Scholars Journal of Medical Case Reports

OPEN ACCESS

Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com/sjmcr/

Paget's disease of Pelvis Mimicking Metastasis in A Patient with Prostate Cancer

Y. Zouine*, C. Gakosso, B. Boutakioute, M. ouali idrissi, N. Cherif idrissi ganouni

Department of Radiology ARRAZI Hospital, UHC Mohammed VI, Marrakesh

DOI: 10.36347/sjmcr.2023.v11i06.025 | **Received:** 31.08.2020 | **Accepted:** 08.09.2020 | **Published:** 10.06.2023

***Corresponding author:** Yousra Zouine
Department of Radiology ARRAZI Hospital, UHC Mohammed VI, Marrakesh

Abstract **Case Report**

Paget's disease of bone is a benign disease, of uncertain etiology, characterized by an accelerated turnover, that is, bone resorption and formation. Paget's disease may be present in up to 5% of the population, and the majority of cases are asymptomatic. We report the imaging findings of Paget's disease of pelvis discovered incidentally in a 70 year old patient with prostatic adenocarcinoma, who underwent an MRI (magnetic resonance imaging) for the staging of his disease and revealed extensive marrow signal abnormalities at the left pelvic bone. Biochemical tests revealed normal serum calcium and phosphorus with markedly raised alkaline phosphatase. X-RAYS and CT SCANS of the pelvis show cortical and trabecular thickening of the left iliac bone that are typical for this disease. Furthermore, increased uptake noted in left hemipelvis suggestive of Paget's disease on the scintigraph. After the treatment the uptake in left hemipelvis remains same confirming Paget's disease.

Keywords: Paget, Bone, Computed tomography, Magnetic resonance imaging.

INTRODUCTION

Paget's disease of the bone (PDB) is a focal metabolic bone disorder characterized by the presence of localized areas with increased bone resorption associated with exuberant, but disorganized bone formation [1]. Although almost any bone can be affected, PDB generally involves the axial skeleton; skull, spine and pelvis are the most frequent sites [2]. It is now known that Paget's disease of the bone is a noninflammatory, metabolic disorder of unknown etiology. The diagnosis is usually radiological, by means of plain radiography [3]. Two distinct forms of PDB do exist: Monostotic, if a single bone is involved, and polyostotic if several bone areas are affected [4].

Cases of coexisting PDB and malignancies may represent a diagnostic dilemma during evaluation of patients affected by a cancer, since radiological features can mimic those of bone metastases [5].

We report a case of a patient affected by prostatic cancer who presented with PDB of the bone.

CASE REPORT

B.M is a 70 year old patient, who presented dysuria and no other symptoms, his physical exam showed an indurated prostate. He had an elevated level of serum prostate-specific antigen PSA of 7.2 ng/ml and underwent a prostate biopsy that confirmed the diagnosis of prostatic adenocarcinoma. The MRI (magnetic resonance imaging) for the staging of his disease revealed extensive marrow signal abnormalities at the left pelvic bone (Figure-1). Biochemical tests revealed normal serum calcium and phosphorus with markedly raised alkaline phosphatase 1,010 IU/L (normal 115–359). X-RAYS and CT SCANS of the pelvis show cortical and trabecular thickening of the left iliac bone (Figure 2 & 3). Furthermore, increased uptake noted in left hemipelvis suggestive of Paget's disease on the scintigraphy. The PDB diagnosis was highly suspected but the prostate cancer with bone metastasis couldn't be formally excluded. After the treatment there was a good response of the prostatic process and a stable uptake in left hemipelvis confirming Paget's disease.

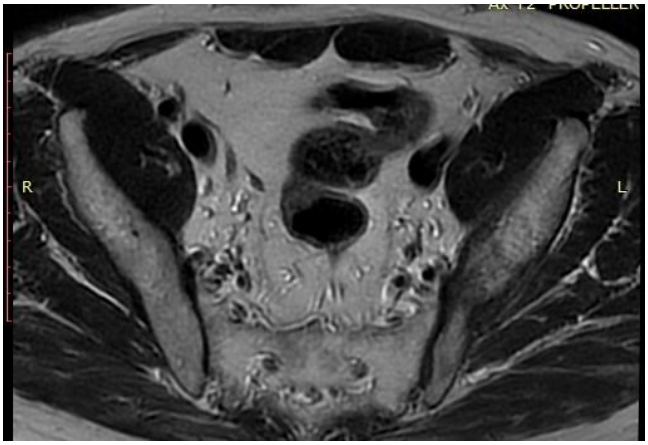

Fig-1: Heterogeneous T 2 marrow signal intensity, cortical thickening, and expansile remodeling of the left iliac bone

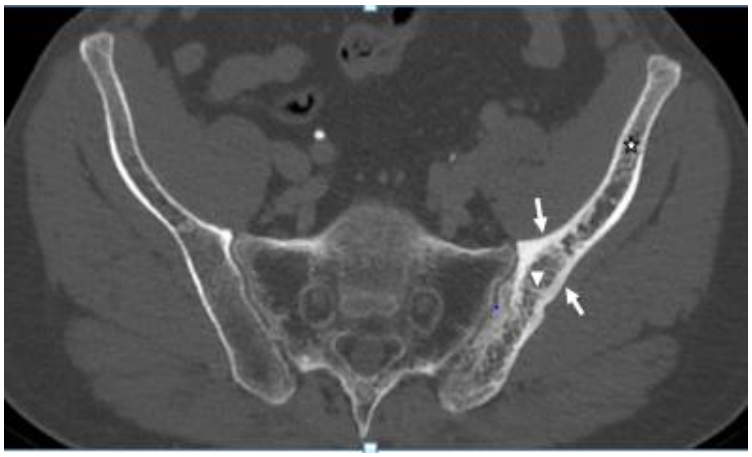

Fig-2: Axial CT scan of the pelvis shows cortical (large arrows) and trabecular (small arrows) thickening of the left iliac bone with maintained yellow marrow (star)

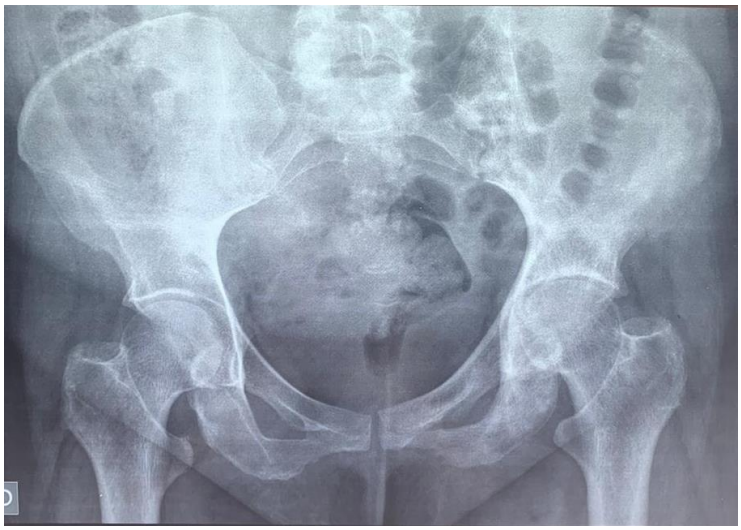

Fig-3: Thickening, sclerosis and increased trabeculation of the whole of the left hemi-pelvis

DISCUSSION

PDB (osteitis deformans) is characterised by excessive bone resorption in focal areas followed by abundant new bone formation, with eventual replacement of the normal bone marrow by vascular and fibrous tissue [6].

In PD the loss of homeostatic control leads to increased osteoblastic and osteoclastic activity and constitutes the background for the main three phases. The initial lytic phase represents a mainly osteoclastic activity, the late osteoblastic phase is characterised by new bone formation, while the intervening mixed phase is seen when there is a combination of osteoblastic and osteoclastic activities [7, 8].

The diagnosis of the disease is based as a whole on clinical presentation, radiological findings and Markedly elevated serum alkaline phosphatase (ALP) is a constant feature while calcium and phosphate levels are typically within normal limits. However, about 15% patients present with normal serum ALP level and isoenzymes of ALP [9]. On the other hand, metastatic bony disease can cause disruption of the normal homeostasis of bone which results in skeletal complications such as pain, fractures and paraneoplastic syndrome like hypercalcemia [10]. Serum ALP level, as mentioned above, can also be elevated in metastatic bone disease as the degree of ALP elevation is a general measure of metabolic activity [11].

The diagnosis of Paget's disease is primarily accomplished by roentgenographic evaluation of the skeleton. The initial stage of the disease is represented by a localized area of reduced bone density often referred to as an osteolytic lesion. In the most advanced stage of Paget's disease, the areas of previous osteolytic dominance are characterized by a chaotic sclerotic appearance, a phase that is called osteoblastic or osteosclerotic

Computed tomography (CT) gives superior detail of the cortical and trabecular bone owing to the higher contrast resolution, the feasibility of "bone window" setting and the cross-sectional display. In a recent review, Theodorou *et al*., [12] reported that CT is particularly suited to showing trabecular coarsening, cortical thickening, osseous expansion and osteolysis facilitating the depiction pagetic bone abnormalities [13]. The fine evaluation of bone texture in the spine allows, for example, the differentiation from other conditions, such as vertebral hemangioma and to some extent, metastatic disease and lymphoma [14]. The exquisite anatomical bony details can be improved by high resolution technique (e.g. in temporal bone). In addition, CT permits a three-dimensional assessment of complex bone structures and gives valuable information about marrow attenuation and soft tissues. Magnetic resonance imaging (MRI) is less useful for imaging cortical and trabecular bone which are primarily affected by PBD but gives an excellent depiction of bone marrow and soft tissues. In pagetic bone various alterations can occur in the marrow such as increased vascularity, residual hematopoiesis, fibrosis and fatty marrow replacement, resulting in a wide range of possible MRI signal variations [15, 16]. A completely normal MRI signal may be seen when there is no change in the intervening marrow at the microscopic level. Increased fat signal may be depicted in the early lytic phase, due to the osteoclastic resorption of the trabecular bone and the proportionately higher fat content in the marrow and in delayed phases of PBD when there is repopulation of the marrow with fat. A heterogeneous signal intensity appearance in both T1- and T2-weighted sequences with reduced fat signal and increased water signal is seen in the mixed phase of PBD as reactive changes in the marrow make it more vascular and the intervening osteoid is more active and cellular. In this phase the cortex may also show slight increased signal compared with the cortex in the adjacent normal bone. A signal reduction on all MRI sequences is seen in the sclerotic and delayed dormant phase, due to the disproportionately increased signal contribution from the trabecular thickening and coarsening compared with the fatty marrow, to the reduced water content in the tissues and to some marrow fibrosis [17].

In the pelvis, osteosclerosis in Paget disease can mimic osteoblastic metastasis. The presence of asymmetric or unilateral distribution, accentuated trabecular pattern, and enlargement of the involved bone are typical features of Paget disease [18].

Computed tomography correlation may often improve the diagnostic accuracy of nonspecific uptake in some patients, with the potential for discriminating between benign Paget's disease and associated sarcomas [19].

In our case the computed tomography scan findings are characteristic for Paget's disease. Follow-up imaging was helpful showing the prostate's primary response to treatment, while the pelvic lesion remained the same, which supported the diagnosis of Paget's disease.

CONCLUSION

Paget's disease of bone can be mimicker of bone metastasis. Further investigations are needed before qualifying a cancer patient as metastatic.

REFERENCES

1. Bhargava P, Maki JH. Images in clinical medicine: Cotton wool appearance of Paget's disease. N Engl J Med. 2010; 363:9.
2. Singer F, Bone HG, Hosking DJ. Paget's disease of bone: An endocrine society clinical practice guideline. J Clin Endocrinol Metab. 2014; 99:4408-4422.
3. Cortis K, Micallef K, Mizzi A. Imaging Paget's disease of boned from head to toe. Clinical Radiology. 2011; 66:662e672.
4. Al Nofal AA, Altayar O, Ben Khadra K. Bone markers in Paget's disease of the bone: A systemic review and meta-analysis. Osteoporosis Int. 2015; 26:1875-1891.
5. Rybak LD, Rosenthal DI. Radiological imaging for the diagnosis of bone metastases. Q J Nucl Med. 2001; 45:53-64.
6. Roodman GD, Windle JJ. Paget disease of bone. J Clin Invest. 2005;115(2):200–8.
7. Hadjipavlou A, Lander P, Srolovitz H. Pagetic arthritis. Pathophysiology and management. Clin Orthop Relat Res. 1986; 208:15-19.

8. Lander P, Hadjipavlou A. Intradiscal invasion of Paget's disease of the spine. Spine. 1991; 16 1: 46–51.
9. Siris ES. Paget disease of bone. In: Becker KL (ed). Principles and practice of endocrinology and metabolism, 3rd ed. Lippincott Williams & Wilkins Company, Philadelphia, 2002.
10. Coleman RE. Metastatic bone disease: Clinical features, pathophysiology and treatment strategies. Cancer Treat Rev. 2001; 27(3):165-76.
11. Lim KP, Kok WH, Kamaruddin NA. Metastatic Bone Disease Secondary to Bronchial Adenocarcinoma in a Patient with Paget's Disease of the Bone. Journal of the ASEAN Federation of Endocrine Societies. 2018 May 21;33(1):63.
12. Singer FR, Roodman GD. Paget's Disease of Bone. Principles of Bone Biology, 2008; 1599–1609.
13. Theodorou DJ, Theodorou SJ, Kakitsubata Y. Imaging of Paget disease of bone and its musculoskeletal complications: review. Am J Roentgenol. 2011; 196(6 Suppl):S64-75.
14. Whitehouse RW. Paget's disease of bone. Semin Musculoskelet Radiol. 2002; 6(4):313-322.
15. Dohan A, Parlier-Cuau C, Kaci R, Touraine S, Bousson V, Larédo JD. Vertebral involvement in Paget's disease: morphological classification of CT and MR appearances. Joint Bone Spine. 2015; 82(1):18-24.
16. Roberts MC, Kressel HY, Fallon MD, Zlatkin MB, Dalinka MK. Paget disease: MR imaging findings. Radiology. 1989; 173(2):341-345.
17. Whitten CR, Saifuddin A. MRI of Paget's disease of bone. Clin Radiol. 2003; 58(10):763-769.
18. Spyridon G. Adamopoulos, Glykeria M. Petrocheilou. The role of CT and MRI in imaging of Paget bone disease. Journal of Research and Practice on the Musculoskeletal System. 2018; 2(1): 12-17.
19. Resnick D. Paget's disease. In:, Resnick D, ed. Diagnosis of bone and joint disorders, 4th ed. Philadelphia, PA: Saunders, 2002:1947–2000.
20. Kamaleshwaran KK, Natarajan S, Shibu D, Malaikkal A, Shinto AS. Paget's disease of pelvis mimicking metastasis in a patient with lung cancer evaluated using staging and follow-up imaging with fluorine-18 fluorodeoxyglucose-positron emission tomography/computed tomography. Indian J Nucl Med. 2015; 30:151–3.