

An unusual cause of 'musculoskeletal' chest pain

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Learning point

Consider sternoclavicular joint infection where chest pain is associated with localised erythema, swelling and tenderness.

Abstract

Chest pain is a frequent cause of admission to an acute medical unit. In most cases the cause is initially considered to be either cardiac or respiratory, with musculoskeletal causes being considered a benign diagnosis of exclusion. We report a case of sternoclavicular joint infection, treated initially as a lower respiratory tract infection. The investigation and treatment of this unusual condition are discussed.

Keywords: chest pain, sternoclavicular joint infection

Case Report

A 48 year old female smoker with type 2 diabetes, hypertension, osteoarthritis of the knees and hypothyroidism attended the Acute Medical Unit (AMU) complaining of chest pain. The pain was mainly in the right side of the chest, but radiated into the right side of her neck. The pain was noted to be worse on coughing and on deep inspiration. The patient also described feeling pain on moving her right shoulder. She had been commenced on Amoxicillin 500mg three times daily by her General Practitioner for a presumed chest infection on the basis of dyspnoea and subjective fever. The patient was, however, afebrile with oxygen saturations of 95% on room air and there was no history of cough or sputum production. The admitting doctor noted that she had a mildly tender chest wall on palpation with some subtle erythema. A chest x-ray (CXR) (Figure 1) was arranged which showed patchy ill-defined alveolar shadowing at the right base. Her C-reactive protein (CRP) was elevated at 219 mg/l. A diagnosis of lower respiratory tract infection resulting in pleural and diaphragmatic irritation was made; the patient was discharged home and advised to complete the prescribed course of Amoxicillin.

The patient re-presented to AMU two weeks later with an obvious mass over her right upper chest wall, sweating and breathlessness. Her temperature was 37.2 degrees and oxygen saturation was 92% on room air. On this occasion, examination revealed a soft, non fluctuant mass over the right upper medial

chest wall with associated overlying erythema. On auscultation the chest sounded clear. A second CXR (Figure 2) revealed clearing of the shadowing previously noted in the right lower zone. There was, however, new shadowing in the left base and right upper zone. The patient went on to have a computerized tomography (CT) scan of the thorax.

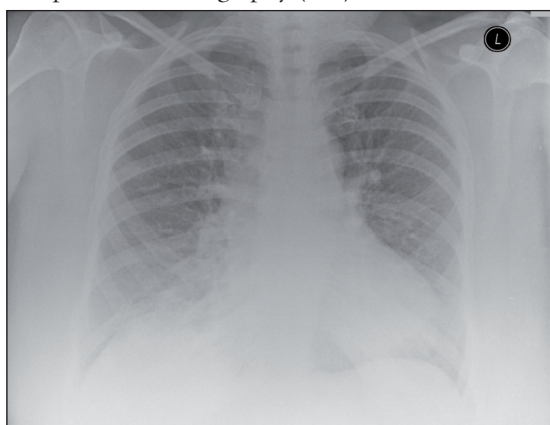


Figure 1. CXR showing patchy consolidation at right base.

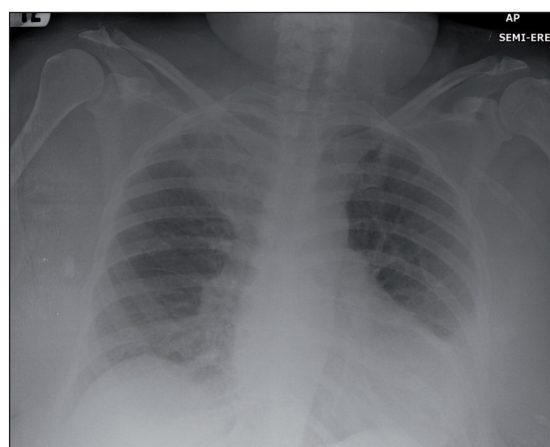


Figure 2. Compared with Figure 1 there is a greater degree of consolidation in the left lower lobe but with clearing of the changes at the right base. There is also now a more well defined area of shadowing in the right upper zone.

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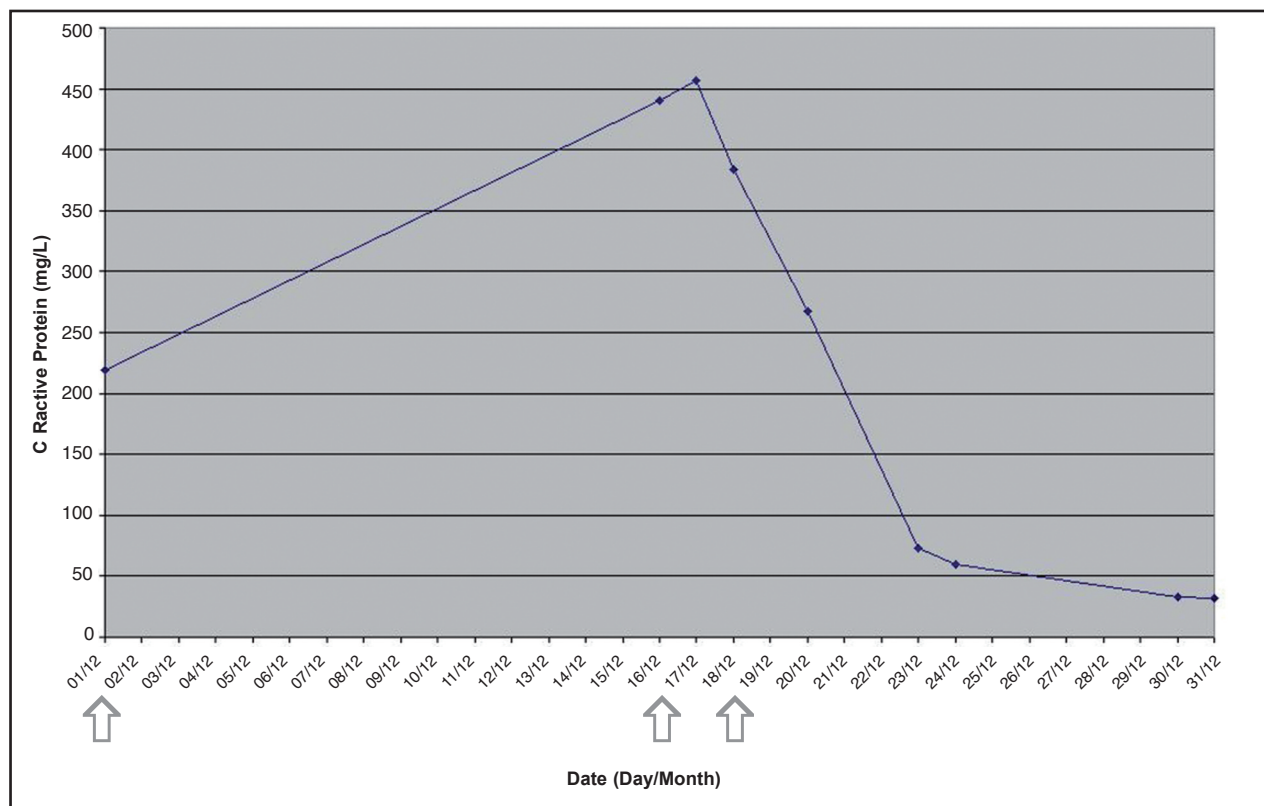


Figure 3. Graph showing how the patient's C-Reactive Protein changed during her treatment course; arrows show initial presentation on 1st December, with readmission on 16th December and commencement of intravenous Flucloxacillin 18th December.

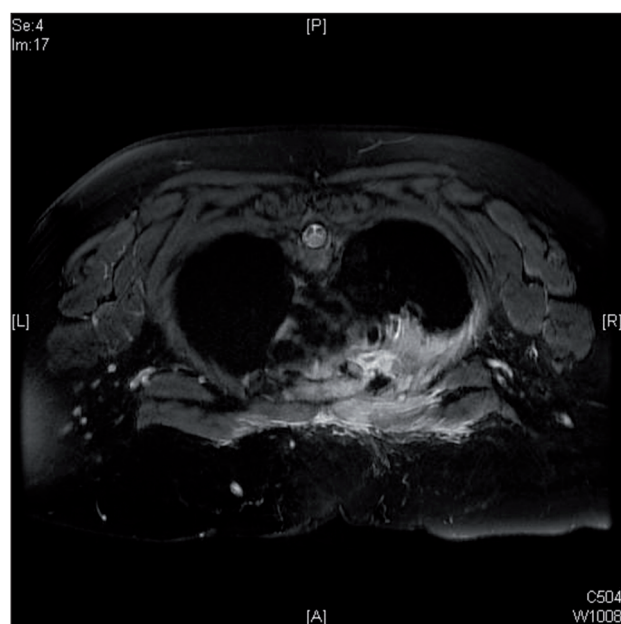


Figure 4. MRI showing extensive abnormal soft tissue and fluid centred around the right sternoclavicular joint and also anterior to the sternum (please note image acquired prone).

Interpretation of the CT suggested that she had a pulmonary mass lesion accompanied by adrenal enlargement. Metastatic lung cancer was considered the unifying diagnosis with infection being considered less likely.

Two sets of blood cultures were collected at the time of the second admission and these grew *Staphylococcus*

aureus. The patient was also noted to have an even further raised CRP (Figure 3). Intravenous Flucloxacillin was commenced which continued throughout her 6 week hospital admission. The CRP improved and the patient felt much better. The mass over the chest wall persisted however and a possible diagnosis of osteomyelitis was suggested. Magnetic Resonance Imaging (MRI) of the chest was then performed to investigate the right upper zone in more detail (Figure 4). This imaging confirmed that, while the previous pulmonary infection was improving there was infection around the right sternoclavicular joint spreading into the surrounding soft tissue. Her adrenal glands were reassessed using MRI; although they remained enlarged, the appearances were considered to be more in keeping with hypertrophy rather than malignant pathology.

The patient was transferred to the care of the Cardiothoracic team for further management. Incision and drainage of a right supra-external clavicular joint abscess was performed. The patient made a good post-operative recovery and follow-up CXR was essentially normal (Figure 5).

Discussion

Most patients referred with chest pain as part of the acute medical 'take' are initially investigated to exclude a cardiac or respiratory cause. 'Musculoskeletal' chest pain is generally considered to be a benign diagnosis of exclusion; however serious causes such as sternoclavicular joint infection are well recognised and may be difficult to diagnose.¹ Clinical features include fever, localised pain

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and tenderness and erythema of the overlying skin may be noted. In this case the significance of these symptoms and signs was not appreciated at the time of her first admission.

Sternoclavicular joint (SCJ) infections are rare² and are not widely described in females; in one case series 73% of patients were male.³ Whilst diabetes has been found to be one common risk factor³ there are a number of others including intravenous drug use that should be considered in patients presenting with SCJ infections (Table 1). Common pathogens that are known to infect the sternoclavicular joint include *Staphylococcus aureus*, *Streptococcus*, *Pseudomonas* and *Escherichia Coli* species.^{2,3}

Investigation using ultrasound guided aspiration of the SCJ has been recommended in acute presentations followed by examination of the aspirate by light microscopy prior to commencing antibiotics.⁴ The antibiotics should be broad spectrum initially and then tailored according to sensitivities. Ideal antibiotic courses appear to vary in length from 14 – 90 days.^{2,3,5} Duration of antibiotic course should generally be guided by the clinical findings and local Microbiology expertise. CT or MRI are useful imaging modalities to delineate the extent of disease and may allow a conservative approach if the infection is not loculated and has not spread outside the joint.^{2,3} It is not clear in our case whether conservative treatment would have been successful. The patient's CRP had

dropped to 32mg/L (Figure 3) after a 4 week course of intravenous antibiotics but the mass on her chest wall persisted.

Surgical debridement and drainage including excision of part of the medial clavicle have been used successfully to treat more extensive SCJ infections.²⁻⁵ Even when en-bloc resection of the SCJ is warranted, these patients were left with no limitation in movement.⁵ Indeed aggressive surgical intervention is recommended as first line when there is radiographic evidence of spread of infection outside the SCJ.⁵ This decision should be made on an individual basis between the surgeon and the patient.

Our case also highlights the pitfalls that can occur when interpretation of initial radiology, in our patient CXR and CT, suggests findings that are inconsistent with the patient's presenting symptoms. The initial CXR was suggestive of pulmonary infection, which was not in keeping with her clinical presentation. Furthermore the CT report failed to take into consideration the speed with which the changes had occurred; this was more in keeping with soft tissue infection rather than malignancy.

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Intravenous Drug Abuse
Diabetes Mellitus
Multijoint infections
Local trauma
Central venous catheterisation
Immune suppression including HIV infection, alcoholism, steroid therapy, etc.
Malignancy elsewhere

Table 1. Recognised risk factors for sternoclavicular joint infection.²⁻⁵

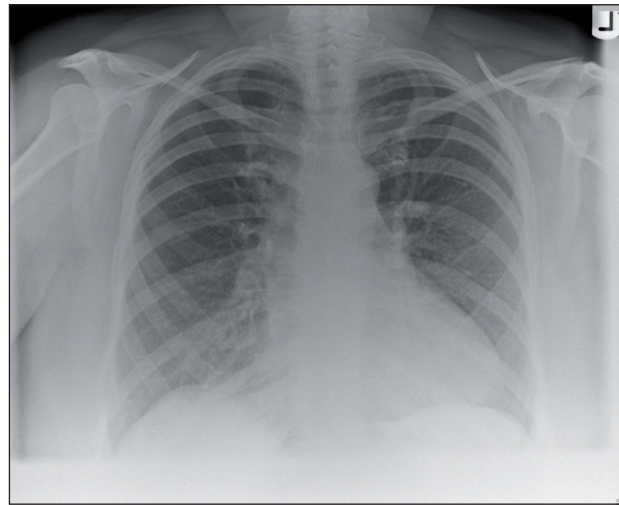


Figure 5. CXR showing resolution of previous shadowing in the right upper zone and base.

References

- Seviour PW, Dieppe PA; Sternoclavicular Joint infection as a cause of chest pain. *BMJ* 1984; **288**: 133-134.
- Burkhart HM, Deschamps C, Allen MS, *et al*; Surgical management of SCJ infections. *J Thorac Cardiovasc Surg* 2003; **125**: 945-949.
- Ross JJ, Shamsuddin, H; Sternoclavicular Septic Arthritis: Review of 180 Cases. *Medicine* 2004; **83**(3): 139-148.
- Robinson CM, Jenkins PJ, Markham PE, *et al*. Disorders of the sternoclavicular joint. *J Bone Joint Surg* 2008; **90**(6): 685-696.
- Carlos GN, Kesler KA, Coleman JJ, *et al*. Aggressive Surgical Management of Sternoclavicular Joint Infections. *J Thorac Cardiovasc Surg* 1997; **113**: 242-247.