

## RESEARCH ARTICLE

# Ambiguity of Primary Patellar Tuberculous Osteomyelitis as a Pre-Patellar Bursitis: A Case Report

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**Abstract**

Case: A 47-year-old male with swelling over the patella and associated pain, subsiding with medicines but recurring after a few days. Diagnosed as prepatellar bursitis by the family physician, it eventually turns out to be osteomyelitis of the patella. Treated with curettage, biopsy, and placement of bio-composite mixed with antibiotics. Intra-operative findings and histopathology confirmed tuberculosis of the patella. On follow-up after 6 years and the completion of anti-tuberculosis treatment, the patient showed full functional and radiological recovery without recurrence. Conclusion: Early treatment with antibiotics and surgery gives excellent results. Identifying it as a tuberculous osteomyelitis is challenging when the condition is closely resembles pre-patellar bursitis.

**Level of evidence: IV****Keywords:** Acid-fast bacilli, Caseous necrosis, Endemic, Osteoarticular, Osteomyelitis, Prepatellar Bursitis, Tuberculosis**Introduction**

Tuberculosis is endemic in Asian countries, especially India; however, its presentation keeps surprising and confounding the treating physicians.<sup>1,2</sup> Tuberculous infection of bones has prevalence of 1–3% of total tuberculosis cases; however, isolated tuberculosis of the patella is extremely rare, with a prevalence of 0.09–0.15% of all osseous infections of tuberculous origin.<sup>3–8</sup> The most frequent osteoarticular locus is the spine, followed by the hip and then the knee.<sup>1,6–9</sup> With approximately one third of the world's population infected with TB and the growing prevalence of HIV and increasing global immigration of people, orthopaedic surgeons are more likely to see patients suffering from osteoarticular tuberculosis.<sup>1,6</sup> The rarity of patellar tuberculous osteomyelitis with nonspecific clinical findings and subtle changes on plain radiographs leads to frequent delays in diagnosis.<sup>1,3,4,10</sup> Author reports a rare case of a lytic lesion of tuberculous origin in the patella without any other osseous involvement.

**Consent:** Written informed consent is obtained from the patient for the publication of this case report and images. A copy of the consent is available for review if required.

**Case Presentation**

A 47-year-old Indian male presented with a sudden onset left knee joint pain of one month with inflammatory swelling of knee, antalgic gait, and restricted range of motion particularly flexion. He had no significant past medical or surgical ailments. Middle class working male who travels by train daily without any family history of medical illness or any tuberculosis in the family. No history of trauma to the knee, weight loss, or any chest symptoms were found. He had no nighttime fever or night sweating, and no associated history of tuberculosis contact. Prior to the outpatient visit, the patient was following up with the family physician, who treated it as a superficial skin infection.

On examination, the patient had prepatellar swelling with tenderness localised to the prepatellar region without

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discharging the sinus. There was little erythema and a

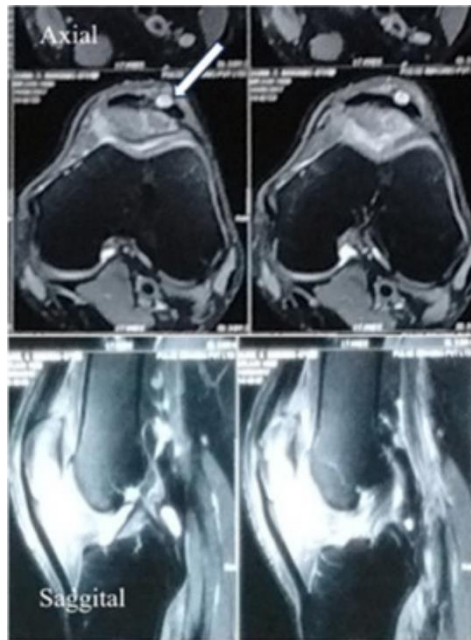
The range of motion was terminally painful; otherwise, it was full range. A primary diagnosis of prepatellar bursitis was made, and anti-inflammatory medicines with empirical antibiotic coverage were prescribed. After two weeks of rest, ice application, and medical treatment, there was no significant relief of symptoms. At this moment, a provisional diagnosis of prepatellar bursitis with underlying bacterial osteomyelitis was considered. For the same reason, an X-ray and an MRI were prescribed along with blood work.

Basic radiological evaluation of knee, on x-ray was suggested erosion of the anterior cortex of patellar margin [Figure 1]. MRI was suggestive of focal osteomyelitis of the patella with anterior surface erosion and associated collection extending anteroinferior subcutaneous planes

localised rise in temperature as compared to another knee. over the patellar tendon [Figure 2]. No intraarticular extension was seen except for some reactionary joint effusion. There was an enlarged popliteal lymph node. Blood work was suggestive of anaemia, with an elevated ESR at 55 and elevated qualitative CRP. X-ray chest evaluation showed an old 5th rib fracture with pleural effusion obscuring the left costophrenic angle [Figure 3]. According to the above-mentioned findings, infective bacterial post-traumatic osteomyelitis with prepatellar bursitis was the provisional diagnosis, and workup was done for surgery of excision biopsy, debridement, and placement of biodegradable calcium granules mixed with antibiotics.



**Figure 1. X-ray AP and Lateral views showing lytic lesion (Arrow) with erosion and periosteal reaction**



**Figure 2. MRI images (A) Axial Section; (B) Sagittal Section**



**Figure 3. Chest X-ray PA view suggestive of rib fracture and left-side pleural effusion obliterating costophrenic angle**

As a first step in surgery, aspiration of the knee was done, and the synovial fluid was sent for culture and sensitivity with fluid analysis. Intraoperatively, author found that the osteomyelitis showed friable necrotic tissue with caseous necrosis of bone, as shown on the clinical picture [Figure 4]. All of the pathological tissue, along with the prepatellar bursa, was resected and curetted and sent for histopathology, acid-fast bacillus culture, and sensitivity, along with gram culture [Figure 4].

The crater created was almost 5 x 1.5 x 1 cm without breaching the patellar cartilage. As there was a primary suspicion of post-traumatic bacterial osteomyelitis, we placed biodegradable calcium pellets mixed with the empirical antibiotic (colistin) so that sustained release of the antibiotic could control osteomyelitis [Figure 5].

The knee was immobilised in extension with the help of a brace for 4 weeks. AFB cultures were negative and the

staining was negative for bacilli. Histopathological examination of biopsied soft tissue and bony material showed necrotic areas surrounded by histiocytes, variable lymph plasma cells, neutrophils and occasional multinucleated giant cells without signs of malignancy [Figure 6]. Due to financial constraints patient refused few of molecular testing. Anti-Tuberculosis treatment initiated for a year. Initial two months of four drugs therapy with basic dosage of Isoniazid, Rifampicin, Pyrazinamide and Ethambutol. Subsequent 10 months patient received Rifampicin and Isoniazid only.

Regularly, patient was evaluated through laboratory tests for any hepatic or renal side effects of the medicines. At a follow-up of 12 months, the knee is free of pain without any recurrent swelling.

The surgical wound had complete healing and no scars or discharging sinus. Bony void also showed near total filling

with new bone seen on x ray. Short-term results showed not function. Follow up X-ray demonstrated partial filling of the dead space or bone loss. After 6 years of follow-up, X-rays show complete healing, and the patient remains

only normalised ESR and CRP levels but also improved knee asymptomatic and without any signs of local recurrence [Figure 7, 8].



Figure 4. Intra-op Images showing (A) caseous yellow bone necrosis and (B) a biopsy sample for histo-pathology



Figure 5. Post of Knee x-ray AP and Lateral views showing bioabsorbable calcium beads Impregnated with antibiotics

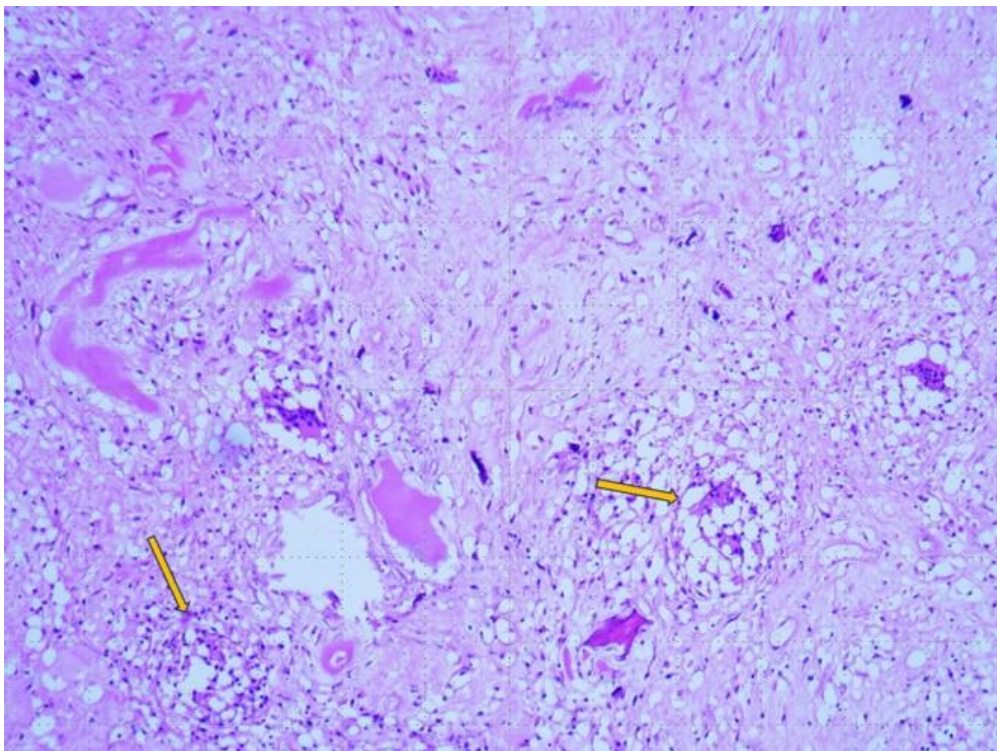


Figure 6. Histopathological microscopic slide showing early forming granulomas (yellow Arrow)



**Figure 7.** Follow-up x-ray knee AP and Lateral views after 6 year shows complete bone healing



**Figure 8.** Clinical picture of complete wound healing (scar) and no discharging sinus

### Discussion

The prepatellar bursa is a synovial bursa that lies subcutaneously between the skin and the patella is anatomically different from other bursae around the knee. The bursa which lies in front of the patellar tendon and tibial tubercle is called as infrapatellar bursa.<sup>4</sup> Many times these two are collectively referred to as the prepatellar bursa. Dye *et al.* found in a cadaveric study that this bursa has a trilaminar structure in 93% of knees as compared to other anatomist who feel it is uni-laminar or bi-laminar structure.<sup>4</sup>

After the spine and hip joints, the knee is the third most common joint affected by osteoarticular tuberculosis. However, isolated tubercular patellar involvement is very uncommon, with an incidence of 0.09 to 0.15%.<sup>3-8</sup> Aitken reported two cases of patellar TB (one paediatric male patient) in 1933.<sup>11</sup> Differential diagnosis of such lytic lesions includes chondroblastoma, osteoblastoma, infected aneurysmal bone cysts, metastatic lesions, Brown tumours, gout, pyogenic and fungal osteomyelitis, etc.<sup>5,7,8</sup> The likely triggers for the infected tuberculous osteomyelitis are trauma, which would activate the infection focus, poverty, immunocompromised status like AIDS. The resistant strains of AFB Bacilli are seen in patients from high prevalence areas like India and other Asian countries.<sup>1,8</sup> Osteoarticular involvement is probably of hematogenic or pulmonary origin.<sup>9</sup> Tuli SM *et al.* examined over one thousand cases of Tuberculosis of bones out of which 90 (8.3%) involved the knee, out of which only one (0.09%) was localised in the patella.<sup>2,3,8,9</sup> Although radionuclide bone scans, CT, and MRI scans have been reported in the literature as excellent diagnostic aids for diagnosing such lesions, biopsy remains the

cornerstone.<sup>2,3,5,10</sup> An osteolytic cystic lesion of the patella with a central sequestrum and absence of marginal sclerosis is usually considered to be infective, including tuberculosis.<sup>2,3,5,8-10</sup>

The patellar bone is an easily accessible bone for needle aspiration cytology, and it can be used for early confirmation of diagnosis.<sup>4,5,7</sup> Surgical debridement can also serve as a diagnostic tool for confirmation of the diagnosis, besides being therapeutic in nature. An early diagnosis followed by definitive treatment is desirable in such cases in view of the proximity of the knee joint to such lesions. Tuberculosis is not so common in the West but is fairly common in countries like India. Hence, in osteolytic lesions of the patella, the possibility of tuberculosis should always be considered, in spite of its rarity. The appearance of a fistulized pre-patellar cold abscess argues for a diagnosis of tuberculosis.<sup>3,8,9</sup>

The serological tests are of prognostic value as they reflect disease severity or the efficacy of treatment.<sup>8</sup> The Tuberculin Skin Test is of least specificity or importance in areas of high endemicity like India.<sup>8,9</sup> Curettage can be used to remove sequestered bone and establish a tissue diagnosis. Cold abscess aspiration or biopsy culture reports are able to grow and detect acid-fast bacilli, however, it could be rarely negative even after allowing adequate time for cultures. Confirmation is made on biopsy.<sup>2-5,8,9</sup> However, subsequent anti-tuberculous therapy is seen as the mainstay of treatment.<sup>1,4</sup>

### Conclusion

Multidrug antituberculosis antibiotic protocol is considered the treatment of choice. Operative options like debridement and curettage are explored in view of

significant abscess and causing compressions or pressure symptoms on surrounding.<sup>1,4</sup> Some authors proposed debriding the posterior wall of bursa and keep anterior wall and subcutaneous tissue intact so that skin complications or sinus formation could be avoided.<sup>4</sup> Treatment duration varies but often exceeds one year. In recent publications, surgery has been limited to a biopsy. The presence of an abscess, however, or a persistent, resistant bone lesion may require surgical cavity curettage.

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