Cardiac Tamponade: A Case Series

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Abstract

Cardiac tamponade is a condition in which the heart is compressed by excess fluid in the pericardial space, which can result in diastolic filling impairment, subsequent cardiac dysfunction, and even cardiac collapse. Cardiac tamponade is an uncommon sequela of chest contusions from blunt chest trauma that brings with it a severe risk of sudden death. We present a small series of cases with successful treatment for cardiac injuries: a young man who was struck by a bull cart and an old man with chronic kidney disease receiving stent graft placement for superior vena cava syndrome.

This report highlights the need to remain alert for cases of tamponade, and measures such as emergent pericardiocentesis should first be administered to maintain the hemodynamics of vital organs such as the heart.

Keywords: Chest contusion; Cardiac tamponade; Hemodynamics

Introduction

Cardiac tamponade is a condition in which the heart is compressed by excess fluid in the pericardial space, which can result in impaired cardiac filling, subsequent cardiac dysfunction, and even cardiac collapse. Cardiac tamponade is an uncommon and fatal sequela of chest contusions from blunt chest trauma that can frequently lead to death if left undiagnosed. Common causes of cardiac tamponade vary, but they include acute pericarditis, post-myocardial infarction, cardiac surgery, sharp or blunt chest trauma, aortic dissection, and malignancy.

Pericardial effusions may develop rapidly (acute) or more gradually (subacute or chronic). When intrapericardial pressure develops quickly and becomes high enough to impede cardiac filling, cardiac function quickly becomes impaired, and cardiac tamponade can be considered present and acute.

The true incidence of cardiac rupture following blunt chest contusion is not well documented, with current records primarily dependent on geography and patient population. Herein, we present successful treatment for cardiac tamponade following cardiac injuries in a young man who was struck by a bull cart and an old man with chronic kidney disease receiving stent graft placement for superior vena cava syndrome.

This report highlights the need to remain alert for cases of tamponade, and life-saving measures such as emergent pericardiocentesis should first be administered to maintain the hemodynamics of vital organs such as the heart.

Case 1

An 18-year-old man was involved in a high-speed frontal collision in which his motorcycle struck a bull cart. Approximately 30 minutes later, he was admitted to the emergency room. At presentation, he was confused, violent, and complaining of thoracic and abdominal pain. He developed hypotension with a systolic blood pressure ranging between 60 mmHg and 80 mmHg, with a pulse rate of 120 bpm and a respiratory rate of 35 breaths per minute. Bruise marks were found on his right flank as well as on his chest. His extremities were clammy with marked peripheral hypoperfusion. Notably, his external jugular veins were distended. Cardiovascular examination revealed auscultated and muffled dual heart sounds with no cardiac murmur. Plain X-ray suggested a widened mediastinum. After chest and abdominal Computed Tomography (CT) scans were finished, he underwent circulatory collapse. The CT scans revealed massive pericardial effusion and confirmed cardiac tamponade. After emergency pericardiocentesis with echocardiography, the patient was quickly transferred to the operating room, undergoing a median sternotomy incision. After cardioplegic arrest under assistance of a heart-lung machine, a 1.5 cm tear was found at
the junction of the right atrium and superior vena cava (Figure 1). The tear was repaired with Teflon-buttressed sutures. The patient’s postoperative course was uneventful, and he was discharged on postoperative day 15.

Case 2

A 78-year-old man with a history of diabetes mellitus, cerebrovascular accident, superior vena cava syndrome, and chronic kidney disease with regular hemodialysis underwent placement of gore extension limb stents to treat his obstruction of right brachiocephalic vein (Figure 2). After the procedure, he presented with newly onset dyspnea and clinical signs of hypotension. An emergency two-dimensional echocardiogram confirmed a diagnosis of cardiac tamponade. Therapeutic pericardiocentesis resulted in prompt cardiac relief, and his hemodynamics developed stably with a systolic blood pressure up to 90 mmHg. Later, the patient was transferred to the intensive care unit for observation. Simultaneously, bleeding tendency including prolonged activated Partial Thromboplastin Time (aPTT) and Activated Clotting Time (ACT) were corrected through transfusion of plasmapheresis and fresh frozen plasma. The patient’s postoperative course was uneventful, and he was discharged on day 8.

Conclusion

In summary, suspicion of blunt cardiac rupture, timely diagnosis, and proper management create an environment for life-saving treatment and effectively reduce subsequent mortality in patients with devastating cardiac injuries.

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References


