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Delayed traumatic cardiac tamponade: An extremely rare sequela of blunt trauma

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ABSTRACT

To our knowledge, there have been minimal information on the delayed traumatic cardiac tamponade, which is an extremely rare but a life-threatening condition if not treated promptly. We present a 25-year-old female who had cardiac tamponade of delayed onset after a motor vehicle crash. It was found on a computed tomography scan of the chest, and confirmed on subsequent echocardiography. Urgent operation of creation of pericardial window was performed. She made a good recovery after the operative intervention. The current report emphasises the importance of having high index of suspicion in patients with non-penetrating multi-trauma with careful observation and appropriate investigations.

Abbreviations

CT: Computed tomography

CTPA: Computed tomography pulmonary angiogram

GCS: Glasgow coma scale

ICU: Intensive care unit

MRI: Magnetic resonance imaging

MTP: Massive transfusion

RV: Right ventricle

TTE: Transthoracic echocardiography

VATS: Video-assisted thoracoscopic surgery

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Introduction

Delayed cardiac tamponade from blunt injury is an extremely rare condition as traumatic tamponade almost always occurs immediately after the injury [1]. The common mechanism of injury is penetrating chest injury, and cardiac tamponade from non-penetrating injuries is found in less than 0.1% of cases [2]. Since the first case was reported in 1991 [3], very few cases of delayed traumatic cardiac tamponade have been reported thus far [2]. Here we present a young female patient who was found to have cardiac tamponade two weeks after a motor vehicle crash, and subsequently treated with operative intervention. Hopefully, the current report increases index of suspicion for recognising this rare but life-threatening condition early, and instituting appropriate management.

Case

A female patient of 25 years of age with a background of previous thoracic spine surgery was

admitted to the hospital after being involved in a high-speed motor vehicle crash. Patient was in the passenger seat of the private car which had head-on collision with a truck at approximately 110km/hour. On initial review at the scene, she was hypoxic and tachypnoeic, had Glasgow coma scale (GCS) of 15 and had a blood pressure of 76/64mmHg. She was immediately intubated on scene. During the primary survey at the hospital, she remained hypotensive and massive transfusion protocol (MTP) was activated. Bilateral chest drains were inserted (Figure 1). Trauma series computed tomography (CT) scan including head and neck, chest, abdomen and pelvis showed multiple rib fractures with bilateral pneumothoraces, grade 5 splenic laceration with large intraperitoneal haematoma and pneumomediastinum. There were no radiological signs of haemopericardium (Figure 2) at the time. Splenic embolization was performed by an interventional radiologist.

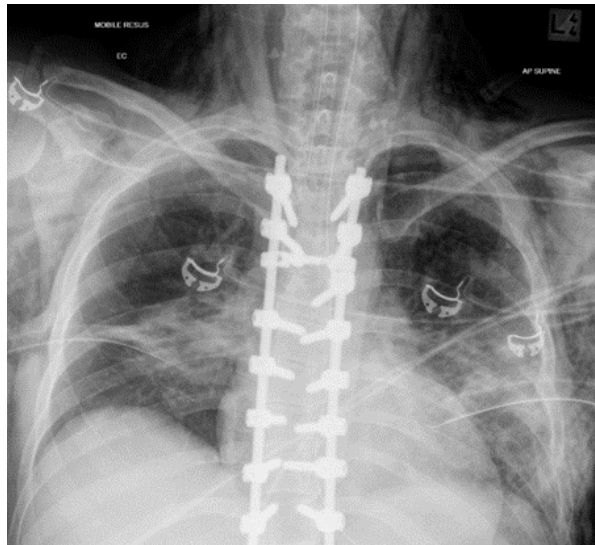


Figure 1. Chest X-ray film of the patient on admission showing bilateral chest drains.

She was extubated 24 hours after in an intensive care unit (ICU). Apart from her sinus tachycardia of 100-110 beats per minute, her vital signs were otherwise stable. On day 5 of the admission, she was found to have left sided empyema requiring operative intervention of video-assisted thoracoscopic surgery (VATS) performed by a cardiothoracic surgeon. Despite normal blood pressure and biochemistry including haemoglobin, her sinus tachycardia persisted throughout the admis-

sion. In the morning of 12th day admission, she complained of worsening dizziness, nausea and worsening shortness of breath. CT pulmonary angiogram (CTPA) was performed to rule out pulmonary embolism. It revealed a large pericardial effusion (Figure 3). Urgent transthoracic echocardiogram followed and it showed features of cardiac tamponade including large pericardial effusion and collapse of right ventricle (RV).

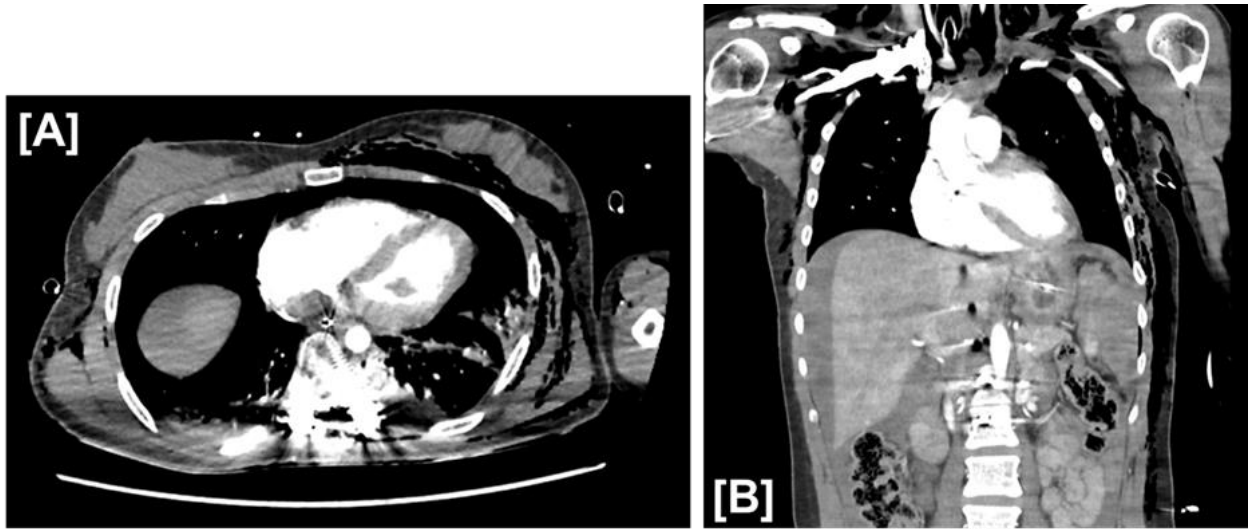


Figure 2. Axial [A] and coronal [B] slides of CT scan performed on admission (Day 0).

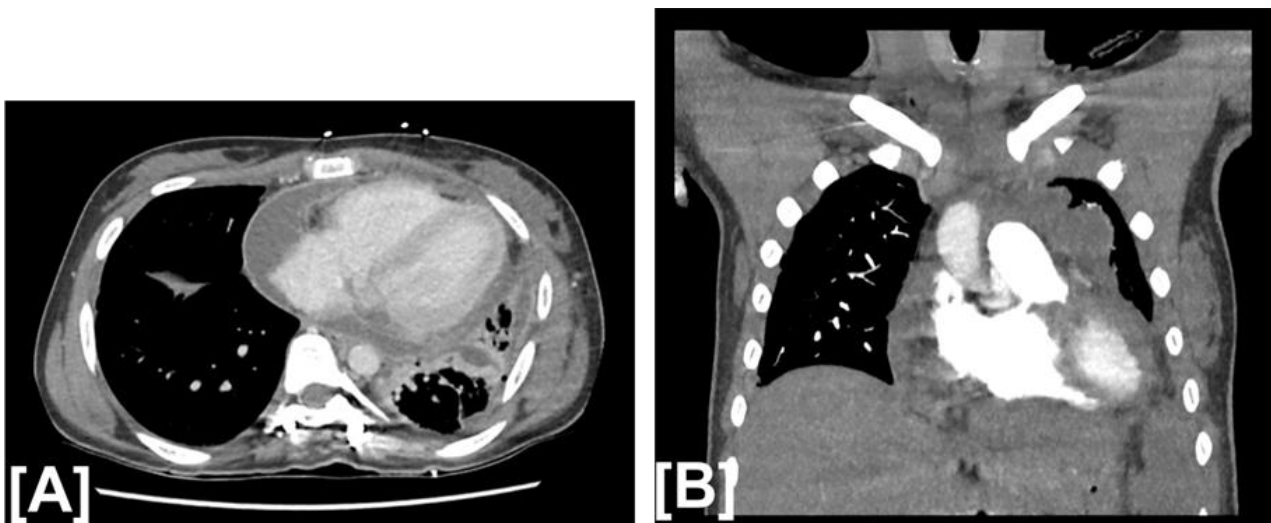


Figure 3. Axial [A] and coronal [B] slides of CT scan performed on day 14 of admission showing new haemopericardium.

Immediate operative intervention of a pericardial window creation was performed by the cardiothoracic surgeon. Intra-operatively, a sub-xiphoid pericardial window was created, which immediately drained 350ml dark-coloured blood. An 18-Blake pericardial drain was inserted. She remained haemodynamically stable throughout the operation. She returned to the ICU and her symptoms of dyspnoea and dizziness improved rapidly post-operatively. The Blake drain was removed 2 days after the operation. Post-operative recovery was unremarkable. The patient was discharged home 10 days after the operation. She was followed up in the trauma outpatient clinic at 6 weeks from the discharge and achieved excellent recovery.

Discussion

Cardiac tamponade is a medical emergency where both cardiac output and venous return are depressed by the compression of cardiac chambers. It is caused by fluid accumulation in the pericardial sac [4]. Most cases of traumatic cardiac tamponade result from penetrating injury to the chest with a classic example being a stab wound to the centre of the chest, making cardiac tamponade caused by blunt trauma rare [4].

The clinical signs and symptoms in patients with delayed traumatic cardiac tamponade can vary widely, especially with the distracting injuries from the multi-trauma. Patients can be asymptomatic initially without the presence of pericardial collection, but complain progressive dyspnoea and signs of heart failure with increasing

collection [5]. This was evident in our patient where she complained of worsening dyspnoea and light-headedness in the morning of day 14 of admission.

The diagnosis of cardiac tamponade is usually confirmed by transthoracic echocardiography (TTE) following identification of pericardial effusion on CT or magnetic resonance imaging (MRI) [5]. A chest CT was performed in our patient with an aim to rule out pulmonary embolism, which instead revealed a large pericardial effusion, and cardiac tamponade was confirmed by the subsequent TTE showing a collapse of the right ventricle. So far, proposed mechanisms of delayed haemopericardium following blunt chest trauma include an acceleration/deceleration sheer-stress injury to the heart and late consequence of myocardial contusion and the laceration of the cardiac chambers, especially the right ventricle [5].

Once the diagnosis is made, the suggested definitive treatment in an unstable patient is a surgical intervention, draining the haemopericardium by creating a pericardial window [6]. Our patient immediately underwent the operation of creating sub-xiphoid pericardial window with the cardiothoracic surgery team. Insertion of a pigtail drain catheter under echocardiography guidance can also be considered in a stable patient [7]. Regardless of the methodology, the intervention should result in resolution of the cardiac tamponade.

Conclusion

We presented a rare case of delayed traumatic cardiac tamponade in a young female patient who was admitted after a motor vehicle crash. As seen in our case, the patient had non-specific clinical manifestations with dyspnoea and sinus tachycardia. The diagnosis was made on subsequent imaging and echocardiography. Recognition of signs and symptoms of the condition remains challenging, especially in patients with poly-trauma. It is a life-threatening condition associated with high mortality if not diagnosed and treated urgently. The current case emphasises the importance of having high suspicion of delayed cardiac tamponade in patients with blunt tra-

uma.

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