An Unusual Case of CV Junction Tuberculosis Revealed as Post-Traumatic Cervical Pain

Un Caso Inusual de Tuberculosis de Unión Craneocervical Revelado como Dolor Cervical Postraumático

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ABSTRACT

Background: Tuberculosis (TB) is a worldwide health problem. Extrapulmonary manifestations of TB are common with skeletal system involvement being the most frequent. Spinal TB accounts for 50% of these cases. Case report: Colombian male patient, 66-years-old, without any medical antecedent of interest, who after traumatic brain injury developed cervical pain, and cervical movement limitation. Cervical MRI revealed an osteolytic process in the odontoid process, which was biopsied transorally. Histological analysis showed chronic granulomatous type of inflammation with caseous necrosis in addition to nonspecific lymphoplasm infiltrate, suggestive of tuberculous origin. Patient was conservative managed.

Conclusions: It is vital to maintain a high degree of clinical suspicion for diagnosis of spinal TB when the location of spinal TB is cervical, and specifically suboccipital. This can be suspected when patient refers to pain, with the previously mentioned characteristics. Conservative management and closely follow up is recommended, but when not improved with conservative therapy, or when paralysis is evident, surgery is indicated.

Key words: Spinal tuberculosis; Pott disease; Sub-occipital tuberculosis

INTRODUCTION

Tuberculosis (TB) is a worldwide health problem, according to the World Health Organization (WHO) it is the leading infectious cause of mortality worldwide killing 1.45 million people16. An increase in the incidence of TB has been reported in many of the developed countries, probably due to the increased incidence of alcohol and drug abuse, human immunodeficiency virus, immunosuppression and the increased influx of immigrants from third-world countries18. Extrapulmonary manifestations of TB are common with skeletal system involvement being the most frequent. Spinal TB, first described by Sir Percival Pott in the 18th century, accounts for 50% of these cases4 and results in immense morbidity and mortality. Tuberculous spondylitis, the infection of one or more vertebral bodies by Mycobacterium tuberculosis with or without involvement of the spinal canal is the most common form of extrapulmonary TB, which is

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around 50% of cases\textsuperscript{14}.

Although the clinical spectrum of spinal TB is variable, back pain is the major symptom. Spinal TB can lead to bone destruction and vertebral collapse resulting in paravertebral abscesses and deformity. If prompt management is not employed, severe neurological symptoms ensue, which can lead to a debilitating consequence. Moreover, spinal TB still remains the leading cause of non-traumatic paraplegia in developing nations.

The objective of this report is to describe the case of a male patient with cervical spine TB discovered after traumatic brain injury.

**Case Report**

Colombian male patient, 66-years-old, without any medical antecedent of interest. After a severe traumatic brain injury and a stay of 18 days in Intensive Care Unit, he developed neck pain on cervical mobilization. Patient refered that after the mentioned trauma, pain has increased, and became associated to mild neck stiffness, impacting on daily activities. On physical examination, the patient was afebrile, with head uptight attitude, and limitations for all cervical movements. Bilateral carotid-jugular lymph nodes were palpable. Paraclinical exams were normal; exclusion of inflammatory syndrome was done. Due to the clinical findings and to the trauma precedent promptly was decided to obtain cervical imaging. Data from cervical X-ray was not contributory. Cervical MRI (Fig 1 A and B) was performed and showed an osteolytic process, a hypo intense lesion on the odontoid process with subligamentous extension, and surrounding soft tissue swelling. No involvement of spinous process was seen. Due to the location of the lesion, in medical board was decided to perform a transoral biopsy, the histological examination revealed bone fragments affected by chronic granulomatous type of inflammation with caseous necrosis in addition to nonspecific lymphoplasm infiltrate, suggestive of tuberculous origin (Fig. 2). In conjunction with the infectology department was decided conservative treatment with quadruple antituberculosis chemotherapy.

**Discussion**

There are no definite guidelines available to diagnose tuberculous vertebral lesions in the current literature. Spinal TB, is the most common and most serious form of osteoarticular tuberculosis, and one of the most common vertebral lesions encountered daily in the neurosurgical practice in endemic countries, accounting for up to one half of the cases of extra pulmonary TB and 5-10% of total TB cases\textsuperscript{2}. Around 1.7% of patients with pulmonary tuberculosis have spinal TB\textsuperscript{2}.

Because of bone destruction, deformity, and neurologic deficits associated with spinal TB it is needed an early diagnosis and treatment. Various systematic reviews and meta-analysis have
concluded that uncomplicated spinal TB is indeed a medical problem\textsuperscript{9,15}, recommending multidrug chemotherapy for at least six months duration\textsuperscript{5}.

It is vital to maintain a high degree of clinical suspicion in countries where the incidence is still high. Delays in diagnosis are due basically to the insidious onset, absence of constitutional signs, delayed reporting or attending to a physician all that coupled with lack of single diagnostic test for diagnosing TB. When dealing with spinal diseases, the clinician is faced to the problem of diagnosis despite advanced imagenological studies, subjecting patients to invasive procedures for final diagnosis\textsuperscript{6}. Spinal TB is a secondary localization of pulmonary tuberculosis and should be considered as a metastasis. Patients being diagnosed pulmonary tuberculosis or persons with multiple exposures to mycobacteria whose have a strong suspicion that they may have contracted the disease, must be analyzed for any second vertebral locations before they submit the symptoms\textsuperscript{13}. Spinal TB suspicion is necessary when attending a patient with the following characteristics: mean age reported to be 40 to 45 years with back pain non responsive to non steroidal anti inflammatory drugs (NSAIDS), localized spinal tenderness and previous history of TB and contact with TB-infected patients. Close differential diagnosis are bacterial spondylitis, brucellosis, fungal involvement, malignancy (both primary and secondary).

\textit{Mycobacterium tuberculosis} culture is the gold standard for diagnosis\textsuperscript{12}. In several studies, the frequencies of bacteriological proof in patients with tuberculous spondylitis who were not on ATT have been reported as 47 to 84%\textsuperscript{11}.

The typical bone lesion for TB is destruction of the anterior region of vertebral bodies with subsequent collapse of the spine\textsuperscript{8}. Major sites for spinal TB are the thoracic and lumbar spine. More rare is the involvement of high cervical spine.\textsuperscript{17} Sana et al\textsuperscript{17} reported the case of sub-occipital tuberculosis in an afebrile patient with chronic cervical pain, limitation to all cervical movements, palpable lymph cervical nodes, and with normal pulmonary X-ray evaluation, managed conservatory with tetra-conjugated drug therapy; biopsy was done through oral route, such as our patient.

Magnetic resonance imaging (MRI) is the most sensitive (93-96%) and specific (92.5-97%) modality for early detection of spinal infections\textsuperscript{6}. The presence of large paravertebral abscesses, involvement of two contiguous vertebrae and intervertebral disc are well known radiologic features of spinal TB, however the affection of multiple vertebral bodies have been described\textsuperscript{9}. Chandrasekhar et al\textsuperscript{6} recommends the evaluation of eight point MRI criteria of the vertebral lesions to enhance the diagnostic ability of tuberculous and non tuberculous pathologies thereby reducing the dependency on histopathologic diagnosis or invasive method for early initiation of therapy. This criterion includes: T1 hypo intense, T2 hyper intense, disc involvement, epiphyseal involvement, pedicle involvement, anterior subligamentous extension, paraspinal extension and no involvement of spinous process. Scores $\geq 6$ favored a tuberculous pathology whereas $\leq 4$ were suggestive of non tuberculous etiology. Repetition of the MRI is recommended after at least two weeks if an early scan detects no abnormalities, but a clinical suspicion of infection exists.

Regarding to treatment issues, the results of conservative treatment consisting of computed tomography guided percutaneous needle aspiration (PCNA) and antituberculous therapy (ATT) for at least 12 months in compliant patients are excellent\textsuperscript{1}. A combined approach using clinical staging, PCNA, and ATT can minimize surgical intervention in most patients. However, ATT remains to be the cornerstone of management of spinal TB\textsuperscript{1}. Surgery is indicated, however, in cases that do not improve with conservative therapy, or when paralysis is evident\textsuperscript{9}.

**Conclusions**

For diagnosis of spinal TB, it is vital to maintain a high degree of clinical suspicion in countries where the incidence is high, such as ours, Colombia. When the location of spinal TB is cervical, and specifically suboccipital, this can be suspected when patient refers to pain, with the previously mentioned characteristics. Conservative management and closely follow up is recommended, but when not improved with conservative therapy, or when paralysis is evident, surgery is indicated.
The authors describe an unusual location of spinal tuberculosis (TB) and emphasize the need to maintain high index of suspicion for its proper diagnosis. Cervical involvement is less frequent in spinal TB, however it has a greater propensity to involve the spinal cord and results neurological deficit.

Anti-tubercular chemotherapy is well established as the mainstay of treatment of uncomplicated spinal tuberculosis. In thoracic involvement, even extensive and “unstable” lesions can be treated non-surgically. The involvement of the craniovertebral (CV) junction in other inflammatory-infectious disorders, however, often requires stabilization. Would a successfully treated CV junction TB lead to further stability? Long-term follow up is needed in order to conclude that.


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