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Osteoarticular tuberculosis of the ankle, a rare localization: a case report

--Manuscript Draft--

Osteoarticular tuberculosis of the ankle, a rare localization: a case report

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Summary

Tuberculosis is a real scourge, posing a real public health problem in countries where the disease is endemic. Osteoarticular tuberculosis represents 2% to 5% of all tuberculosis cases and 11% to 15% of extra-pulmonary tuberculosis cases. Involvement of the foot and ankle is rarer. We report the case of osteoarticular tuberculosis of the ankle in a 71-year-old patient with type 2 diabetes and hypertension who presented to the trauma department of the Mohammed V Military Hospital with a painful swelling of the ankle. Standard X-rays and CT scan of the ankle showed inflammatory involvement of the bone and joints. Antitubercular antibiotic therapy was instituted for nine months. Given the context of endemicity, any atypical presentation of lingering bone lesions should raise the suspicion of osteoarticular tuberculosis in order to ensure early therapeutic management.

Keywords: tuberculosis, ankle, PCR

Introduction

Tuberculosis is a major public health problem and is one of the top 10 causes of death worldwide. According to the WHO, nearly 35 000 cases are reported each year in Morocco in 2021.

Osteoarticular tuberculosis accounts for 2% to 5% of all tuberculosis and 11% to 15% of extrapulmonary tuberculosis [1,2]. Tuberculous spondylodiscitis is the most common (50% of cases) [3,4]. Involvement of the foot and ankle is rarer [5].

We report a rare case of osteoarticular tuberculosis of the ankle in a 71-year-old diabetic and hypertensive patient admitted for ankle arthritis and we emphasize the value of molecular biology in the early management of these rare pathologies.

Observation

A 71-year-old patient with type 2 diabetes, hypertension, and right hemiparesis following an ischemic stroke, without any history of tuberculosis exposure, was admitted for a right ankle swelling over 01 month without any history of trauma. The clinical examination found a warm, red, fluctuating, and

painful swelling of the ankle. Joint mobilization was painful. The patient did not present any signs of tuberculosis infection. Soft tissue ultrasound showed a poorly defined hypoechoic, heterogeneous swelling extending into the joint with infiltration of the muscular and tendinous structures suggesting a complicated abscessed tenosynovitis and myositis.

The ankle CT scan revealed a diffuse heterogeneous appearance of the bone structure with lytic lesions of the subchondral bone and bone cortex accompanied by diffuse infiltration of soft tissues and muscle calcifications (Figure 1).

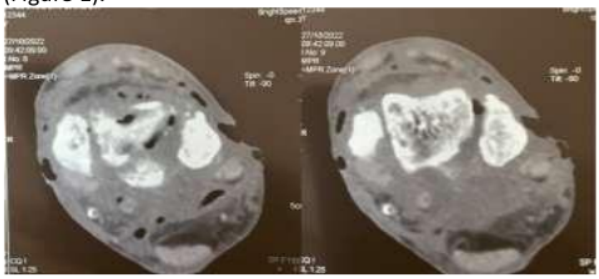

Figure 1 :Lytic lesions of the subchondral bone and cortical bone with diffuse infiltration of soft tissue.

The thoracic CT scan allowed the visualization of diffuse bronchial micronodular lesions, which converge in places with a bilateral pleural effusion, more marked on the right (figure 2).

Figure 2: Diffuse bronchial micronodules.

On a biological level, the laboratory results showed a CRP of 138.7 mg/L, lymphopenia (0.5 G/L), and normochromic microcytic anemia of 9.5 g/dL. The peripheral smear was normal with no atypical cells. The renal and hepatic function were preserved and no electrolyte abnormalities were reported.

During the surgical operation, the pus was collected for cytobacteriological analysis. The sample was seeded on Columbia agar with 5% sheep blood, Polyvitex® chocolate agar, and in a Heart-Brain broth for enrichment which was then sub-cultured on blood agar. Incubation was performed aerobically at 37°C for 18-24 hours. All cultures and subcultures were found sterile. The direct examination of the deep pus stained by Gram's method showed a significant inflammatory cellular reaction mainly composed of polynuclear cells with no bacterial flora detected.

The mycobacteriological examination of the pus was carried out and showed Acid-Fast Bacilli (AFB) on direct examination (Figure 3) after Ziehl-Neelsen staining (1 to 10 AFB/100 fields). The culture in solid Löwenstein Jensen medium and liquid MGIT (Mycobacteria Growth Indicator Tube) medium became positive on days 21 and 10, respectively. Real-time PCR (GeneXpert MTB/RIF®, Cepheid) allowed the detection of the *Mycobacterium tuberculosis* complex at a very low level without detection of resistance to rifampicin.

Figure 3: Acid-fast bacillus found on direct examination by Ziehl-Neelsen staining.

In accordance with the Moroccan national anti-tuberculosis program, a nine-month course of anti-bacillary antibiotic therapy was used to treat the patient: the combination of ethambutol, pyrazinamide, isoniazid, and rifampicin for two months followed by the combination of isoniazid and rifampicin for the remaining seven months. The treatment was successful, with good clinical tolerance, disappearance of symptoms and no relapse 5 months after completion of treatment.

Discussion

Osteoarticular tuberculosis represents 2% to 5% of all tuberculosis cases and 11% to 15% of extrapulmonary tuberculosis cases [1,2]. Tuberculous spondylodiscitis is the most frequent (50% of cases) [3,4]. involvement of the foot and ankle is rarer [5]. Tuberculous osteoarthritis usually results from hematogenous dissemination from an initial pulmonary, lymph nodes or other organ infection, which may be symptomatic or unnoticed [8]. Osteoarticular tuberculosis most often occurs in an immunocompromised individual (HIV infection, corticosteroid therapy, immunosuppressive treatment, diabetes, chronic renal failure) with a bimodal age distribution: 55 years in native populations and 20- 35 years in immigrants [10].

The atypical location, the insidious clinical presentation, the lack of an initial diagnosis of pulmonary tuberculosis, as well as the hemiparesis, explains the delayed diagnosis. The presence of tuberculosis impregnation signs such as night sweats and general deterioration are rare, and the main clinical signs are pain, swelling and functional impotence [6].

The chest X-ray lacks specificity because more than 80% of patients do not have concomitant active tuberculosis. [7].

The standard ankle radiography, thoracic CT and ankle CT are nonspecific but allow for the detection of lesions and help determine their nature. MRI is the preferred examination because it ensures early

detection, from the beginning of the infection, of the affected bone parts and their extension to the soft tissues and neighboring joints. [6].

The anatomopathological study, although specific, was not performed given the purulent nature of the sample.

The laboratory tests allowed us to detect the presence of an inflammatory syndrome. The high CRP and the significant cellular reaction in the pus, associated with sterile cultures, led to the search for Koch's Bacillus by molecular method and direct examination with culture. In extrapulmonary tuberculosis, samples are often paucibacillary, hence the interest in molecular methods that have a high sensitivity and specificity (92-98%) for the diagnosis of *Mycobacterium tuberculosis* complex, with a short turnaround time for results (2 hours) and a good positive predictive value for rifampin resistance (98%) [9]. Direct examination and culture are still necessary. Indeed, culture on solid media allows obtaining strains for further study, especially for exploring resistance to anti-tuberculosis drugs in case of therapeutic failure. Culture in liquid media makes up for the slow growth in solid media. Direct examination, when positive, confirms the presence of Mycobacterium spp. by observing the acid-fast bacilli.

Treatment relies on anti-bacillary drugs, which slow down the progression toward sequelae, namely chronic pain, and deformity. [6] The majority of lesions heal within 6-12 weeks under medical treatment. [8]

Surgical treatment is indicated in case of failure of medical treatment when synovitis, fistula, or abscess persist [6]. Since the introduction of anti-tuberculosis quadri-chemotherapy, the indications for surgery have become very restricted and selective, and are limited to the prevention or correction of deformities as well as the improvement of the function of the affected joint [8]. Arthrodesis procedures are mainly indicated at the level of the foot and ankle. [6]

Conclusion

Given the endemic context, any atypical presentation of lingering bone lesions should raise the suspicion of osteoarticular tuberculosis to ensure early therapeutic management. The treatment of osteoarticular tuberculosis is multidisciplinary and requires coordination between the physician, bacteriologist, and surgeon.

Ethical approval

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

Author contributions

ZM contributed to the initial drafting of the manuscript, while BE, BY, MA, and CM revised it. ELM provided the final approval for the version that will be published.

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Competing interests

The authors declare no competing interest.

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