

Acute aortic regurgitation due to chordae tendineae rupture

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Abstract

A 60-year-old male presented with sudden onset chest pain and pulmonary oedema. Investigation confirmed torrential aortic regurgitation of a bicuspid valve. At surgery a ruptured chordae tendineae was identified which had been supporting the left-right cusp commissure with loss of attachment to the aortic wall. This case demonstrates that chordae tendineae may be present as a supporting structure of the aortic valve, and rupture can be a rare cause of torrential aortic regurgitation, similar in pathogenesis to how it may be associated with acute severe mitral regurgitation.

Acute aortic regurgitation due to chordae tendineae rupture

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A 60-year-old male presented with sudden onset chest pain and pulmonary oedema. Investigation confirmed torrential aortic regurgitation of a bicuspid valve. At surgery a ruptured chordae tendineae was identified which had been supporting the left-right cusp commissure with loss of attachment to the aortic wall. This case demonstrates that chordae tendineae may be present as a supporting structure of the aortic valve, and rupture can be a rare cause of torrential aortic regurgitation, similar in pathogenesis to how it may be associated with acute severe mitral regurgitation.

Key Words : aortic valve regurgitation, chordae tendineae

A 60-year-old male presented with sudden onset severe chest pain and pulmonary oedema. Echocardiogram confirmed torrential aortic regurgitation of a bicuspid aortic valve raising the possibility of infective endocarditis. He did have a dental abscess treated 4-weeks prior to this admission however, his inflammatory markers were not elevated, he remained afebrile throughout the admission and repeated blood cultures were negative. Computed tomography excluded aortic dissection and significant coronary artery disease.

He was referred to cardiothoracic surgery and proceeded to emergency aortic valve replacement. No evidence of endocarditis was found on inspection of the valve. Furthermore, valve culture and histopathology revealed no evidence of infection. Rather there was a ruptured chordae tendineae (a fibrous strand) that had been connecting the left and right commissure to the aortic wall (Figure 1). Its rupture resulted in loss of attachment of the commissure to the aortic wall, resulting in a flail leaflet unusually most pronounced at the aortic wall. Careful retrospective review of the preoperative ECG-gated cardiac CT demonstrated the pathology (Figure 2).

This case describes ruptured chordae tendineae as a rare cause of acute aortic regurgitation. Chordae tendineae are more typically implicated in dysfunction of the mitral valve. However, rarely they may be found as embryonic remnants supporting aortic valve leaflets and associated with aortic valve pathology (1). Here, we describe rupture of chordae tendineae present as a supporting structure of the aortic valve, resulting in acute loss of aortic leaflet support and subsequent torrential aortic regurgitation.

References

Abdelaziz MM, Martinelli G, Luckraz H. Chordae Tendineae of the Aortic Valve. *J Card Surg.* 2016 May;31(5):328-9

Figure 1. (a) Intraoperative in situ photo and (b) photo of valve leaflet following resection demonstrating the ruptured chordae tendineae

Figure 2. On the left there is normal position of the non-coronary cusp (+), with the flail commissural segment between the RCC and LCC (white arrowhead) with a resultant large regurgitant orifice area between the two. On the short axis views in the upper and lower left ventricular outflow tract, these show the flail right and left coronary cusps (*), with bridging continuation between these (arrowhead) with a faint stalk projected into the lumen (arrow).



