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Atriocaval laceration presenting as delayed pericardial tamponade

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Atriocaval injuries are rare and usually manifest in patients presenting in extremis. Delayed complications are even more uncommon. This case documents delayed pericardial tamponade in a patient with an atriocaval laceration.

Clinical Summary

A 39-year-old man was struck in the anterior chest by a large metal beam. The patient was hemodynamically stable with a pulse rate of 106 beats/min. Chest radiograph was normal, and a focused assessment for the sonography in trauma was negative for pericardial fluid. Computed tomography scan of the chest was unremarkable.

The patient was admitted to the intensive care unit, and a transthoracic echocardiogram revealed a normal ejection fraction and no pericardial effusion. He was extubated on hospital day 2, and the chest tube was removed on hospital day 5. He was discharged the following day. Physical examination and chest radiograph results were normal 1 week after discharge.

Two weeks later the patient presented to the cardiologist with a 2-day history of shortness of breath. A transthoracic echocardiogram demonstrated a large pericardial effusion.

The cardiothoracic surgery department was consulted, and the patient was taken to the operating room. A median sternotomy was performed, followed by a pericardiectomy for a tense hemopericardium. Further examination revealed a thrombus in the region of the inferior vena cava-atrial junction and a partial-thickness injury (Figure 1). Because of the injury location and the need for repair, the patient was placed on cardiopulmonary bypass. Multiple pledgeted sutures were used to close the partial-thickness defect.

The patient's postoperative course was uncomplicated. He was extubated on postoperative day 2, the chest tubes were removed on postoperative day 3, and he was discharged on postoperative day 6.

The patient was reevaluated on postoperative day 16 and was recovering uneventfully.

Discussion

Intrapericardial great vessel injury is a rare occurrence, accounting for a small fraction of the 25% of trauma deaths that are the result of thoracic injuries.¹ Although the incidence of atriocaval injury is unknown, Fulda and colleagues² reported 59 patients with ruptures of the heart and/or pericardium, 7 of whom had atriocaval junction disruption. The survival from atriocaval injuries, once routinely fatal, has been improved with rapid transport to trauma centers and rapid diagnosis. Yet, 50% of patients die before reaching the hospital, whereas 50% of the remainder die despite treatment.^{3,4}

Most documented cases of atriocaval injury manifest immediately as hemopericardium with pericardial tamponade, if not already having proven fatal from exsanguinations caused by associated pericardial disruption or associated injuries. Differential diagnosis should include pericardial tamponade from intrapericardial great vessel injury in a patient with refractory hypotension and shock, especially without obvious blood loss.



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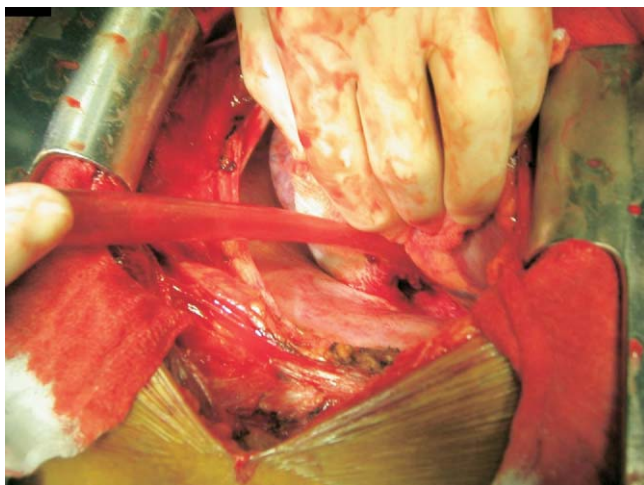


Figure 1. Intraoperative photograph shows a partial-thickness laceration with clot at the atriocaval junction.

The chest radiograph is the initial diagnostic tool in evaluating blunt chest trauma. The gold standard for diagnosis of aortic injury is aortography, although dynamic helical computed tomography scanning has documented sensitivity equal to aortography and can demonstrate pericardial fluid. Surgeon-performed focused assessment for the sonography in trauma examination is considered the test of choice for rapid screening. Transesophageal echocardiography is an additional diagnostic tool but is not always readily available, and the entire thoracic aorta is not well visualized with this technique.

Once the injury is diagnosed, a median sternotomy should be performed. Cardiopulmonary bypass should be considered with repair and reconstruction of these injuries, especially because bleeding can be significant.

Our case documents the rare occurrence of delayed pericardial tamponade 3 weeks after injury. The delay in presentation was most likely because of a clot forming over a partial-thickness tear at the atriocaval junction. Tamponade occurred either from slow bleeding into the pericardial space over the course of 3 weeks or a sudden displacement of the temporary clot at the atriocaval wound.

This case reiterates the need for physicians to be continually aware of late complications after blunt chest trauma. Interval follow-up examination of all patients with significant chest trauma is highly recommended and should be continued for several months after such trauma. The clinical examination should then direct one to obtain further diagnostic studies. These patients must also be instructed to return immediately when chest pain or shortness of breath occurs.

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