Successful repair of coronary sinus rupture presenting as cardiac tamponade following blunt chest trauma

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Abstract

The isolated coronary sinus (CS) rupture causing cardiac tamponade following blunt chest trauma is a very rare and very unique traumatic form of cardiac tamponade. Prompt recognition of this injury is crucial for patient survival. CS injuries are frequently difficult to repair and are potentially lethal. A meticulous repair carried out on an arrested, empty and well-protected heart is recommended to achieve secure haemostasis and CS patency. To our knowledge, this is the first report on the successful repair of isolated CS rupture following blunt chest trauma.

Keywords: Coronary sinus • Trauma • Cardiac tamponade

INTRODUCTION

Blunt chest trauma is associated with multiple cardiac injuries, and is highly fatal. Traffic accidents are the most common cause of blunt traumatic cardiac rupture (80%), and the most common site of injury is the right atrium (43%) [1–3]. Coronary sinus (CS) rupture after blunt trauma is very rare [4, 5]. In cases where the pericardium remains intact, rapid development of cardiac tamponade makes survival improbable after such injuries. We present a rare and the first successful repair case of isolated CS rupture causing cardiac tamponade following blunt trauma.

CASE REPORT

A 73-year-old man presented to the emergency department of our institute after a motor vehicle crash. On arrival to our trauma unit, the initial haemodynamic status was unstable with a blood pressure of 70/40 mmHg, pulse rate of 130 beats/min, central venous pressure of 20 cm H2O and an increased respiratory rate of 27 breaths/min with severe subcutaneous emphysema. Chest tubes were placed to treat haemopneumothorax (Fig. 1A). A computed tomography (CT) scan revealed a haemopericardium and indicated cardiac tamponade with an intact sternum (Fig. 1B). After a median sternotomy and the evacuation of a large hematoma in the pericardium, we found a rupture in the mid-portion of the CS, which was an oval-shaped defect measuring approximately 1.5–1.7 cm (Fig. 1C) with sharp lacerations in the margin and left pericardial avulsion with an intact left phrenic nerve (Fig. 1D). During conventional cardiopulmonary bypass on the arrested heart, a pericardial patch was sutured to the edges of the injury, and the area covered with a fibrin-collagen patch (TachoComb®, CSL Behring, Tokyo, Japan) and reinforced with ‘BioGlue’ (CryoLife, Kennesaw, GA, USA) (Fig. 1E). The postoperative course was uneventful, and the patient has been taking oral anticoagulation. Multislice CT 3-dimensional reconstruction demonstrated CS patency and the absence of CS strictures (Fig. 1F).

DISCUSSION

Blunt chest trauma has been associated with multiple cardiac injuries [1–3]. Traumatic blunt cardiac rupture is a rare cause of cardiac tamponade and carries high mortality. Typically, cardiac tamponade results from penetrating trauma to the chest; however, as this case highlights, this can also occur following blunt chest trauma. Moreover, many cases of blunt chest trauma are associated with sternum fracture. Two similar cases have been reported, in which prolonged damage of right atrioventricular groove resulted in CS avulsion [4]. Another patient who suffered a sternal fracture did not survive after repair [5].

The CS injury is a very rare complication of cardiac surgery and is usually related to the placement of a CS perfusion catheter for retrograde cardioplegia infusion. CS injuries are frequently difficult to repair and are potentially lethal due to...
inadequate myocardial protection, inadvertent coronary artery injuries and possibly post-repair CS thrombosis. A meticulous repair carried out on an arrested, empty and well-protected heart is recommended to achieve secure haemostasis and CS patency. In previous reports similar to our case 1 resulted in death while another resulted in neither CS patency nor stricture. To the authors’ knowledge, this is the first report on the successful treatment of isolated CS rupture following blunt chest trauma without sternal fracture.

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**REFERENCES**