Manubrium sterni stress fracture: an unusual complication of non-contact sport

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Abstract
Tremendous force is usually required to cause sternal fractures. Normally this is caused either by a direct blow to the chest or by an indirect injury from hyperflexion of the torso. A case is presented of a fracture of the manubrium sterni in a young man as a complication of body building exercises—a non-contact sport. It appears that this has not been reported before.


Key terms: manubrium sterni; stress fracture; non-contact sports

Fractures of the sternum have occurred with increasing frequency paralleling the incidence of motor vehicle accidents.1 2 Musculoskeletal complications such as fracture and dislocation of the manubriosternal joint in contact sports, for example wrestling, are not uncommon.1 Our review of published reports failed to show any previous description of fracture of the manubrium sterni from non-contact sports.

Case report
A previously healthy 26 year old man, 85 kg weight and 187 cm height, was admitted to our department for chest x ray because of anterior chest pain. A week earlier, during a training session, where he performed strenuous abdominal exercises involving ‘sit ups’, he felt a sudden sharp pain in the upper chest. People around him heard a loud sharp sound. The patient complained of anterior chest pain on movements, and coughing elicited the sternal chest pain. He contacted the local hospital one week later because the pain persisted. There was no history of trauma. There was tenderness to palpation at the manubrium. Sternal x rays revealed a transverse fracture of the manubrium sterni and no other pathology (fig 1). Chest x rays and rib films were reported normal. A computerised tomographic scan (CT) of the thorax revealed no evidence of neoplasm involving the manubrium sterni. The patient was treated with analgesics, and there was no sternal discomfort after eight weeks.

Discussion
The manubrium sterni is a very rigid and strong bone, because of the attachment to it of the ribs and the clavicles. The clavicle forms a very strong and stable joint at the top of the manubrium. The first rib is attached directly to the body of the manubrium, whereas the second rib has strong ligamentous connections to the manubriosternal joint, ensuring its strength and stability. Fracture of the manubrium is rare. Fracture of the sternum accounts for less than 0·5% of all traumatic fractures.4 Seventy per cent of them are located at the body of the sternum and 17·6% at the manubriosternal joint.5 Fractures of the sternum most often occur following direct trauma to the chest, for example “steering wheel” injuries or falls from heights,1 but they are also seen following hyperflexion trauma of the torso. The fractures are often accompanied by rib or spine fractures.2

In our case the patient was performing strenuous abdominal exercises in the form of “sit ups”; raising the upper part of the body

![Lateral radiograph of the sternum shows fracture of the manubrium.](https://example.com/fig1.jpg)
Simultaneous rupture of the quadriceps tendon with contralateral rupture of the patellar tendon in an otherwise healthy athlete

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Abstract
A case of a healthy athlete with simultaneous rupture of quadriceps tendon and rupture of the contralateral patella tendon is reported. Both tendons rupturing in the same patient is rare and this is the first reported case in a previously healthy person. Different mechanisms are implicated in the different ruptures. The rarity is because the simultaneous presence of contributory factors for either injury in the same person is uncommon.

Key terms: quadriceps tendon; patella tendon; simultaneous rupture; weight lifter.