

Case Report

Paraplegia in spinal tuberculosis due to anterior spinal artery syndrome

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Tuberculosis remains a major public health problem especially in developing countries. Around 10% of patients with extra pulmonary tuberculosis may have bone and joint involvement and half of them will have tuberculosis of spine. Paraplegia is the most dreaded complication of spinal tuberculosis. Infective thrombosis or endarteritis of spinal vessels leading to infarction of the spinal cord is a very rare cause of paraplegia. We describe a 45-year-old lady presenting with spinal tuberculosis leading to paraplegia with associated anterior spinal arterial thrombosis.

Keywords: Spinal tuberculosis; Anterior spinal artery infarction; Paraplegia; MRI**Copyright:** ©2015 Thillainathan S *et al.* This is an open access article distributed under the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.**Funding:** None**Competing interests:** None**Received:** 08 June 2015**Accepted revised version:** 13 October 2015**Published:** 26 December 2015***Correspondence:** sharmila15@gmail.com

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Introduction

Tuberculosis remains a major cause of morbidity and mortality in developing countries. Paraplegia is the most dreaded complication of spinal tuberculosis. Here we present a patient with a clinical picture consistent with spinal tuberculosis associated with anterior spinal arterial thrombosis presenting as paraplegia.

Case presentation

A forty five year old lady from Colombo presented with subacute onset paraplegia with a sensory level up to T8. She was apparently well until two months back when she developed a cough, which was neither productive nor associated with fever, for which she received some oral antibiotics. Over the next two weeks she developed severe backache localized to the thoracic region, which was aggravated by movements but not radiating to the legs. There was no associated spinal deformity or kyphosis. Subsequently she noticed weakness and numbness of bilateral lower limbs, which developed within two days, while upper limbs were preserved. At the same time she developed urinary and faecal incontinence. Examination revealed a sensory level at T6 with impaired pain and temperature sensation below T6 level with exaggerated deep tendon reflexes of lower limbs. Joint position sensation and vibration sensation were intact.

Initially transverse myelitis was suspected on clinical grounds and intravenous immunoglobulin therapy was given along with intravenous dexamethasone for five days. There was some improvement in paraplegia but it was not sustained. A gadolinium-enhanced MRI of the brain excluded multiple sclerosis, which could be associated with transverse myelitis. Urgent magnetic



Figure 1. T2 weighted MRI scan of the spine showing soft tissue density in anterior epidural space extending from C8/T1 to T6/T7 level with mild cord oedema.

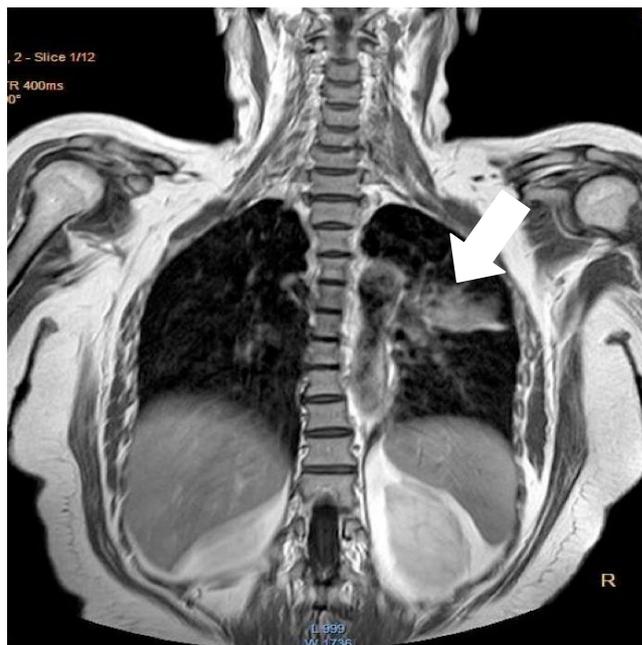


Figure 2. MRI scan of chest revealing a soft tissue density lesion in left hilar region (Arrow) with multiple nodular opacities.

resonance imaging (MRI) of brain and whole spine revealed bilateral homogeneously enlarged lacrimal glands, a soft tissue density in anterior epidural space extending from C8/T1 to T6/T7 level with mild spinal cord oedema (Figure 1). MRI and High-resolution computed tomography chest showed a soft tissue density lesion in left hilar region with multiple nodular opacities scattered in both lung fields. There was no mediastinal or hilar lymphadenopathy (Figure 2).

Paraplegia associated with anterior epidural soft tissue density of the dorsal spine as well as the hilar mass raised the suspicion of lymphoma or tuberculosis while bilateral enlarged lacrimal glands pointed towards sarcoidosis. Angiotensin-converting-enzyme inhibitor level and serum calcium level were persistently low. She underwent video-assisted thoracoscopy and a biopsy was taken from the hilar mass. Interestingly microscopy of the lung tissue revealed multiple and large foci of granulomas composed of aggregates of epithelioid histiocytes, Langerhans type multinucleated giant cells and central caseation. Ziehl-Neelsen stain showed fragmented acid fast bacilli and the diagnosis of caseous tuberculosis was strongly suggested. Erythrocytic sedimentation rate was 75mm/1st hour. Sputum for acid fast bacilli, sputum culture and mantoux test were negative. She was started on anti-tuberculosis treatment (ATT) with isoniazid, rifampicin, pyrazinamide and ethambutol. On day 10 she developed severe drug induced hepatitis leading to hepatic encephalopathy and was admitted to the intensive care unit for observation. Once she became clinically and biochemically stable, under very close observation ATT regime was reintroduced gradually and was tolerated.

During the treatment process MRI whole spine was repeated ten weeks later, which showed clearing of the previously noted epidural soft tissue density revealing a low intensity lesion in T1 weighted images and a high signal intensity lesion in T2 weighted images. This indicates a short segment anterior spinal artery territory infarction from T3 to T5 level (Figure 3, 4). The lesion was darker than the grey matter in contrast to the substance of cord.

Thrombophilic screening proved negative. 2D Echocardiogram excluded any cardiac source of embolism. Tuberculosis endarteritis leading to the obliteration of the anterior spinal artery, which is a rare cause for spinal tuberculosis paraplegia, was diagnosed. With anti-tuberculosis treatment and continuous physiotherapy she gradually gained some sustained improvement of being able to move the legs but movement of lower limbs against gravity was not achieved. Sensory impairment and incontinence persisted.



Figure 3. T1 weighted MRI scan of spine displays low signal intensity from T3 to T5 level (Arrow) in sagittal view

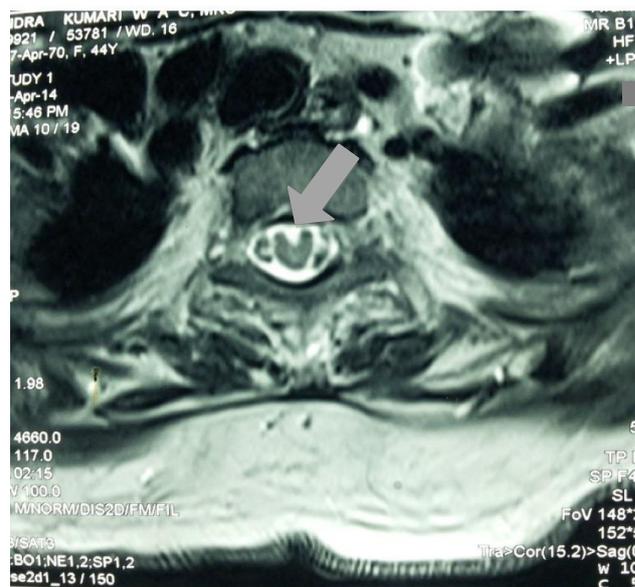


Figure 4. T2 weighted MRI scan displays high signal intensity lesion (Arrow) in the anterior part of the spinal cord.

Discussion

Around 10% of patients with extra pulmonary tuberculosis may have bone and joint involvement and half of them will have tuberculosis of the spine (1). Among spinal tuberculosis the incidence of neurological involvement is 10-46% (2). Spinal tuberculosis is common among children and young adolescents but may occur in any age group. Paraplegia is the most dreaded complication of spinal tuberculosis.

Among the patients with active spinal tuberculosis, paraplegia may be caused by direct involvement of meninges and spinal cord by the tuberculous infection or by direct mechanical pressure on the spinal cord by tubercular abscess, caseous granulation tissue and debris or by intrinsic changes in the spinal cord such as inflammatory oedema. Infective thrombosis or endarteritis of spinal vessels leading to infarction of the spinal cord is a very rare cause of paraplegia (3).

Granulomatous endarteritis of anterior spinal artery is a rare specific manifestation of spinal tuberculosis. In our patient the infection seemed to have spread from the hilar caseous lesion via haematological seeding to the arteries of spinal cord. Infarction of spinal cord is an unusual but important cause of paraplegia and it is caused by endarteritis, periarteritis or thrombosis of an important tributary to the anterior spinal artery (4). MRI is an excellent tool for the evaluation of the pathogenesis of spinal tuberculosis with neurological complications and it is considered to be the most accurate investigation to identify early cord changes (5). A study by Jain et al reports that compression up to 76% of the spinal cord diameter can be tolerated without any neural defects (6). On the other hand when vascular or mechanical instability is present, paraplegia can occur at an early stage (7) and the paralysis caused by infarction may persist for longer duration (4).

Spiller WG (1909) first described anterior spinal artery syndrome as having pain at the level of lesion, disturbance of pain and temperature sensation, paraparesis or tetraparesis and urinary incontinence (8).

Currently MRI is considered as the best modality of choice for confirming the diagnosis of anterior spinal artery syndrome in suspected patients (9). Relative to normal spinal cord, the lesions due to anterior spinal artery thrombosis appear hyperintense in T2 weighted images while it appears as hypointense lesions in T1 weighted images and the lesions are usually seen anteriorly in spinal cord (9). A finding of vertebral body infarction contiguous to a cord signal abnormality on MRI is a definite indicator of ischemia and a useful confirmatory sign if present. However, this is established in only 4 to 35 percent of patients and its absence does not exclude spinal cord infarction (10).

We believe this patient suffered from an infarction of the spinal cord because of the typical clinical features on presentation, absence of cord compressions and exclusion of other known neurological diseases. A typical loss of motor neuron function with dissociated sensory

impairment below the level of the lesion pointed to anterior spinal artery syndrome (11) as a result of an infarction occurring in the region supplied by this artery. MRI during the acute stage revealed soft tissue intensity in anterior epidural space with mild spinal cord oedema. Ten weeks later repeat MRI revealed a low intensity lesion in T1 weighted images and a high signal intensity lesion in T2 weighted images indicating distinct focus of short segment anterior spinal artery territory infarction from T3 to T5 level. A similar finding was reported in patients with spinal cord ischemia (12).

This unique case emphasizes that obliterative tuberculous endarteritis leading to anterior spinal artery occlusion should be considered in the differential diagnosis of any paraplegia, especially in countries with a high incidence and prevalence of tuberculosis.

Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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