

# Coinfection of *Streptococcus agalactiae* and Tuberculous Osteomyelitis of Tibia Mimicking Brodie's Abscess in an Immunocompetent Adult: A Case Report

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## Learning Point of the Article:

Reinforcing the fundamentals in the diagnostic approach in bone infection with definite microbiological and histopathological analysis of sample to diagnose rare coinfections.

## Abstract

**Introduction:** Coinfection of tuberculous osteomyelitis with *Streptococcus agalactiae* has not been reported in an immunocompetent adult so far. The slow progress of tuberculous osteomyelitis, due to lack of significant elevations in the laboratory values and changes in the radiographic appearance, often leads to confusion with brodie's abscess. These two clinical conditions often lead to delay in diagnosis and progressive bone destruction. The aim of this report was to highlight recognizing the possibility of coinfections in tuberculous osteomyelitis and early treatment targeting both organisms simultaneously.

**Case Report:** We report a case of a 24-year-old male patient from Kerala, India presented with pain and swelling over distal leg for 2 weeks along with mild fever for 1 month. Imaging showed a brodie's abscess over distal tibia. Pus culture isolated *S. Agalactiae*. Bone biopsy reported as necrotizing granulomatous lesion. Computed tomography thorax was suggestive of necrotic tuberculous mediastinal and hilar lymphadenopathy. Based on histopathology, microbiology, and radiological findings, coinfection of tuberculous osteomyelitis and bacterial infection was confirmed and antitubercular therapy was started, along with antibiotics for *S. agalactiae*.

**Conclusion:** Tuberculous osteomyelitis mimicking brodie's abscess is very rare. It is important to consider coinfection in osteomyelitis and it is essential to do tuberculosis-polymerase chain reaction and histopathological examination, along with bacterial and fungal culture of pus in subacute osteomyelitis for the early diagnosis and treatment.

**Keywords:** Tuberculous osteomyelitis, *Streptococcus agalactiae*, brodie's abscess.

## Introduction

The coinfection of tuberculosis (TB) and bacterial infection in the same bone is rare and has not been widely reported. Superadded bacterial infection in TB patients can lead to delayed diagnosis and inadequate treatment [1]. According to the 2017 World Health Organization report, 6.3 million new TB cases and 1.6 million deaths due to TB have been reported in 2016 [2]. In almost 75% of tuberculous osteomyelitis cases, *Mycobacterium*

TB spreads through hematogenous route [2]. Diagnosis of extrapulmonary TB, that constitutes of about 15–20% of TB, in immunocompetent patients is difficult due to atypical presentation [1]. TB abscess in immunocompetent hosts are seen very infrequently with involvement of spine in most cases [3]. Skeletal TB accounts for 1–3% of all TB cases [4].

Brodie's abscess is a sub-acute form of osteomyelitis, presenting as a collection of pus in bone [5]. The slow progress of

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## Author's Photo Gallery



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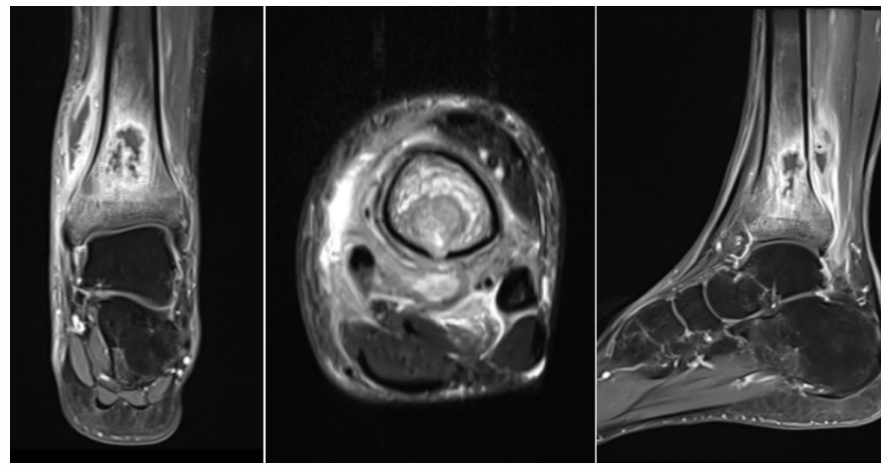
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**Figure 1:** X-ray of ankle ap/lateral view.



**Figure 2:** Magnetic resonance imaging ankle with distal tibia.

tuberculous osteomyelitis, due to lack of significant elevations in the laboratory values and changes in the radiographic appearance, often leads to confusion with brodie's abscess [2]. Sari et al. reported a case of a 65-year-old male with tuberculous osteomyelitis of distal tibia mimicking brodie's abscess which was detected by TB-polymerase chain reaction (PCR) [2].

In this study, we present a case of coinfection of tuberculous osteomyelitis of tibia with *Streptococcus agalactiae* infection mimicking brodie's abscess in a young immunocompetent patient.

### Case Report

A 24-year-old male of Asian origin came to our clinic with complaints of pain, swelling of left distal leg for the 2 weeks following blunt injury to right ankle. The patient had mild fever for 1 month with weight loss of 6 kgs over 3 months. His past

medical history was insignificant. He had received Bacillus Calmette-Guérin vaccination and there was no history of recent contact with TB patients tenderness with local rise of temperature which was elicited at distal leg. The patient was afebrile at the time of presentation. Erythrocyte sedimentation rate and C-reactive protein were 12 and 18, respectively, with normal total white blood cell count. A plain X-ray of the left leg showed a well-defined lytic lesion at the distal metaphysis of tibia (Fig. 1). Magnetic resonance imaging reported as left tibia showing hypointense signals in T1 involving distal metaphysis extending to the subchondral region. On post-contrast study, there is abnormal enhancement in distal tibia with eccentric hypointensity and linear extension into the metaphysis. There is hyperintensity of adjacent soft tissues with thick-walled collection seen along the medial and posterior aspect of distal tibia with cortical breach on the posterior tibia cortex (Fig. 2). Intraoperatively, pus was noted to arise from distal tibia which

was sent for microbiological and histopathological study (Fig. 3). The patient was taken up for distal tibia bone debridement and curettage. Culture-indicated growth of *S. agalactiae* and appropriate intravenous antibiotics were started. Bone biopsy result came after 10 days from initial washout and reported as necrotizing granulomatous lesion with Langerhans giant cells and mixed inflammatory cells suggestive of tuberculous osteomyelitis. On further imaging, computed tomography thorax revealed necrotic tuberculous mediastinal and hilar lymphadenopathy. The patient was treated with antitubercular treatment regime according to Indian tubercular society protocol (2 months-isoniazid 600 mg/week, rifampicin 450 mg/week, pyrazinamide 1500 mg/week, ethambutol 1200 mg/week, 4 months-isoniazid 600 mg/week, and rifampicin 450 mg/week). Antimicrobial therapy



**Figure 3:** Clinical image of distal leg showing pus.



**Figure 4:** Follow-up X-ray of tibia.

(Clindamycin+Cefazolin) was given for a period of 6 weeks for *S. agalactiae* infection. The patient was given below knee back slab for 4 weeks for soft-tissue healing and protective weight-bearing. Post-operative X-ray taken at follow-up showed no reactivation of infection (Fig. 4).

### Discussion

Tubercular and bacterial coinfection is uncommon in patients with preserved immunity. There are a few reports regarding the occurrence of TB with organisms such as *Streptococcus pneumoniae*, *Salmonella Typhi*, and *Streptococcus milleri* [1]. However, TB osteomyelitis and bacterial coinfection within bone has not been reported in the literature. *S. agalactiae* is known to cause endocarditis, skin and soft-tissue infections, osteomyelitis, pneumonia, meningitis, and urinary tract infections [6].

Brodie's abscess is known as a solitary lesion in the metaphyseal region and is characterized by the new bone formation around it. Tuberculous osteomyelitis can mimic many diseases clinically and radiologically such as brodie's abscess, pyogenic infections, osteosarcoma, osteoid osteoma, osteoclastoma, and aneurysmal bone cyst [2]. Osteoporosis, bone lysis, sclerosis, and periostitis are seen in both tuberculous osteomyelitis and chronic pyogenic osteomyelitis and it is often difficult to differentiate the two conditions [7]. Making an accurate and timely diagnosis of brodie's abscess is a challenge as patients remain afebrile often with unremarkable inflammatory markers and rarely exhibiting signs of systemic illness [8].

Vohra et al. reported about a case series of 28 patients with TB osteomyelitis and stated of six patients who exhibited clinical and radiological findings similar to chronic pyogenic osteomyelitis. To achieve rapid diagnosis and treatment, "culturing for every tumor and biopsy for every infection" should always be kept in mind [7]. In another study, Akgul

noted that clinical, radiological, and laboratory findings of their tuberculous osteomyelitis case showed close similarity with subacute osteomyelitis [9]. Sari et al. reported a case of a 65-year-old male diagnosed with tuberculous osteomyelitis of tibia with similar clinical and radiological findings of that of brodie's abscess [2]. Nijhawan et al. reported a case of a 64-year-old male with tuberculous osteomyelitis mimicking brodie's abscess and these low virulence clinical cases can lead to delay in diagnosis and progressive bone destruction [10].

Arora et al. reported that three patients with concurrent TB and bacterial infection in pulmonary and extrapulmonary sites and antibiotics and anti-tubercular therapy were initiated, leading to improvement of the patient [1].

In all these studies, there was no superadded bacterial infection of bone along with mycobacterium TB which makes this case a rarity.

### Conclusion

Tuberculous osteomyelitis mimicking brodie's abscess is very rare. It is important to consider coinfection in osteomyelitis and it is essential to do TB-PCR and histopathological examination, along with bacterial and fungal culture of pus in subacute osteomyelitis for the early diagnosis and treatment.

### Clinical Message

Coinfection of tuberculous osteomyelitis with bacterial infection in the same bone has not been reported before, and thus, it is important to send pus sample for TB polymerase chain reaction test and histopathological examination, along with bacterial and fungal culture to determine the pathogens involved in all cases so that early treatment can be initiated. Brodie's abscess can mimic as tuberculous osteomyelitis and to consider TB as one of the differentials in the diagnosis of subacute osteomyelitis.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Conflict of interest:** Nil **Source of support:** None

### References

1. Arora AA, Krishnaswamy UM, Moideen RP, Padmaja MS. Tubercular and bacterial coinfection: A case series. *Lung India* 2015;32:172-4.
2. Sari A, Dinçel YM, Erdogdu IH, Sayiner HS, Agir I, Çetin MÜ. Tuberculosis osteomyelitis of the tibia mimicking Brodie abscess: A case report and review of the literature. *SAGE Open Med Case Rep* 2019;7:1-7
3. Saldaña NG, Bejarano JI, Porras MH, de la Garza EA, Gutiérrez SF, Gutiérrez JL, et al. Co-infection with *Streptococcus anginosus* and *Mycobacterium tuberculosis* in

an immunocompetent pediatric patient. A case report. *BMC Pulm Med* 2020;20:5.

4. Siddiqui MS, Javed S, Razak A, Zubairy A, Khan SH. Brodie's abscess with tuberculous osteomyelitis of the foot. *JBR BTR* 2014;97:168-9.

5. van der Naald N, Smeeing DP, Houwert RM, Hietbrink F, Govaert GA, van der Velde D. Brodie's abscess: A systematic review of reported cases. *J Bone Jt Infect* 2019;4:33-9.

6. Raabe, V.N. and Shane, A.L. (2019a) 'Group B streptococcus (*Streptococcus agalactiae*)', *Microbiology Spectrum*, 7(2), pp. 1–13.

7. Vohra R, Kang HS, Dogra S, Saggarr RR, Sharma R. Tuberculous osteomyelitis. *J Bone Joint Surg Br* 1997;79:562-6.

8. Salik M, Mir MH, Philip D, Verma S. Brodie's abscess: A diagnostic conundrum. *Cureus* 2021;13:e16426.

9. Akgül T, Ozger H, Göksan BS, Eren I. Cystic transphyseal bone tuberculosis: A report of two cases. *Acta Orthop Traumatol Turc* 2012;46:316-9.

10. Nijhawan D, Goel K, Goel R. Tuberculous osteomyelitis of the tibia simulating Brodie's abscess-a case report. *Int J Sci Res* 2020;9:54-55.

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