



CLINICAL IMAGES

## Scapular stress fracture in a professional cricketer and a review of the literature

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Although stress fractures are well described in certain areas of the skeleton, e.g. the tibia, we believe a case of scapular stress fracture in a cricketer has not been described previously. This article describes such a case, illustrating the clinical course and the radiological investigations used to diagnose this rare problem.

A 21-year-old professional cricketer presented with atraumatic right shoulder pain. He was a right-hand-dominant fast bowler. He reported several weeks of night pain but no history of morning stiffness or other generalised symptoms. Towards the end of a season of English county cricket that had run on immediately following a season in South Africa he developed an acute exacerbation of the shoulder pain severe enough to cause him to retire from a match. The injury had been treated as a possible teres minor strain by a club physiotherapist for a period of 3 weeks with no success and the pain continued, causing inability to bowl.

On presentation to us the cricketer was found to have normal symmetry of the shoulders with no obvious wasting of the periscapular muscles. The pain was well localised to the posterolateral aspect of the shoulder and he was found to have maximal tenderness over the upper aspect of the lateral border of the scapula. He was noted to have what appeared to be a mildly painful arc and pain on active external rotation, although all active and passive movements were symmetrical. He had no clinical signs of impingement or instability and

testing of the supraspinatus was pain free. However on power testing of external rotation he was found to be mildly weak and suffered moderate pain. At this stage teres minor pathology remained a possibility but the presence of a stress fracture was considered.

Preliminary plain films performed were originally reported as normal, but following review showed an abnormality at the lower aspect of the glenoid neck on the inferolateral border of the scapula (Fig. 1).

The findings on plain films warranted further investigation and subsequently a computed tomography (CT) scan was performed (Figs 2a - c). This confirmed an area of intense new bone formation associated with a lucent line travelling superomedially across the inferolateral pillar of the scapula. The appearances were typical of a stress fracture with no insidious findings.

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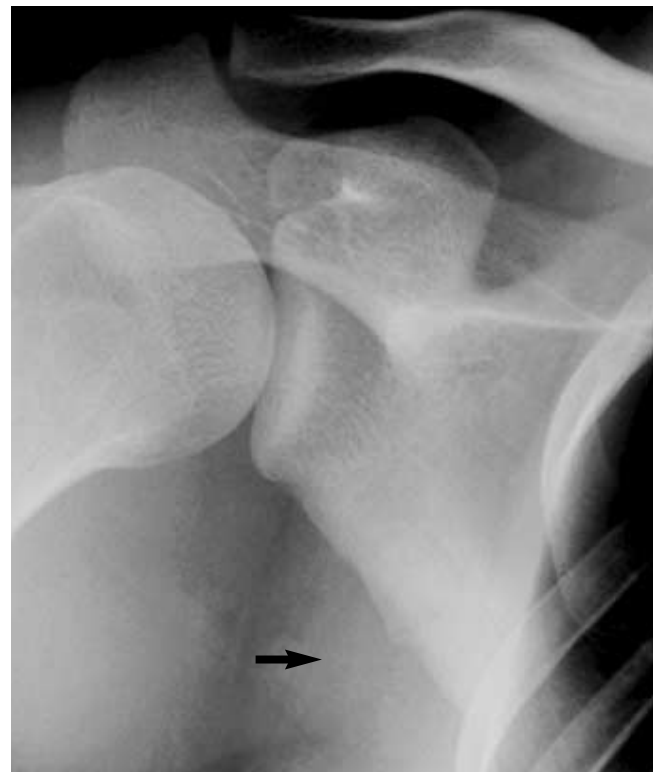


Fig. 1. Plain film showing a fracture of the lateral scapular border.



Fig. 2a. CT scan of the scapula showing a stress fracture. The axial image shows an exuberant callus at the fracture site.

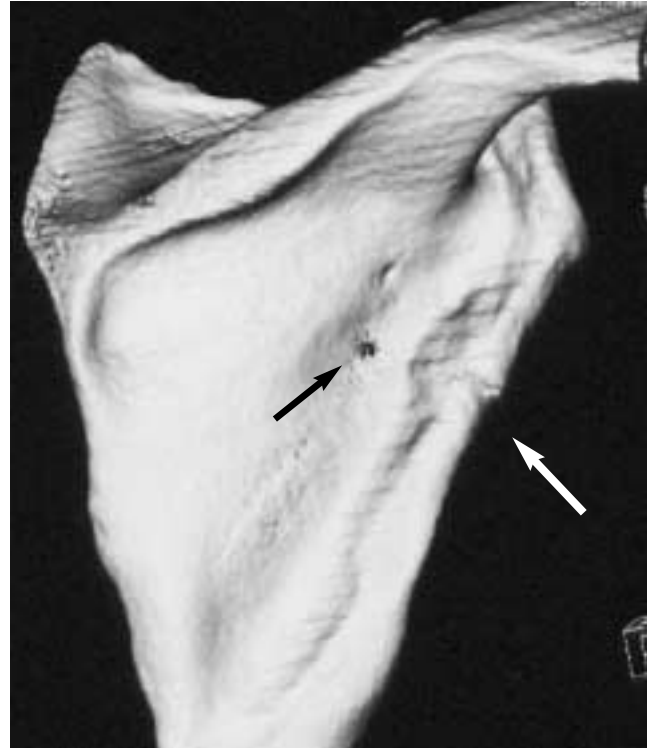


Fig. 2c. 3D reconstruction of the scapular stress fracture. Note the close proximity of the stress fracture (white arrow) and the nutrient foramen (black arrow).



Fig. 2b. CT scan of the scapula, coronal multiplanar reconstruction, showing a stress fracture of the scapular blade. Note the fracture line and surrounding sclerosis.



Fig. 3. MRI scan showing the scapular stress fracture. An axial STIR image shows bone marrow oedema of the surrounding bone marrow as well as surrounding soft-tissue oedema.

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An additional magnetic resonance image (MRI) of the scapula demonstrated bone marrow and soft-tissue oedema, which confirmed the stress fracture (Fig. 3).

The diagnosis was discussed with the patient and in view of the fact that his symptoms had begun to improve following a period of rest, a conservative management plan was decided upon. After approximately 2 months of rest the cricketer has

now returned to full competition and has had complete resolution of symptoms.



### Discussion

Scapular fractures are uncommon, accounting for less than 1% of all fractures, and are normally associated with high-impact injury.<sup>1-3</sup> The commonest form of trauma is as a result of road traffic accidents but scapular fractures have been described in sportsmen.<sup>4,5</sup> Acute scapular fractures have also been reported in so-called low-trauma, indirect electrical injuries.<sup>6,7</sup> The proposed mechanism behind these electrical injuries is muscle tetany, leading to forces greater than the maximum failure stress of the scapula. Other unusual fractures described are avulsion fractures<sup>8,9</sup> due to injuries and fractures due to sudden strenuous exercise.<sup>10</sup> Stress fractures are well described in the sporting population, the commonest sites being the lower limb such as the foot,<sup>11-13</sup> tibia<sup>14</sup> and femur.<sup>15,16</sup> However the upper limbs are not immune to stress fractures with reports in the clavicle,<sup>17,18</sup> ulna,<sup>19</sup> humerus<sup>20</sup> and olecranon.<sup>21</sup> These occurred in gymnasts, polo players, bodybuilders and throwers respectively. Other sites that can be affected are the sacrum<sup>22</sup> and lumbar spine.<sup>23,24</sup> Stress fractures of the scapula are extremely rare and we are aware of only 4 cases described in the literature. The first of these was a 30-year-old jogger<sup>25</sup> who had recently begun using hand weights. The second was a 39-year-old assembly worker,<sup>26</sup> the third a 68-year-old<sup>27</sup> using

crutches after knee arthroplasty, and the last an above-knee amputee ambulating on crutches.<sup>26</sup> Except for the stress fracture in the jogger we could find no reports of scapular stress fractures in active sports people. The fracture in the jogger was in the upper border in the supraspinous fossa.

Our case in the professional cricketer occurred following an extended season. The professional nature of sport together with the ease of long-distance travel will undoubtedly lead to sportspeople having an extended, if not year-round, season and it is possible that we may see an increase in this type of pathology. The repetitive nature of bowling obviously puts unusual stresses on the scapula. In our case the fracture occurred along the lower border of the neck/body junction; it may be that the anatomy of this area, including muscle origins, may predispose it to stress fractures. It is important to note that the diagnosis of a stress fracture was made on the basis of clinical history and radiological investigation. There were no insidious radiological findings and nothing of note in the past medical history. Stress fractures have been related to underlying pathology such as inflammatory arthropathy<sup>28</sup> and also metabolic and hormonal disturbance in female athletes.<sup>29</sup> Other pathology such as osteoid osteoma is in the radiological differential<sup>30,31</sup> but with appropriate imaging this can be



excluded. While non-union is a recognised complication of stress fractures,<sup>32</sup> we are confident that in our patient resolution of symptoms indicates that the fracture has healed and there is no immediate need for follow-up investigation.

We have described the first case of stress fracture in a cricketer. It is important to rule out other pathology and causes of shoulder pain; we feel this can be done with appropriate clinical and radiological evaluation. It is possible to treat such cases conservatively with rest.

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