Atypical mycobacterium infection of sternoclavicular joint: A unique case

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Abstract

We report a rare case of atypical *Mycobacterium intracellulare* infection encountered in a left sternoclavicular joint of an immunocompetent patient. The 34-year-old female patient presented with a one-year history of left sternoclavicular joint pain and swelling. The patient had multiple radiological investigations, which were suspicious for an infective cause. The patient had a biopsy of the joint, which returned showing acid-fast bacilli. The patient consequently received a prolonged course of medical treatment for *M. intracellulare*.

Keywords

mycobacterium, sternoclavicular, tuberculosis

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Case report

A 34-year-old British female of right-hand dominance, presented to an Orthopaedics outpatient clinic with a one-year history of pain and swelling over her left sternoclavicular joint (SCJ). The patient worked full time as a medical receptionist, had no significant medical history and had been taking Paracetamol 1 g four times daily alongside Indomethacin 50 mg three times daily for analgesia.

The patient described the pain as a constant ache, with no radiation, which is exacerbated particularly by movements above head height. The patient had additionally noticed crepitus over the joint, which equally had been present for one year. The SCJ pain had also been limiting the patient at work as well as activities of daily living. The patient's pain had been severe enough to awake her from sleep particularly when laying on her left side.

The patient described no pain in her other joints, however did complain of generalised malaise and fatigue, which coincides with the onset of the swelling in the left SCJ. The patient denied any recent foreign travel, and has had no contact with those recently travelled abroad. There was no significant family history of joint disease to note. The patient denied previous surgery on her left SCJ, steroid injections or aspirations.

Prior to being seen in an Orthopaedics outpatient clinic, the patient had been investigated comprehensively

for rheumatological pathology. The patient had elevated inflammatory markers including a white cell count of $14.2 \times 10^9/L$, a C-reactive protein of 40 mg/L and an erythrocyte sedimentation rate of 40 mm/h. The patient has had multiple rheumatological screenings, which were all negative for anti-nucleic antibody, rheumatoid factor and anti-cyclic citrullinated peptide antibodies. Urine Bence Jones protein was negative and serum uric acid levels also returned as normal.

On examination, the patient's height was 1.60 m, weight 112.4 kg, a body mass index of 43.9 and no history of weight loss. The patient had a full range of movement in her neck, which was pain free. She was tender on direct pressure of the SCJ. The patient had forward flexion to 90°, abduction to 90° limited by pain over the SCJ, external rotation to 90° and internal rotation to L3. There were no signs of impingement syndrome and the rotator cuff appears intact. General examination revealed no swelling of other joints, and movements of other joints were normal.

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Figure 1. Posteroanterior chest radiograph.

Figure 2. Three-dimensional reconstruction computed tomography.

Imaging revealed degenerative changes on plain X-ray (Figure 1). A computed tomography (CT) scan of both shoulders was organised to delineate anatomy better (Figure 2). The CT showed narrowing of the left mid-clavicular joint space, with well-marked sclerosis of the proximal end of the left clavicle as well as the adjacent manubrium. The patient had a magnetic resonance imaging (MRI) which showed irregularity of the articular surface of the clavicle with abnormal signal present in the proximal clavicle and adjacent sternum, suggestive of a low-grade infection (Figure 3). There was no soft tissue collection or large joint collection and the contralateral side was normal. A nuclear medicine whole body scan showed a focal increased uptake at the left SCJ (Figure 4).

To achieve a definitive diagnosis, an aspiration and biopsy were performed of the medial end of the left clavicle under general anaesthesia. Culture of the fluid revealed acid-fast bacilli, in the form of *Mycobacterium intracellulare*. Histology also confirmed the diagnosis of *M. intracellulare* (Figure 5).

The patient made a good recovery from theatre and her wounds had healed well at two-week follow-up. The patient was then commenced on long-term drug therapy for non-tuberculosis mycobacterium (NTM) including Clarithromycin, Rifampicin and Ethambutol. The patient showed signs of improvement since commencement of therapy. The patient completed two years of treatment after regular discussion with our local microbiology team. Typically, treatment is continued for at least 12 months as per the British Thoracic Society guidelines.¹

Her MRI three months later following completion of treatment shows the left SCJ is surrounded by bone marrow oedema, no significant erosive changes but findings in keeping with early degenerative changes. There were new marrow signal changes across the

Figure 3. Magnetic resonance imaging scan.

Figure 4. Nuclear medicine whole body.

Figure 5. Pathology slides of *Mycobacterium intracellulare*.

right SCJ with marrow oedema as well as mild sclerosis in the medial end of the right clavicle and opposing manubrium sterni (Figure 6). In view of her remaining asymptomatic from her right SCJ and already having completed anti-tuberculosis treatment, this was treated as inflammatory in aetiology. She also showed improvement in her biochemical parameters and is still being followed up in clinic. The patient's symptoms have shown complete resolution and inflammatory markers have remained stable. Therefore, treatment has been deemed curative and no further intervention has been required at three-year follow-up.

Discussion

Atypical mycobacterium is commonly found in soil and water.² *M intracellulare* is part of the NTM species and it can cause an infection in humans; however, infections of joint and bones are extremely rare.³ Commonly atypical NTM has been associated with lung disease, cervical lymphadenitis and skin infection.³ *M intracellulare* has previously been reported affecting the upper limb, causing tenosynovitis, arthritis and osteomyelitis.^{3,4} Atypical mycobacterium is usually of low pathogenic potential.⁴ However, it is being reported with increasing frequency in immunocompetent patients.⁵

Immunocompromised patients are associated with local recurrence as well as disseminated disease.³ Kozin and Bishop have reported 15 cases of upper limb NTM in immunocompetent patients that had achieved resolution, whilst this figure was only 4 out of 10 in those immunocompromised.⁴ The aim of treatment is curative and this is often the case after 12 months of treatment with anti-tuberculosis drugs.¹

The theory behind musculoskeletal infection due to NTM have been reported resultant to contamination following surgical treatment, penetrating injury or steroid injections.³ Surprisingly, in this particular case there has been no history of surgical treatment or any penetrating injury/procedures, making the sporadic onset particularly extraordinary.

The most reliable method of diagnosis is aspiration of fluid or biopsy of tissue.³ The sample is then

Figure 6. Magnetic resonance imaging post treatment.

examined under Ziehl Neelsen staining looking for acid-fast bacilli or observing granuloma formation. In this patient, this method of tissue diagnosis allowed early diagnosis and thus early treatment with anti-tuberculosis drugs.

In summary, atypical mycobacterium infections of the musculoskeletal system follow a chronic course. Mycobacterium have challenges in both diagnoses and treatment; therefore, it is of utmost importance to have atypical mycobacterium as a differential diagnosis. Atypical mycobacterium should be suspected in those patients presenting with chronic histories of pain and swelling. Biopsy and microbiological analysis is essential to obtain a definitive diagnosis. Successful curative outcomes are often achieved with a combination of both surgical debridement and drug therapy with anti-tuberculosis medications.¹

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