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An Article on Mri Imaging of Atypical Thigh Pathologies

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ABSTRACT

Thigh pathologies are common in orthopedic practice. In this Article I discuss two common conditions presenting atypically as thigh pain. paget disease and thigh hemorrhage are discussed.

KEYWORDS X-ray,magnetic resonance imaging,thigh,paget disease,heamorrhage

INTRODUCTION

Radiologic assessment of thigh pathologies may be achieved with several imaging techniques. xray, ct scan are common techniques used. Mri is used in bone marrow pathologies and soft tissue pathologies. The radiographic features of calcification are usually well demonstrated on CTscan. In this article, I discuss two common conditions atypically presenting as thigh pain.

Case 1:

52 year old male patient attended the hospital with complaints of left thigh pain for one month.Xray of bith hips(-fig1)was taken.it shows sclerosis of head,neck and upper shaft of left femur without joint changes.CT was also taken. That confirms sclerosis.MRI scan was taken.it shows hypointense thichening of cortex of upper shaft of left femur(fig2) with hypointense signal changes in head and neck of left femur in T1W sequence.hypointensity persists in T2W sequences(fig3). abnormal hyperintense signals seen in head and neck of left femur in fat sat sequences(fig4).fat sat sequences(STIR) also show abnormal hyperintense signals in right sacrum(fig5) near right sacroiliac joint. On MRI contrast administration,there is minimal contrast enhancement seen in abnormal marrow regions(fig6&fig7).radiological differential diagnoses are paget disease,osteoblastic bone metastases.bone biopsy was done. HPE report is paget disease.

Case 2:

11 year old male child was admitted in our hospital with swelling and pain in right thigh after trivial injury.the patient is a known case of acute lymphoid leukemia. Xray of right thigh was taken.thers was no bony injury. MRI was taken.T1W sequences show abnormal fluid collection with areas of hyperintensity(fig8)in the anterior aspect of thigh within the muscular compartment. There is minimal collection in posterior aspect also.T2W sequences show

hyperintese collection with loculations(fig9).In fatsat TIR sequences ,there is no suppression of collection(fig10).T1W fatsat axial shows hyperintensity suggestive of blood products(-fig11).on MRI contrast administration fig 12 shows peripheral enhancement of collection.no obvious

bone marrow signal changes detected in MRI. The radiological diagnosis is intramuscular hematoma with possible early changes of abscess formation. The fluid was aspirated .that was hemorrhagic fluid.

DISCUSSION

Paget disease of bone (PD) is characterized by excessive bone resorption in focal areas followed by abundant new bone formation. Later normal bone marrow is replaced by vascular and fibrous tissue[1]. The etiology of PD is not well understood, but one PD-linked gene and several other susceptibility loci have been identified, and paramyxoviral gene products have been detected in pagetic osteoclasts. The disease is relatively common and can affect up to 4% of individuals over 40 and up to 11% over the age of 80[2]. The majority (approximately three quarters) of patients are asymptomatic at the time of diagnosis. There are three stages classically described (but is part of continuous spectrum)

1-lytic (incipient active): predominated by osteoclastic activity
2-mixed (active): osteoblastic as well as osteoclastic activity
3-sclerotic/blastic (late inactive)

The following are the several major patterns of involvement described in MRI Imaging[3]

1-dominant signal intensity in pagetic bone similar to that of fat; most common pattern: probably corresponds to the early mixed active phase
2-relatively low T1 and high T2 signal alteration (also referred as a "speckled" appearance); second most common pattern: probably corresponds to granulation tissue, hypervascularity, and oedema seen in active disease
3-low signal intensity on both T1 and T2 images: suggesting presence of compact bone or fibrous tissue; least common pattern: seen in late blastic inactive phase

Patients with acute leukaemias are at high risk of both hemorrhage and thrombosis. Among bleeding complications, of particular importance is the disseminated intravascular coagulation (DIC) syndrome, due to the massive intravascular activation of blood coagulation with consumption of clotting factors and platelets, leading to severe haemorrhages.

The imaging characteristics of blood on MRI are variable and change with the age of the blood.

In general, five stages of haematoma evolution are recognised: hyperacute,acute,early sbacute,late subacute and chronic stages.

extracranial blood products age differently than intracranial blood products, and extracranial hematomas often have a heterogeneous appearance.so there is difficulty in confirming the age of an extracranial hemorrhage[4].

Hematomas that occur without a history of frank trauma can mimic soft tissue tumors. The magnetic resonance imaging (MRI) signal patterns of hematomas are strongly affected by the hemoglobin breakdown products . by taking into account the magnetic properties of hemoglobin and its metabolites, these patterns can best be understood[5]

stage	time	hemoglobin	T1	T2
hyperacute	<24 hours	oxy	iso	hyper
acute	1-3 days	deoxy	iso	hypo
Early subacute	3-7 days	Methemo in RBC	hyper	hypo
Late subacute	>7 days	Methemo free	hyper	hyper
chronic	>14 days	hemosiderin	Iso,hypo	hypo

Administration of MRI contrast material aids in the exclusion of a neoplasm when the lesion in question does not exhibit enhancement. Conversely, the presence of an enhancing nodule in a muscle lesion may suggest the diagnosis of a neoplasm rather than a hematoma.

CONCLUSION

Paget disease is a common skeletal disorder of middle-aged and elderly persons characterized by excessive and abnormal remodeling of bone. The disease varies considerably in severity and evolves through various phases of activity, followed by an inactive phase. CT and MRI help delineate pagetic bone changes and have proven extremely useful in the diagnosis of sarcomatous transformation, which constitutes the most dreaded complication of the disease.

Differentiating between a simple hematoma and a hemorrhagic neoplasm may be difficult in certain patients, both clinically and by means of imaging.MRI helps a lot in this situation by its varying signal changes of hemorrhage.

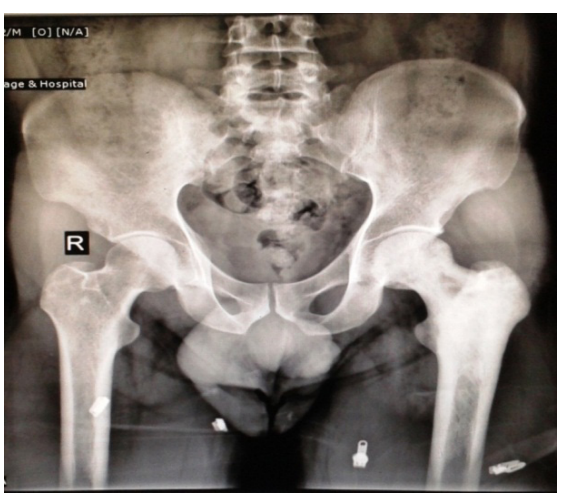

Fig1- Xray shows sclerosis of head,neck and upper shaft of left femur without joint changes.

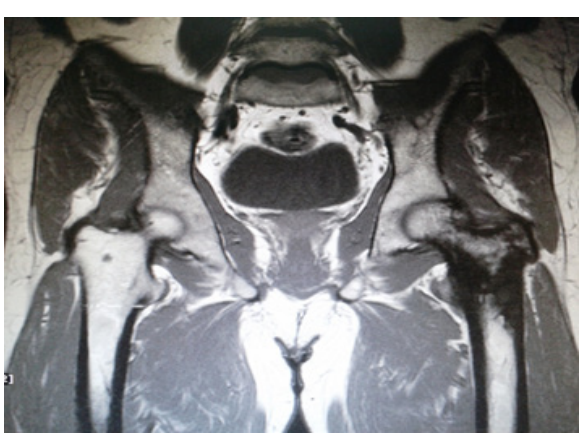

Fig2-MRI T1W- hypointense thichening of cortex of upper shaft of left femur

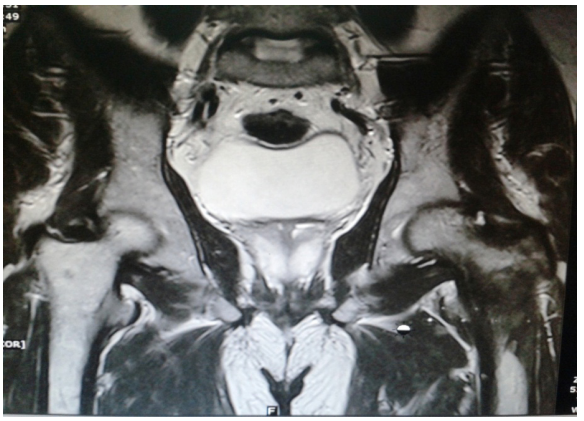

FIG3-MRI T2W- hypointensity persists in left femur

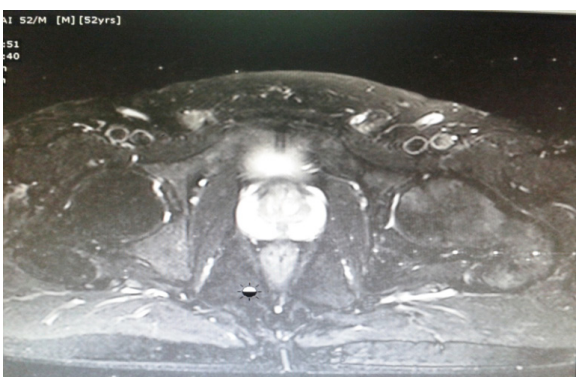

Fig4-MRI fatsat- abnormal hyperintense signals seen in head and neck of left femur

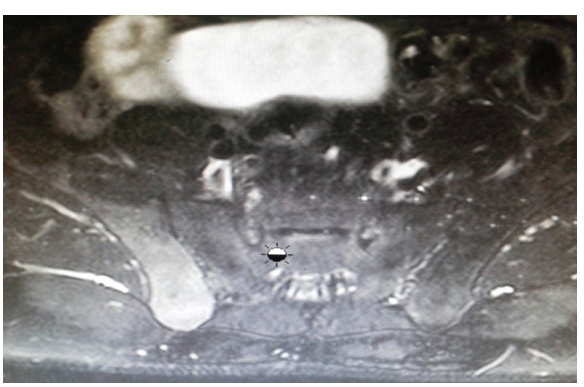

Fig5-MRI fatsat- abnormal hyperintense signals in right sacrum.

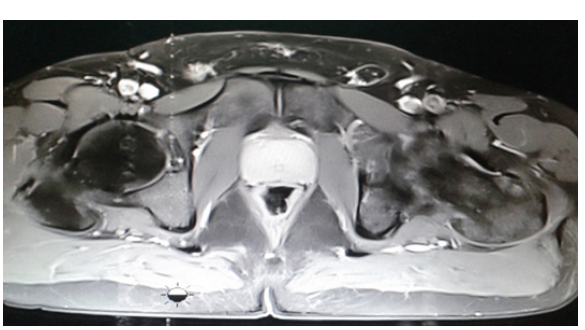

Fig6-MRI contrast- minimal contrast enhancement seen in abnormal marrow regions

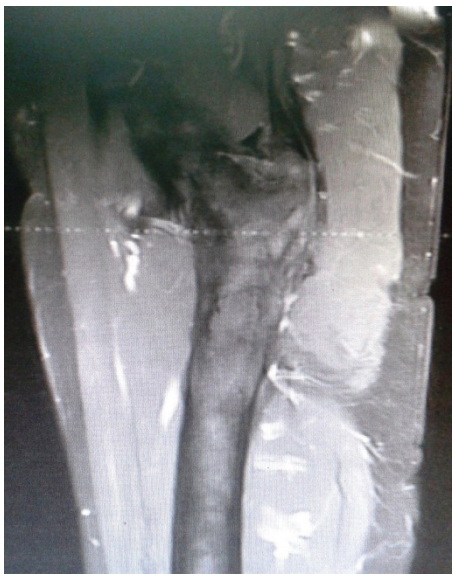

Fig7-MRI contrast- minimal contrast enhancement in abnormal marrow regions

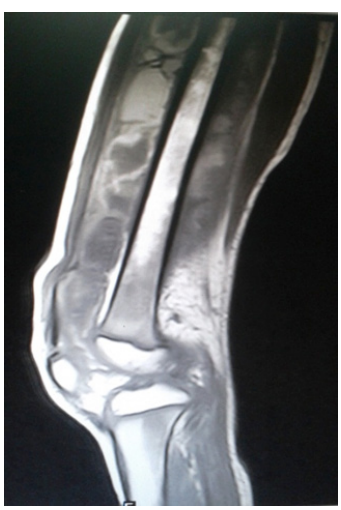

Fig8-MRI T1W- abnormal fluid collection with areas of hyperintensity

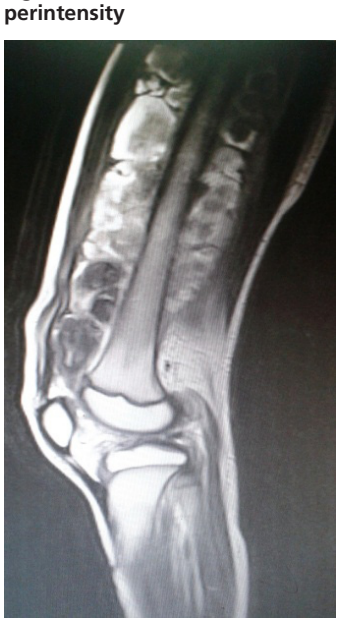

FIG9-MRI T2W- hyperintese collection with loculations

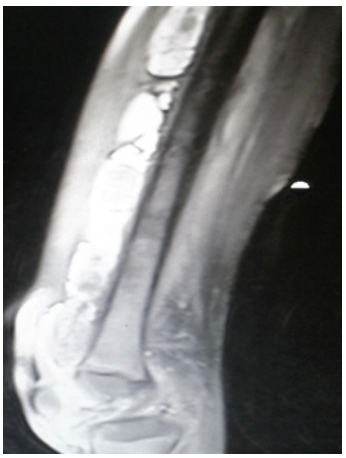

Fig10-MRI fatsat- no suppression of collection.

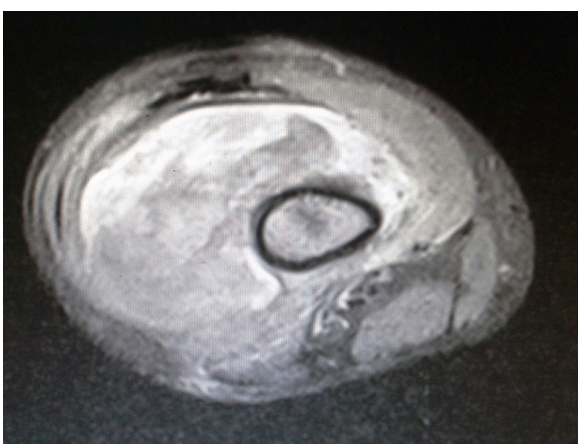

Fig11-MRI T1W with fatsat- hyperintensity suggestive of blood products.

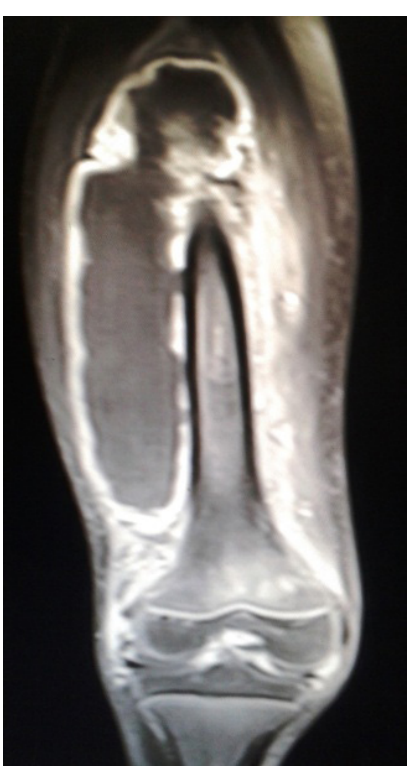

Fig12-MRI contrast- peripheral enhancement of collection

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