Case report

Isolated pericardial rupture with left-sided haematothorax after blunt chest trauma

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Abstract

Pericardial rupture after blunt chest trauma is described in the literature. The rupture is mostly caused by high velocity trauma with associated injuries. As a result the patients are often critically ill. We describe a case of a 59-year-old man who suffered from an isolated pericardial rupture with a left-sided haematothorax diagnosed 3 months after minimal blunt chest trauma. The patient was operated upon and the defect was closed without detrimental sequelae.

Keywords: Pericardial rupture; Haematothorax; Blunt chest trauma

1. Case report

Rupture of the pericardium due to blunt chest trauma is often associated with other injuries. In most cases these injuries are lethal and are therefore diagnosed post-mortem. Isolated pericardial rupture has a higher survival rate and if there are no clinical symptoms, diagnosis is sometimes overlooked [1]. We report the case of a patient with late sequelae of an isolated pericardial rupture.

A 59-year-old man complained to his general practitioner about progressive dyspnea which he had been suffering from for 1 week. He had never been ill before. There were no episodes of coughing or sputum production. The patients history revealed no smoking, tuberculosis or contact with asbestosis. The patient used no medication. However, 3 months prior to admission he fell 2.5 m down the stairs. There were no direct complaints after this accident.

On physical examination we saw a pale patient with blood pressure of 140/80 mmHg on both arms. The pulse rate was 84 regular. Normal heart sounds were heard. Percussion of the right hemithorax was normal but reduced on the left side with an absence of breath sounds. There were no pathological findings in abdomen. A chest X-ray revealed a massive left-sided pleural effusion with shifting of the heart and mediastinum to the right side. The superior mediastinum was not enlarged. Rib fractures were not detected. Chest computed tomogram showed enormous pleural effusion and shift of the mediastinum to the right side. There were no signs of aortic vascular pathology such as dissection or rupture. Trans-oesophageal echo showed a normal left and right ventricular function without valve dysfunction. No pericardial effusion was seen. Laboratory findings at admission in our hospital showed a haemoglobin of 4.9 mmol/l (n = 8.5–10 mmol/l). Puncture of the pleural effusion showed blood with a relatively high level of haemoglobin (3.5 mmol/l). The patient was haemodynamically stable.

The patient was operated upon and a small postero-lateral thoracotomy was performed. After opening the pleural cavity 4.5 l of liquefied blood was removed. At inspection the only pathological finding was a large pericardial defect measuring 5 × 7 cm along the anterior side of the phrenic nerve (Fig. 1). The rim of the defect was clearly thickened. The defect was closed with a non-resorbable Marlex® Mesh (Bard Vascular Systems Division, Billerica, MA) graft and the patient was extubated. At the seventh postoperative day the patient was released from the hospital in good health.

Pathological anatomical examination of tissue of the edge of
the pericardium showed signs of recent and old haemorrhages. At follow-up at 5 months the patient had no complaints and the chest X-ray showed no pleural effusion. The haemoglobin level was normalized.

2. Comment

In a retrospective series of 20,000 patients admitted to a level 1 trauma centre, 59 patients were identified as having a pericardial rupture [1]. The majority of them, 63%, also had rupture of one or more cardiac chambers. Only 17 patients, 0.1%, had an isolated pericardial rupture. This percentage was also found by Parmley [2]. The cause of injury is mostly related to a high velocity trauma and in only 5% of the cases, due to a fall [1]. The predominant localization of the pericardial tear is on the left side and along the phrenic nerve, as was seen in 64% of the cases [1]. In another series the left sided tear was three times as high as on the right side [3,4]. An explanation could be that there is a larger free floating mass on the left side in combination with a larger surface of the pericardium. Symptoms due to pericardial rupture mostly depend on the underlying trauma and associated injuries [1,3]. In most cases there is hypotension or cardiac arrest. In the case of isolated pericardial rupture symptoms may be mild or absent. The chief danger is cardiac herniation through the defect [3,5]. Our patient showed no complaints resulting from the pericardial rupture but did exhibit symptoms of massive pleural effusion. Diagnosis can be made by chest X-ray or a computed chest tomography when there is a displacement of the heart [6]. Nowadays with video assisted thoracoscopy available this method can lead to the diagnosis [7]. The electrocardiogram may only be of use when there is cardiac luxation thus giving changes in axis or rotation. In our case with a firm preoperative examination the diagnosis, even in retrospect, cannot be confirmed. Pericardial tears which do not allow possible herniation of the heart do not require closure. On the other hand where herniation might appear the defect should be widened or, as treatment of choice, closed primarily or with a prosthetic patch. In our case 3 months after the accident with severe retraction and thickening of the pericardial rim and in the absence of firm adhesions between the heart and pericardium, closure had to be done with a prosthetic patch.

In the large series by Fulda the overall survival rate of pericardial rupture was 24%. Those suffering from a pericardial tear alone, the survival rate was 67% [1]. When the diagnosis of an isolated pericardial rupture is made treatment is simple and effective. When the diagnosis is overlooked the danger exists of cardiac herniation days or years after the accident with possible sudden death.

References

