

## ACUTE SUPPURATIVE PRESENTATION OF OSTEOARTICULAR TUBERCULOSIS IN CHILDREN

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(Received on 10.8.2010; Accepted after revision on 7.3.2011)

### Summary

**Introduction:** Osteoarticular tuberculosis is known for its atypical presentations. The acute presentation of osteoarticular tuberculosis although mentioned by many observers is seldom seen in practice. We report the varied presentations of acute suppurative presentation of osteoarticular tuberculosis in pediatric age group.

**Methods:** Our study retrospectively assessed 10 children with osteoarticular tuberculosis who had acute presentation with short history of a few days and signs of acute inflammation.

**Results:** The age range varied from 3-12 years. The duration of symptoms averaged 14.7 days (range, 4-28 days). Three patients were afebrile at the time of presentation. The diagnosis of tubercular aetiology was made only retrospectively in all the cases. All, except one, were subjected to Fine Needle Aspiration Cytology (FNAC)/trochar bone biopsy. Diagnosis was based on smear positive for acid fast bacilli (n=3), histopathology (n=5), and on clinicoradiological findings in two cases. The acute exudative pattern was seen in seven and gravity assisted tracking and accumulation of abscess (dependent) in three patients. In eight patients, the FNAC/trochar biopsy decompressed the lesion initially. Incision and drainage were performed on one case of osteoarticular tuberculosis with clinical presentation of acute pyogenic infection. Another patient of acute exudative pattern was subjected to drainage and debridement in view of impending burst. Both exudative and dependent forms of suppurative presentations of osteoarticular tuberculosis responded well to standard antitubercular chemotherapy. The abscesses resolved within a period of 6-12 weeks.

**Conclusion:** The acute suppurative presentation is a rare and atypical form of osteoarticular tuberculosis. It has close resemblance to acute pyogenic infections or septic arthritis and pose significant diagnostic dilemma for the unwary. A vigilant and methodical approach is the key for managing acute suppurative tubercular presentations. [*Indian J Tuberc* 2011; 58: 66-71]

**Key words:** Tuberculosis, Pyogenic, Cold abscess, Pediatric

### INTRODUCTION

Osteoarticular tuberculosis is known for its atypical presentations.<sup>1</sup> The infrequent occurrence of these forms of tuberculosis poses a diagnostic challenge for the treating clinicians and often results in delayed recognition and treatment. Many a time, the patient has been subjected to unnecessary or even multiple surgeries pending correct diagnosis.<sup>2,3</sup> Acute suppurative presentation is one of the atypical forms of osteoarticular tuberculosis and closely mimics acute pyogenic infection or septic arthritis. We report the varied presentations of acute suppurative presentation of osteoarticular tuberculosis in the pediatric age group.

### METHODOLOGY AND RESULTS

We retrospectively analyzed records of 10 children (2005-2009) of osteoarticular tuberculosis who had acute presentation with short history of a few days and signs of acute inflammation (Table 1) (Figure 1). The study was undertaken after prior approval from Institution's Ethical Committee.

The age range varied from 3-12 years. The duration of symptoms averaged 14.7 days (range, 4-28 days). No patient gave history of intake of antitubercular drugs in the past. Three patients were afebrile at presentation. However, they had history of low grade or occasional episodes of fever prior to consultation with us. The initial work-up

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**Table 1:** Patient data (n=10).

S.No.	Age (in years)	Involved bone/ joint	Abscess Site	Category	Duration of symptoms ** in days	Basis of diagnosis
1.	9	Rt. 1 <sup>st</sup> MC	Thumb	acute	21	histopathology
2.	12	L5-S1	Rt. gluteal region	dependent*	28	clinicoradiological
3.	11	Lt. hip	Gluteal region	dependent	28	clinicoradiological
4.	5	Rt. cuboid	Foot lateral aspect	acute	10	histopathology
5.	12	Rt. 5 <sup>th</sup> MT	Foot lateral aspect	acute	7	smear positive for AFB
6.	8	Lt. clavicle	Medial end of clavicle	acute	5	smear positive for AFB
7.	10	Sternum	Lateral end of clavicle	dependent	14	histopathology
8.	3	Rt. humerus lower end	Medial aspect of elbow	acute	4	smear positive for AFB
9.	3	Lt. PP IF, Lt. 5 <sup>th</sup> MT	Index finger	acute	16	histopathology
10.	3	Lt. ankle	Ankle	acute	14	histopathology

\*\* = duration of symptoms at local site.

\**Dependent*- tracking and gravity assisted accumulation of abscess

Abbreviations: Rt.-right; MC- metacarpal; Lt.-left; MT-metatarsal; PP-proximal phalanx; IF-index finger, AFB- Acid fast bacteria.

(except case 10) was essentially similar as for acute pyogenic infection or septic arthritis and included complete hemogram, Erythrocyte Sedimentation Rate (ESR), C-reactive protein (CRP), chest x-rays and radiographs of the affected part. Two patients had evidence of old tubercular infection in the past in the form of calcified pulmonary foci. The diagnosis of tubercular aetiology was made only retrospectively in all patients. In one patient with ankle involvement, an arthrotomy was performed in emergency on clinical diagnosis of septic arthritis (Case 10) (Figure 2). The diagnosis of tuberculosis was made on synovial histopathology in this patient. All other patients were subjected to FNAC from non-dependent area. In patients with osseous lesions, a trochar bone biopsy correlating with radiological



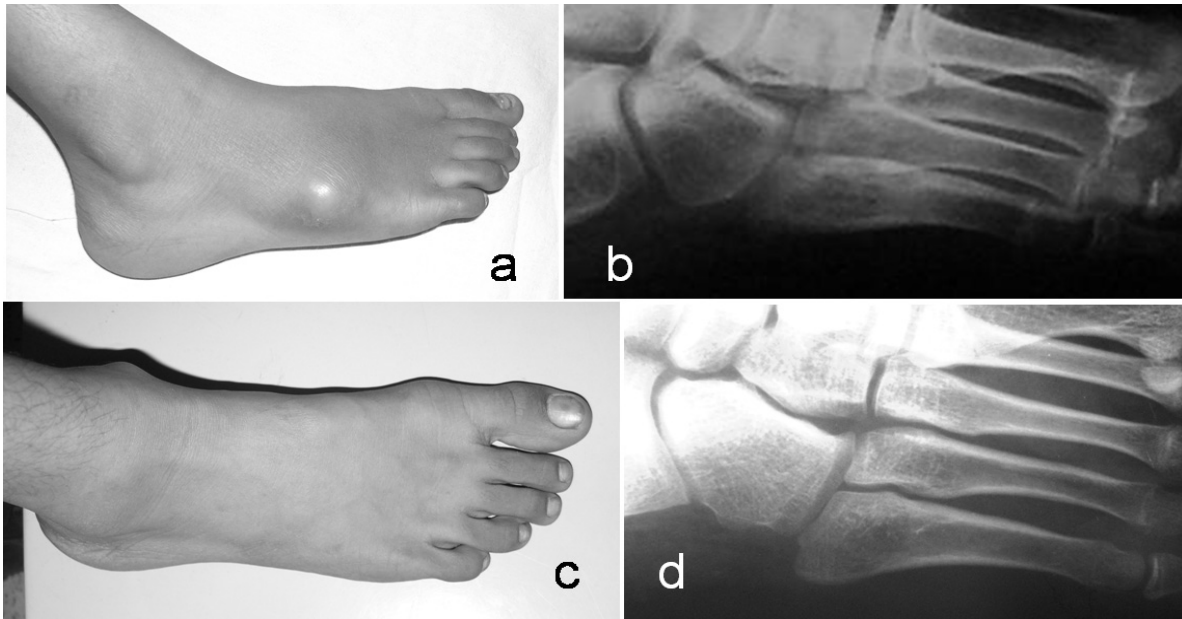
**Fig. 1.** Case 8. The three year young child presented with acute suppurative tubercular abscess with just four days' history. A smear of the pus aspirated from non dependent area revealed acid fast bacteria.

**Fig. 2.** Case 10. a) The osteoarticular tuberculosis was not kept in differential diagnosis. The ankle was drained following a clinical diagnosis of acute pyogenic arthritis. The synovial histology revealed tubercular granulation. b) Subsequent plain radiographs taken show irregularity and lytic areas in talus.



**Fig. 3.** Case 3. The acute gluteal abscess was a manifestation of left hip tubercular involvement.

lesion was also taken. In cases 2 and 7, the primary was obvious in Magnetic Resonance Imaging (MRI) obtained following suspicion in plain radiographs. In case 3 (Figure 3), the left hip involvement was evident in radiographs of pelvis with both hips. The specimen thus collected was sent for Gram stain, acid fast bacteria stain (Ziehl–Neelsen stain) and histopathology examination. Tubercular diagnosis was based on smear positive for acid fast bacilli (n=3), histopathology including arthrotomy case (n=5), and on clinicoradiological findings in two cases. There were seven patients with acute exudative and three with gravity assisted tracking and accumulation of abscess (dependent) (see discussion) pattern (Table 1). In eight patients, the FNAC/ trochar biopsy decompressed the lesion initially. In case 6, in view of impending burst, the abscess was incised and cavity debrided. Two patients with gluteal abscesses were subjected to repeated debulking aspirations (Cases 2 and 3). The cases were treated according to the departmental protocol for management of all osteoarticular tuberculosis cases including spinal tuberculosis with or without neurological deficit. All



**Fig. 4.** Case 5. a) Acute suppurative presentation of osteoarticular tuberculosis of 5<sup>th</sup> metatarsal. b) Plain radiographs showing lytic areas and expansion of base of 5<sup>th</sup> metatarsal. c) Resolution of abscess following antitubercular treatment in six weeks. d) The lesion in the bone resolved in five months.

patients were placed under Category I and initiated on four drug chemotherapy under DOTS, starting with intensive phase of four drugs for two months (isoniazid, rifampicin, ethambutol, pyrazinamide) followed by continuation phase consisting of two drugs (isoniazid, rifampicin) for six months. The treatment was extended to a total of 12 months by continuation of two drugs (isoniazid, rifampicin) further for six months.<sup>4-8</sup> The acute exudative patients were given splintage at involved site. In dependent pattern, the management was based on disease activity of primary site. In all cases, the systemic signs (e.g. fever) responded by average of three weeks and the abscesses resolved by 6-12 weeks on standard antitubercular chemotherapy (Figure 4).

## DISCUSSION

Classically, tuberculosis has been associated with a chronic course and “cold” abscesses composed of products of liquefaction,

serum, leucocytes, granulation tissue, necrotic material, bone debris and tubercle bacilli.<sup>4</sup> Tubercular abscess is described as warm when compared with an acute pyogenic abscess. In certain atypical conditions, the tubercular presentation closely mimics an acute pyogenic infection or septic joint. Acute suppurative presentations of tuberculosis have been described with involvement of lymph nodes, thyroid, breast etc., but infrequent with osteoarticular tuberculosis.<sup>9-11</sup> The suppurative presentations of tuberculosis may have very similar duration of symptomatology (days-weeks) and the systemic signs corresponding to an acute pyogenic infection.<sup>1,3</sup> The abscess aspirate characteristics are typically misleading and may not reveal tubercle bacilli.<sup>1</sup> The diagnostic dilemma is further intensified in small children where incidence of septic arthritis and acute pyogenic infections is high in developing countries. Many a time, the acute abscess has been incised and drained in mistaken diagnosis of acute pyogenic infection (Case 10) (Figure 2).<sup>2</sup>

The atypical acute suppurative presentation may be encountered in three situations of osteoarticular tuberculosis. Firstly, there may be acute exudative response associated with tuberculosis. This pattern is believed to be hypersensitivity response to an already existing old tubercular lesion in body.<sup>12</sup> The old lesion may be untreated or partially treated but contained by natural immunity.<sup>13</sup> Many of these patients may exhibit scar marks of old healed tuberculosis. This variety is manifested more with involvement of superficial bones and joints such as phalanges, metacarpals, clavicle, sternum, shoulder joint, etc. We had seven patients demonstrating this variety (Table 1) (Figures 1, 4). We found no specific predilection for any joint or bone in acute suppurative presentation of tuberculosis. Teklali *et al* has described this type of 'acute' presentation in nine patients in his series of 106 children with osteoarticular tuberculosis collected over a period of 21 years but provided no further details.<sup>13</sup>

Second variety is a complication of gravity assisted tracking and collection of cold abscess, burst impending. As a large amount of cold pus accumulates in preformed lax tissues, it causes pressure necrosis of the overlying subcutaneous tissue and skin. The soft tissue produces a local inflammatory response clinically appreciable as "hot" abscess. In this pattern, usually the formation of pus takes place at a different site from abscess accumulation such as spine, hip etc. The pus migrates from primary site to a distant site such as buttock, knee, neck, etc. (Figure 3). The systemic signs vary according to the disease activity at the primary site and high grade fever may not be present. Associated spasm at local site may also be absent. In the current series, dependent variety was seen in three patients.

A third extremely rare scenario is concomitant suppurative and tubercular infection.<sup>3,13,14</sup> Opara *et al* described a knee joint involvement in a 23-year-male where the superficial popliteal abscess was due to popliteal lymph node suppuration caused by staphylococcus aureus and knee sepsis was due to tuberculosis.<sup>3</sup> Clinical distinction between

acute pyogenic and tubercular infection is extremely difficult in this variety and frequently missed.<sup>3</sup> We did not have any such case in our series.

The three different patterns of acute suppurative presentation associated with osteoarticular tuberculosis demand awareness of this atypical form, precise and methodical clinical assessment and support of dedicated laboratory services to aid in diagnosis. We suggest collection of samples for Ziehl–Neelsen staining prior to drainage procedure when suspicion for tuberculosis is high or areas where tuberculosis is in endemic proportions. The smear for acid fast bacteria reveals the diagnosis early in many cases. In patients with obvious radiological lesion in bone, FNAC/ trochar biopsy serves the dual purpose of abscess decompression and tissue for diagnosis. Synovial biopsy should always be taken if arthroscopic or open drainage of acute arthritis is performed when risk factors are present. The various risk factors in children described are recent tuberculosis contact, previous pulmonary tuberculosis, malnutrition, poor sanitation, overcrowding, exanthematous fevers, diabetes, trauma, previous steroid therapy, and immunodeficiency.<sup>3,8</sup> In dependent pattern, investigation of primary site is advocated. Once diagnosed, the acute suppurative presentations of osteoarticular tuberculosis respond well to standard antitubercular chemotherapy.<sup>3,12-14</sup> In case of large collection, antigravity aspirations of the abscess are helpful.<sup>7</sup> Some clinicians have also advocated debridement of tubercular abscess.<sup>4,6-8</sup> We recommend surgical drainage of abscess and debridement of the cavity in cases of an impending burst not responding to aspirations or when pressure effects of abscess are problematic.

The limitations of this retrospective study are its small sample size and retrospective diagnosis of the pathology. Quantitative assessment of the various microbiological parameters such as organism's virulence, host immunity and mediators of inflammation

cascade, etc., would provide insight into pathogenesis of this atypical presentation of the disease.

## CONCLUSION

**The atypical acute suppurative presentations of osteoarticular tuberculosis do exist. Unless specifically considered, this diagnosis will be missed with the typical aerobic and anaerobic cultures. For all cases of suppurative abscess, a high index of suspicion for tuberculosis should be maintained, especially when there are risk factors at presentation or there is failure to achieve an adequate response to appropriate antibacterial treatment.**

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