Aortic Valve Injury Following Blunt Chest Trauma

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Introduction

Heart valve injury following blunt chest trauma of car accidents is increasing. Although aortic valve involvement is rare, however, in survivors of blunt cardiac trauma it is the most commonly involved valve and the most frequent valve lesion is isolated injury of the noncoronary cusp of aortic valve.

Case Presentation: A 31-year-old man with a history of car accident (five months before) was referred to our clinic because of shortness of breath. A holo-diastolic blowing murmur was heard on physical examination. Transesophageal echocardiography demonstrated severe aortic insufficiency secondary to rupture of the left coronary cusp associated with avulsion of aortic valve commissure.

Conclusions: Since the aortic valve is rarely affected in blunt cardiac injury, it will be generally undiagnosed during the primary evaluation of a patient with blunt chest trauma. However, any patient presenting dyspnea after chest trauma should be examined for suspected aortic valve injury.

Keywords: Aortic Valve; Rupture; Aortic Valve Insufficiency; Echocardiography
a mechanical bileaflet valve. The post-operative course was uneventful. The patient’s condition improved dramatically and he was discharged a week after the operation.

Figure 1. Chest Radiograph Showing Cardiomegaly and Interstitial Pulmonary Edema

Figure 2. Transthoracic Echocardiograms

Transthoracic echocardiograms show long regular-edged prolapsing mobile particles on the left coronary cusp (arrow) and massive aortic regurgitation by the color Doppler.

Figure 3. Transesophageal Echocardiograms

Transeosophageal echocardiograms at 0 and 120 degrees show large tear of the left coronary cusp of the aortic valve (arrow) and avulsion of the free edge of the left coronary cusp. LCC: left coronary cusp.

Figure 4. Intraoperative View of the Left Coronary Cusp Rupture
3. Discussion

Clinically, cardiac injury may be missed at the initial post-trauma assessment due to the lack of suspicion of cardiac involvement. Also, other coexistent injuries such as fractured ribs and pulmonary contusion with the same chief complaints may mask the manifestations of cardiac injury. The respiratory distress may prohibit auscultation of the heart. Thus the diagnosis of AV rupture is often delayed or missed for a time interval of days to months.

The mechanism of non-penetrating rupture of the AV is believed to be a sudden increase of intra-thoracic pressure at the time of impact, particularly during early diastole when the pressure difference across the aortic valve is maximal (7).

Although noncoronary cusp was the most torn leaflet that was found, yet multiple leaflets injury may coexist. Valve repair has been reported in a few cases (8), but avulsion-type valve injury makes primary repair difficult so valve replacement is the recommended operative procedure (7). In conclusion, in any patient after blunt chest trauma the possibility of cardiac valve injury including AV should be taken into account.

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