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RESEARCH ARTICLE

AN ODD GIANT CELL TUMOR OF THE ILIAC BONE

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Abstract

Giant cell tumors of the bone are benign primary tumors, that can be locally aggressive causing recurrence and metastasis.They are most commonly located in long bones, and uncommonly in the pelvic bones.We report the case of a young female patient admitted for a mass in her left hip, to which imaging showed an iliac bone tumor and biopsy confirmed the diagnosis of a giant cell tumor of the iliac bone.

Introduction:-

Giant cell tumors of the bone (GCTB) are benign primary tumors with an aggressive potential, commonly found in patients in their 20-40s, with a slight feminine predominance.

They are seen within the metaphysis or epiphysis of long bones, and uncommonly in flat bones.

We describe the case of a young patient admitted for a mass in her left hip, to which imaging showed an iliac bone tumor and biopsy confirmed the diagnosis of a giant cell tumor of the iliac bone.

Case Report:

A 26 years old female patient, without any medical history records, consulted for a painful voluminous mass of her left hip, that had been growing for approximatively 4-5 years.

A required thoraco-abdominal CT-scan showed a voluminous heterogeneous mass of the left iliac bone, without any other suspicious lesion. Biological tests were normal. The patient underwent a bone biopsy to which a giant cell tumor was retained. Because the tumor was not resectable, a treatment with Denosumab had been chosen.

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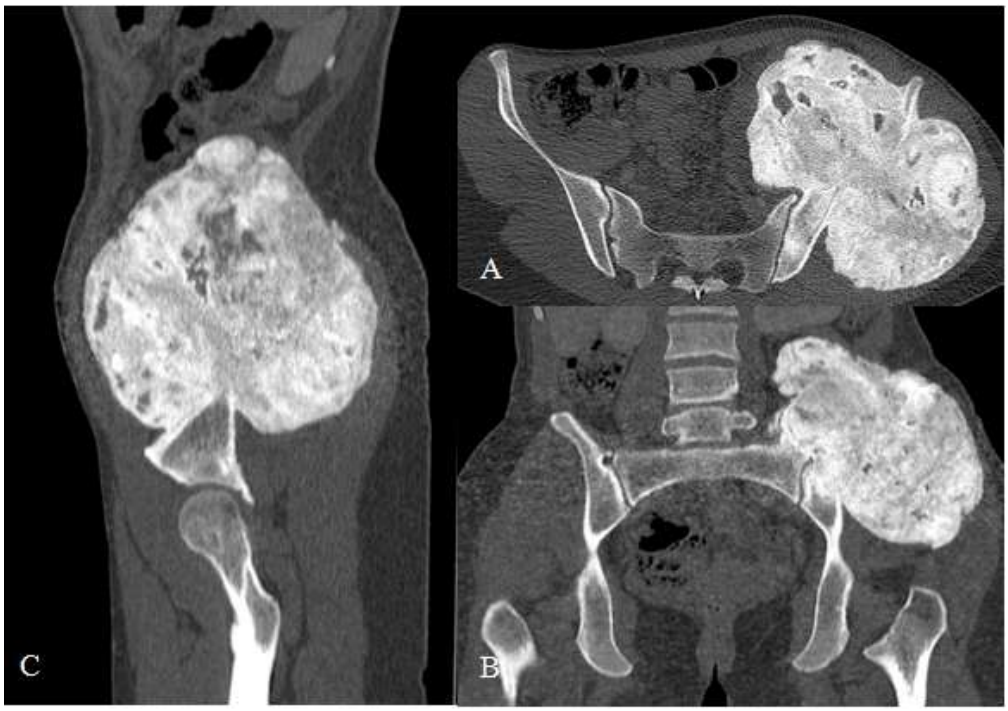

Figure 1:- Abdominal CT scan in axial (A) coronal (B) and sagittal (C) reconstructions, showing a well-circumscribed voluminous heterogenous left iliac bone tumor, both condensing and lytic.

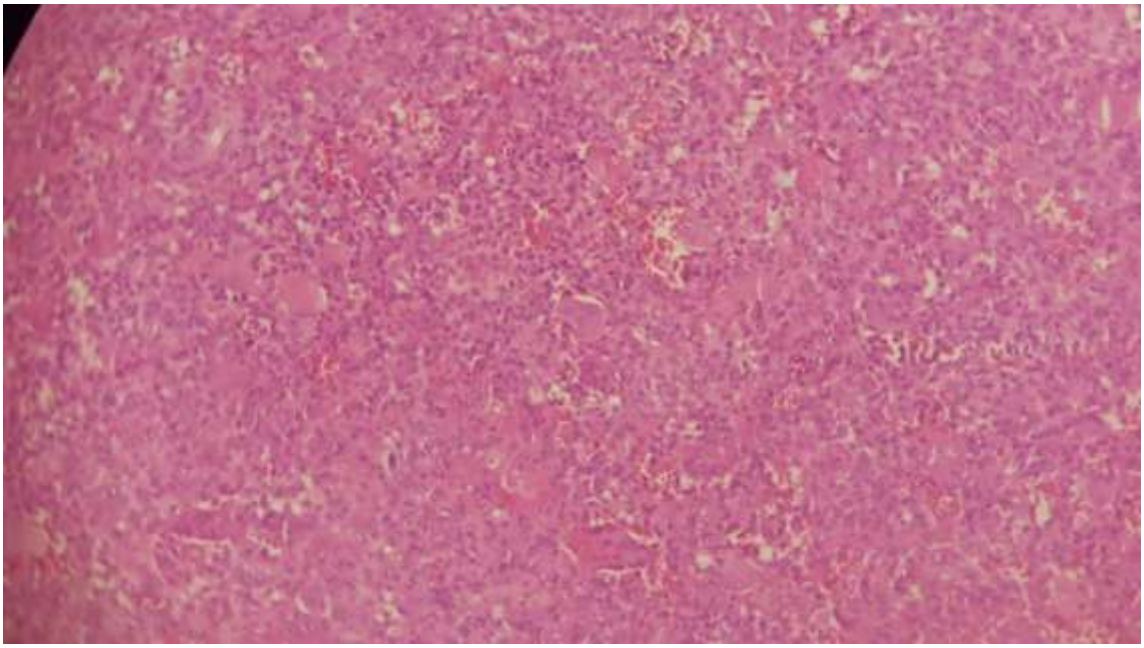

Figure 2:- Image of microscopic examination (H&E stain, x20), revealing the presence of multinucleated giant cells dispersed around mononuclear cells in favor of a giant cell tumor.

Discussion:-

The giant cell tumor of the bone is a benign primary bone neoplasm with an aggressive potential, it has been classified by the World Health Organization (WHO) as "an aggressive potentially malignant lesion". [1]

It represents 4-5% of primary bone tumors [2] and 15-20% of all benign tumors. [3]

It affects women slightly more than men, with a sex ratio of 1.3-1.5 to 1 [3] , And usually appears at the age of 20-45 years old. [2]

Its most common location is the metaphysis or epiphysis of long bones with a 50-65% knee predominance [4] including distal femur (23-30%) and proximal tibia (20-25%), à 10-12% predominance for distal radius, a 4-9% predominance for the sacrum and a 4-8% predominance for proximal humerus. [5]

It uncommonly develops in pelvic bones with only 1.5-6% incidence. [6], [1] A study by Zheng et al. on 165 patients in a period of 45 years, showed that the most frequent pelvic bone localization is the acetabular region then the iliac region then the pubic and ischial region with a ratio 2:1.5: 1. [7]

Other rare localizations include: vertebral bodies (3-6%), Hand and wrist (1-5%) and foot (1-2%). [5]

Giant cell tumors contain mononucleated cells and osteoclast-like multinucleated giant cells, formed by a fusion of stromal cells and monocytes. These multinucleated giant cells express a receptor activator of nuclear factor kappa-B (RANK) and the RANK ligand (RANKL) is a mediator of osteoclast activation. [6]

Clinical symptoms of discovery are non-specific and can range from pain, to soft tissue swelling, palpation of a mass, or a decrease of joint motion.

Usually, these tumors are asymptomatic and are only discovered at a stage where they are large or vascular. [6]

Imaging modalities include X-rays, CT-scan, MRI, and a body scan. It appears as a well-circumscribed lytic lesion, with geographical appearance and a narrow transition zone, but without sclerotic margins on the opposite of most benign tumors.

The lesion doesn't contain any matrix calcifications, periosteal reaction or new bone formation.
it is usually eccentric in the metaphysis or epiphysis extending to the sub-chondral bone.

The CT-scan allows a better assessment of the lesion than a plain X-Ray, it also allows an evaluation of the chest, to look for metastasis.

The MRI allows an evaluation of its extension to soft tissue, to the adjacent joint or to neurovascular structures. Nonetheless, its findings are non-specific, showing a well-defined heterogenous lesion with cystic changes, with low signal intensity on T1 weighted sequences, and an intermediate signal intensity on T2 weighted sequences.

An atypical radiological feature includes presence of ossification and calcification reflecting calcium deposition and bone repair after bone destruction. [8]

The body scan helps look for multicentric GCTB, but the decrease in the uptake of the radiotracer found within the center of the tumor in not specific of GCTB. [4] [3]

The giant cell tumor is solitary and benign in 80% of the cases [1], It is rarely multicentric (less than 1%) and can be therefore even more aggressive. [3]

Metastasis rate is estimated to 1-4%, occurring most frequently in the lungs. [1]

Diagnosis of this tumor is confirmed histologically through a biopsy, that shows multinucleated giant cells with 3 different cell types: either giant cell tumor stromal cells of osteoblastic origin, or mononuclear histiocytic cells, or, multinucleated giant cells of an osteoclast-monocyte lineage. [3]

GCTB's treatments are very diverse, and the surgical treatment is the most preferred, especially for pelvic GCTB.
Treatment options are either:

Surgical:
aggressive curettage, cement filling, or en bloc resection of the tumor with a prosthetic reconstruction or a bulk allograft. [6]

Medical:
Bisphosphonates and denosumab.

Radiotherapy.
Or **arterial embolization.**
Denosumab has become an extremely useful treatment for unresectable GCTB with a 90% positive response, it is a monoclonal antibody specific for a receptor activator of nuclear factor kappa-ligand (RANKL), inhibiting the osteoclastic activity of the osteoclast-like multinucleated giant cells, leading to tumor reduction and bone reformation. [2], [4]

Although treatment has good responses, recurrence rate is up to 35% [3], with a 10% risk of malignant transformation at recurrence.

It mainly depends on the anatomical site of the lesion, its resectability, and the type of surgical treatment performed: a simple curettage or wide resection. [6]

Conclusion:-

Giant cell tumors are benign primary neoplasms of the bone than can be locally aggressive. They are mostly found within young patients with an age range from 20 to 45 years old, and the pelvic location of GCTB is uncommon.

Imaging usually shows a well-defined lytic lesion without sclerotic margins, and although the lesion doesn't have a specific appearance, imaging allows locating it, precising its local extension, recurrence, and the presence of metastasis or a multicentric GCTB.

Diagnosis is confirmed histologically.
The preferred treatment is surgical, and Denosumab has shown good responses to patients with unresectable tumors.

Conflicts of Interest:
No potential conflict of interest relevant to this article was reported.

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