

Cardiac ventricular tear following blunt chest trauma

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Introduction

A blunt trauma injury to the chest causing a cardiac injury is a very rare incident. Suszoko reported the first cardiac laceration following non-penetrating trauma in 1968 after a man struck his chest while he fell onto a chair [1]. Perchinsky reported one patient who had a cardiac perforation from a rib fragment, 0.007% of all blunt traumas in his series [2]. We report a case of ventricular laceration following blunt trauma to the chest due to a dislodged xiphoid bone fracture.

Case report

A 56 year old carpenter, transferred from a local hospital presented to the Accident & Emergency unit (A&E) of Teaching Hospital, Kurunegala one morning following an accidental fall over a wooden stump with an impact to the central chest region. There were no visible external injuries and his main complaint was central chest pain at the time of the incident. He soon became dyspnoeic and lost consciousness by the time he arrived to the hospital.

On examination the patient's peripheries were cold and clammy; pulse rate of 115/min with low volume, systolic blood pressure (BP) of 40mmHg, and peripheral oxygen saturation was brought up to 100% with oxygen via facemask.

An urgent chest x-ray showed a globular heart (Figure 1) and an urgent ECG showed small complexes along with the clinical signs of Beck's triad (muffled heart sounds, low BP and elevated Jugular venous pressure); a pericardial tamponade was the working diagnosis. However, following stabilization of the patient's haemodynamic status we proceeded to confirm our diagnosis by 2D echocardiography, which showed no

evidence of cardiac rupture. A CT chest / abdomen a moderate sized cardiac tamponade with a soft tissue haematoma in the lower anterior chest wall closer to the xiphisternum.

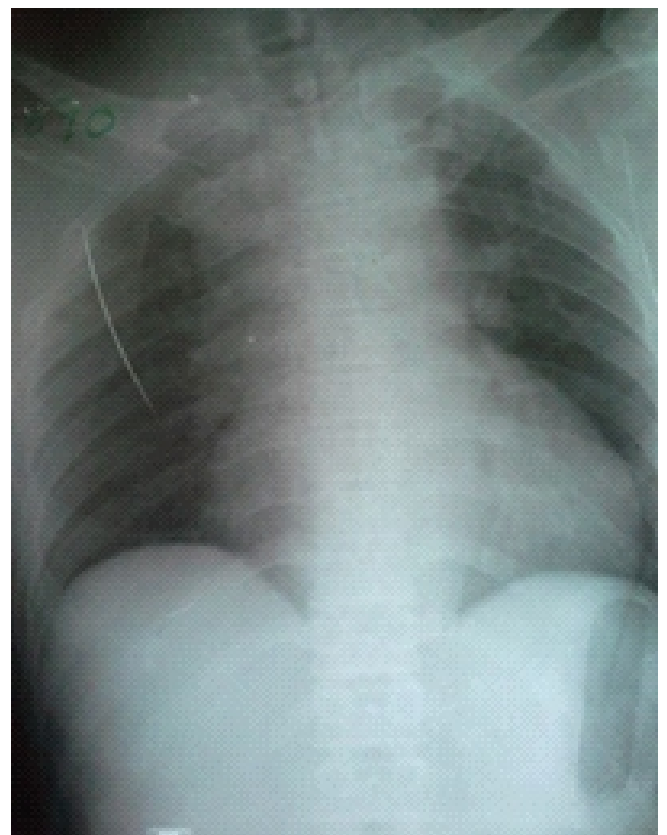


Figure 1. Chest X-ray showing a globular heart shadow and widened mediastinum

The patient was rushed directly from the A&E to the operating Theatre. An emergency open pericardial drainage via a subxiphoid incision was done. There was evidence of a pericardial tear, 1500ml of blood was drained, and a fractured segment of the xiphoid process was found to be dislodged penetrating the pericardium and the right ventricular wall (Figure 2); the bone segment was excised. A 28FG IC tube was placed at the pericardium, and one at the left thoracic cavity as a prophylaxis to pneumothorax.

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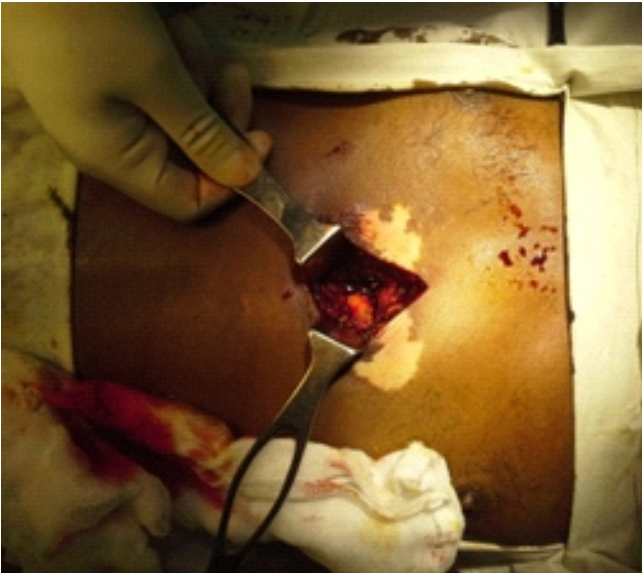


Figure 2. Fractured segment of xiphoid process penetrating the pericardium and ventricular wall.

He was immediately transferred to the Teaching Hospital, Kandy for further definitive surgical care in a cardiothoracic unit. The pericardium was re-opened, with the removal of blood clots (Figure 3) and repair of a right ventricular tear (Figure 4) with 4/0 polypropylene pledgets, immediately via a midline sternotomy. Six days later the patient's condition having improved significantly, he was transferred back to Teaching Hospital, Kurunegala for further observation. Follow up was organized by both Cardiac units in Kurunegala and Kandy.



Figure 3. Large clot being evacuated from pericardial cavity.

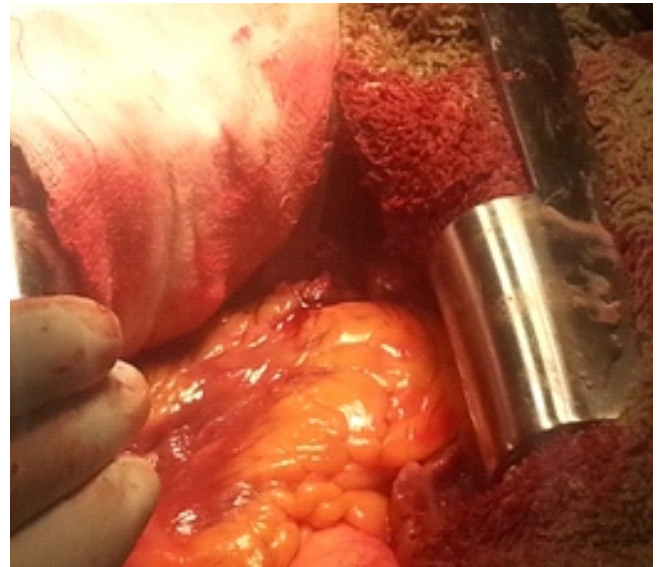


Figure 4. Small laceration over the right ventricular wall.

Discussion

Haemodynamic compromise and cardiac tamponade is an absolute indication for drainage. It should be mentioned here that with a high clinical suspicion and positive basic investigations such as the above a general surgeon could and should take the initiative to carry out a life-saving emergency pericardial decompression in a haemodynamically unstable patient. These second line investigations were arranged at the A&E, and done because it was readily accessible to the surgical team and the patient's condition had stabilized for the moment.

The current management provided by the European Heart Journal recommends that pericardiocentesis be done under guided fluoroscopy in a cardiac catheterisation laboratory with ECG monitoring [3].

On critical discussion, of the surgical approach, amongst the available options of echocardiogram-guided pericardiocentesis [4], emergency subxiphoid percutaneous drainage [5], left side mini-thoracotomy and percutaneous balloon pericardiotomy, we chose a midline open pericardial drainage because a pathology around the xiphoid process was suspected (in this case the fractured xiphoid process was retrieved hence alleviating the cause), and better visualization and access was provided. Also, in the hope of a more definitive treatment the same incision can be extended as a midline sternotomy.

Cardiac bleeding after a tear at the heart muscle, following a blunt trauma is a rare but severe life-threatening condition, usually associated with high mortality. Age and body weight prove to be aggravating factors [6]. Elderly patients are more prone to osteoporosis or lower bone density, making bone fractures easy to occur and difficult to mend [7].

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Key Point:

- High clinical suspicion along with prompt resuscitation is adequate enough for a general surgeon to undertake a quick therapeutic intervention that would buy time until definite treatment is made available, even in the settings of only preliminary positive investigations.