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Mycobacteria Intracellulare Spondylodiscitis Presenting as Progressive Consecutive Vertebral Sclerosis: A Case Report

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Learning Points for this Article:

Spondylodisicits caused by NTM is rare and often missed. High degree of suspicion is required. It can present as progressive consecutive vertebral body sclerosis. If required, open biopsy should be done to procure adequate samples for diagnosis. Prolong culture techniques are required to grow the organism.

Abstract

Introduction: Non-tuberculous mycobacteria (NTM) are slow-growing organisms affecting both immunocompromised and immunocompetent patients. As compared to tuberculosis, they pose formidable challenge in successful management beginning with diagnosis extending through its treatment.

Case Report: Our case highlights unusual spinal presentation of NTM, intricacies in diagnosis, and successful management.

Conclusion: As the prevalence of NTM is rising, it is important as clinicians to understand unique aspects which differ from tuberculosis for appropriate and successful treatment.

Keywords: Non-tuberculous mycobacteria, spondylodiscitis, vertebral sclerosis.

Introduction

Common causes of spondylodiscitis of spine are tuberculosis and pyogenic. Atypical infections of spine are not uncommon. We have seen isolated reports of various kinds of atypical infections such as fungal (mucormycosis, Cryptococcus, and blastomycosis), parasitic (hydatid disease, toxoplasmosis, and cysticercosis), and non-tuberculous mycobacteria (NTM) [1, 2, 3]. Therefore, high degree of suspicion and methodical approach is important in early diagnosis and successful treatment.

NTM are widely distributed in environment and comprises more than 150 species of mycobacteria. It commonly affects immunocompromised patients; however, it is also seen in immunocompetent patients. NTM are of two types; slow growing and fast growing. Osteomyelitis is commonly caused by slow-growing organisms such as Mycobacteria avium-intracellulare complex, Mycobacterium ulcerans, and Mycobacterium marinum. [4, 5] It most commonly affects pulmonary system. Skeletal affection is not uncommon and is seen in the form of chronic granulomatous affection in bursae, joints, and bone. It is caused by direct inoculation through puncture wound, injection, surgical incision, or accidental trauma [4].

Vertebral osteomyelitis is extremely rare with only few case reports described in literature. Thoracic spine is commonly affected followed by lumbar spine. Unlike other skeletal affection, vertebral involvement is rarely caused by direct inoculation. Hematogenic or lymphogenic route has been described. Delayed diagnosis is a major concern and independent risk factor in successful management of NTM spondylodiscitis, especially in slow-growing mycobacteria [4, 6]. We describe a case of NTM spondylodiscitis with its clinic-

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Author's Photo Gallery


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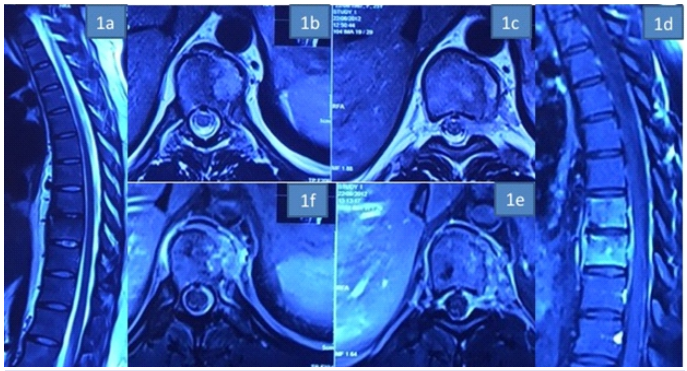

Figure 1: (a) T2 sagittal film showing T8-9 paradiscal lesion, (b and c) T2 axial film pre/paravertebral soft tissue involvement, (d) T1 sagittal film showing vertebral body enhancement, (e,f) T1 axial film showing pre/paravertebral soft tissue involvement.

radiological presentation, diagnostic dilemma, and successful management.

Case Report

We report a case of 28-year-old female, presented to the outpatient department with mechanical mid back pain with the right girdle radiation, since 2 years. She also had rest pain and night pain. There were no constitutional symptoms. On examination, there was no neurological involvement. There was local tenderness present over mid-thoracic region. No other local signs of infection were present. Straight leg raise test was negative. She was diabetic on oral hypoglycemic drugs. She had magnetic resonance imaging (MRI) scans dating 4 years back which revealed spondylodiscitis at T8-T9 level with prespinal and paraspinal soft tissue component and intense enhancement of T8-T9 vertebral body (Fig. 1). Based on that computed tomography-guided biopsy (histopathology and tuberculous culture) was done elsewhere which came negative. Empirical antituberculous treatment (ATT) (primary line drugs) was given thereafter for 2 years. However, she did not improve clinically and radiologically. At this time, radiograph showed vertebral body sclerosis T8-9 (Fig. 2) and MRI showed T8-9-10 marrow edema and prevertebral and paravertebral soft tissue component with epidural compression (Fig. 3), worsening seen in spite on ATT. This time transpedicular decompression was done elsewhere and sample was sent for examination, which unfortunately again came to be negative (histopathology and tuberculous culture). Empirical ATT (primary line drugs) was started and given for 18 months, but there was no clinical improvement.

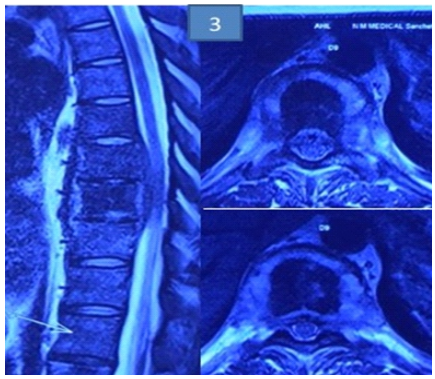

Figure 3: T2 sagittal image (sagittal and axial) showing T8-9 vertebral body involvement with pre/paravertebral soft tissue involvement.

We did plain radiograph (Fig. 4) which showed thoracic 8-9-10 sclerosis, which had progressed as compared to the previous radiograph. MRI scan (Fig. 5) showed T8-9-10 involvement with soft tissue component similar to last scan. Laboratory investigations showed erythrocyte sedimentation rate-45, C-reactive protein positive, and white blood cell counts were normal.

Based on imaging and history, our main differential diagnoses were as follows:

1. Mycobacteria tuberculosis.
2. Slow-growing organism's, for example, atypical mycobacteria.
3. Sclerosing vertebral metastasis/idiopathic vertebral sclerosis was less likely as soft tissue component is rarely seen in these conditions.
4. Pyogenic or fungal causes for spondylodiscitis were less likely as the course of disease was less aggressive with lack of any other constitutional symptoms.

We performed a posterolateral decompression. We did not do any fixation as thoracic spine is relatively stable due to the presence of rib cage and there was no radiological evidence of instability. Intra-operatively, pus was encountered with granulation tissue. The sample was sent for histopathology and

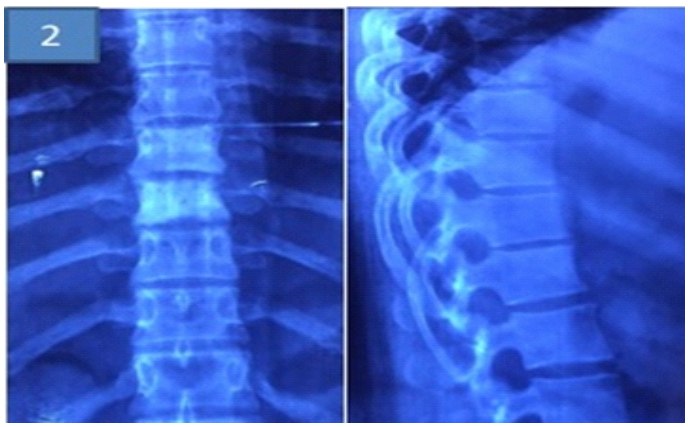

Figure 2: Plain radiograph showing T8-9 sclerosis.

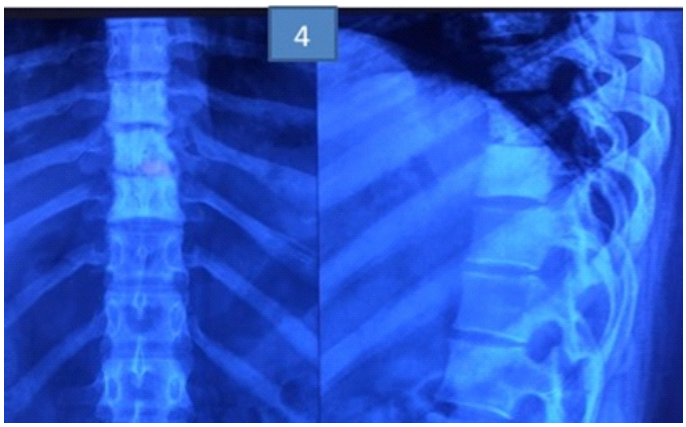

Figure 4: Plain radiograph showing T8-9-10 vertebral sclerosis.

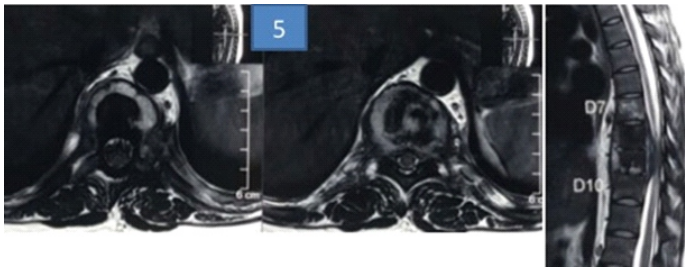

Figure 5: Magnetic resonance imaging showing T8-9-10 vertebral involvement with soft tissue abscess.

culture. Histopathology report suggested of non-granulomatous infection. Culture at 6 weeks suggested Mycobacteria intracellulare.

Antibiotics were started in consultation with infectious disease specialist. She was given rifampicin, ethambutol, and clarithromycin for a year. At 1-year follow-up, the patient showed good clinical improvement. Her MRI showed resolution of lesion (Fig.6). Inflammatory markers were within normal values. After 1 year of stopping the medicines, the patient shows no clinical recurrence.

Discussion

Vertebral body sclerosis is an uncommon finding. It is seen in cases of metastasis, lymphoma, tuberculosis, hemangioma, idiopathic vertebral sclerosis, and Paget's disease of bone [7, 8]. However, sclerosis along with soft tissue component points in favor of infective etiology. Sclerosis in infection is reactive sclerosis, which tends to progress as pathology increases [8]. Our case had three consecutive vertebral body scleroses which were progressive over 4 years suggesting increase in pathology.

Tissue diagnosis and culture should be done in all cases and are preferred, especially when getting diagnosis, is of prime importance. Percutaneous techniques for biopsy have a variable rate of positive yield ranging from 36% to 91% in the infectious spondylodiscitis. Percutaneous biopsy can be false negative due to various reasons such as inadequate sample size, sampling error, and empirical antibiotics at the time of biopsy [9]. Open biopsy is the most reliable method of procuring sample for diagnosis and has higher success rate [10]. Delay in diagnosis is common causing poor outcome. Therefore, multiple culture samples and more importantly prolonged culture techniques are recommended. In our case, previous biopsies were negative, so we needed better targeted sample with good quantity to grow the organism. Hence, surgery was done and prolonged culture helped in procuring the diagnosis. Surgical debridement also helped in reduction of tissue load of infection.

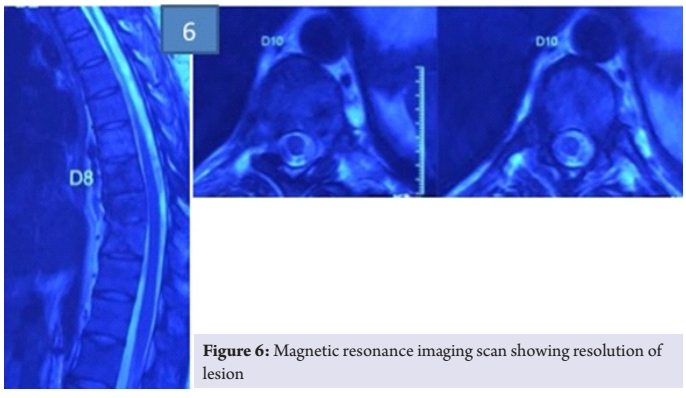

Figure 6: Magnetic resonance imaging scan showing resolution of lesion

Treatment of NTM osteomyelitis involves surgical debridement and chemotherapy. It is been shown that surgical debridement is adequate for NTM osteomyelitis. However, additional chemotherapy is beneficial [5, 9]. Kato et al. recently reported no infection recurrence in a patient with vertebral osteomyelitis treated by debridement and surgery using antibacterial iodine supported instrumentation [11]. Kim et al. in an analysis of 69 patients reported 67.6% of patients required surgery.

Drug regimen should ideally be given based on drug sensitivity as per American thoracic society [6]. Literature suggests correlations between the type of organism and antibiotics to be considered. Among slow-growing NTM, clear correlations have been established for amikacin and macrolides (M. avium complex) and for rifampicin (Mycobacterium kansasii). Among rapid-growing NTM, correlations have been established in extrapulmonary disease for aminoglycosides, cotrimoxazole, and cefoxitin. In pulmonary disease, outcomes are poor and correlations are less clear, especially for Mycobacterium abscessus [12]. Duration of chemotherapy in slow-growing NTM is at least 1 year and fast-growing NTM is at least 6 months [6]. Our case had isolated of M. intracellulare, which was slow-growing organism, so antibiotics were given for a year.

Differentiating NTM from tuberculosis can be tricky. The complexity of the diagnosis is due to the indolent nature of the disease, non-specific symptoms, lack of distinctive clinic radiological signs, and lack of suspicion.

Conclusion

NTM can present as progressive consecutive vertebral sclerosis. Its differentiation from tuberculosis can be sometimes tricky due to lack of specific clinic-radiological findings. High level of suspicion is required for early diagnosis and treatment.

Clinical Message

Spondylodiscitis caused by NTM can be often missed. Prolong culture techniques should be used for growth, especially in slow-growing microbes. Appropriate tissue diagnosis by open biopsy if required must be done in a timely manner to prevent delaying diagnosis.

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