Osteoid osteoma of the spine
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Section: Paediatric radiology
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Patient: 13 years, male

Clinical History:

A 13 year old male basketball player was referred to our department for an MRI examination due to a long-standing low back pain (for 12 months). However, due to patient's claustrophobia a CT examination was finally performed.

Imaging Findings:

A 13 year old male basketball player was referred to our department for an MRI examination due to long standing low back pain (for a period of 7 months). No specific characteristics of this pain were initially described and symptoms receded with antianalgetic (NSAID) drugs. Patient's symptoms were initially attributed from the team's doctor to intense practising. Physiotherapy and rest were also proposed at that time. Plain x-ray at the onset of the symptoms was negative. However, pain was not fully regressed during the last seven months and even worsened during the last month (especially during night sleep). Limping and scoliosis were also appeared. An MRI examination of the lumbar spine was then proposed.

Due to claustrophobia the patient finally underwent a CT examination of the lumbar spine. A lytic lesion measuring 1.6 cm was demonstrated at the inferoposterior aspect of the LT side of neural arch of L4 vertebra (Fig 1,2). Calcified focies at the center of the lesion, as well as slight expansion and hazy sclerosis of the adjacent bone were also demonstrated (Fig 3). Osteoid osteoma was proposed as the final diagnosis. Surgical removal of the lesion was performed with full regression of patient's symptoms immediately after the surgery.

Discussion:

Vertebral osteoid osteoma is a very rare entity. It represents a benign tumour, characterized by a nidus of osteoid/woven bone in vascular tissue, surrounded by an area of reactive sclerosis [1]. Although osteoid osteoma's origin remains blurred it is well known that it is a benign, highly vascular, osteoblastic proliferation [1]. Only 10% of all osteoid osteomas are encountered in the spine, and lumbar spine is the most commonly affected site (59%), followed by cervical spine, thoracic spine and sacrum (27%, 12% and 2%, respectively) [5]. It usually arises at the posterior elements (75%), particularly the lamina (33%), articular facets (19%) and pedicle (15%). Lesion located on the vertebral body is extremely uncommon (7%) [5]. 80% of cases occur between 5 and 25 years of age [6].

Almost all patients complain of local back pain, worsening during the night which may regress with salicylates. Osteoid osteoma should be highly suspected when back pain and scoliosis appear in adolescents/young adults. Painful scoliosis is a typical symptom and can be accompanied by gait disturbances, radicular pain (6%) or, when neglected, even limb atrophy [1,4]. Spinal radiographs are often negative due to lesion's small size and complex anatomy of the spine [4]. CT is the best imaging method for identifying the nidus, which usually is a well defined round or oval low density area, with various degrees of surrounding bone changes, ranging from mild cancellous sclerosis to exuberant periosteal reaction. Sometimes in the centre of the nidus, calcifications may be present in such a degree that may occupy almost the whole nidus, representing mineralized osteoid [5]. Contrast
administration results in significant nidus enhancement corresponding to the high vascularity of the lesion. MR appearance is generally non specific. On T1W-images the nidus is of low to intermediate sign intensity, though on T2WI it appears with intermediate to high signal intensity, except when the nidus is completely mineralized and presents with low signal intensity on all pulse sequences. Dynamic T1 Contrast enhanced imaging reveals peak enhancement during arterial phase and early partial washout [1,2]. Angiographic findings are usually an intense blush of the nidus during the arterial phase that persists during venous phase. Malignant transformation has never been referred, neither growth progression. On the contrary spontaneous regression is not so uncommon [1]. Differential diagnosis of osteoid osteoma includes primarily osteoblastoma, which is larger (>2-2,5 cm), and usually presents size progression during years. Osteoma is never characterized by a nidus or surrounding periosteal reaction or increased activity on bone scanning. Enostosis, which is also cold on bone scan, is differentiated by its thorny radiations and its low signal on T2WI MR images. Differential diagnosis from vertebral Brodie’s abscess may be more difficult, but clinical and laboratory data of osteomyelitis may be helpful [1]. Surgical en-block resection of the nidus is the preferred method. CT-guided percutaneous removal or radio-frequency ablation are alternative methods, with satisfying results [1,3,4].

**Differential Diagnosis List:** Osteoid osteoma

**Final Diagnosis:** Osteoid osteoma

**References:**


Description: Origin:
Description: A lytic lesion measuring 1.5 cm at the inferior-posterior aspect of the L4 neural arch with calcified foci at its center and hazy sclerosis of the adjacent bones (extending to the vertebral body).
Origin:
Description: Bony expansion and hazy sclerosis of the LT posterior elements of L4. Origin: