

Paget's Bone Disease - A Different Case of Pain

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Abstract: *Paget's bone disease is a chronic pathology that affects the osseous turnover, with favourable prognosis if treated early. Most patients are asymptomatic, but pain is a frequent clinical manifestation. The authors present a case of a patient, with a mechanic lumbosciatalgia, with 4 months of evolution, progressive worsening on the previous days, at the time with inflammatory component. He had a lumbar-sacred CT-scan revealing "grossly trabecular areas alternating with lytic areas on D11, L2, L5 and sacrum, evoking vertebral angiomas but not excluding infiltrative lesion" and blood samples with increased Sedimentation Rate (SR), Alkaline Phosphatase (AP) and β -2-Microglobulin, and an electrophoretic proteinogram with β -2-Mycroglobulin peak. He was hospitalized and performed a bone scintigraphy that revealed multiple increased uptake lesions, and analysis that showed an increase in Bone AP and Collagen Telopeptides. Correlating clinical findings, imaging, analysis and excluding other diseases the diagnosis of Paget's Bone Disease was established.*

Keywords: Paget Disease of bone; Quality of Life; Pain; Byposphonates

1. Introduction

Paget's Bone Disease is a chronic pathology that affects bone turnover, with greater prevalence on males and increasing with age^{1,2,3}. Most cases are asymptomatic, and identified by radiographic alterations, Alkaline Phosphatasys (AP) elevation, or by pain^{3,4}. The preconized therapeutic is based in anti-resorptive agents, namely bisphosphonates, in symptomatic patients^{4,5}.

2. Case

A 78 years old male referred a lumbago irradiating to both lower limbs with several months' evolution and worsening during the previous two weeks and a cervicobrachialgia and right omalgia. Initially the pain worsened with movements and relived with rest, but at observation was present during rest.

In the physical examination there was spontaneous pain on the lumbar region, irradiating through the lower limbs. The pain worsened with movements. There were no sensitivity alterations. The cervicobrachialgia and omalgia were present with movements.

The following ambulatory exams were available:

- Lumbar-sacred Computed Tomography (CT): "on the vertebral bodies of D11, L2, L5 and on the sacrum grossly trabecular zones alternating with lytic areas (...)."
- Blood analyses with normal hemogram and leucogram, elevated Erythrocyte Sedimentation Rate (ESR) - 59mm, electrophoretic proteinogram with a beta-globulin peak (16, 3%), elevated AP - 382 IU/L (25-100), elevated Beta-2-microglobulin - 2183mg/L (0.8-2.2), and mildly elevated C Reactive Protein (CRP) - 3-, 113mg/dL (<0.5).

The hypothesis of mielomatous infiltration or secondary neoplasia was admitted, and the patient hospitalized.

Initial analyses maintained the SR elevation -52mm, elevated AP - 415IU/L, elevated ferritin - 1037ng/mL (22-

322) and CRP of 2, 73mg/dL. A thoracic (FIG. 1) and shoulder (FIG. 2) radiography revealed no alterations.



Figure 1: Thoracic radiography

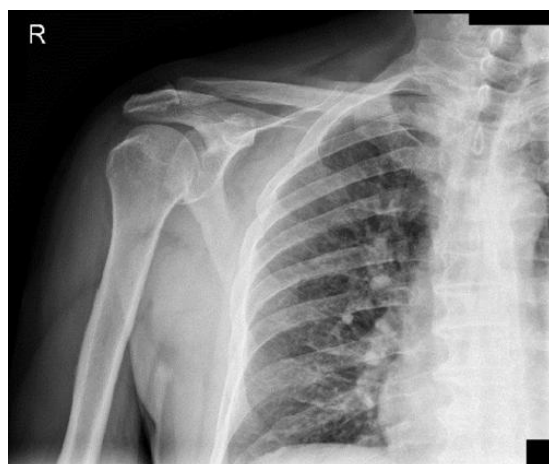


Figure 2: Shoulder radiography

A Thoracic-abdominal-pelvic (TAP) CT and prostatic echography were requested. The TAP-CT (FIG. 3) identified

“alterations of the osseous structure suspicious of metastatic lesions found at D11, L2, L5, Sacrum and both iliacs.”

The prostatic echography was normal.

A Bone Scintigraphy was requested, and Collagen Teloptides, Hidroxirolin and Osseous AP were also requested, for the study of an eventual Paget’s bone disease.

The bone scintigraphy (FIG. 4) revealed “multiple increased uptakelesions including practically every headbone, D5, D6, D8, D10, D11, L2, L5 and Sacrum. The pelvis bones are homogeneously affected. Similar anomalies comprising both clavicles and the sternal manubrium. Typical pattern of Polyostotic Paget’s Disease.”



Figure 3: TAP-CT

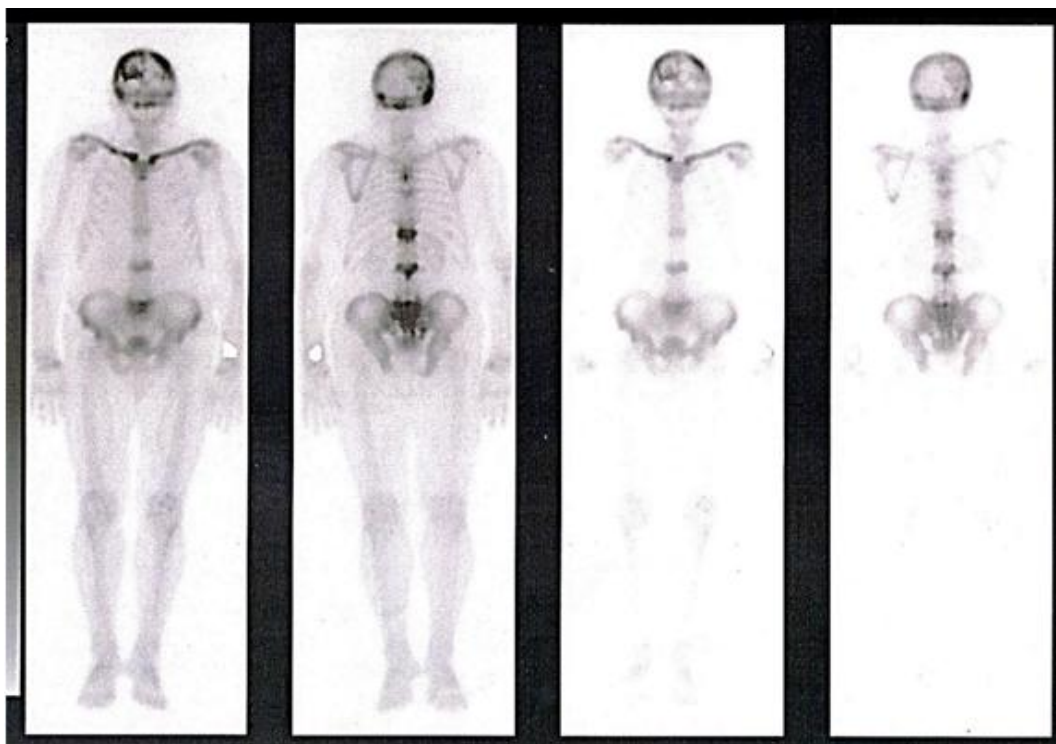


Figure 4: Bone Scintigraphy

Since the patient maintained pain, transdermal fentanyl was initiated.

A myelogram and bone biopsy excluded Multiple Myeloma (MM).

The patient was discharged with the likely diagnosis of Paget’s Bone Disease, medicated with Fentanyl, Magnesium Metamizole and Paracetamol, with a consult scheduled.

On the consult the dosing of Hydroxyproline - 31, 3 (< 42), Type I Collagen Teloptides - 816 (3 – 63), 0, 97 after 1/5 dilution (<0, 7) and Bone AP – 161, 1 U/L (15 – 41, 3), were available and were compatible with the diagnosis. Zoledronic Acid, Calcium Carbonate and Colecalciferol were initiated.

8 months later the improvements of algic complaints was notorious, with normalization of the AP levels (79IU/L, initially 382 IU/L).

3. Discussion

Paget's bone disease has a greater prevalence on males, increasing with age, and more frequent on the occidental Europe^{1,4}. It affects bone turnover in sparse noncontiguous areas of the osseous system, increasing the number and activity of osteoclasts, and thus bone resorptive areas and resorptive rate, with hypervascularization^{1,2,4}. Sequentially an increase on the osteoblastic activity occurs, changing the bone matrix pattern^{1,4}. Finally, a sclerosis stage occurs, with reduction of bone resorption and formation of harder, denser and less vascularized bone¹. Frequently all the phases are observed in different parts of the skeleton, and in the absence of Calcium or Vitamin D deficiency the bone mass keeps within normal range or increased^{1,4}.

Most patients are asymptomatic and diagnosed by the elevation of AP or radiographic findings^{1,2,5}. The most frequently affected places are the pelvis, vertebral bodies, skull, femur and tibial bone, being pain the most frequent manifestation, either through bone hypervascularization, expanding lytic lesions, fractures, bone deformity, nervous structures compression or articular surface degenerative alterations^{1,2,4}. The incidence of malignancy on disease affected bone is low^{1,2,4,5}. Cardiovascular complications due to bone hypervascularization, although rare, may occur^{1,2,4}. Calcification on vascular structures have been associated with Paget's bone disease^{1,2}.

Although less specific, bone scintigraphy is more sensible than radiography on the identification of active lesions^{1,2,3,4}. CT scans may be necessary for the evaluation of fractures, and Magnetic Resonance Imaging (MRI) for the evaluation of neoplasia.^{1,2,3,4}

The biochemical evaluation allows the diagnosis and monitorization of the disease's evolution, through dosing of elevated bone resorption and osteosynthesis markers¹. To most patient's total serum AP is a good marker of disease activity and treatment response. Some with normal serum AP may require bone specific AP^{1,2,5}.

Paget's bone disease has a good prognosis if diagnosed and treated before major bone alterations occur^{2,3,5}.

Treatment prevents chronic pain, bone deformity and reduces the risk of fracture, being mandatory in symptomatic patients and adequate in asymptomatic patients with structures of high risk involved (long bones, vertebrae and skull)^{3,4}. Drug therapy consists of second generation bisphosphonates⁵. Calcium and Vitamin D supplementation should be performed to avoid hypocalcemia during treatment^{3,5}.

The presented case reports a Paget's Bone Disease typical presentation with pain and the characteristic lesions throughout scattered noncontiguous areas of the osseous system¹.

This case highlights the possibility to improve the patient's quality of life by minimizing pain, and how by the knowledge of the underlying physiopathology reduction of polypharmacy and medication costs can be achieved^{3,4}.

4. Learning Points

In the presence of pain and osseous lytic lesions the possibility of a Paget's bone disease should be considered, particularly in ageing males

Treatment helps to prevent complications and improves Quality of life.

5. Conflict of Interest

The authors declare no conflicts of interests.

References

- [1] **Dan L. Longo, et. al.** *Harrison's Principles of Internal Medicine, 18e*. United States of America : The McGraw-Hill Companies, Inc., 2012. 978-0-07174889-6.
- [2] **Griz L, Fontan D, Mesquita P, et al.** Diagnosis and management of Paget's disease of bone. *Arq Bras Endocrinol Metabol*. 2014; 58: 587-599.
- [3] **Ferraz-de-Souza B, Correa PHS.** Diagnosis and treatment of Paget's disease of bone: a mini-review. *Arq Bras Endocrinol Metabol*. 2013; 57: 577-582.
- [4] **White G, Rushbrook J.** Paget's disease of bone. *Orthopaedics and trauma* 2013; 27: 254-265.
- [5] **Seton M.** Paget disease of bone: Diagnosis and drug therapy. *Cleve Clin J Med*. 2013; 80: 452-462.