Case Report

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Vascular Groove Sign in Osteoid Osteoma of the Vertebral Body

Mukesh Kumar, KrishnaKumar R[1]

Abstract:

Osteoid osteoma is a small, benign, painful tumor. Its size is the main distinguishing feature between osteoid osteoma and osteoblastoma and varies between 1.5 and 2 cm. Computed tomography (CT) is usually the best technique for imaging osteoid osteoma because the tomographic nature of the images makes it easy to visualize a lucent nidus, among the surrounding dense bone sclerosis. Vascular supply of osteoid osteoma tumor and nidus are well described. A new CT finding that is vascular groove sign is highly sensitive and specific for osteoid osteoma. It was found that most of this sign was seen in the long bones with very few in the flat bones and only one case of vascular groove sign in the body of the vertebra. A 15-year-old girl presented to us with complaints of lower back pain of 15 months; Pain was a dull-aching type which subsides by nonsteroidal anti-inflammatory drugs and reappears in the middle of the night. She was evaluated and diagnosed to have osteoid osteoma on CT scan with typical vascular groove sign in the vertebral body of L5, which is not mentioned in the literature to the best of our knowledge. Vascular groove sign is highly sensitive and specific for the diagnosis of osteoid osteoma by CT scan; this sign is mentioned mostly in the long bones with only one case in the lamina of the vertebra. We report a case with vascular grove sign in osteoid osteoma of the vertebral body of L5.

Keywords:

Computed tomographic scan, osteoid osteoma, vascular groove sign

Introduction

Osteoid osteoma is a small, benign, painful tumor. Its size is the main distinguishing feature between osteoid osteoma and osteoblastoma and varies between 1.5 and 2 cm.[1-5] Osteoid osteoma accounts for about 5% of all bone tumors and 11% of benign bone tumors.[6] It mainly affects adolescents and young adults.[7] It is characterized by pain which is continuous, not dependent on physical exercise, usually worse at rest, especially at night, and relieved by nonsteroidal anti-inflammatory drugs (NSAIDs).[8]

Computed tomography (CT) is usually the best technique for imaging an osteoid osteoma; the imaging picture is characteristic with a small round-to-oval radiolucent area ("nidus"), surrounded by a regular halo of bone sclerosis. Within the nidus, there may be a central and irregular nucleus of bone density, sometimes ring shaped.[9,10]

The study by Liu *et al*.[11] demonstrated a new CT finding that is vascular groove sign in osteoid osteoma. In their study of 42 cases, they found most of the sign in the long bones with very few in the flat bones and only one case of vascular groove sign in the lamina of the vertebra.

We report a case of osteoid osteoma of the vertebral body of L5 with vascular groove sign in the CT scan image.

This patient was referred to the department of interventional radiology, and radiofrequency ablation was done and she relived from the symptoms.

Department of Orthopaedics, Mehndiratta Hospital, Ambala, Haryana, [1]Department of Orthopaedics, Division of Spine, AIMS, Kochi, Kerala, India

Address for correspondence:
Dr. Mukesh Kumar, Department of Orthopaedics, Mehndiratta Hospital, Ambala - 134 003, Haryana, India.
E-mail: mukeshmedico@gmail.com

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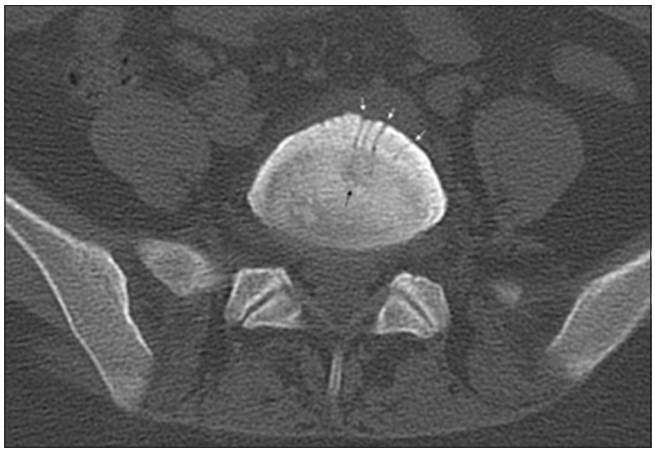

Figure 1: Computed tomography scan axial image of the L5 vertebral body showing (with arrow) multiple grooves

Figure 2: Computed tomography scan sagittal image of the L5 vertebral body showing (with arrow) multiple grooves in the lower part of body

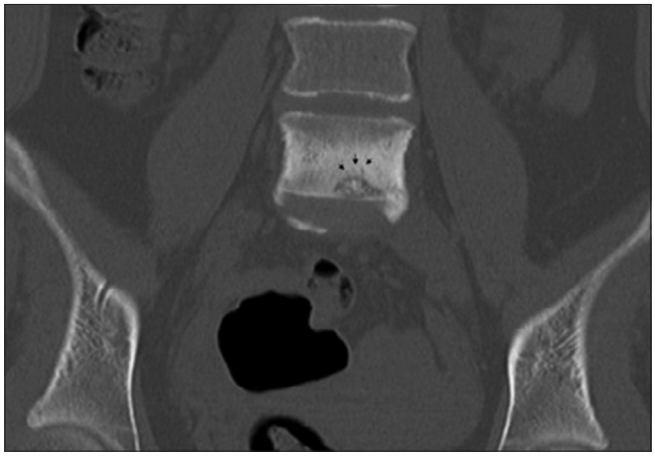

Figure 3: Computed tomography scan coronal image of the L5 vertebral body showing (with black arrow head) multiple grooves in the lower part of vertebral body

Figure 4: Bone scan showing increased uptake in the L5 vertebral body

Case Report

A 15 years old girl presented to us with complaints of lower back pain of 15 months; there was no history of radiation of pain, numbness or weakness of the limb, and bowel or bladder habit disturbance. Pain was a dull-aching type which subsides by NSAIDs and reappears in the middle of the night.

For these complaints, she was consulted in a nearby hospital where magnetic resonance imaging (MRI) of the lumbosacral spine was done and was started on antituberculosis treatment; the patient had temporarily relief of pain but aggravated after 3 months; the patient was reevaluated with MRI scan and was assured in view of similar findings on MRI. Since the pain was persisting, so parents consulted in other hospital where again MRI of the lumbosacral spine was repeated in view no clinical findings. MRI reported as similar findings, so the patient was referred to clinical psychology.

She reported to us with a similar history of low back pain, which subsides on NSAIDs and associated night pain. In view of typical history, we suspected as a case of osteoid osteoma, and a second opinion of radiologist regarding MRI was taken who is consisted with osteoid osteoma as probable diagnosis and was advised to do CT scan.

In CT scan, we found the vascular groove sign which is specific for osteoid Osteoma [Figures 1-3], and the bone Scan [Figure 4] was done to add in the diagnosis.

This patient was referred to the department of interventional radiology, and radiofrequency ablation was done and she relived from the symptoms.

Discussion

Osteoid osteoma is a small, benign, painful tumor. Its size is the main distinguishing feature between osteoid osteoma and osteoblastoma and varies between 1.5 and 2 cm.[1-5] Osteoid osteoma accounts for about 5% of all bone

tumors and 11% of benign bone tumors.[6] CT is usually the best technique for imaging an osteoid osteoma. The imaging picture is characteristic with a small round-to-oval radiolucent area ("nidus"), surrounded by a regular halo of bone sclerosis. Within the nidus, there may be a central and irregular nucleus of bony density, sometimes ring shaped.[9,10]

de Chadarévian *et al*.[12] critically analyzed the vascular supply of osteoid osteoma tumor and found that a prominent arterial and arteriolar blood supply was a constant finding within the various zones of soft tissues, skeletal muscle, and bone surrounding the nidus.

Liu *et al*.[11] demonstrated a new CT finding that is vascular groove sign in osteoid osteoma. In their study of 42 cases, they found most of the sign in long bones with very few in the flat bones and only one case of the vascular groove sign in the lamina of the vertebra. The sensitivity of the vascular groove sign for the detection of osteoid osteoma was 73.8% for reader 1 and 76.2% for reader 2; the specificity was 96.6% for reader 1 and 89.7% for reader 2; the positive predictive value was 96.9% for reader 1 and 91.4% for reader 2.[11]

Conclusion

Vascular groove sign is highly sensitive and specific for the diagnosis of osteoid osteoma by CT scan; this sign is mentioned mostly in the long bones with only one case in the lamina of the vertebra. We report a case with vascular grove sign in osteoid osteoma of the vertebral body of L5.

Clinical massage

Vascular groove sign is highly sensitive and specific for CT scan-based diagnosis of osteoid osteoma in the long bones as well as in the vertebra.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their 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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