

CASE REPORTS

Manubriosternal joint dislocation in contact sport

M Smith, B Lenehan, D O'Keefe, A Martin

Abstract

A 17 year old man developed chest pain and shortness of breath immediately after a scrummage while playing rugby football. A lateral chest radiograph showed a dislocated manubriosternal joint, with no associated injuries. This has not been previously reported in a sporting setting. This injury should be considered in flexion-compression injury of the thorax.

(*Emerg Med J* 2001;18:488–489)

Keywords: sport; manubriosternal joint dislocation

Case report

A 17 year old man presented to the accident and emergency department, complaining of chest pain exacerbated by movement and shortness of breath.

He had been playing rugby football, and felt something “pop out” during a scrummage. When packing down on the right side of the front row, he went below his opposite number, and was pushed from behind by his second row, sustaining a flexion-compression injury of the thorax/neck (his neck flexed forward forcibly—his chin impacting on his sternum).

On examination, he was tachycardic (HR 100) and hypertensive (182/100), O₂ saturation was 99%.

His shortness of breath, resolved with analgesia. There was a tender, hard step deformity over the manubriosternal joint (MSJ). Marked kyphosis was noted. No other injuries were obvious. Examination of the cardiovascular system was normal as was the electrocardiogram.

Creatinine phosphokinase was raised at 202 (normal <195), myoglobin normal, troponin I raised at 0.05 (normal 0.0–0.03) suggesting a cardiac contusion.

A lateral chest radiograph (fig 1) showed dislocation of the MSJ. Frontal chest film and cervical spine radiographs were normal. He was given supplemental oxygen, pain relief, and was observed for 24 hours. No reduction was attempted. He has been advised to avoid contact sport in the short-term and is being followed up at regular periods with lateral chest radiographs and clinical examination.

Discussion

This is the first reported case of traumatic MSJ dislocation in sport, and only the third in history with no associated rib fractures.^{1 2}



Figure 1 Lateral chest radiograph showing dislocation of the manubriosternal joint.

There are two types of MSJ dislocations described. Type I is a backward dislocation of the body caused by a direct force acting on it, for example, direct compression injury to the anterior chest.^{3 4} Type II, which is most common, follows hyperflexion with compression injury to the upper thorax. Indirect forces transmitted to the sternum through the clavicles, the chin, or the upper two ribs cause backward displacement of the manubrium.⁵

Tremendous force is required to fracture or dislocate the MSJ. The diagnosis of MSJ disruption is suspected clinically and detected by a lateral roentgenogram of the thorax. When an apparent air/fluid interface is seen on chest radiographs of patients trauma, a careful study of the integrity of the MSJ should be made.⁶

There is significant individual variation of the mediastinal structures at the plane of the MSJ.⁷

Most common associated injuries are rib fractures, pulmonary contusion, pneumothorax, extremity fractures.

One study showed an 18% incidence of myocardial contusion associated with sternal fractures.⁸ Joint disruption without associated spine or rib fractures trauma is extremely rare.

In the acute phase observation, closed reduction and elastic strapping or open reduction and internal fixation using wire loops or Kirshner wires of the MSJ have been described. Late untreated traumatic MSJ disruption can lead to a significant deformity of the chest wall. A successful late repair based on classic pectus excavatum repair has been reported.

There is a significant association between thoracic fractures occurring with fractured sternums, the injury occurring either by flexion compression or flexion rotation. Jones *et al*

Department of
Accident and
Emergency Medicine,
University College
Hospital Galway,
Newcastle, Galway,
Republic of Ireland
M Smith
A Martin

Department of
Vascular Surgery,
University College
Hospital Galway
B Lenehan

Department of
Radiology, University
College Hospital
Galway
D O'Keefe

Correspondence to:
Dr Smith (mylessmith@
iolfree.ie)

Accepted for publication
25 January 2001

found two cases of thoracic and cervical spinal injury associated with manubriosternal dislocation.⁹

Arrhythmias requiring medical management are problematic, Gouldman finding 61% of patients having a rhythm other sinus at presentation. Myocardial contusion should be routinely sought by serial 12-lead ECGs and bedside troponin tests.

- 1 Cameron HU. Traumatic disruption of the manubriosternal joint in the absence of rib fractures. *J Trauma* 1980;**20**:892.
- 2 Schwagten V, Beaucourt L, Van Schil P. Traumatic manubriosternal joint disruption: case report. *J Trauma* 1994;**36**:747–8.

- 3 Fowler AW. Flexion-compression injury to the sternum. *J Bone Joint Surg* 1957;**39B**: 487–97.
- 4 Kelly MC, Hopkinson ND, Zaphiropoulos GC. Manubriosternal joint dislocation in rheumatoid arthritis. *Ann Rheum Dis* 1986;**45**:345–8.
- 5 Nikas DJ, Freeman JF, Newsome RE, *et al.* Late repair of chest deformity secondary to traumatic manubriosternal disruption: case report. *J Trauma* 1995;**39**:781–3.
- 6 Nicholson AA, Holt ME, Jessop JD. Dislocation of the manubriosternal joint: detection on frontal chest radiographs. *Br J Radiol* 1988;**61**:643–5.
- 7 Chukwuemeka A, Currie L, Ellis H. Ct anatomy of the mediastinal structures at the level of the manubriosternal angle. *Clin Anat* 1997;**10**:405–8.
- 8 Gouldman JW, Miller RS. Sternal fracture: a benign entity? *Am Surg* 1997;**63**:17–19.
- 9 Jones HJ, McBride GG, Mumby RC. Sternal fractures associated with spinal injury. *J Trauma* 1989;**29**:360–4.