

Clinical case

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Bone tuberculosis, in patients with no prior history of tuberculosis

*Tuberculosis ósea, en pacientes sin antecedentes de tuberculosis*Portman-Santos D,^{*,‡} Baley-Amiga I,^{*,§} Jasqui-Remba S^{*,¶}

Centro Médico ABC, Ciudad de México, México.

ABSTRACT. There are different types of infection caused by *Mycobacterium tuberculosis*, the pulmonary variety is the most common of them; infection of the bone secondary to joint replacement, is usually caused by a previous lung infection that has been disseminated. However primary bone infection is very rare and little reported, which makes information on the matter very scarce. A female patient is presented with a history of congenital hip dysplasia, who underwent multiple surgical interventions, including total hip arthroplasty (THA), afterwards she presented a fistula and persistent serous exudate; a biopsy was performed where acid-fast bacilli were detected. The delay in the diagnosis of osteoarticular tuberculosis (OATB) can lead to negative consequences, affecting the quality of life of the patient. Conventional diagnostic methods may be insufficient for the diagnosis of OATB.

Keywords: bone tuberculosis, osteoarticular tuberculosis, postoperative infection, joint replacement, congenital hip dysplasia, total hip arthroplasty.

RESUMEN. Existen diferentes tipos de infección causadas por *Mycobacterium tuberculosis*, siendo la variedad pulmonar la más común de ellas; la infección del hueso secundaria a la artroplastia suele estar causada por una infección pulmonar previa que se ha diseminado. Sin embargo, la infección ósea primaria es muy rara y poco reportada, lo que hace que la información al respecto sea muy escasa. Se presenta un paciente femenino con antecedentes de displasia del desarrollo de la cadera, que se sometió a múltiples intervenciones quirúrgicas, incluida artroplastia total de cadera (ATC), posteriormente presentó una fístula y exudado seroso persistente; se realizó una biopsia donde se detectaron bacilos ácido-alcohol resistentes. El retraso en el diagnóstico de la tuberculosis osteoarticular (TBOA) puede tener consecuencias negativas, afectando la calidad de vida del paciente. Los métodos diagnósticos convencionales pueden ser insuficientes para el diagnóstico de TBOA.

Palabras clave: tuberculosis ósea, tuberculosis osteoarticular, infección postoperatoria, reemplazo articular, displasia del desarrollo de la cadera, artroplastia total de cadera.

Introduction

Tuberculosis continues to be a global health problem in low-income countries. It is classified into two main varieties, pulmonary and extrapulmonary; for the purpose

of this report, the focus will be on the extrapulmonary variety, specifically in bone tuberculosis - this being the one presented by the patient reported in this case.

Approximately one third of the world's population has a *Mycobacterium tuberculosis* infection; however, only 1-2%

* Medical doctor.

ORCID:

‡ 0000-0003-3490-1280

§ 0000-0001-6514-8223

¶ 0000-0002-9678-7295

Correspondence:

Daniel Portman Santos

E-mail: dr.daniel.portman@gmail.com

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of these cases accounts for osteoarticular tuberculosis, being this clinical entity an uncommon presentation of the disease.¹

Postoperative infections by *Mycobacterium tuberculosis* due to joint replacement have a low incidence; hence the little evidence reported and the great absence of clinical practice guidelines in this regard.²

The lack of information, together with the low incidence of this pathology, makes it difficult to include bone tuberculosis among differential diagnoses. Consequently, the necessary tests to rule out or diagnose this entity are performed late, when the infection has already spread, and it has become necessary to remove the affected bone altogether with anti-tuberculous therapy.³

It is of great importance to create awareness about the incidence of this pathology in health care providers, since having more information on the matter could lead to a timely diagnosis, reducing complications and improving the short-term and long-term prognosis of patients.

Case report

A 23-year-old female patient presents a significant history of untreated congenital hip dysplasia.

At 16 years of age, she was evaluated at a Regional General Hospital, where she underwent left total hip arthroplasty (THA) without apparent complications.

At the age of 21, she presented a left hip prosthesis dislocation, which was reduced, and replaced; the procedure was performed without apparent complications. Three months after the surgery, a fistula with serous fluid leakage was found, therefore she went to the same hospital where she had received her previous treatment.

Due to the fistula and pain persistence, she went to a third level specialty center where a serous exudate was



Figure 2:

Left knee prosthesis
anteroposterior radiography.

found in the fistula. A culture of the exudate was performed, identifying *Staphylococcus aureus* and *Staphylococcus lugdunensis* in the sample; the patient received antibiotic treatment and underwent a surgical debridement, followed by three more surgical debridements later on.

Due to the persistent pain and after multiple specialist consults, she was admitted for a left femoral extraction procedure and was fitted with a femoral spacer.

When the patient turned 26 years old, she persisted with joint instability, for which she went to a national third level health institute, where the decision was made to perform a hemiarthroplasty with an Austin Moore hip device. This type of prosthesis is designed as a salvage prosthesis following femoral neck fractures.

The patient returned to the operating room on several occasions, where she underwent hip reconstruction with bone graft, presenting at the end of the procedure a surgical wound dehiscence with serous exudate as well as high levels of C-Reactive Protein (CRP). The patient received antibiotic therapy and treatment for three months until the surgical wound had adequately closed and healed.

After this event, due to the spread of the infection, a left knee prosthesis was placed (Figures 1 and 2); however, due to the persistence of high levels of CRP, an intra-operative biopsy was performed, where *Enterococcus faecalis* was identified and acid-fast bacilli were observed, thus reaching the diagnosis of bone tuberculosis. The patient was started on amoxicillin and was referred to the outpatient service of the same institute for anti-tuberculosis treatment. The intensive phase of the treatment began with pyrazinamide, ethambutol hydrochloride, rifampicin and isoniazid (DOTBAL), taking 4 tablets every 24 hours for 10 weeks, followed by the support phase, taking 2 tablets every 48 hours (Monday, Wednesday and Friday) for 10 months.



Figure 1:

Left knee prosthesis
lateral radiography.

In 2019, the patient was sent to a first-level care unit where she was referred to the Division of Infectious Diseases, where she will continue to receive anti-tuberculous treatment in a clinic near her home, as well as physical therapy.

Patient's perspective

As a patient, my experience was initially one of great uncertainty and fear, since the information I had up to that moment was tuberculosis was an eradicated disease and it had a high mortality rate at the time. At a certain point I felt relieved with the diagnosis, since I had visited several doctors in both public and private hospitals without being given a specific diagnosis, which led me to reach a point of resignation. I think the problem is the rarity of the disease that made doctors not request adequate studies. I know the infection was acquired during a surgery, but I have no certainty of which one, since I underwent several procedures. The only thing left to say is I feel fortunate to have found the infectious diseases specialist and laboratory specialist who made my diagnosis possible, since I did not present any symptoms that indicated that the disease was due to the fistula. I think that constantly sanitizing operating rooms can avoid situations like mine. In addition, an efficient diagnosis could have prevented a hip and femoral wear, which eventually led to a femoral replacement and hip reconstruction with bone grafting; financial and emotional wear, and 10 years in hospitals, putting aside my educational training, as well as my entire social life, forcing me to depend on others.

Discussion

OATB is an infection caused by Koch bacillus (*Mycobacterium tuberculosis*), which can affect bones and joints, it is usually divided into vertebral, or Pott's disease, and extra-vertebral; the latter is usually conformed by peripheral arthritis, generally of a single isolated source.⁴

There is no clear predominance of any sex, affecting both sexes equally. The ages of presentation in developed countries range between 40 and 60 years; however, in migrants and undeveloped countries it occurs at earlier age, in children, it usually occurs on the metaphysis, while in adults it occurs on the epiphysis.⁴

In its majority, OATB is a paucibacillary infection, which means that only a few Koch bacilli are found in the lesions, which tend to multiply slowly.⁴

It is common to find a reactivation of systemic tuberculosis (Tb) when performing orthopedic surgery in patients with previous pulmonary Tb infection. However, there are cases in which the infection occurs in patients without a previous history of Tb; this report focuses on the latter. An hematogenous spread, which can go directly to the synovium or indirectly through the adjacent bone, is necessary for a bone infection to develop.⁴

The diagnosis of this pathology is based on a careful anamnesis and a thorough medical history that can guide the physician towards a suspected diagnosis; however, a confirmatory test is necessary to determine the diagnosis.

The clinical signs of this pathology include localized pain, fever, and weight loss; sometimes a cold abscess can be found, that is, a lump without inflammation.⁵

Imaging studies are of little use for the final diagnosis, although they can provide suggestive images such as osteopenia, bone cysts, decrease in the inter-articular space and subchondral erosions, which is the reason OATB should be included as a differential diagnosis for all lytic lesions of the bone.⁵

The Mantoux, or tuberculin skin test, is an adequate test to detect patients with exposure to *Mycobacterium tuberculosis*; however, the most specific test is a culture in which the acid-fast bacillus (AFB) is isolated.⁵

Smear microscopy is a useful method to detect AFB, however, it is necessary that between five and ten thousand bacilli are found, in order to obtain a positive result. In extrapulmonary Tb it is easier to find this concentration in biopsies than in samples of biological fluid, bearing in mind that a negative smear microscopy does not rule out the diagnosis.⁶

A biopsy is an alternative method to cultures, with the advantage of offering quick results. Fine needle aspiration biopsy is used in a general way, in which, if classifying granulomas are found, it is inferred that the patient has OATB until proven otherwise.¹

In the case reported in this article, the patient attended multiple hospitals and private doctors on different occasions, where diagnostic methods oriented towards Tb were not performed, resulting in a delay in diagnosis and initiation of treatment.

According to Torres et al, there are various causes for the delay in diagnosis; amongst them is the tendency of health personnel to not consider extrapulmonary TB as a differential diagnosis in the absence of pulmonary symptoms, the association of the disease with immunocompromised or elderly patients and the limited use of microbiology in diagnostic methods.⁷

The treatment of extrapulmonary TB is controversial; even so, most of the published guidelines, agree a treatment very similar to that of pulmonary Tb should be administered, which consists in the administration of anti-tuberculosis drugs such as pyrazinamide, ethambutol hydrochloride, rifampicin, and isoniazid.³

There are different opinions on the indicated duration of treatment; the general consensus is 6 months of treatment with the previously mentioned drugs. Other articles recommend treatments of 9 to 12 months; however, there are no clinical studies that support the clinical benefit of these schemes.³

In Mexico, anti-tuberculosis treatment must be carried out under strict medical supervision, meaning the patient

must go to their health center for a supervised administration of each dose during the entire treatment.⁸

Continuous clinical control and vigilance must be maintained, once the treatment has started, in order to verify its effectiveness. The Official Mexican Norms indicate the control must be clinical, with the use of smear microscopy, and must be carried out once a month, or before the month is up, if the clinical status of the patient requires it.⁸

The long-term prognosis is mostly linked to adherence to treatment, its availability, opportune diagnosis, and the availability of rehabilitation therapies. Fistulation and drainage are common in OATB, as well as joint or bone destruction, frequently requiring reconstruction and prosthesis replacement once anti-tuberculous treatment has been completed.⁶

Conclusion

Osteoarticular tuberculosis is a complex clinical entity that requires timely diagnosis and immediate treatment; the delay in diagnosis can lead to important complications in the prognosis and patient's quality of life. Conventional diagnostic methods may be insufficient for the diagnosis of OATB due to its paucibacillary characteristic; so it is important to keep in mind the use of specific methods, such as tissue biopsy cultures.

As we can see in this patient, the lack of protocols and supplies for asepsis and antisepsis in the public sector hospitals, together with a late diagnosis of the disease, can lead to a delayed start in treatment, which will compromise the function of the limb in the future, and the prognosis of the patient.

The constant review of this issue, as well as the publication of new cases and their management, are useful tools for the study and learning of all health professionals, bringing us closer to the objective of improving medical care for all patients, as well as keeping this pathology present in new and young doctors, so they keep bone tuberculosis in

mind as a differential diagnosis, performing tests for early diagnosis and start treatment if needed.

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References

1. Aparicio G, Viudez I, Pérez JL, Delgado F. Tuberculosis osteoarticular de presentación extrapulmonar y extraespinal. *Acta Ortop Mex.* 2012; 26(1): 15-20.
2. Spinner RJ, Sexton DJ, Goldner RD, Levin LS. Periprosthetic infections due to *Mycobacterium tuberculosis* in patients with no prior history of tuberculosis. *J Arthroplasty.* 1996; 11(2): 217-22. doi: 10.1016/s0883-5403(05)80023-3.
3. Fuentes ZM, Caminero JA. Controversias en el tratamiento de la tuberculosis extrapulmonar. *Arch Bronconeumol.* 2006; 42(4): 194-201. Disponible en: <https://doi.org/10.1157/13086625>
4. Pertuiset E. Tuberculosis ósea y articular de los miembros. *EMC - Aparato Locomotor.* 2015; 48(4): 1-13. Disponible en: [https://doi.org/10.1016/S1286-935X\(15\)74971-3](https://doi.org/10.1016/S1286-935X(15)74971-3).
5. Watts H, Lifeso RM. Current concepts review - tuberculosis of bones and joints. *JBJS.* 1996; 78(2): 288-99. doi: 10.2106/00004623-199602000-00019.
6. Ramírez-Lapausa M, Menéndez-Saldaña A, Noguerado-Asensio A. Tuberculosis extrapulmonar, una revisión. *Rev Esp Sanid Penit.* 2015; 17(1): 3-11. Disponible en: <https://dx.doi.org/10.4321/S1575-06202015000100002>
7. Torres L, Arazo P, Pérez JB, Lezcano MA, Revillo MJ, Amador P. Estudio del retraso diagnóstico en pacientes con tuberculosis. *Rev Esp Sanid Penit.* 2003; 5(3): 101-5.
8. Norma Oficial Mexicana NOM-006-SSA2-1993 para la Prevención y Control de la Tuberculosis en la Atención Primaria a la Salud. 1993.

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