

Case Report

Dissection of the Aortic Root Presenting as a Double Aortic Valve

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We report a case of aortic root dissection in a middle-aged male without history of recent trauma, presenting as a critical aortic regurgitation due to right cusp dislodgement. The intraoperative transesophageal echocardiogram revealed the "double aortic valve" sign suggestive of low dissection, which proved to extend to both coronary arteries.

Isolated aortic root dissection with involvement of both major coronary arteries is a rare condition. In most cases aortic root dissection is the result of blunt trauma.¹ We report a case of aortic root dissection in a middle-aged male without history of recent trauma presenting as a double aortic valve on the echocardiogram.

Case presentation

A 48-year-old male, a fireman, presented with shortness of breath, fever and productive cough. He complained of fatigue and weakness for two days and reported an incident of lightheadedness the day before. Physical examination on admission showed the patient was tachypneic and tachycardic, with normal blood pressure. He reported no trauma and no back pain during the last few days. The patient was a heavy smoker and had a clear medical history. The clinical and radiological examination showed aortic regurgitation, pulmonary edema and chest infection. A transthoracic echocardiogram revealed the critical aortic regurgitation due to right cusp dislodgement with preserved left ventricular ejection fraction. A chest computed tomography scan with contrast administration sized the aortic root at 4.6

cm, but it was not diagnostic of dissection due to the lack of a typical dissection flap. On a second look, a faint double intra-aortic line seemed more like an artifact rather than an intra-aortic flap (Figure 1). The coronary angiogram showed no other pathologic findings, although catheterization of the left main stem was difficult. The aortography showed the abnormality of the aortic root and the severe aortic regurgitation (Figure 2).

The patient was scheduled for aortic repair or replacement. The intraoperative transesophageal echocardiogram showed the "double aortic valve" sign suggestive of low dissection, which proved to extend to both coronary arteries, but especially the left (Figures 3a, b).

The surgical findings were dissection of the aortic root with acute transverse circular rupture of the wall, while the adventitia was stuck to the cardiac fat, preventing free rupture. Furthermore, the dissection extended to both coronary arteries, while there was a longitudinal intimal rupture at the left coronary orifice. The patient underwent a Bentall procedure with a mechanical prosthetic valve. The ruptured wall of the left orifice was fixed with intermittent stitches.

The patient had an uneventful post-

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Figure 1. Chest computed tomography scan with contrast administration is not demonstrative of aortic dissection. The faint intra-aortic line seems more like an artifact, as it also extends to the adjacent tissues. Notice the bilateral diffuse pulmonary infiltrations with right pleural effusion, but no pericardial effusion.

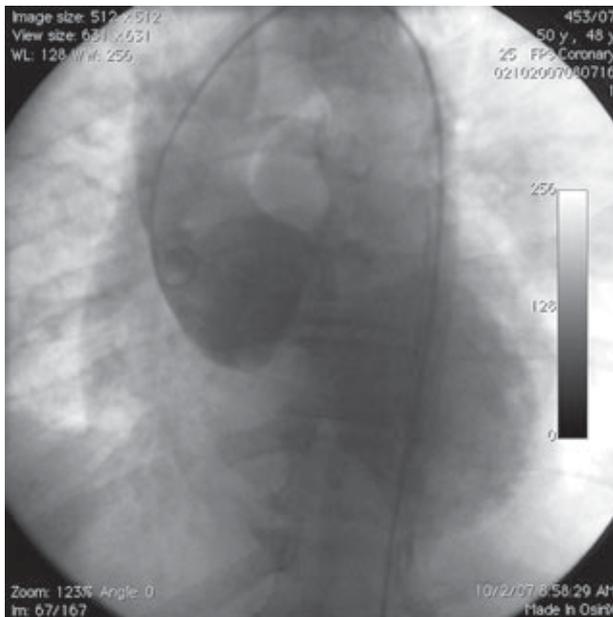


Figure 2. Aortography revealing the aortic root distension and the severe aortic regurgitation.

operative course and he is alive without problems 30 months later.

Discussion

In blunt trauma, the most commonly injured site of



Figure 3. Transesophageal echocardiography depicting the “double aortic valve” in both short (A) and long (B) axis view.

the ascending aorta transection is just above the aortic valve.^{1,2} In the case presented, the type of the rupture is typical of traumatic injury, although the patient denied any injuries in the recent past.

In acute dissection involving the ascending aorta, the non-coronary cusp becomes incompetent as the dissection proceeds toward the aortic annulus and the cusp prolapses into the ventricle, producing significant aortic insufficiency.³ The other cusps are usually spared, as the coronary ostia anchor the intima to the media and adventitia.³ The second most commonly dissected sinus is the right coronary sinus. Occasionally, the left coronary sinus of Valsalva may also be dissected. Cases of coronary ostial dissection may be associated with malperfusion, as the aortic false channel progresses into the coronary ostium, creating an extension of the false lumen into the coronary artery. In general, the false lumen is located in the upper aspect of the artery. Its extension along the length of the artery is variable and may involve the artery for several millimeters.⁴

It seems that the transesophageal echocardi-

gram is the gold standard diagnostic procedure in cases of aortic root dissection, as it has better accuracy compared to the computed tomography scan and transthoracic echocardiogram.⁵

In similar situations of De Bakey Type II dissections with involvement of the aortic root, the surgical procedure of choice is composite graft replacement. The aortic root replacement with a composite graft, according to the classic Bentall procedure, significantly improved the postoperative outcome, providing satisfactory early and long-term results.⁶ The perioperative mortality of the procedure is about 7% and is absolutely acceptable.⁷

In the case reported here, the orifice of the left coronary was torn and repaired with intermittent stitches. We believe that repair of torn coronary arteries is preferable to coronary bypass grafting. It avoids ligation of the coronary ostium and the consequent complete graft-dependent perfusion of large territories of the myocardium, while also providing antegrade flow in the coronary tree.

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