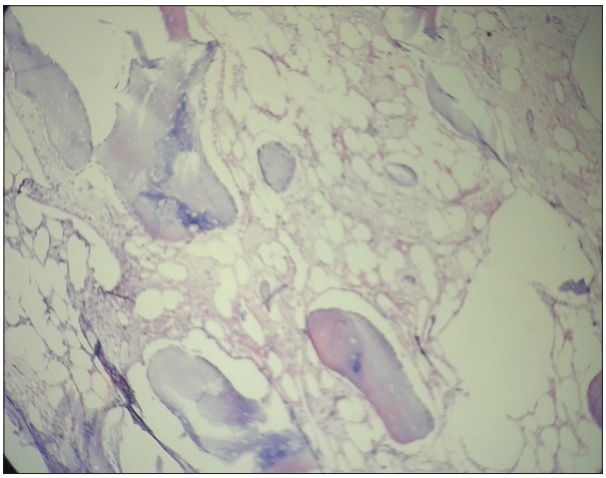

Figure 2: Photomicrograph revealing the vascular osteoid nidus surrounded by dense sclerotic bone (H and E, ×100)

location, there are chances of neurological deficit and dural tear during its removal, recurrence and postoperative instability.[4] Intraoperative/postoperative bone scan is investigation of choice to predict complete excision of tumor during surgery.[4,7] High frequency radiowave ablation is not preferred if tumor is close to neural tissue. Surgical excision of entire lesion can be expected to completely relieve pain and associated spasm.[7]

CONCLUSION

Spine is an uncommon site for this benign tumor, and these patients are usually symptomatically treated for nonspecific back pain. MRI is useful investigation but CT scan appears as better investigation modality to study the extent, size and location of the osteoid osteoma in the spine. Most patients require direct surgical excision, curettage or percutaneous radiofrequency ablation to remove lesion and definite diagnosis is made histologically.

Hence, osteoid osteoma of spine should be kept in mind if any young patient presents with persistent backache, painful scoliosis or radicular pain in lower limb.

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