Learning from errors

Bilateral distal tibial stress fractures in a military recruit

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Summary

Stress fractures are common injuries in athletes and military recruits. They result from repetitive microtrauma, which over time exceeds the bone's intrinsic ability to repair itself. The site of occurrence is most commonly the weight-bearing lower limb. Such injuries are easily missed as the history and clinical signs are often not consistent with an acute injury and therefore may not warrant an x-ray on first presentation to the emergency department or primary care. Even when plain radiographs are taken, the fractures may not be initially evident and in the presence of a high index of clinical suspicion, further investigations may be necessary. We present the case of a military recruit who developed bilateral distal tibial stress fractures early on in his training.

BACKGROUND

1. Although stress fractures are relatively common injuries, it is very rare to have bilateral simultaneous stress fractures of the distal tibia and very few reports of this particular injury pattern could be found in the literature.
2. It is important to maintain a high index of clinical suspicion of the possibility of a stress fracture being the cause of a patient's symptoms, especially in certain groups of individuals. 'At risk' groups include athletes, military recruits or anybody who has made a sudden, significant increase in their level of physical activity.

CASE PRESENTATION

We present the case of a 26-year-old military recruit who developed bilateral lower limb stress fractures during early training. He was otherwise fit and well with no history of musculoskeletal pathology.

Two weeks prior to the onset of symptoms, he had commenced his military basic training, having increased his physical training many months before this.

He presented to the medical officer with right ankle pain during week 2 of his training and presented again with pain in his right ankle at week 3. Physical examination of him on both occasions led to the diagnosis of muscular strain/sprain and he was treated with oral anti-inflammatory agents. His discomfort was felt to be consistent with his current level of training and therefore no imaging was performed at this time.

At week 5 of his training he presented again with increasing symptoms of bilateral ankle pain and by this stage he was struggling with the activities of daily living.

Radiographs of both ankles were obtained that revealed bilateral distal tibial stress fractures (figures 1 and 2).

Figure 1 Anteroposterior (A) and lateral (B) radiographs of the patient's right ankle demonstrating a distal tibial stress fracture.

Figure 2 Anteroposterior (A) and lateral (B) radiographs of the patient's left ankle demonstrating a distal tibial stress fracture.

TREATMENT

Once the diagnosis was made, he was referred to the local orthopaedic department. The injuries were managed with protected weight bearing and showed a significant improvement over a 6-week period.

DISCUSSION

Breithaupt, a Prussian military surgeon, first described the symptoms of stress fractures in military recruits in 1855.¹ Since then there have been several reports of such injuries in this group of individuals. Kurklu *et al*² reported the case of bilateral tibial plateau stress fractures following training for the ceremonial march, but there does not appear to be any other report of bilateral distal tibial stress fractures in military recruits.

Diagnosing stress fractures is difficult; Milgrom *et al*³ carried out a prospective study of 295 infantry recruits during 14 weeks of basic training. Forty-one per cent reported medial tibial pain during the study and underwent routine scintigraphic (nuclear medicine bone scan) evaluation; a stress fracture was found in 46% of symptomatic individuals. Milgrom *et al*³ concluded that physical examination was neither sensitive nor specific. They did report that when both pain and swelling were localised the lesion most likely proved to be a stress fracture.

In summary, when a patient presents with bone pain after periods of intense physical training or following the commencement of new or unusual activities, clinicians must have a high suspicion of a stress fracture or fractures as the cause of their symptoms. The finding of localised pain on physical examination should prompt further investigations. Not all stress fractures are seen on x-rays

and often MRI or nuclear bone scans (scintigraphic examination) are required to confirm diagnosis.

Learning points

- ▶ Stress fracture should be within the differential diagnosis of at risk groups of individuals presenting with musculoskeletal pain.
- ▶ Stress fractures may not always be apparent on plain radiographs, and further imaging (MRI or nuclear medicine bone scan) may be necessary for making the diagnosis.
- ▶ Once a diagnosis is made, the prognosis is usually good following a period of rest or protected load bearing through the limb. A missed diagnosis may result in prolonged morbidity and occasionally a displaced fracture requiring operative intervention.

Competing interests None.

Patient consent Obtained.

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