

SUBACUTE OSTEOMYELITIS SIMULATING BONE TUMOURS- A DIAGNOSTIC TRAP

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ABSTRACT

BACKGROUND

Subacute osteomyelitis is a type of osteomyelitis without any clinical signs and symptoms of osteomyelitis for more than 3 weeks' duration with characteristic radiological features. Cut-off between the infection and tumour is narrow. The aim of this study is to increase the awareness about increasing incidence of less common pattern of subacute osteomyelitis in our day-to-day practice. Subacute osteomyelitis radiological presentations are not always fitted into the proposed classification system, thus leading to a diagnostic trap. This article brings out the significance of histopathological examination following the surgical procedure which will aid in treatment and prognostic aspects. Total 8 patients (5 male and 3 female) who admitted in our institute have been investigated and they underwent biopsy and curettage. Histopathological, microbiological examination was done. Antibiotic sensitivity of isolated organism was assessed. In eight patients, osteomyelitis was confirmed with biopsy and culture sensitivity. They were completely cured without any recurrence or any other complications except one patient who had segmental osteonecrosis of head of femur due to the location of Brodie's abscess in neck of femur. Biopsy & Culture is mandatory to confirm the diagnosis and for the treatment aspect. So for any infection a biopsy and for any tumour culture and sensitivity should be done.

KEYWORDS

Subacute Osteomyelitis, Bone Tumour, Infection.

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BACKGROUND

Subacute osteomyelitis radiological presentations are not always fitted into the proposed classification system, thus leading to a diagnostic trap.^[1] This article brings out the significance of histopathological examination following the surgical procedure which will aid in treatment and prognostic aspects.

It is a type of osteomyelitis without any obvious clinical signs and symptoms of osteomyelitis for more than 3 weeks' duration with characteristic radiological (metaphyseal lytic lesion with surrounding sclerosis) features. Salient features of subacute osteomyelitis are altered host-pathogen relationship, less common than AHO (Acute Haematogenous Osteomyelitis), lack of signs & symptoms of osteomyelitis and usually mimics benign and malignant tumour.^[2]

The Current trend of subacute osteomyelitis is due to increasing incidence as compared with AHO, less common type become increasing in frequency and cut-off between the infection and tumour is narrow. The aim of this article is to increase the awareness about increasing incidence of less common pattern of subacute osteomyelitis in our day-to-day practice which is often misdiagnosed as neoplasm and the vice versa.

The classification currently used is Roberts' classification (modified Gledhill's classification). It has six types including four basic forms of the disease occurring in the long bones and spine. The classification is given below.

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Type	Gledhill Classification	Roberts' Classification	Differential Diagnosis
I	Solitary localised zone of radiolucency surrounded by reactive new bone formation	Ia—Punched-out metaphyseal radiolucency	Langerhans' cell histiocytosis
		Ib—Punched-out radiolucent lesion with sclerotic margin	Brodie abscess
II	Metaphyseal radiolucencies with cortical erosion	Metaphyseal radiolucencies with cortical erosion	Osteogenic sarcoma
III	Cortical hyperostosis in diaphysis; no onion skinning	Localised diaphyseal cortical and periosteal reaction	Osteoid osteoma
IV	Subperiosteal new bone and onion skin layering	Diaphyseal lesion with Onion skin periosteal reaction	Ewing's sarcoma
V	—	Central radiolucency in epiphysis	Chondroblastoma
VI	—		Lesion crossing the physis, Destructive process involving vertebral body Tuberculosis; osteogenic sarcoma

Most common type - Type - Ib (Brodie's Abscess). But, we encounter Type - III & Type - IV More Often.

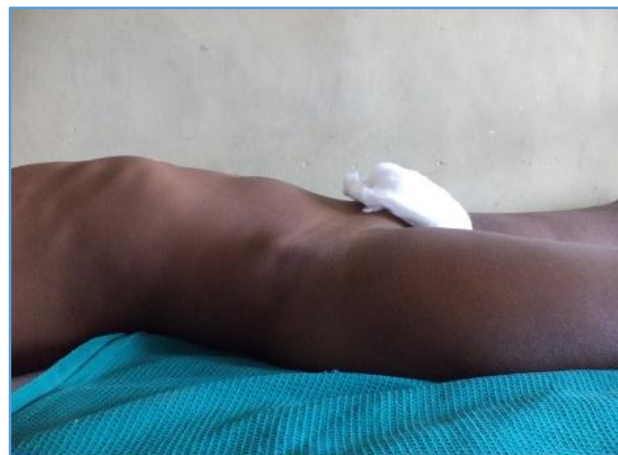
MATERIALS AND METHODS

Totally 8 patients (5 male and 3 female) who admitted in our institute have been investigated. All patients underwent biopsy and curettage. Histopathological and Microbiological examination was done. Antibiotic sensitivity of isolated organism was assessed.

Case 1

A 16-year-old male presented with pain and swelling over right proximal thigh, 1 month duration. Four weeks later, he developed extensive lytic lesion of proximal femur metaphysis with onion skin periosteal reaction in diaphysis in spite of intravenous antibiotics.

At the time of admission diagnosed clinically as Brodie’s abscess and subsequently revised to neoplasm and biopsy was performed.



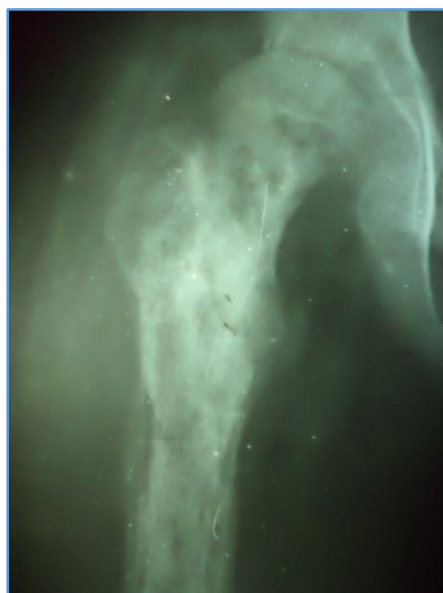
Clinical Photo



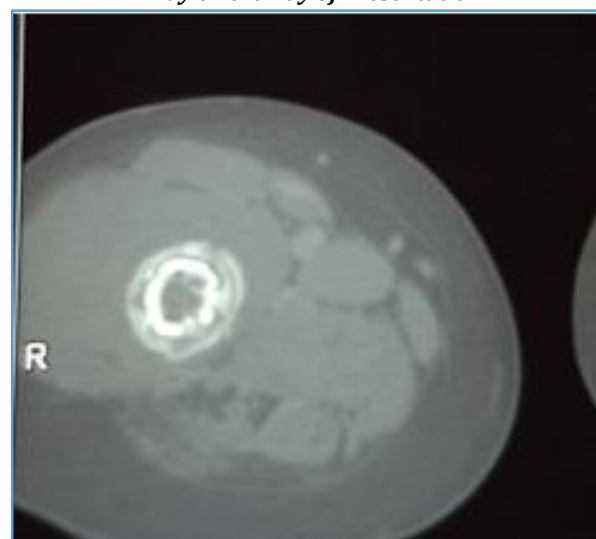
X-ray on the Day of Presentation



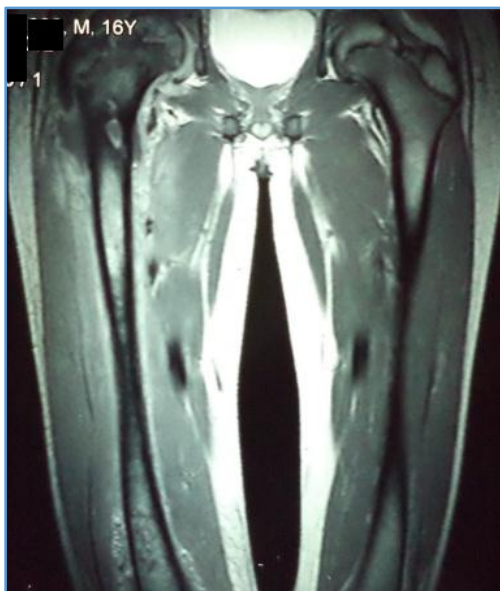
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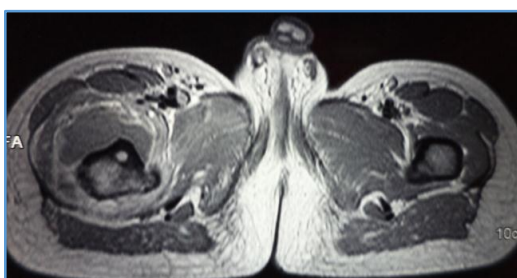
X-ray after 4 Weeks



CT Scan



MRI Scan



MRI Scan



CT Scan



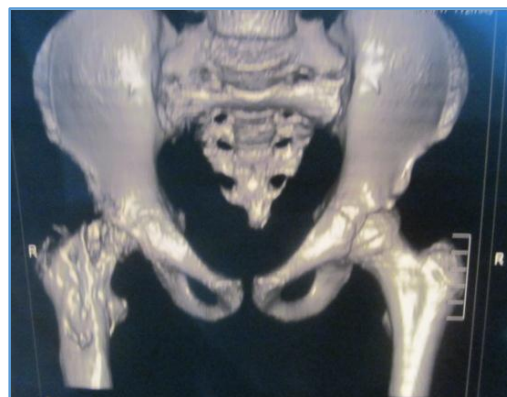
Per-op Picture



Biopsy and Aspirate



Followup X-Ray



Followup CT scan

MRI (at the time of admission) – Showed hypointense lytic lesion surrounded by hyperintense lesion in metaphyseal region? Ewing’s Sarcoma (as per the MRI report). CT (4 weeks later) showed metaphyseal mixed lytic and sclerotic lesion and onion skin diaphyseal periosteal reaction. He was approached laterally, biopsy and curettage was done. HPE showed Nonspecific osteomyelitis with chronic inflammation, Culture report showed pure growth of Staphylococcus aureus and sensitive antibiotic was started. X-rays were taken after 6 months.

Combined metaphyseal and diaphyseal subacute osteomyelitis is not described in Roberts’ classification. On review of literature, only one article reported this combined lesion (Harris et al).

Case 2

A 28-year-old female presented with pain over left hip and she had limping of one month duration. Clinically, she had no fever and no swelling. TC, DC, ESR and CRP were normal. X-ray showed lytic lesion in the neck of femur with sclerotic bone surrounding the lysis. CT report was probably osteoid osteoma of neck of femur.



Pre-op X-ray



CT Scan



CT Scan



Post-op X-ray

Through a lateral approach, lesion was curetted. Serous fluid came out. HPE Showed Chronic inflammatory cells, Brodie’s abscess. Culture showed no growth.

Case 3

A 20-year-old female with complaints of swelling in Left leg, proximal third, of 6 months’ duration. She had no fever and occasional pain was present. TC, DC, ESR and CRP were normal. Pre-operative X-ray showed diaphyseal lytic lesion (Type V). MRI Report showed hypointense lesion with soft tissue oedema, possibility of Osteoid osteoma.



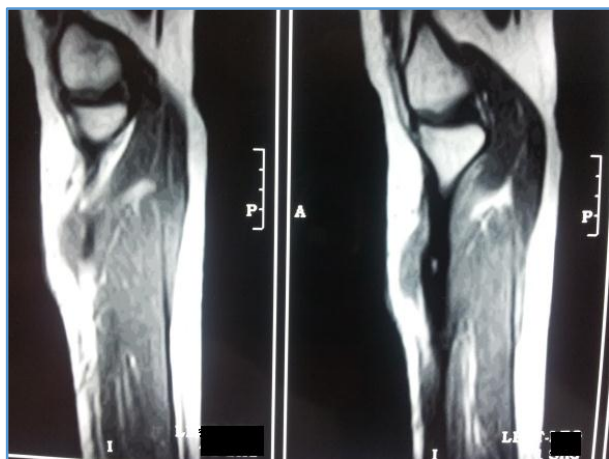
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Pre-op X-ray AP View



Pre-op X-ray Lateral View



MRI Scan

MRI Report

IMPRESSION:

- ABOVE FEATURES ARE SUGGESTIVE OF OSTEOID OSTEOMA OF PROXIMAL LEFT TIBIA.
- SUGGESTED NUCLEAR IMAGING FOR FURTHER EVALUATION.
- NO EVIDENCE OF OSTEOMYELITIS SEEN.

HPE Report

HP No : 0902712

Received on : 09/03/2012 Age : 20yrs Sex : FEMALE Page : 1

Reported on : 15-Mar-12 Received through : Lab

Duration : Material :

Microscopic Notes : 7 OSTEOID OSTEOMA

Microscopic Diagnosis : SWELLING 8 X 6 CMS (L) PROXIMAL LEG (TIBIA) ANTEROMEDIAL ASPECT. 4 1/2 MONTHS DURATION, NO TENDER / WARMTH. XRAY : UNICORTICAL REACTION WITH CAVITY. MRI : FLUID LEVEL WITH SOFT TISSUE.

Microscopic Appearance : MULTIPLE BITS AE

Microscopic Appearance :

SECTIONS SHOW EXUBERANT GRANULATION TISSUE WITH DENSE ACUTE AND CHRONIC INFLAMMATORY CELL COLLECTION WITH FEW SMALL NECROTIC BONY FRAGMENTS. NO GRANULOMAS OR NEOPLASM SEEN. FEATURES SUGGESTIVE OF CHRONIC SUPPURATIVE OSTEOMYELITIS. KINDLY CORRELATE WITH CLINICAL AND RADIOLOGICAL FINDINGS.



Per-op Picture



Per-op Picture

Per-op finding are Infective granulation tissue and Dead bone was excised. HPE report showed chronic inflammation and the culture organism is Staphylococcus aureus. Sensitive antibiotic was started. On followup X-ray --- completely healed. No recurrence, no sinus.

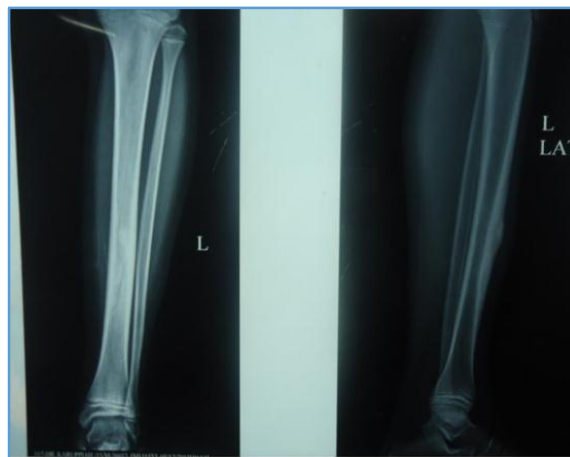
Followup X-ray



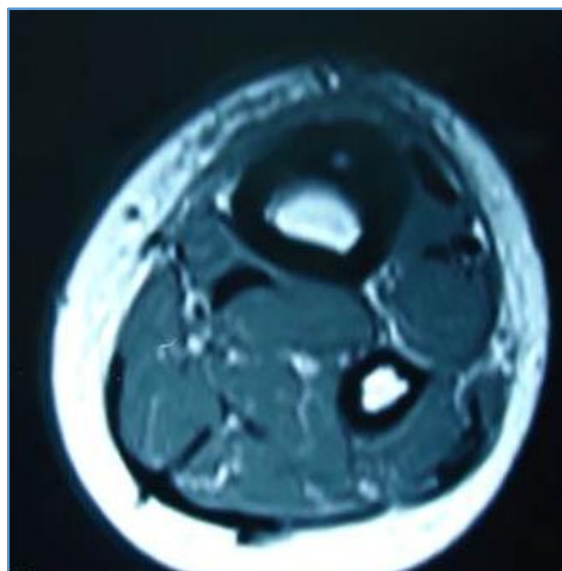
Post-op X-ray AP View



Post-op X-ray Lateral View



Pre-op X-ray



MRI Scan



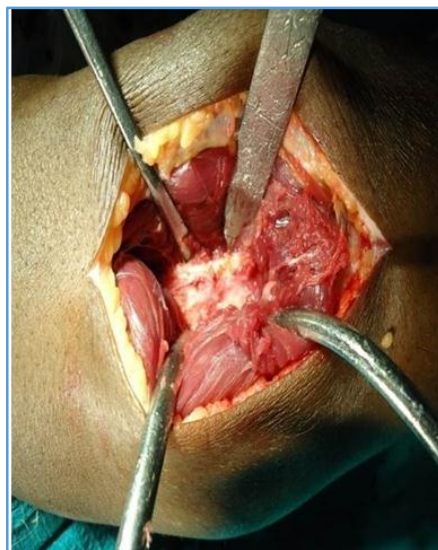
Clinical Photos

Case 4

A 14-year-old boy presented with Left leg swelling, no pain and no signs of inflammation. X-ray showed diaphyseal cortical lytic lesion. MRI showed hypointense lesion surrounded by hyperintense lesion in coronal section. Sagittal section showed features suggestive of unicortical abscess in diaphyseal region. MRI report was Ewing's sarcoma.



MRI Scan



Per-op Picture



Post-op X-ray

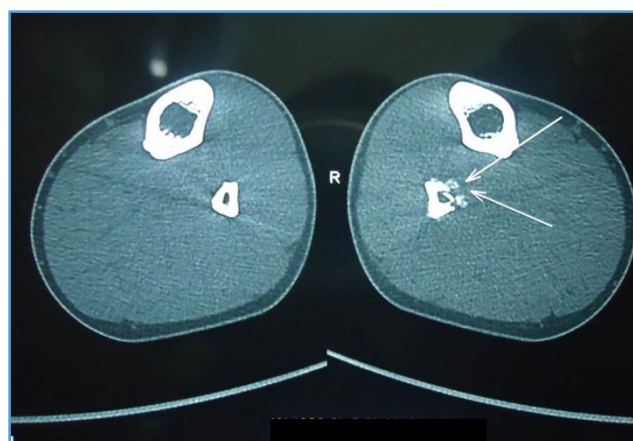
Lesion was explored for biopsy and serosanguinous pus & necrotic cortical bone was present which was sent for culture. Curettage of the lesion was done and sent for HPE. HPE report showed chronic inflammation and Culture showed Staphylococcus aureus.

Case 5

A 25-year-old male with complaints of swelling in the right leg of 6 weeks' duration (on the lateral aspect of proximal third). Biopsy was done and it was a unicortical abscess. Organism was Staph aureus.



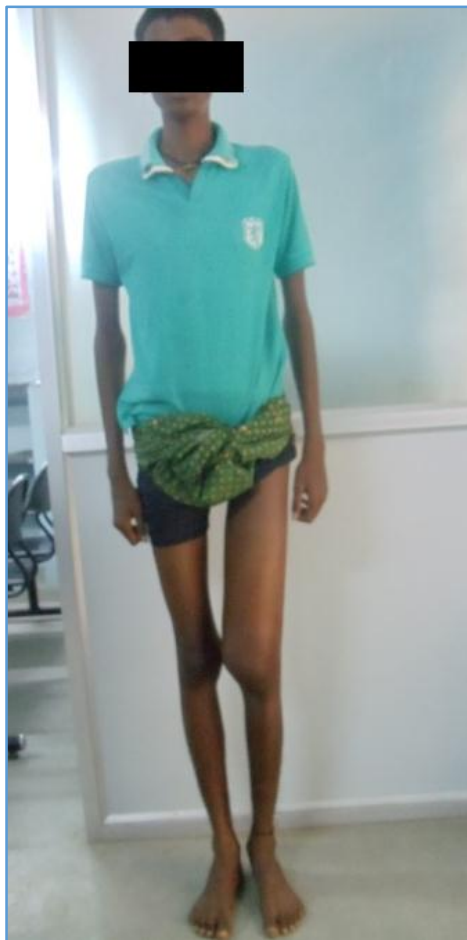
CT scan



Pre-op CT

Case 6

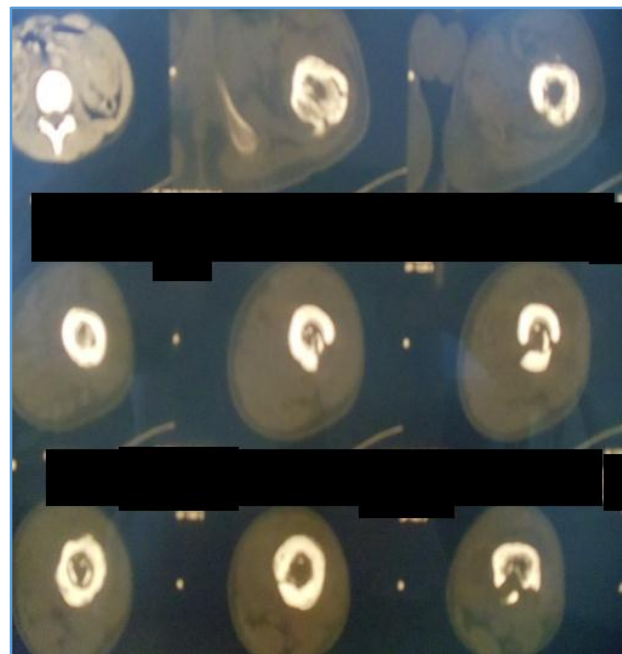
A 22-year-old male patient with complaints of left thigh swelling and pain of 1 month duration, no discharging sinus and no fever. X-ray showed extensive diaphyseal and metaphyseal periosteal reaction. Biopsy showed chronic nonspecific osteomyelitis and Culture showed Staph aureus.



Clinical Photos



Pre-op X-ray



CT Scan



MRI Scan

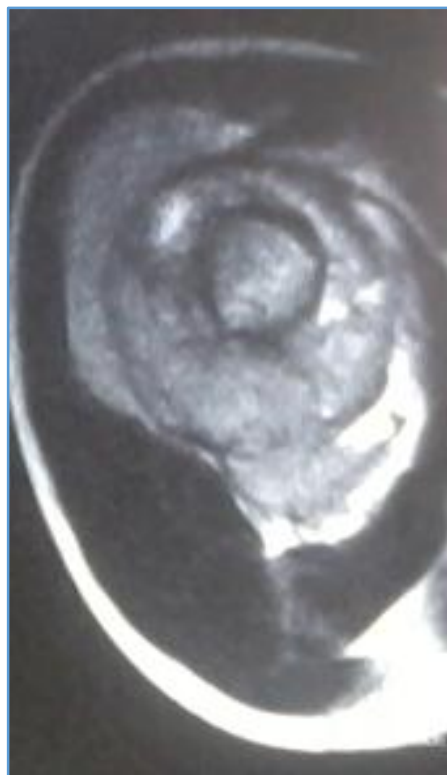
Case 7

A 10-year-old boy presented with pain & swelling in proximal humerus of 3 months' duration. He was referred from an orthopaedician from periphery as Ewing's sarcoma. Except for elevated ESR & CRP, others were normal. Biopsy was favourable for osteomyelitis, Culture was Staph aureus.

Antibiotics and reassurance were given. Swelling reduced in size after a course of antibiotics.



Clinical Photos



MRI Scan



MRI Scan

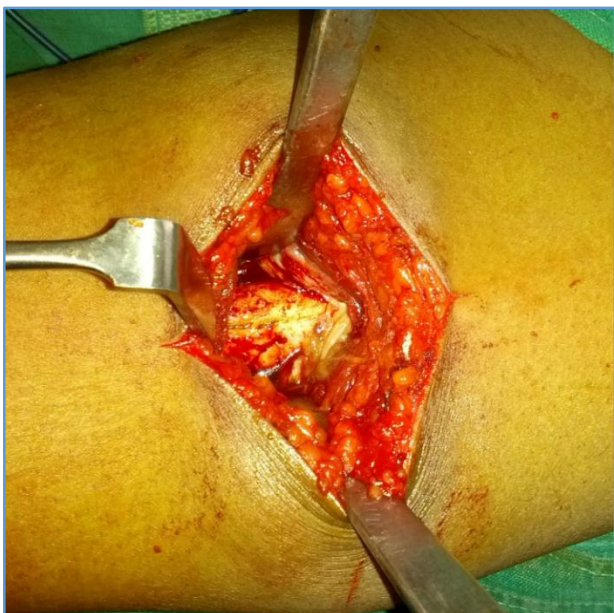


Clinical Picture

Case 8

A 19-year-old female presented with pain over left hip for 1 year duration. Blood investigations were within normal limits except elevated ESR and CRP. X-ray showed extensive periosteal reaction in mid-1/3rd of left femur, nidus is not clearly seen. Initial differential diagnosis was osteoid osteoma and subacute osteomyelitis.

Biopsy report showed chronic nonspecific osteomyelitis and Culture and Sensitivity showed Staph aureus sensitive to cefoperazone. Final diagnosis was unicortical abscess, left femur.

*Pre-op Picture**Per-op Picture**Pre-op X-ray*

RESULTS

In all eight patients, osteomyelitis was confirmed with biopsy and culture sensitivity. HPE showed six cases of non-specific osteomyelitis. Culture report showed *Staphylococcus aureus* was isolated in six patients. Two patients showed no growth. Antibiotic sensitivity was mostly sensitive to Cefoperazone, sulbactam, Ceftriaxone, Cloxacillin, Amikacin, Linezolid. They were treated with curettage and 2 weeks of sensitive parenteral antibiotics followed by 4 weeks of oral antibiotics. They were completely cured without any recurrence or any other complications except for one patient who had segmental osteonecrosis of head of femur due to the location of Brodie's abscess at the neck of femur. Combined metaphyseal and diaphyseal subacute osteomyelitis are not described in Roberts' classification. Among the eight patients, two patients were in this category and not fitted under Roberts' classification.^[1]

DISCUSSION

Incidence of subacute osteomyelitis is increasing nowadays compared with that of the acute form. Subacute osteomyelitis develops when there is an altered host-pathogen relationship as a result of increased host resistance and decreased bacterial virulence. The acute process may also be masked by antibiotics administered early in the clinical course. Apart from raised ESR, other data does not support a diagnosis of osteomyelitis^[3] and the radiological presentation may be suggestive of a benign or malignant bone tumour.^[4,2,5] Subacute osteomyelitis radiological presentations do not always fit into the proposed classification system.^[1] *Staphylococcus aureus* is the causative organism by most authors.

CONCLUSION

Differentiation of subacute osteomyelitis and bone tumour is very difficult even with modern investigation. To overcome this diagnostic challenge, histopathological examination (biopsy) and culture is mandatory to confirm the diagnosis and for the treatment and prognosis aspect. For any infection a biopsy and for any tumour culture and sensitivity should be done.

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