CASE REPORT

A case of tuberculous sacroiliitis in a patient with systemic lupus erythematosus

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Article Information

Keywords: Systemic Lupus Erythematosis, Tuberculosis, Sacroilitis

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DOI: http://doi.org/10.4038/cjms.v57i2.4990

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Introduction

Systemic lupus erythematosus (SLE) is a disease with a complex pathophysiology which predominantly affects females of reproductive age. SLE patients are found to have defective innate and adaptive immune responses [1]. Sacroiliitis in SLE is uncommon. Sacroiliitis usually presents with lower backache or buttock pain and the diagnosis is often delayed or missed due to the vague presentation and lesser awareness compared to peripheral joint arthritis. Causes of sacroiliitis are many, but infectious etiologies are uncommon. In acute pyogenic infections, salmonella and pneumococci are implicated, whilst in chronic infections, tuberculous and brucellosis are seen. Sacroiliitis is also seen in osteoarthritis and in spondyloarthritis such as ankylosing spondylitis, psoriatic arthritis and reactive arthritis [2]. However, there is a scarcity of literature on sacroiliitis in patients with SLE.

Case report

We report a 32-year-old woman with a diagnosis of SLE who presented with a debilitating lower back pain for one month. Her pain was felt mainly over right lower back and significantly affected mobility and activities of daily living. In addition, it was associated with a significant loss of appetite and weight (8kg over 2 months). She denied any trauma to back, chronic cough, fever, morning stiffness, alteration of bowel habits or involvement of any other joints. There were no new skin rashes, oral ulcers or hair loss. She was diagnosed to have SLE six years prior to this presentation. The diagnosis was made based on the 2012 SLICC (Systemic Lupus International Collaborating Clinics) criteria [3]. Two years prior to this presentation she was diagnosed with cerebral lupus and class iii lupus nephritis. Mycophenolate mofetil was added to her regular medications of prednisolone and hydroxychloroquine. Her

brother was diagnosed with smear positive pulmonary tuberculosis in 2018 and was residing in the same house with her when his diagnosis was made.

She was thin built with a body mass index of 18kgm^{-2} and pale but did not have alopecia, oral ulcers or lymphadenopathy. Bronchial breathing was heard over left lower zones of her lungs. There was tenderness over right sacroiliac joint on positive pelvic compression. FABER (Flexion, Abduction and External Rotation) and the Gaenslen's tests positively localised the pain to the right sacroiliac joint [4]. There was no active peripheral arthritis. Spinal flexion and extension were normal.

Her hemoglobin was 9.4g/dL (11-14g/dl) with an MCV (Mean Corpuscular Volume) of 82fL (75-90fL) and an MCH (Mean Corpuscular Hemoglobin) of 26pg (28-35pg). Liver and renal functions were normal. Erythrocyte sedimentation rate was 80mm/hr. Mantoux reading was 2mm. Chest radiograph revealed left lower lobe consolidation with bilateral hilar lymphadenopathy and a left upper lobe cavitatory lesion (Figure 1). Subsequent High Resolution Computed Tomography (HRCT) of the chest confirmed these findings. Sputum TB nucleic acid amplification test using cartridge-based method (Gene-Xpert®) detected *Mycobacterium tuberculosis*. The X-rays and magnetic resonant imaging (MRI oblique coronal fat-sensitive T1SE and fluid-sensitive T2-weighted fat-saturated sequences) of sacroiliac joints performed on 5th week of the illness were normal. During the 7th week of the illness, the joints were re-imaged. Sacroiliac joint X-rays showed changes of right sacroiliitis. MRI delineated early right sacroiliitis with contrast enhancement of the joint and abnormal bone marrow in post gadolinium sequence without soft tissue signal changes or localised collections (Figure 2). CT guided biopsy was attempted and failed. Open biopsy was performed on right sacroiliac joint. Histology revealed reactive granulation tissue. TB Gene-Xpert performed on the specimen obtained from the joint detected *M.tuberculosis.* Culture of the joint aspirate isolated *Myco-bacterium tuberculosis.* Contrast enhanced CT imaging of chest, abdomen and pelvis did not identify disseminated tuberculosis. HLA-B27 was negative, while the Brucella antibody titer was normal.

A diagnosis of pulmonary tuberculosis with right sacroiliac involvement was made. The patient was commenced on anti-tuberculosis therapy (anti TB), which was continued for 9 months. A clinical recovery was made within 2 months of treatment,while a radiological resolution with right sacroiliac joint fusion was achieved at 1 year (Figure 3).

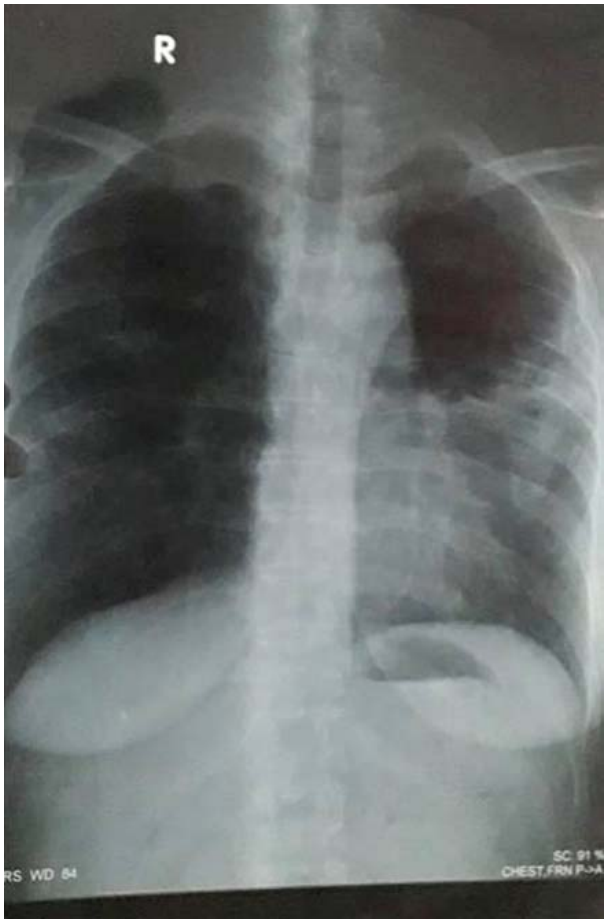

Figure 1. Chest X-ray (PA) – left lower lobe consolidation with bilateral hilar lymphadenopathy and left upper lobe cavitatory lesion.

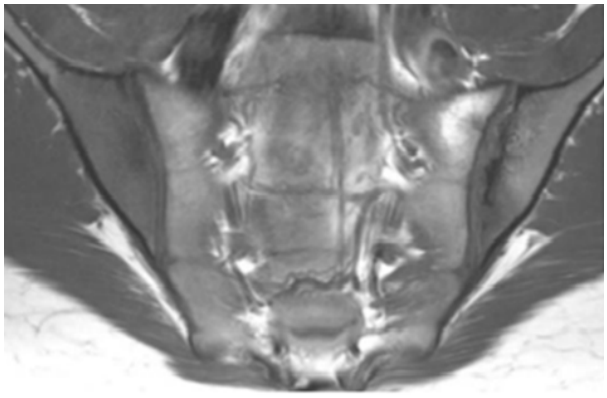

Figure 2. MRI oblique coronal fat-sensitive T1SE and fluid-sensitive T2-weighted fat-saturated sequence – early right sacroiliitis with contrast enhancement of the joint and abnormal bone marrow in post-gadolinium sequence without soft tissue signal changes or localised.

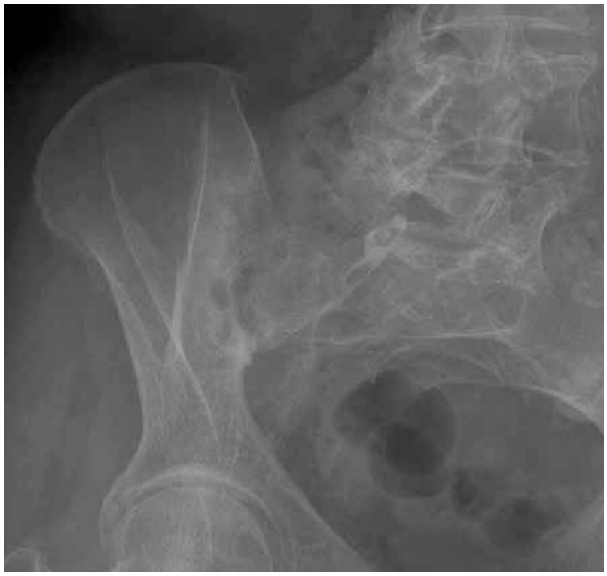

Figure 3. X-ray Sacroiliac joints – right sacroiliac joint fusion.

Discussion

Infection is one of the commonest causes for mortality and morbidity in patients with SLE, accounting for 16-23% hospitalisations [5]. SLE patients are more prone to develop opportunistic and chronic infections due to defective immune responses [1]. These range from defects in major histocompatibility complex (MHC) mediated pathogen recognition to complement and T-cell mediated pathogen clearance [1]. In addition to immunological abnormalities in lupus, treatment with immunosuppressive agents also predisposes patients to opportunistic infections [6]. Hence, infective causes such as pyogenic sacroiliitis, tuberculous sacroiliitis and brucellosis can be regarded as the most likely etiology of sacroiliitis in a patient with SLE.

Extrapulmonary tuberculosis involving musculoskeletal system comprises 1-5% of all cases. Among them the incidence of sacroiliac joint involvement is 3-9.7% [7]. Populations at high risk are the elderly, immunocompromised patients, people of low socio-economic status, immigrants from endemic areas and those with heavy alcohol use. Prior to the use of anti TB drugs, the mortality related to musculoskeletal TB has been high [8], and the introduction of anti TB therapy has favorably changed the outcome.

The diagnosis of TB sacroiliitis in SLE is challenging due to the indolent nature of the disease. Less than half the patients with TB sacroiliitis have co-existing pulmonary disease [7]. Eliciting inflammatory type of pain in the history suggests either AS or SLE related arthritis [9]. Our patient had a non-inflammatory type of a back pain suggestive of infectious etiology.

Mantoux test is useful in diagnosing active and latent TB. Literature shows that the sensitivity of Mantoux in active tuberculosis is 86%. However, the false-positive rates are as high as 42% due to previous vaccination or latent TB. In contrast, in those with confirmed pulmonary TB, false-negative rates are 20.5%, which is even higher in patients with extrapulmonary TB due to their impaired cellular immunity [10]. Our patient's Mantoux was negative (2mm) reflecting possible underlying impaired cellular immunity.

The irregular outline and obliquity make the sacroiliac joints difficult to fully assess radiographically. It may take years of clinically evident disease until clear structural joint abnormalities become visible on conventional radiography in many patients with sacroiliitis related to spondyloarthritis [11]. However, MRI detects bone marrow oedema as an early feature of sacroiliac joint inflammation. Therefore, MRI oblique coronal fat-sensitive T1SE and fluid-sensitive T2-weighted fat-saturated sequences and bone scans are considered gold standard for imaging in sacroiliitis [12,13]. An MRI is superior to a bone scan, as it can characterise sacroiliac joint disease and assess disease severity and activity. Our patient had very early inflammation of right sacroiliac joint which was not detectable during the first radiographic evaluation.

Kang *et al*. conducted a study to compare MRI findings of infectious sacroiliitis with spondyloarthritis related sacroiliac joint involvement[14]. Iliac-dominant pattern bone marrow oedema and joint space enhancement were more in favor of spondyloarthritis, whereas non-iliac dominant pattern bone marrow oedema, large bone erosions, thick capsulitis, extra capsular fluid collection and periarticular muscle oedema were observed more frequently in infectious sacroiliitis [14]. Periarticular muscle oedema is considered the single most important predictor of infectious sacroiliitis. Our patient had sacral pattern bone marrow oedema without significant periarticular soft tissue changes owing to very early disease.

Definitive diagnosis is obtained by fine needle aspiration or open biopsy. Open biopsy has a higher yield of tissue samples (95-100%) compared to closed techniques (65-70%). However, false negative results should be anticipated in long standing tuberculosis, due to the paucibacillary nature of the disease. Osman, *et al*. demonstrated that aspirates from the sacroiliac joint were negative for tuberculosis in 14% of patients, although they had positive evidence of pulmonary tuberculosis [15,16]. Mechal Y, described that the sensitivity and specificity of GeneXpert MTB/RIF were almost the same in both pulmonary (78.2% and 90.4%) and extra-pulmonary (79.3% and 90.3%) samples [17]. Our patient had *M. tuberculosis* isolated from both sacroiliac joint and sputum confirming an etiological diagnosis of tuberculosis with active chest infection. In addition to obtaining a definitive aetiological diagnosis, the advantage of open biopsy is

that the process of healing might be faster [18]. Tuberculous sacroiliitis usually heals by fusion and the average time taken for radiological recovery is considered 2 years [7]. Our patient achieved radiological resolution at the end of the first year.

Conclusion

Patients with SLE are more prone to opportunistic infections, due to their inherent defective immunity and concurrent immunosuppressive treatments. This case highlights the difficulties associated with achieving an aetiological diagnosis in tuberculous sacroiliitis. Clinicians should suspect infective causes if the presentation of backache is non-inflammatory in nature. Even in the absence of conclusive radiographic evidence of infective sacroiliitis, presence of unilateral sacroiliitis with high degree of clinical suspicion of an infective aetiology warrant obtaining specimens for microbiological diagnosis.

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