Traumatic Aortic Leaflet Perforation Diagnosed Three Years After a Blunt Chest Trauma: Original Image

Künt Göğüs Travmasından Üç Yıl Sonra Tanı Alan Travmatik Aort Kapakçık Yırtığı

Özgül UÇAR,[a]
İbrahim KOCAOĞLU,[b]
Sinan AYDOĞDU[a]

[a]Department of Cardiology, Ankara Numune Training and Research Hospital,
[b]Department of Cardiology, Türkiye Yüksek İhtisas Training and Research Hospital, Ankara

Geliş Tarihi/*Received:* 15.11.2010
Kabul Tarihi/*Accepted:* 01.01.2011

This case reports was presented as poster presentation in the 5th Congress of Update in Cardiology and Cardiovascular Surgery (25-28 September, 2009, Antalya, Turkey).

Yazışma Adresi/*Correspondence:*
Özgül UÇAR
Ankara Numune Training and Research Hospital, Department of Cardiology, Ankara, TÜRKİYE/TURKEY
ozgul_ucar@yahoo.com

Key Words: *Heart injuries; aortic valve insufficiency; echocardiography*

Anahtar Kelimeler: *Kalp hasarı; aort kapağı yetmezliği; ekokardiyografi*

Turkiye Klinikleri J Cardiovasc Sci 2012;24(2):183-4

A 61-year-old previously healthy man presented with a progressive dyspnea. Physical examination revealed a blood pressure of 130/50 mmHg and heart rate of 94 bpm and aortic 4/6 diastolic murmur at cardiac auscultation. Transthoracic echocardiography (TTE) revealed a flail aortic valve with severe aortic regurgitation as well as dilated left ventricle (end-diastolic diameter 72 mm) and mildly reduced systolic functions (ejection fraction 50%). There was a moderate mitral regurgitation probably due to mitral annular dilatation. Estimated peak systolic pulmonary artery pressure was 62 mmHg. We performed transesophageal echocardiography (TEE) for better visualization of the aortic valve and ascending aorta. On TEE, the right coronary cusp of the aortic valve was perforated with severe aortic regurgitation (Figure 1, 2). The patient had no signs of any infection, but from his history it was learnt that he had a traffic accident with a blunt chest trauma three years ago. He had multiple rib fractures after the accident. An echocardiographic examination was not made during his admission for the traffic accident. We concluded that the perforation of the right coronary cusp was due to the blunt chest trauma which the patient experienced three years ago. Medication of heart failure was begun and the patient underwent a successful aortic valve replacement with a mechanical prosthesis.

Penetrating or non-penetrating (blunt) chest trauma may cause a life threatening cardiac injury.[1] Traumatic rupture of cardiac valves following blunt trauma is rarely seen. The most commonly affected valve is the aortic valve, followed by mitral and tricuspid valves. In autopsy studies of victims of blunt thorax trauma, involvement of the aortic valve was only found in 4 of 546 cases (0.73%, 2 of the 4 were congenital bicuspid valves).[2] The noncoronary cusp of the aortic valve is most commonly affected because the runoff into the coronary arterial system protects the other cusps.[3] Usually only one cusp is damaged. The mechanism of injury is sudden increase in intrathoracic pressure leading to a concomitant increase in intraaortic pressure. The most vulnerable period of injury for the aortic valve is early

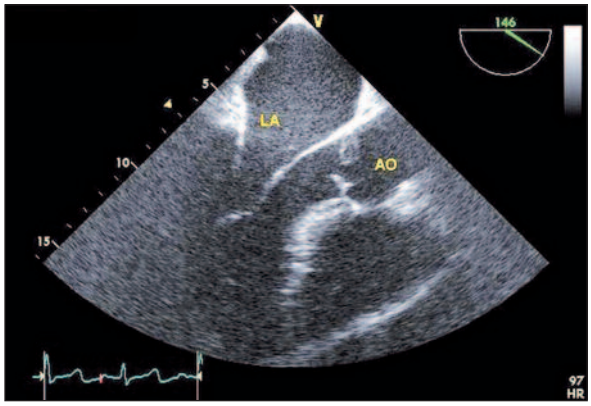

FIGURE 1: Transesophageal echocardiography in aortic long-axis view reveals perforation in the right coronary cusp.
(See for colored form http://cardivascular.turkiyeklinikleri.com/)

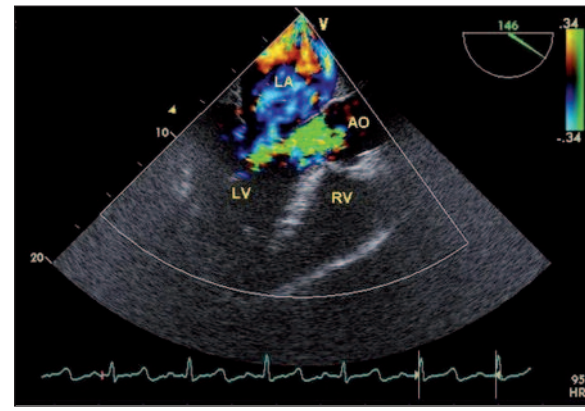

FIGURE 2: Color Doppler echocardiography demonstrates severe aortic regurgitation in aortic long-axis view of transesophageal echocardiography.
(See for colored form http://cardivascular.turkiyeklinikleri.com/)

diastole. Damaging of cardiac valves lead to progressive acute ventricular failure, which often requires urgent surgical management. However when the initial tear is small, the patient can be asymptomatic for years until the valve cusp separates from the annular attachment. [4] Strain or bouts of violent coughing can facilitate the expansion of the initial tear. The diagnosis of traumatic aortic regurgitation can be difficult in a patient with multiple injuries. In a patient with sternum or rib fracture, presence of a wide pulse-pressure, diastolic murmur and hemodynamic compromise suggest aortic valve injury. In this situation TTE and TEE should be performed immediately. When the cardiac injury is not serious, it may remain unrecognized for a long time. Therefore patients with thorax trauma should be followed-up for several years for late onset presentations of leaflet perforation.

REFERENCES

1. Keçeligil HT, Demirağ MK. [Cardiac trauma]. Turkiye Klinikleri J Surg Med Sci 2007;3(7):31-6.
2. Parmley LF, Manion WC, Mattingly TW. Nonpenetrating traumatic injury of the heart. Circulation 1958;18(3):371-96.
3. Haskins CD, Shapira N, Rahman E, Serra AJ, McNicholas KW, Lemole GM. Repair of traumatic rupture of the aortic valve. Arch Surg 1992;127(2):231-2.
4. Aoyagi S, Okazaki T, Fukunaga S, Ueda T. Concomitant traumatic aortic valve and coronary artery injury. Ann Thorac Surg 2007;83(1):289-91.