Shoulder pain and pyrexia following subclavian line insertion

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A 49-year-old recently diagnosed diabetic man with no previous cardiac history was admitted to the coronary care unit in atrial fibrillation and severe heart failure. Despite treatment with digoxin and two DC cardioversions he continued to have episodes of atrial fibrillation causing haemodynamic collapse. He was therefore treated with intravenous amiodarone via a right subclavian vein cannula inserted by the infraclavicular approach (an uncomplicated aseptic procedure by an experienced operator). This remained *in situ* over the next two weeks to monitor central nervous pressure and to administer intravenous therapy. The line was removed after 15 days and at no time was there evidence of local erythema or infection. The patient remained afebrile throughout this time. Routine CVP line tip culture grew *Staphylococcus aureus* but, as there was no evidence of local or systemic infection, this was not treated.

After removal of the right subclavian vein cannula he developed pain and swelling of the upper arm, diagnosed clinically as subclavian vein thrombosis. This was treated with intravenous heparin and resolved in a few days. During this time he became febrile and developed a purulent discharging sinus at the site of line insertion, accompanied by a painful swelling over the medial end of the clavicle. Culture of pus and blood grew *S aureus* sensitive to flucloxacillin and fusidic acid. Plain X-ray and bone scanning were unhelpful. The computed tomography (CT) scan of the medial end of the clavicle is shown in the figure.

Questions

- 1 What does the CT scan show?
- 2 What is the diagnosis?
- 3 What treatment is indicated?

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Figure 1 CT scan of the right sternoclavicular joint

Answers

QUESTION 1

There is thinning of the cortex of the medial end of the clavicle, and swelling of the soft tissues overlying the area.

QUESTION 2

Osteomyelitis of the medial end of the clavicle, confirmed histologically following surgical resection of this and the sternoclavicular joint.

QUESTION 3

Intravenous flucloxacillin and fusidic acid were started, but despite one month of therapy the discharging sinus remained, and he was treated surgically by resection of the medial end of the clavicle and the sternoclavicular joint.

Discussion

This case illustrates two of the potential complications of central venous cannulation, namely; osteomyelitis of the clavicle, and subclavian vein thrombosis. Infective complications of central vein cannulation are common, although osteomyelitis of the clavicle following CVP line insertion has only rarely been reported.¹

Osteomyelitis, other than cases secondary to open fractures, is usually thought to occur following haematogenous spread.² In our patient the infection was probably due to direct spread to the clavicle from the cannula. Local erythema is the usual precursor of infective complications, but our case illustrates that the absence of local erythema or pyrexia before line removal does not exclude the subsequent development of infective complications.

The optimum management of clavicular osteomyelitis is unclear.^{3,4} Although antibiotic treatment alone can be sufficient in managing

Summary points

- central venous cannulae should be removed as soon as possible after insertion
- the absence of local erythema or infection does not exclude the subsequent development of infective complications
- a combined medical and surgical approach should be considered in the treatment of clavicular osteomyelitis

the condition, we believe that the combined medical and surgical approach in this patient resulted in quicker resolution of symptoms and allowed prompt referral for transplant assessment. The relationship of this infection to the patient's diabetes is uncertain. There is no evidence that osteomyelitis, other than of the foot, is more common in diabetics.⁵ However, diabetics with poor glycaemic control have a higher carrier rate for pathogenic organisms⁶ suggesting that skin preparation should be scrupulous.

An awareness of the infective complications of central venous cannulation is essential to realise the importance of early removal of cannulae and anticipate and treat complications that arise. The absence of erythema at the site of line insertion does not exclude the subsequent development of infective complications.

Final diagnosis

Osteomyelitis of the clavicle complicating a subclavian line insertion.

Keywords: diabetes mellitus, osteomyelitis, central venous cannulation, dilated cardiomyopathy

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