DISSEMINATED REFRACTORY TUBERCULOSIS WITH BICEPS TENDON INVOLVEMENT IN AN IMMUNOCOMPETENT PATIENT

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ABSTRACT

Objective: The authors report a rare case of disseminated tuberculosis which had compromised the long head of biceps tendon and shoulder joint, during standard drug therapy. Methods: On a first sight, the accurate diagnosis wasn’t accomplished and the patient had been treated with physiotherapy for rotator cuff tear. However, the patient presented with a fast growing mass in anterior region of the proximal third of the arm, complaining of pain increase. Aspirative puncture of the mass revealed a yellow fluid and the laboratorial analysis confirmed infection by M. Tuberculosis. The patient was treated with surgical debridement and his drug therapy was changed. Results: Resolution of infectious status and complete shoulder function restoration was succeeded. Conclusion: Due to its high prevalence in Brazil, tuberculosis must always be considered as a possible cause of inflammatory joint disease, even in immunocompetent patients. Keywords - Tuberculosis osteoarticular; Shoulder; Rotator cuff; Infection

INTRODUCTION

For centuries, tuberculosis has afflicted humanity(1) and has been considered the leading cause of death from a single infectious agent in adults worldwide, according to the WHO(2). Brazil is 14th among 23 countries accounting for 80% of all cases worldwide. Sources from the Ministry of Health estimate the prevalence in the country to be 58 cases per 100,000 inhabitants, with about 50 million infected, and 111,000 new cases and 6,000 deaths per year(3). The incidence of infection with Mycobacterium tuberculosis is increasing in both developed countries and developing countries, due to the following factors: increasing numbers of immunocompromised patients, drug resistance, aging populations, and occupational exposure of healthcare professionals(4). However, osteoarticular involvement is uncommon and occurs in less than 5% of all forms of tuberculosis(5). Bone involvement is predominant and the spine is the region that is most frequently affected(6). Joint involvement is even less common, and 50 to 73% occurs in the load-bearing joints, such as the hips and the knees(7-9). The shoulder is rarely involved(6,7).

We report a case of disseminated tuberculosis in an immunocompetent patient with musculoskeletal involvement, involving the shoulder joint, mainly the biceps tendon sheath.

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CASE REPORT

JVS, male, age 41, mason, White, born in Paraíba, resident of Rio de Janeiro, visited the orthopedic outpatient clinic at the Hospital Universitário Clementino Fraga Filho, Universidade Federal do Rio de Janeiro (HUCFF-UFRJ), on the 47th day of treatment for disseminated tuberculosis (pleural and liver involvement) with RHZ (rifampicin, isoniazid, and pyrazinamide), complaining of right shoulder pain for about a year after trauma from falling from standing height. The pain was initially mild and intermittent, localized in the anterior region of the right shoulder and did not limit his daily activities. About 20 days prior to the assessment, the intensity of pain increased and became constant, worsening at night and limiting daily activities.

On physical examination, active elevation was 110°, active external rotation was 60° and active internal rotation was at the fourth lumbar vertebra. Reported diffuse pain with mobilization. He had a visible mass in the anterior medial third of the right arm, without signs of inflammation. On palpation, it was mobile, soft and had well-defined limits. The Neer(10), Yocum(11), and Hawkins(12) tests were positive; the O’Brien test(13) and acromioclavicular compression were painless; the Speed(14) and Yergason(15) tests were negative; he complained of pain on palpation of the intertubercular groove. The maneuvers to assess the integrity of the rotator cuff were hampered by severe pain.

At the time, he brought a report of a shoulder ultrasonography performed at another institution, which described “slight irregularity of the articular bone surface, complete rupture of the rotator cuff, thickening and heterogeneity of the rotator cuff compatible with tendinosis, presence of thick liquid with the sheath of the long head tendon of the biceps and the subdeltoid bursa. Hemorrhagic bursitis? Synovial proliferation”.

At the time, the clinical diagnosis at the outpatient clinic was of rotator cuff injury with associated tendinopathy of the biceps. MRI was requested and the patient was referred to physical therapy.

After 15 days, the patient came to the emergency room of HUCFF, reporting worsening of symptoms and an increase of tumor volume in the anterior region of the arm associated with the appearance of localized heat and erythema (Figure 1). He was febrile (38.8°C) and had completed the 2nd month of RHZ. Immediately, laboratory and image exams were performed upon suspicion of infection.

Lab: leukocytes 5.960/mm³ (normal differential count), hemoglobin 11.8 g/dL, hematocrit 36.4%, platelets 249.000/mm³, ESR 80mm in one hour, albumin 3.6 g/dL, total protein 6.5 g/dL, transferrin 202.3 mg/dL. Moreover, HIV serology was negative and he was reactive to the tuberculin test (10mm).

Shoulder ultrasonography showed collection of ill-defined contours and thick heterogeneous content located in the anterior portion of the biceps involving the long and short tendons measuring approximately 10 x 7 x 4 cm. That collection was insinuating superiorly. There was similar content in the subcoracoid and subacromial/subdeltoid bursa and glenohumeral space. The supraspinous tendon was thickened by tendinosis. The rest of the rotator cuff was without changes.

Radiographic study was complemented by simple radiographs and magnetic resonance imaging. The radiographs did not reveal additional relevant information. In contrast, magnetic resonance imaging revealed the presence of predominantly hypointense lesions on T1 and hyperintense in the other sequences, localized in the subcoracoid and subacromial/subdeltoid bursa and glenohumeral space. The supraspinal tendon was thickened by tendinosis. The collection involving the biceps tendons was punctured percutaneously, immediately before the surgical procedure, under surgical antisepsis with iodine alcohol solution (Figure 3). The test for acid-fast bacilli (AFB) by the Ziehl-Neelsen method was positive.

The patient was then submitted to surgery under brachial plexus block, in the supine position. A deltopectoral incision was made, extending distally over the mass. A large amount of purulent discharge with clots emerged from the surgical wound.
Figure 2 – Imaging tests. (A) Anteroposterior plain radiograph of the shoulder and proximal half of the left humerus, showing only an increase in the volume of soft tissue. (B) Coronal oblique slice magnetic resonance image of the shoulder and upper half of the right arm, T2-weighted fat-suppressed, revealing voluminous collection in the proximal region of the arm, following the long portion of the biceps proximally. (C) T1-weighted axial slice magnetic resonance image of the proximal region of the right arm showing large collection in its anterior region.

Figure 3 – Photograph showing the performance of fine needle aspiration of the mass, which revealed heterogeneous, thick, and yellowish liquid content. The smear of the liquid using Ziehl-Neelsen staining confirmed the presence of acid-fast bacilli (AFB).

(Figure 4) after opening the bicipital sheath. On inspection during surgery, this was found to be the main focus of infection. Drainage of pus was performed, debridement of devitalized tissue and abundant washing of structures, including the shoulder joint with saline. The wound was closed with simple stitches and the patient was closely monitored during the postoperative period. He was discharged after five days.

The material was sent for histopathology, cytology, smear microscopy (Ziehl-Neelsen method), and culture for mycobacteria in Lovestein-Jansen medium and for common germs. Histopathological examination revealed “acute and chronic nonspecific inflammation” and the cytopathological exam showed “synovial hyperplasia and cellular necrosis”. The cultures were negative. The diagnosis was confirmed by positive AFB smear.

Due to daily fever persisting in the 3rd month of treatment with RHZ, besides presenting the disseminated form of tuberculosis (pleural, musculoskeletal, and liver), we chose to optimize therapy by adding ethambutol and amikacin to the regimen and removing pyrazinamide. He remained in use of four drugs for three months when amikacin was then removed from the regimen. He remained under treatment with rifampicin, isoniazid, and ethambutol until the completion of 12 months of treatment.

He evolved to complete resolution of pain and complete functional improvement of the right shoulder. In addition, there was also complete regression of the pleural effusion and the success of therapeutic regimen more clearly confirmed the previous diagnosis of tuberculosis. There was no recurrence of swelling at the wound site, and other signs of local infection were no longer observed. At the moment, with 24 months of follow-up, he complains of mild discomfort in the right shoulder only upon great exertion and its function is graded as good (33 points) according to the UCLA scale(16) (Figure 5). Radiography from the last consultation shows no changes.
DISCUSSION

Musculoskeletal involvement is uncommon in tuberculosis and occurs in less than 5% of cases(5). Of these, most cases have bone tuberculosis and only a small number of patients have joint tuberculosis; muscle and/or tendon involvement is even more rare, accounting for 1% of the cases of musculoskeletal tuberculosis(5,8,17). Joint involvement occurs predominantly in the load-bearing joints, while the involvement of the shoulder joint occurs in only about 2% of cases of joint tuberculosis(2). The relative rarity of joint tuberculosis, in particular, in the shoulder, is one of the factors that contributes to the usual delay in the diagnosis of the condition. Moreover, the signs and symptoms are nonspecific and often drawn out clinically, evolving gradually over several months(7,8,18-23). The time between the onset of symptoms and initiation of treatment may extend to one year(8,17). Although our first diagnostic impression of the injury in the outpatient clinic was rotator cuff injury associated with tendinopathy of the biceps, in our case, the diagnosis was made easier because the patient was undergoing drug treatment of extrapulmonary tuberculosis (pleural and liver) and returned spontaneously to the hospital, and came to the emergency room 15 days later with a large mass in the proximal region of the right arm. Additional exams are of great value in the confirmation of the diagnosis, since the clinical features are nonspecific. Laboratory tests are usually normal except for ESR, which is usually high(22,24). As in our case, most patients are positive in the tuberculin test (purified protein derivative – PPD)(17), although this test has little value, especially in areas of high prevalence of tuberculosis(4,23). Among the imaging tests, MRI is the gold standard(25) and it was useful in our case in revealing musculoskeletal signs compatible with tuberculosis. Gahlaut et al.(26) call attention to the difficulty in the diagnosis of extrapulmonary tuberculosis and suggest that it be confirmed by the presence of one of the following criteria: 1 – positive culture for M. tuberculosis, 2 – demonstration of AFB in a smear, 3 – biopsy material containing caseous granuloma typical of a tuberculosis infection. The combination of various diagnostic modalities is important for the detection of musculoskeletal tuberculosis(8), and this was essential in our case, in which the cultures were negative, histopathological and cytopathological exams were inconclusive and only the smear was positive.

In our case, there was bone (in the proximal humerus), joint, and tendon involvement, according to the evaluation of the magnetic resonance imaging and the surgical findings. The intra-articular situation of the long portion of the brachial biceps promotes their involvement in cases of aseptic or septic arthritis of the shoulder. However, in this case, the inspection during surgery showed the biceps tendon sheath at the level of the intertubercular groove to be the main focus of infection. The occurrence of extrapulmonary tuberculosis seems to result from the reactivation of latent foci after a primary infection(27). Most joint forms occur due to extension of the focus from adjacent bone, although direct hematogenous infection of the synovial membrane can also occur(24). The involvement of tendons also seems to occur most likely due to contiguity(18). Bickel et al.(18) proposed that tuberculous tenosynovitis originates from the primary involvement of bone, and subsequent tendon involvement; the initial focus

Figure 5 – (A, B and C): Photographs of the patient showing good final clinical results after 24 months of outpatient treatment.
is then cured and the disease would localize only in
the tendon. While we recognize through the review
of pathogenic mechanisms of extrapulmonary tuber-
culosi s that the primary involvement of the biceps
tendon is unlikely, there is no way to confirm in this
case whether the osteoarticular infection preceded
the tendon involvement or vice versa. In fact, no
case of isolated bicipital tendinitis tuberculosis was
found during the literature review done in the pre-
paration of this report, although many authors have
reported other atypical locations. Only one third of patients with musculoskeletal tuberculosis
have a history of pulmonary disease, although the
presence of findings consistent with previous tuberculosis is common in imaging studies (chest radiography and computed tomography). Our
patient, although he denied a history of pulmonary
disease, revealed cicatricial changes in the apex of
the right lung in CT scans, consistent with previous
pulmonary tuberculosis.

The occurrence of extrapulmonary, including
musculoskeletal, tuberculosis, is more common in
immunocompromised patients. In immunocom-
petent individuals, extrapulmonary tuberculosis
accounts for 15-20% of all forms of tuberculosis,
while in immunocompromised individuals, extra-
pulmonary tuberculosis accounts for 50% of cases.
This is another peculiarity of this case: it is of an
immunocompetent patient with disseminated tuber-
culosi s which also failed to be treated by standard
drug treatment.

The incidence of multidrug-resistant tuberculosis
(MDR-TB) has increased; it is estimated that 3% of
all new cases are multidrug resistant. However,
by definition, MDR-TB is one in which in vitro tests
show resistance to at least rifampicin and isonizad.
It is pointed out in the second Brazilian Tuberculosis
Consensus that a retreatment regimen lasting 12
months should be proposed for patients who expe-
rience failure of the standard RHZ regimen, regard-
less of sensitivity testing. Similarly, the World Health
Organization proposes the adoption of the failure of
standard treatment in places where sensitivity tests
are not available. In cases of confirmed multidrug
resistance, alternative drug treatment should last up to
18 months. In our case, sensitivity testing of the
material obtained from the collection in the synovial
sheath of the biceps was not possible, as Koch’s bac-
cillus was not isolated in culture. However, pleural
fluid culture performed at the beginning of evolution
two months before the onset of symptoms on the right
shoulder revealed M. tuberculosis sensitive to first-
line drugs. In this case, acquired resistance may have
occurred, as it is much more common than primary
resistance, or simply non-adherence to treatment;
the latter possibility was vehemently denied by the
patient. In fact, due to the failure of the initial treat-
ment, our patient underwent the retreatment regimen
for 12 months, with complete resolution of the dis-
seminated infection.

The treatment of musculoskeletal tuberculosis is
essentially clinical (drugs) and its duration should
be extended to 12 months. Early diagnosis and
treatment promote complete or nearly complete
recovery of joint function in about 95% of cases.
According to Erdem et al., surgical treatment of
musculoskeletal tuberculosis should be indicated
in cases of persistent symptoms after four months
of chemotherapy. However, in our case, surgical
treatment was necessary due to the presence of a
large collection of infectious content in the right
arm, with a rapid increase in volume over a short
period of time (Figure 1).

Finally, the importance of this report is to hi-
highligh t the growing presence of musculoskeletal
tuberculosis and call the attention of orthopedists
to performing this diagnosis. Due to its high pre-
valence in Brazil, tuberculosis should always be
considered in the differential diagnosis of cases of
chronic and progressive involvement of the joints,
bones, muscles, tendons, and bursae, even in immu-
nocompetent individuals.

REFERENCES

2. World Health Organization. Global tuberculosis control e surveil lance, planning,
3. Sociedade Brasileira de Pneumologia e Tisiologia. II Consenso Brasileiro de
cons_tuberculose_2004.pdf)
4. Watts HG, Lifeso RM. Current concepts review. Tuberculosis of bones and
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