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Role Of The Bacteriology Laboratory In The Diagnosis Of Tuberculous Trochanteritis: A Case Report And Review Of The Literature.

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Abstract:
Background: *Tuberculous trochanteritis is a rare infection, accounting for less than 2% of cases of osteoarticular tuberculosis. Its unusual localization and subtle clinical manifestations pose significant diagnostic challenges for healthcare providers. This case highlights the central role of bacteriology laboratories in the early diagnosis of tuberculous trochanteritis, complementing radiological and histological approaches. We emphasize that bacteriological and molecular biology examinations remain crucial tools for confirming the etiology of tuberculosis and excluding mycobacteria not belonging to the mycobacterium tuberculosis complex. This enables more precise therapeutic decisions to be made.*
Key words: *Bacteriological diagnosis - Mycobacterium tuberculosis - PCR - Tuberculous trochanteritis*

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I. Introduction

Despite the fact that Morocco is a country with a high tuberculosis endemic, tuberculous trochanteritis (TT) remains an exceptional infection, accounting for only 1.8% of all osteoarticular tuberculosis worldwide [1]. Its unusual localization and discreet clinical appearance [1] often present clinicians with a diagnostic challenge. Alongside radiology and histology, molecular biology and bacteriological examinations are currently of great interest for an earlier diagnosis of this condition. The aim of our work is to highlight the role of the bacteriology laboratory in the diagnosis of TT.

II. Objective

Our aim is to provide an update on :

- The insidious nature of tuberculous trochanteritis, which should lead us to look for an infectious aetiology when chronic pain refuses anti-inflammatory and analgesic treatment.
- The importance of bacteriological and molecular examinations in addition to histological and radiological examinations, as they enable early and definitive diagnosis, eliminating atypical mycobacteria and making the best therapeutic decision.

III. Case Presentation:

We report the case of a 52-year-old woman, with no history of pulmonary tuberculosis and no notion of tuberculosis contagion, who consulted the traumatology-orthopedics department of our hospital for a progressive onset of pain in the right hip, associated with relative functional impotence dating back several months. Medical treatment was offered. After a few days, the patient presented with an exacerbation of the pain, which was resistant to analgesics, and a swelling of the superior-external aspect of the hip. Clinically, the mobilization test revealed pain in the region of the greater trochanter.

The blood count showed a slight increase in monocytes (1.3 ×103 /µl), a slight decrease in lymphocytes (1.3×103 /µl) and an elevated CRP (126 mg/l).

Magnetic resonance imaging (MRI) of the hip showed an appearance compatible with infectious arthritis of the right coxofemoral joint, associated with the presence of a huge periarticular abscessed collection. The latter was punctured during the biopsy of the greater trochanter. Both specimens were sent in parallel to the bacteriology and pathology laboratories. Histology revealed an inflammatory granulomatous epithelioid and gigantocellular reaction with caseous necrosis and calcification.

Bacteriology included a series of examinations. Firstly, the bacteriological examination of deep pus

(BEDP) (Fig.1), which included direct microscopic examination (DME) after Gram staining (Fig.2), aerobic cultures (Fig.3/a (1,2,3)), an anaerobic culture (Fig.3/b4) and finally a culture in liquid enrichment medium (blood culture broth type) (Fig.3/c5) which we incubated in the BACTEC® system. The results of these tests are shown in Table 1. Secondly, the DME after auramine staining was doubtful, requiring confirmation by Ziehl-Neelsen (ZN) staining, which came back negative (Fig.4/a). Thirdly, the real-time polymerase chain reaction (RT-PCR) performed on the Cepheid Xpert® MTB/RIF system (Fig.5) enabled a very low detection of mycobacterium tuberculosis and the absence of rifampicin resistance (Fig.6). Finally, culture on Löwenstein Jensen (LJ) medium was positive after 28 days incubation, showing >50 creamy-white colonies with a rough cauliflower-like appearance (Fig.4/b).

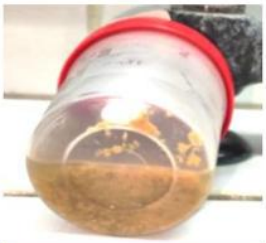

Fig.1: Subtrochanteric pus sample

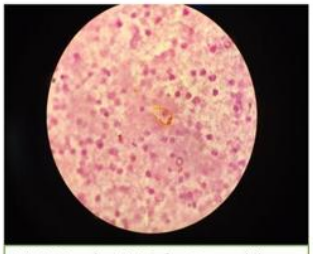

Fig.2: Negative DME after Gram staining, showing numerous neutrophils (Obj×40)

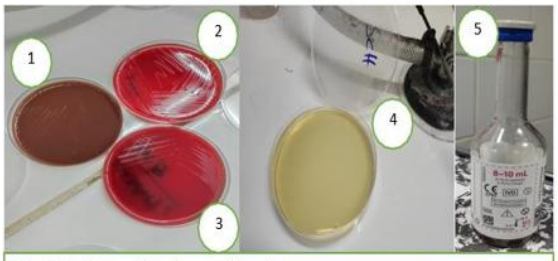

Fig.3: Sterile aerobic and anaerobic cultures

1- Cooked blood agar 2- Fresh blood agar 3- Columbia Nalidixic Acid agar

4- Schaedler agar 5- Aerobic enrichment broth

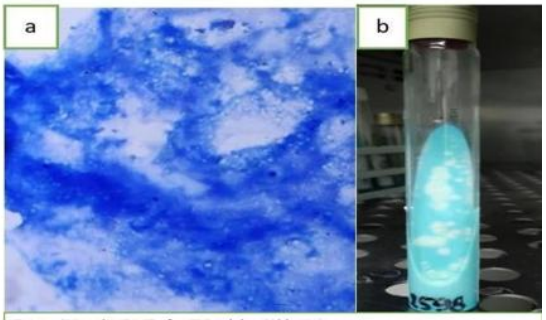

Fig.4: a/ Negative DME after ZN staining (Obj×100)

b/ LJ negative culture

Fig.5: Cepheid Xpert® MTB/RIF system

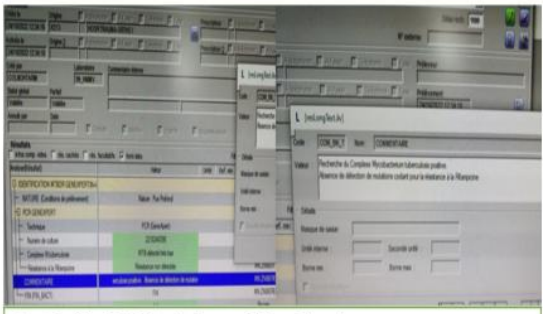

Fig.6: Positive RT-PCR and absence of rifampicin resistance

Bacteriological examination of deep pus			
DME after Gram staining	Aerobic culture	Anaerobic culture	Enrichment broth
Negative	Sterile	Sterile	Negative

Table 1 : Results of all bacteriological tests performed on the subtrochanteric pus

A thoracic-abdominal-pelvic CT scan to look for other sites of tuberculosis revealed no abnormalities. All of the above arguments contributed to the diagnosis of TT. Early medico-surgical management (without waiting for culture results) was therefore initiated. Anti-tuberculosis drugs were combined with trochanterotomy. The patient progressed well, with pain relief and resumption of mobilization after the subsequent fitting of a hip prosthesis.

IV. Discussion:

Diagnostic Tools And Their Characteristics:

TT is generally diagnosed late, at an advanced stage of cold abscess or fistulisation [1], preceded by a

progressive onset of pain with an average tolerance of 6 years [2]. The clinical picture is not specific and may be confused with other non-infectious aetiologies. This was the case in our patient.

Radiological Examination:

MRI remains the examination of choice for the detection of TT, allowing analysis of the soft tissues and identification of the abscess and its extensions [1].

Histological Examination:

Is a tool for confirming the diagnosis of TT [1]. It generally presents as an inflammatory granulomatous epithelioid and gigantocellular reaction with caseous necrosis [1]. This was the case in our patient, who presented with necrosis with a faint caseum and calcifications reflecting the age of the infection. The discreet nature of the caseum makes the clinician uncertain as to the tubercular aetiology of the lesion, bearing in mind that tuberculosis can present with or without caseum, and that there are other granulomatous pathologies which constitute a differential diagnosis and whose necrosis does not present with caseum (rheumatoid arthritis, rheumatic fever, tertiary syphilis, cat's claw disease). In all cases, additional bacteriological and/or molecular tests are required to confirm the diagnosis and establish it with certainty.

Bacteriological Examination:

The following are essential tools for establishing a definitive diagnosis of TT:

BEDP: our patient was not on antibiotic treatment prior to this examination, which is a prerequisite for avoiding false-negative results [3]. The sterility of the cultures and enrichment broth in our case reflected the absence of bacteria. This result prompted us to look for a tuberculous aetiology by searching for acid-fast bacilli (AFB) using DME after staining.

DME after auramine and ZN staining: auramine staining is used for rapid detection of the presence of AFB; if positive or doubtful, the biologist performs a ZN stain, which is considered to be a confirmatory tool. This test has good specificity and low sensitivity [4], especially for low bacterial loads. Despite the negativity of our DME, and given the strong suspicion of tuberculosis based on the radiological and anatomopathological data, we were led to search for the mycobacterium tuberculosis complex (MTC) genome by molecular biology.

Culture: given the sterile nature of the subtrochanteric pus, it was cultured directly from the centrifugation pellet without prior decontamination [4]. A positive culture shows creamy-white colonies with a rough cauliflower-like appearance, as in our patient's case. Despite the late nature of culture, which is explained by the slow generation time of AFB, it remains an essential means of establishing the diagnosis. Its sensitivity is greater than that of PCR, so that PCR negativity does not exclude the diagnosis of extrapulmonary tuberculosis (EPTB) [4], especially in cases of strong histological suspicion. Hence the importance of clinico-biological discussion.

Tortoli and al reported PCR negativity in 50 cases of culture-positive EPTB [5]. Some studies have shown the opposite, with culture being less sensitive than PCR. Iram and al described the ability of PCR to detect 12.5% more positive cases than culture [6]. Vadwai and al reported sensitivities of 53% and 81% respectively for culture and PCR [7].

Molecular Biology:

RT-PCR is performed using the Cepheid Xpert® MTB/RIF system, which is designed to detect the CMT- specific proB gene and the rifampicin resistance gene [8] . The very low detection of CMT explains the very high performance of RT-PCR for extrapulmonary samples (including deep pus) compared with DME, which is consistent with the results of two studies [5,6] . Iram and al reported that GeneXpert was able to detect 15% more positive cases of extrapulmonary tuberculosis (EPTB) than DME [6]. Tortoli and Diallo reported sensitivities >85% and 94.74% versus 47% and 43% respectively for PCR and DME [5].

PCR is a powerful, rapid (time to result less than one hour) and highly specific test, but its sensitivity is low [4]. Despite this lack of sensitivity, PCR has a very good positive predictive value and helps clinicians to make an early diagnosis in more than 30% of EPTB cases [9]. This low sensitivity is linked to the pauci-bacillary nature of the sample and therefore to the DME result. Diallo et al reported a sensitivity of 96.15% in cases of EPTB with a positive DME and only 87.5% with a negative one [5]. Vadwai et al reported a similar sensitivity in the case of positive smears and a lower sensitivity of around 64% in the opposite case [7]. The nature of the sample to be examined and the presence of PCR inhibitors are two other factors that may contribute to a reduction in the sensitivity of the test [10] . A Tunisian study reported a sensitivity of 80% for pus collections compared with biopsies (87%) [10]. In our case, there were no PCR inhibitors because our patient was not on heparin, the pus sample was not contaminated with blood and it was handled with latex-free

gloves.

PCR confirmed the tuberculosis aetiology of trochanteritis, establishing the diagnosis of certainty and ruling out atypical mycobacteria in particular [4]. It thus helped in the therapeutic decision to use rifampicin in complete confidence, enabling better management while avoiding relapses.

Management And Course:

If left untreated, TT can develop into coxalgia [1]. In the opposite case, the evolution is favourable in 76% of cases [2]. This was the case in our patient, who progressed well after anti-tuberculosis antibiotic therapy and trochanterotomy. The first was based on 2 months of quadritherapy with Rifampicin, Isoniazid, Pyrazinamide and Ethambutol, followed by 10 months of dual therapy with Rifampicin and Isoniazid. The second was carried out after antibiotic therapy and a hip prosthesis was fitted.

V. Conclusion:

TT is a rare insidious condition which is often diagnosed late and requires multidisciplinary management. In our case, bacteriology was used to confirm the tuberculosis etiology, enabling the diagnosis to be made with certainty and the best therapeutic decision to be taken.

Références :

[1] Manjaoui J, Debbour S, KADI S Et Al. La Trochanterite Tuberculeuse (A Propos D'un Cas). Rev Maroc Chir Orthop Traumato. 2010;41:52- 54.

[2] Karray, S., Karray, M., Ayadi, K., Zouari, M., Zlitni, M., Douik, M., ... & Slimane, N.. Les Trochantérites Tuberculeuses. Int. Orthop.1993 ;17(5), 313-319. DOI:10.1007/BF00181708

[3] Andrianarivelo AM, Ravaoarisaina ZM, Razanadrakoto II, Et Al. Infections Osteo-Articulaires: Apport De L'examen Bacteriologique. Revue De Chirurgie Orthopédique Et De Traumatologie Malgache 2015;5.

[4] Léa DP. Prise En Charge De La Tuberculose Pulmonaire À L'officine : État Des Lieux Des Connaissances Et Proposition D'un Guide Pratique, [Thèse De Doctorat]. [Lille]: Faculté De Pharmacie De Lille; 2023.

[5] Tortoli E, Russo C, Piersimoni C Et Al. Clinical Validation Of Xpert MTB/RIF For The Diagnosis Of Extrapulmonary Tuberculosis. EUR RESPIR J S. 2012;40(2):442-447. DOI:10.1183/09031936.00176311

[6] Iram S, Zeenat A, Hussain S Et Al. Rapid Diagnosis Of Tuberculosis Using Xpert MTB/RIF Assay-Report From A Developing Country. Pak J Med Sci. 2015;31(1):105-10. PMID: 25878624

[7] Vadwai V, Boehme C, Nabeta P, Et Al. Xpert MTB/RIF: A New Pillar In Diagnosis Of Extrapulmonary Tuberculosis?. J CLIN MICROBIOL. 2011, 49(7):2540-2545. DOI:10.1128/Jcm.02319-10

[8] Genxpert, Cepheid Innovation. Xpert® MTB/RIF, Ref: GXMTB/RIF-US-10, In Vitro Diagnostic Medical Device, Cepheid 2020 [Cité Le 17 Avril 2025]. Disponible Sur : Https://Www.Cepheid.Com/Content/Dam/Www-Cepheid-Com/Documents/Package-Insert-Files/Xpert-MTB-RIF- FRENCH-Package-Insert-301-1404-FR-Rev-G.Pdf

[9] Blanie M, Pellegrin JL, Et Maugein J. Apport De La PCR Dans Le Diagnostic Des Tuberculoses Extrapulmonaires. Med Mal Infect. 2005;35(1):17-22. DOI: 10.1016/J.Medmal.2004.08.002

[10] Marouane C, Smaoui S, Kammoun S Et Al. Evaluation Of Molecular Detection Of Extrapulmonary Tuberculosis And Resistance To Rifampicin With Genexpert® MTB/RIF. Med Mal Infect. 2016;46(1):2024. DOI:10.1016/J.Medmal.2015.10.012