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MULTIFOCAL SPINAL TUBERCULOSIS ASSOCIATED WITH PARAPLEGIA

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ABSTRACT

Spine tuberculosis affecting multiple vertebrae at different levels is a rare disease. This case report describes a condition of multiple spine tuberculosis of vertebral bodies number T6, T12 and L1 in 53-year-old man. The patient presented backache for two months that followed by paraplegia due to compression of the spinal cord at the level of T12. This was caused by tuberculous necrotic material. Plain radiographs revealed signs of spine tuberculosis. Myelographs demonstrated the spinal cord compression at the level of T12. In addition, the operative material was used to confirm the diagnosis of spine tuberculosis by showing positive culture of *Mycobacterium tuberculosis* and signs of tuberculosis on histopathological examination. A laminectomy was made to ease the compression and a combination of anti-tuberculous chemotherapy was given to the patient for one year. Gradual recovery was initiated within five weeks after operation that was assisted by physiotherapy. Good improvement was gained after six months whereas complete recovery was obtained after one year. It is recommended, therefore, when spine tuberculosis is detected in certain vertebra, x-ray of other ones should be made to exclude the possibility of other spine infection.

Key words: spine, tuberculosis, paraplegia

INTRODUCTION

Tuberculosis (TB) of the spine or Pott's disease, occurs in less than 1% of patients with TB when *Mycobacterium tuberculosis* in the bloodstream and lymphatics enters into the anterior portion of the vertebral body [1]. The diagnosis of Pott's disease can be missed or significantly delayed because some patients may be asymptomatic, while others may present with atypical and non-specific symptoms. Therefore, it is still associated with significant morbidity and mortality throughout most of the world [2].

Tuberculosis is still the second most frequent infectious disease after malaria on a worldwide basis and remains a major cause of skeletal infection in many parts of the world [3]. In developed countries the incidence of TB, which had been declining over the past decades, has shown an alarming resurgence, due to several factors, which include the rise in the number of people who have altered immune systems, the advent of multidrug-resistant to TB, an aging population, arrival of immigrants from areas where TB is endemic and an increase in the number of health care workers who are exposed to the disease [3]. The incidence of spinal infection varies from 1 in 125,000 to 1 in 250,000 of which two-thirds are pyogenic and only one-third tuberculosis [4]. Only about one third of patients who have TB of bone or a joint have evidence of pulmonary disease. Furthermore, although a skeletal lesion may be a part of the presenting symptom complex of TB, any individual who has a skeletal lesion that is suspected of being

tuberculous should be evaluated for the possibility of other involved sites, including the lungs, intestinal tract, and kidneys [5].

The "Medline" and "Biomedical Reference Collection: Comprehensive" databases, which dated from January 1960 to October 2001, were searched using the following medical subject headings: multifocal spine tuberculosis, spine tuberculosis, and bone tuberculosis. The type of search was "standard and all words" and was limited to human studies and English language only. Some other related references were manually searched. The search revealed only one case with multifocal spine tuberculosis [2]. This article describes a rare case of multifocal Pott's disease involving two thoracic vertebrae at different levels (T6 and T12) and one lumbar vertebra (L1) where the condition was associated with paraplegia.

CASE REPORT

A 53-year-old man admitted to hospital complaining of paraplegia. Two months earlier, the illness started as backache. There was gradual weakness and loss of sensation of lower limbs. This followed by complete motor and sensory loss on both lower limbs. The socioeconomic condition of the patient was poor. There was no past history of pulmonary TB. The laboratory tests revealed ESR 100 mm/hr, WBC 5000 /cmm, Hb 13.3 g/100 ml, PCV 40%, and S. Acid phosphatase 2.5 K.A.U. Plain radiographs of the spine revealed osteolytic lesion of T6 vertebral body, and osteolytic lesion and collapse of T12 and L1 vertebral bodies. The myelographs showed complete spinal

canal obstruction at the level of T12. A laminectomy operation at the level of obstruction was performed to release the compression where all infected and necrotic materials were removed. Operative specimens were obtained for microbiological and histological investigations. Infected material was aspirated by syringe during surgical operation, which was used for microbiological tests. Direct Gram staining was used for detection of pyogenic bacteria. Direct Ziehl-Neelsen stain was used for identification of acid fast bacilli (AFB). This stain was also employed to examine smear obtained from colonies that grew on mycobacterial culture. Routine aerobic and anaerobic cultures were performed. Two bottles of Lowenstein-Jensen medium were used for mycobacterial culture. Infected tissue specimens were obtained for histological examination. Direct Gram stain revealed no pyogenic microorganisms. Direct Ziehl-Neelsen stain was negative for acid fast bacilli. Aerobic and anaerobic cultures yielded no growth of pyogenic organisms. Mycobacterial culture on Lowenstein-Jensen medium showed growth of *Mycobacterium tuberculosis*. Histological test revealed signs of tuberculosis. The patient was given the following anti-TB chemotherapy: isoniazid (300 mg/day), rifampin (600 mg/day) and streptomycin (0.75 g/day) for eight weeks. This was followed by isoniazid and rifampin for further 10 months. Postoperative rehabilitation was applied by means of physiotherapy, which started after complete healing of the surgical wound. The patient started to regain gradual sensory and motor activity after five weeks of operation that could feel skin touch and move his toes slightly. The recovery advanced to a large extent after six months that he could walk but with some difficulty. One year later, after the surgical operation and after completion of anti-TB chemotherapy, there was complete recovery and without any neurological sequelae. There were also no signs of active tuberculosis on radiographs.

DISCUSSION

Many cases of spine tuberculosis had been seen in Basrah city, but the present case was the only one that showed multifocal tuberculous spine infection. One case only of multifocal spinal tuberculosis was previously reported in English literature that involved cervical, thoracic and lumbar vertebrae and presented with progressive quadriplegia [2]. On the contrary, several cases of pyogenic spine infection were presented with multiple levels of spine infection [4]. The rarity of multifocal spinal tuberculosis in comparison with pyogenic one might be attributed to that pyogenic bacteria are more liable to cause bacteremia or septicemia than mycobacteria where can be localize at different levels of the spine. Tuberculosis is one disease that reactivated by stress. Poverty with compromised immunity and stress conditions in the country, where the patient lived, might cause extensive tuberculous infection on several sites of the spine.

Skeletal TB is the most common form of extrapulmonary TB. Whereas spinal TB (Pott's disease) is the most frequent form of skeletal system TB, comprising 50% of all cases [6]. The vast majority of cases of spinal TB involve the thoracic and lumbar regions, while the cervical spine is involved in fewer than 5% [6]. TB of the cervical region is the most dangerous form of skeletal TB, and the risk of quadriplegia and death is great [7]. Wherever the primary site of TB infection is, it travels by subligamentous spread in the spine, as well as into paravertebral spaces and adjacent soft tissues. It causes osteonecrosis characterized by loss of the extracellular matrix of vertebral bone and collapse of the vertebrae [7]. In spinal TB, the anterior portions of two or more contiguous vertebrae are involved owing to haematogenous spread through one artery intervertebralis feeding two adjacent vertebrae [8]. It was assumed that the infection originates from pelvic organs initially and then disseminates haematogenously to involve more superior areas of the spine. This would explain why the anterior portion of the spine is involved and why cervical TB is so rare [2]. In Pott's disease, the spinal cord may become involved by two mechanisms: firstly, compression by bony elements and/or expanding abscess; or secondly, direct involvement of cord by granulation tissue [9]. Neurological deficits in spine TB are usually more symmetrical and of more gradual onset than those resulting from other pathologies [1].

A clear distinction between tuberculous and pyogenic spine infection by means of histology and by culture growth was only found in 62.2% of cases [10]. Nevertheless, tuberculosis should be suspected if there are pus cells without pyogenic bacteria on direct Gram stain smear, or if there is no growth of any pyogenic bacteria on routine aerobic and anaerobic cultures [11]. This suggests that antituberculous chemotherapy can be started before waiting the result of mycobacterial culture, which may require two weeks or more to be obtained, and also before the result of histology that may be inconclusive in some cases. In addition, tuberculous bone infection should be suspected if there is no growth of any pyogenic bacteria or if there is growth of *Staphylococcus epidermidis* alone on routine aerobic and anaerobic sinus-track cultures. Mycobacteria can often be identified from sinus-track culture from patients in whom operative culture, histopathology and clinical examination have failed to confirm the diagnosis of tuberculosis [12]. In very rare occasion, tuberculous and pyogenic spine infection may affect the spine concurrently where the diagnosis of spine tuberculosis could be concealed by positive culture of pyogenic bacteria [13].

In the recognition of skeletal TB, conventional radiology still remains a cornerstone, but it is very important to balance together the radiological and clinical features [5,14]. Typical radiographic changes indicative of Pott's disease include verte-

bral destruction and narrowing of the intervertebral space seen on plain radiographs [15]. Similar findings may be seen with metastatic diseases and fungal infections, whereas involvement of the disc suggests TB and pyogenic infections. Correlative CT and MRI have made diagnosis of spinal TB substantially easier [15]. CT scan images on bone setting support the diagnosis by demonstrating the irregular disappearance of bony trabeculae [16]. MRI is invaluable for both accurate diagnosis and follow-up of proper treatment, but it cannot identify soft tissue calcification, which is pathognomonic of TB [8].

TB of the bone and joints is a treatable condition, with the course and prognosis resting on early recognition and aggressive treatment [14]. Surgical treatment should include anti-TB medication, abscess decompression and the anterior surgical approach is chosen for cervical and lumbar regions [2]. Extrapulmonary TB should be managed according to the principles used for pulmonary TB [14]. Therefore, a daily treatment with isoniazid, rifampin, and pyrazinamide for the first 2 months, followed by isoniazid and rifampin administered daily or twice weekly under direct observation, is recommended. Prolonged drug therapy (i.e., in children for a minimum of 12 months) proves effective for eliminating or sterilizing the so-called persistent bacilli, which are small populations of metabolically inactive microorganisms. Because of the spontaneous emergence of drug resistance in a small number of tubercle bacilli, monotherapy with even the most potent bactericidal drug (isoniazid) may result in the selection of a resistant bacterial population and lead to treatment failure and acquired drug resistance. Treatment should not be delayed pending culture results because experience suggests that delay in treatment may result in a less than optimal outcome [14].

CONCLUSION:

The present case described a patient who reported backache that followed by paraplegia, and whose vertebrae number T6, T12 and L1 were infected with *Mycobacterium tuberculosis*. It is concluded that spine TB may involve multiple vertebrae at different levels of the spine. Therefore, all vertebrae should be verified by radiographs for any signs of infection in such cases.

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