



## Case report

# Primary patella tuberculosis mimicking pre-patellar bursitis: A case report and review of the literature

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## ABSTRACT

**Introduction and importance:** The Patella is very rare site for tuberculosis (TB). The knee is the third most common site for skeletal TB. The incidence of patella TB being 0.09 to 0.15%.

**Case presentation:** We report a case of primary tuberculous osteitis isolated from the patella. The complaint was a mixed knee pain without notion of trauma. The CT showed a large osteolysis of the upper half of the patella. The diagnosis was established on the histological study after biopsy. The patient was operated by a medial approach without arthrotomy and the pathological tissue was resected and curetted. Complementary anti-bacillary antibiotic treatment was administered for 12 months. At the last clinical control, the knee was free and painless, and we had no recurrence.

**Clinical discussion:** Aitken reported the first case in literature in 1933. The initial signs and symptoms are non-specific and sometimes confounded by a coincidental history of trauma. It is difficult to diagnose TB of patella in early stages because there are no constitutional symptoms. Sometimes serological parameters are inconclusive. CT scan can help if the osteolysis contained a central bone sequestration, bordered by peripheral sclerosis. Confirmation of patellar tuberculosis is made on biopsy.

**Conclusion:** The tuberculous localization in the patella is rare and it can pose a problem of differential diagnosis with other affections, in particular infectious and tumors. It should always be kept in mind, especially in the face of a picture of pre-patellar bursitis which progresses slowly and whose biological inflammatory syndrome is not straightforward.

## 1. Introduction

According to the World Health Organization (WHO), 1.4 million people die of tuberculosis each year [1]. Osteoarticular tuberculosis (TOA), also known as peripheral tuberculosis, represents 1 to 3% of tuberculosis cases, all locations combined. The knee occupies the third place of these localizations after the disco-vertebral localization and that of the hip [2] with a particular tropism for its synovium to attack the bone structures thereafter. Primary and isolated tuberculosis of the patella is exceptional; the literature suggests a prevalence of 0.09 to 0.15% of all cases of osteoarticular tuberculosis [3]. Only ten cases of patellar tuberculosis (PD) have been RECENTLY reported [4].

We present a rare case of an osteolytic lesion in the patella, without other concomitant localization. This study is reported in line with the SCARE 2020 checklist [5].

## 2. Case report

We present the case of a 49-year-old immunocompetent Tunisian woman who presented with an 8-month history of spontaneous left knee inflammatory pain with knee swelling, limping at walking, and restriction of movements (Fig. 1). The patient had no past medical or surgical history. Her family members were healthy. She didn't use any kind of drugs.

No history of trauma to the knee, weight loss, or any chest symptoms were found. There is no history of night fever or night sweating. The patient didn't have a HIV or COVID 19 infections. She had no other osteoarticular, respiratory, or systemic symptoms. A previous history of contact with tuberculosis (TB) was not identified. On examination, the patient had tenderness on palpation of the medial joint surface of the patella and patellar crepitation without discharging sinus. The range of

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Fig. 1. Inflammatory aspect of the knee with a flossum.

motion was 10° flexum to 100° which was very painful at the end of the stroke. There was no inguinal lymphadenopathy. An anemia was found on blood analysis.

C-Reactive Protein was relatively high controlled twice at 40 mg/l.

The tuberculin skin test was positive with a 14 mm induration at 72 h. The test for Koch's bacillus (BK) in sputum and urine was negative. The chest X-ray was without abnormalities.

The CT done first, shows on the sagittal reconstructions a large antero-superior bony notch that erases half of the base of the patella, with thickening of the patellar and quadriceps tendons opposite, as well as the soft parts (Fig. 2). Further exploration by MRI reported on sagittal T1 and axial T2 Fat/Sat slices oedema of the patellar spongy bone with T1 hypointense, T2 hyper signal with oblong lobulated lesion centered on the cortical front of the patella with T2 hypersignal breaking the cortical, surrounded by a hypointense border. The whole thing is associated with an intra-articular effusion of low abundance with synovial thickening and infiltrated appearance of the soft subcutaneous parts (Fig. 2). The sagittal and axial T1 FAT/SAT injected sequences generate an intense contrast price of the cortical lesion of the patella associated with a contrast price of the soft parts opposite and of the synovium. The cartilaginous surface of the patella is continuous on all sections (Fig. 2). The diagnosis of primary tuberculous osteitis of the kneecap was most likely.

The patient was operated by a medial approach without arthrotomy. It was carried out by our orthopedic surgery team of Habib Bougatfa

Hospital. This procedure didn't need advanced technical or logistical resources.

On exploration of the anterior patellar surface, a grayish-yellow friable tissue was discovered with a large whitish sequestration, the whole bathed in a liquid of cloudy appearance: all of the pathological tissue was resected and curetted (Fig. 3). We thus kept an empty crater of 3 \* 3 cm extended from the base to the middle of the patellar body flush with the cartilaginous plane without breaking it. The hyperhemized quadriceps tendon still attaches to what's left of the base of the kneecap while losing its usual luster. An anatomopathological and bacteriological sample were taken. The remaining bone bed was very curved without filling. The closure is done plan by plan on a small caliber redon drain guarded for 2 days. The suites were simple. An immobilizing knee brace held the knee in extension for 4 weeks while still providing protected support.

Histological study of the curved tissue confirmed the diagnosis of bone tuberculosis by highlighting the presence of caseous necrosis surrounded by gigantocellular epithelial follicles without signs of malignancy. Anti-bacillary treatment was started for twelve months: two months of quadruple antibiotic therapy based on Isoniazid (5 mg/kg per day), Rifampicin (10 mg/kg per day), Pyrazinamide (25 mg/kg per day) and Ethambutol 20 mg/kg/day then ten months of Rifampicin and Isoniazid, with a very regular hepatic and renal biological control (monthly for the first three months then quarterly until the end of anti-tuberculosis treatment). The short-term course was good with improved knee function.

At a follow-up of 18 months, walking is normal, the knee is free and painless (0/0/140), the operative wound is healed, without collection opposite, the control knee X-ray showed partial filling of the bone void generated by curettage without associated patellofemoral pinching signs.

### 3. Discussion

The Patella is very rare site for tuberculosis (TB). The knee is the third most common site for skeletal TB after the spine and the hip with the incidence of patella TB being 0.09 to 0.15% [6,7].

Aitken [8] reported the first case in literature in 1933. According to Tuli SM review of 1074 cases of osteoarticular Tuberculosis, only 90 cases (8.3%) involving the knee, out of which only one (0.09%) was localized in patella [6].

Direct invasion following injury, hematogenous and local spreads from pre patellar bursitis may be routes of infection in Patella [9,10].

The probably risk factors of patellar tuberculosis were the presence of notion of trauma which would activate a preexisting osteoarticular focus the low socio-economic level, HIV infection (AIDS), the emergence of resistant strains of *Mycobacterium tuberculosis* and patients from high endemicity areas [3,4,6,11].

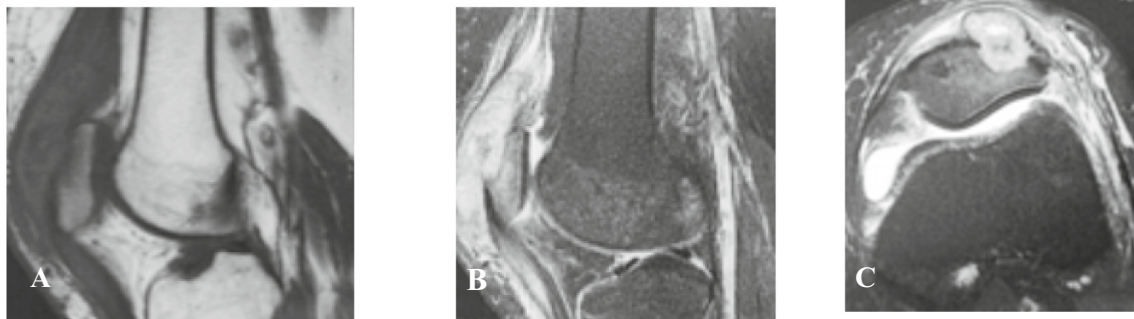
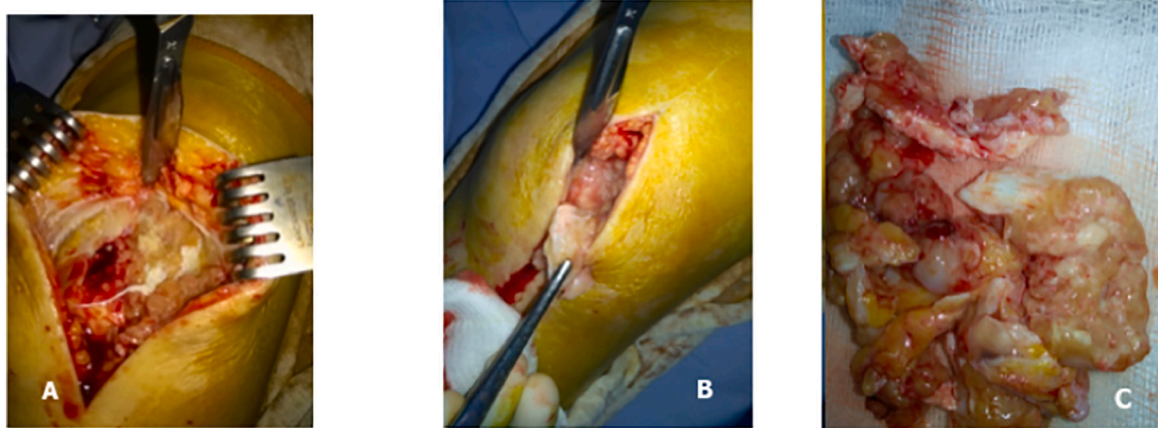


Fig. 2. (A) Sagittal CT scan: Anterosuperior lysis of the body of the patella which encroaches on the base with net thickening of the tendons and soft parts, (B) Sagittal T1 MRI patellar cancellous edema in T1 hyposignal with lobulated oblong lesion centered on the anterior cortical of the patella (C) MRI injected axial T2 FAT/SAT Gado: Intense contrast enhancement of the patellar lesion associated with contrast enhancement of the overlying soft parts and synovium. The cartilaginous surface of the patella is respected.



**Fig. 3.** Intra-operative views: (A) Lysis of the anterior surface of the patella filled with a friable grayish yellow tissue, (B) Extraction of the sequestrum, (C) Curettage product: we can clearly see the presence of the caseum.

We haven't found an association in literature between patellar TB and COVID 19 infections.

In our case, there was not a clear explanation of the unifocal origin of the involvement of the patella by mycobacterium tuberculosis unless a latent focus which was grafted on the patella by hematogenous route and did not may have manifested by another joint or extraarticular localization.

The disease is paucibacillary and for this reason can be diagnosed only if the index of suspicion is high [6]. The initial signs and symptoms are non-specific and sometimes confounded by a coincidental history of trauma.

It is difficult to diagnose TB of patella in early stages because there are no constitutional symptoms. The patient presents mostly with features of chronic knee synovitis. The appearance of a fistulised prepatellar cold abscess argues for a diagnosis of tuberculosis [12].

A correlation can be found between laboratory findings of blood samples, for example, an elevated levels of erythrocyte sedimentation rate (ESR) and C-reactive protein and the disease. This serological parameters are generally inconclusive but they have prognostic than diagnostic value and reflect disease severity or efficacy of treatment. Mantoux test (Tuberculin Skin Test) is not specific in areas of high endemicity.

X-ray and MRI are useful for making diagnosis. MRI imaging becomes essential to localize, identify, and pinpoint the diagnosis. Radiographs in initial stages can be normal, however keeping a high index of suspicion, MRI can help in the assessment of soft-tissue involvement, including bursae around knee joint, synovium, and also aid in characterizing bone involvement of patella and adjacent bones. In cases of patellar tuberculosis, MRI may depict abnormal marrow signals involving patella (hyperintense on STIR/T2W and isointense on T1W), focal altered signal intensity lesions-developing abscesses, associated synovial thickening, and rarely joint effusion. Post-contrast T1W images may reveal enhancing synovial thickening and heterogeneous enhancement of the marrow changes [13,14].

Imaging differentials include post-traumatic marrow edema, prepatellar bursitis, inflammatory arthritis, and crystal deposition disease [15]. Fluid aspirate for bacteriological evaluation may be equivocal, and tissue diagnosis is essential for confirmation [16,17].

CT scan can help if the osteolysis contained a central bone sequestration, bordered by peripheral sclerosis [16,18].

Hartofilakidis-Garofalidi [20] reported three cases of patella tuberculosis, all involving open osteolysis in the knee joint and probably representing very evolved forms.

Pus culture reports are mostly negative and materials mostly fail to demonstrate acid-fast bacilli. Confirmation is made on biopsy [3,16,19]. The biopsy could be performed percutaneously under X-ray or CT

guidance, given the superficial location of the patella.

Osteoarticular tuberculosis treatment is based on multiple anti-biotherapy. Treatment duration varies between 12 and 18 months. In recent publications, surgery has been limited to biopsy. The presence of an abscess, however, or persistent resistant bone lesion may require surgical cavity curettage and debridement [9,21].

#### 4. Conclusion

The tuberculous localization in the patella is exceptional and it can pose a problem of differential diagnosis with other affections, in particular infectious and tumors. It should always be kept in mind, especially in the face of a picture of pre-patellar bursitis which progresses slowly and whose biological inflammatory syndrome is not straightforward. The presence of bone lysis on an X-ray of the knee should attract the attention of the clinician. Histology remains a key component of the diagnosis with certainty allowing for adequate medical management first and foremost by surgery depending on the stage and extent of patellar tuberculosis.

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The study type is exempt from ethical approval.

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#### CRediT authorship contribution statement

Writing the paper, Study Concept: Khezami karim.  
Data collection, Study Concept: Bennour Mohamed Amine  
Supervision: Mohamed Amine Bennour.

#### Guarantor

Dr. Khezami Karim.

#### Registration of research studies

Not applicable.

#### Consent

Written informed consent was obtained from the patient for

publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor in Chief of this journal on request.

#### Provenance and peer review

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#### Declaration of competing interest

This article has no conflict of interest with any parties.

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