Stress fracture of the sixth rib in a canoeist

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A 22-year-old Caucasian male canoeist of regional standard presented with non-radiating left sided chest pain which had arisen during a period of intensive water training. A physiotherapist had treated this as intercostal muscle strain without improvement.

Clinical examination showed only pain on forced expiration and tenderness over the insertion of the left serratus anterior. His pain was reproduced over

the insertion of the left serratus anterior. His pain was reproduced by arm and trunk movements mimicking the canoeing stroke and stressing the serratus anterior against resistance. Plain radiograph was normal. A Tc⁹⁹ scan showed increased uptake in the anterolateral portion of the left sixth rib (Figure 1) and a diagnosis of stress fracture was made.

After 4 weeks of cycling and jogging but no upper body training, gentle canoeing sessions were reintroduced and gradually increased over the next month without complaint. He resumed full training and competition and has now been asymptomatic for 12 months.

Discussion

Canoeing is a demanding non-weight-bearing sport taxing both aerobic and anaerobic metabolic pathways¹. The canoe stroke employs cyclic flexion, rotation, extension and flexion of the trunk and propulsive force is given by the arms. The paddling arm is flexed and lifted, the elbow moving away from the body, while the upper arm is lowered and moved towards the canoe. Fixation of the scapula during these movements is essential. No stress fractures have been reported in canoeists¹ in contrast with studies showing rib stress fractures in rowers^{2,3}.

Stress fractures of the ribs have been reported mainly in the first rib^{4,5} and in patients suffering from chest diseases⁶. In rowers, they have been described in two sites: posterolaterally in the proximity of the scapula² and the ninth rib⁷. Stress fracture is rare in non-weight-bearing sports⁸.

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Figure 1. Tc⁹⁹ scan, anteroposterior view. A definite area of increased uptake is located on the sixth rib

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