

Introduction

Cardiac rupture due to blunt trauma is a rather rare condition associated with a very high (50-90%) mortality. The mechanism of rupture in the majority of cases is deceleration trauma and the right side cardiac chambers are more frequently affected than the left side ones. A review of the literature indicates that left atrium injury accounts for 25% of cardiac rupture cases, most of which involve the left atrial appendage and the pulmonary vein- atrial junction.

Case presentation

A 55-year-old man fell from a height of 10 meters while working on a scaffolding. He subsequently arrested and was given CPR by a bystander (his wife with instructions from 999). When the helicopter ambulance arrived the patient was awake and agitated with spontaneous circulation. He immediately underwent bilateral thoracostomies with blood emerging from the right side. The patient was haemodynamically very unstable and an echocardiogram performed at the site revealed extensive cardiac tamponade. Therefore, a clamshell thoracotomy was performed and after the incision of the pericardium numerous clots and a large quantity of fresh blood were aspirated. A bleeding point identified at the posterior heart surface was partially controlled with the application of a Roberts clamp. The surgical wound was packed and the patient was air transferred to UHW.

The patient was directly transferred from the Accident and Emergency Department to the operating theatre. The clamshell thoracotomy was unpacked and the Roberts clamp which was protruding from the left side of the incision left in place.

The injury was identified to the base of the left atrial appendage and the bleeding was controlled with pledgeted 4/0 Prolene sutures. The Roberts clamp was removed and haemostasis was ensured. All four internal mammary artery ends were ligated. There were no other significant injuries other than multiple rib fractures bilaterally. The pericardium was left widely open as it was not possible to approximate it because of the oedematous and dilated heart.

CT scans of the head, thorax and abdomen, performed post operatively, revealed no other major injury but the multiple rib fractures.

The patient had an eventful postoperative recovery and remained in ITU for 6 weeks. He developed renal failure and his recovery was also complicated by severe dysrhythmias which finally resulted in the implantation of a permanent pacemaker. He also became septic and received the appropriate antibiotic treatment. His cerebral function constantly improved although he remained disorientated. He didn't have any recollection of his accident.

Discussion

Cardiac rupture occurs in about 6-10% of patients suffering blunt chest trauma and is associated with a very high mortality (50 – 80 %). Teixeira PG et al in 2009 reviewed 334 cases of blunt cardiac rupture . The most common causes were motor vehicle collision (73%) , pedestrians struck by auto (16%) , followed by fall from height (8%). Almost half of these patients (161 – 48%) died either on arrival or in the emergency Department. The overall mortality of patients arriving alive to hospital was 89% with survival being affected by physiological condition, pattern of cardiac rupture, rapidity of diagnosis and of surgical intervention.

The underlying mechanisms of blunt cardiac rupture are probably rapidly increased venous pressure following impact as well as deceleration forces. Other mechanisms which can cause blunt heart rupture include compression of the heart between the sternum and vertebral column and direct penetration by rib or sternum fractures.

When the diagnosis of blunt cardiac rupture is established by echocardiographic evidence of cardiac tamponade , immediate surgical intervention is necessary .

Clamshell thoracotomy is a good choice for emergency cases in extremis since it provides rapid and easy access to both thoracic cavities and the pericardial cavity as well as excellent visualization of injuries within the thorax . It also facilitates the institution of internal cardiac massage . All four internal mammary ends should always be ligated once the circulation has been restored .

Conclusion

We report a case of left atrial appendage rupture following a blunt chest injury which was successfully treated initially by emergency clamshell thoracotomy before definite control of bleeding in the operating room.

To our knowledge , this is the first case of left atrial appendage rupture which received initial life-saving surgical treatment outside the hospital.