Severe Restrictive Aortic Regurgitation Resulting from Valve Tenting by Unusual Aortic Chordae Tendineae Strands

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A fifty-eight-year-old male presented with severe aortic regurgitation (AR) due to abnormal fibrous chordae tendineae bands. Successful aortic valve replacement was performed where the chordae tendineae were removed.

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A non-functioning aortic valve is caused either by valve stenosis or regurgitation. Aortic valve regurgitation is called valve insufficiency; the valve leaflets do not close completely causing the blood to flow back to the heart instead of being fully ejected to the aorta. The clinical onset of aortic regurgitation (AR) is usually insidious and progresses slowly, except in cases of infective endocarditis (IE) or aortic dissection[1].

Aortic insufficiency could be due to prolapse of the valve leaflets, or a congenitally deformed valve, infected valve (endocarditis), or due to dilation of aorta (aortic aneurysm), holes in leaflets, rheumatic valve disease or in rare cases where the aortic valves are attached to unusual aortic chordae tendineae in our case. Similar cases were reported[2,3].

The aim of this presentation is to report a case of severe aortic regurgitation (AR) due to abnormal fibrous chordae tendineae bands which was successfully treated surgically.

THE CASE

A fifty-eight-year-old male with history of previous surgical mitral valve repair in 2010 using minimal access approach. The patient had a history of essential hypertension and presented with dyspnea NYHA functional class II. On physical examination, he had diastolic murmur of aortic regurgitation with no pulmonary edema, no fever or inflammatory syndrome. Coronary angiography revealed no coronary artery disease.

The transthoracic echo revealed a sclerotic aortic valve with normal aortic annulus size but a mildly dilated aortic root. A linear structure could be seen extending from the left coronary sinus of Valsalva towards the edge of the left coronary cusp (LCC), moving synchronically with the leaflet and creating a coaptation defect secondary to tenting with moderate to severe eccentric aortic regurgitation. The finding of chorda tendinea strands could also be seen in the 3D analysis of the ultrasound confirmed by topographic and functional images. It also revealed an impaired left ventricle systolic function with ejection fraction of about 35%. The echo showed also normal tricuspid valve with no tricuspid regurgitation, see figure 1.

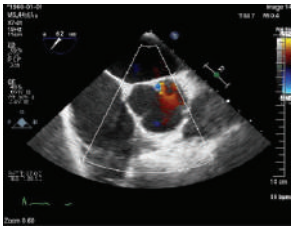

Figure 1 (A)

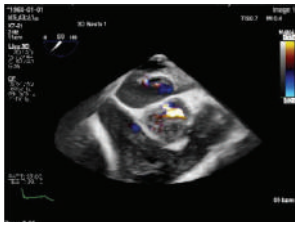

Figure 1 (B)

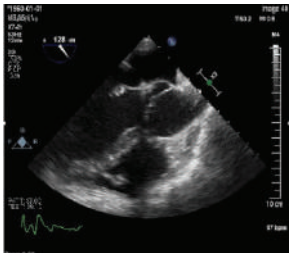

Figure 1 (C)

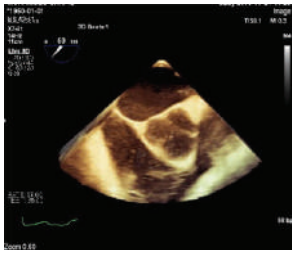

Figure 1 (D)

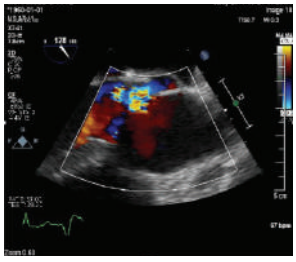

Figure 1 (E)

Figure 1 (A-E): Transesophageal Echocardiography Showing the Chordae Tendineae Strands Connecting a Mildly Dilated Aortic Root to Sigmoid Cusps

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The patient underwent aortic valve repair surgery. A small perforation in LCC was repaired and chorda tendinea strand was resected, with an autologous pericardial patch, see figure 2.

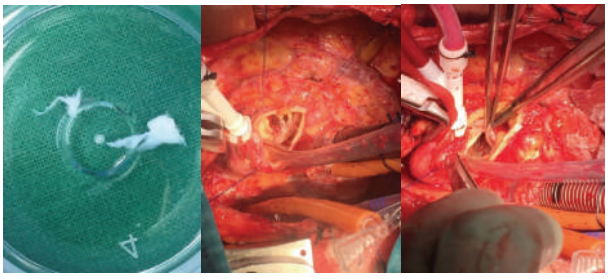

Figure 2 (A) **Figure 2 (B)** **Figure 2 (C)**

Figure 2: (A) Isolated Part of the Aortic Valve with Chordae Tendineae Strands and (B-C) Surgical Views of Aortic Valve with Several Chordae Tendineae Strands Suspending the Valve

Postoperative echocardiography showed ejection fraction of 50% with peak gradient across aortic valve of 3 mmhg mild residual aortic insufficiency, see figures 3 and 4.

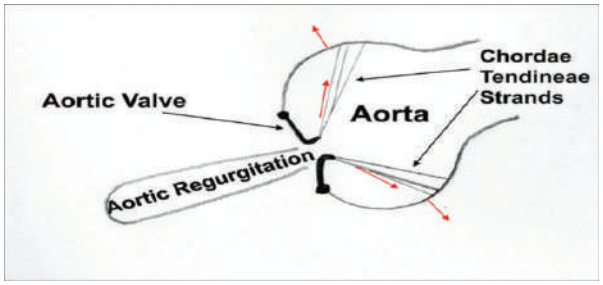

Figure 3: Mechanism of a Restrictive Aortic Regurgitation Resulting from Valve Tenting by Unusual Chorda Tendinea Strands Connected to Valsalva Aortic Root[3]

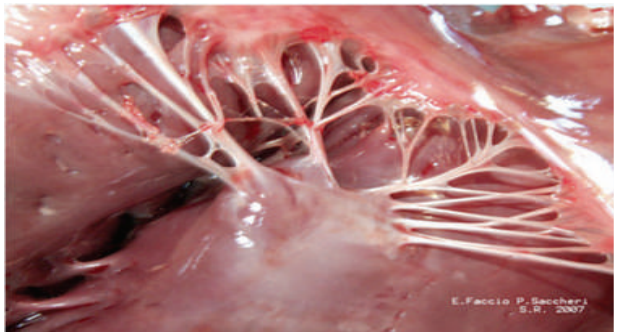

Figure 4: Normal Chordae Tendineae Which Attaches the Valves to the Heart Papillary Muscles, Chordae Tendineae Are Approximately 80% Collagen and 20% Elastin[3]

The patient was clinically improved and remained stable.

DISCUSSION

To our knowledge, this is the first case of severe aortic regurgitation due to tenting of a tricuspid aortic valve by attached chordae tendineae to a dilated aortic root, without annular dilatation, and without any other congenital heart defect in the Kingdom of Bahrain. A similar case was reported in a 74-year-old hypertensive patient complaining of progressive dyspnea[3]. Our patient had better functional capacity. A case of aortic regurgitation due to rupture of a well-balanced fibrous strand suspending a degenerative tricuspid aortic valve in a 52-year-old patient was reported[4].

CONCLUSION

This is the first case documented in the Kingdom of Bahrain. It was treated successfully, such case reports of aortic regurgitation with rare etiologies are valuable resources for future research

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