

## Aortic Regurgitation due to Commissural Dehiscence of the Aortic Valve

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### Abstract

Commissural dehiscence of the aortic valve is a rare cause of aortic regurgitation. We report a 53-year-old male who had progressive aortic regurgitation and aortic root dilatation. A flap or intimal tear of the proximal aorta was absent with echocardiography and computed tomography. Transesophageal echocardiography revealed prolapse of the right and left coronary cusps with no intimal flap in the ascending aorta. During the operation, there was no dissection or intramural hematoma in the ascending aorta. However, there was dehiscence of the commissure between the right and left coronary cusps of the aortic valve. Aortic root and ascending aortic replacements were successfully performed. Commissural dehiscence of the aortic valve should be taken into account when prolapse of the aortic cusp is the cause of aortic regurgitation.

**Keywords:** Aortic surgery; Aortic regurgitation; Aortic valve surgery; Aortic root

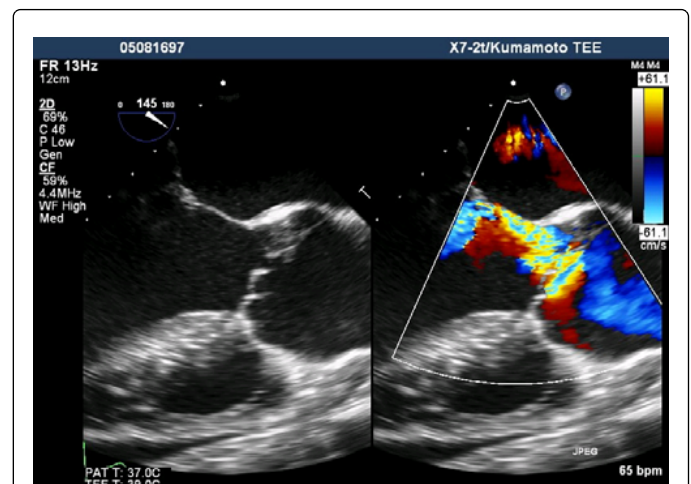
### Introduction

Commissural dehiscence of the aortic valve is a rare cause of aortic regurgitation. This condition has been documented in only a few case reports [1-5]. Commissural dehiscence of the aortic valve is occasionally found intraoperatively because preoperative diagnosis of this condition is difficult. We report a case of commissural dehiscence of the aortic valve that caused aortic regurgitation and aortic root dilatation.

### Case

A 53-year-old man was admitted to our hospital with congestive heart failure. He had dyspnea on exertion 1 month before referral to our hospital. His symptoms improved after use of diuretic drugs. Transthoracic echocardiography demonstrated severe aortic regurgitation and moderate mitral regurgitation with left ventricular dilatation (left ventricular diastolic dimension, 67 mm; left ventricular systolic dimension, 50 mm). Contrast-enhanced computed tomography (CT) showed dilatation of the aortic root (sinus of Valsalva, 45 mm). A flap or intimal tear of the proximal aorta was absent with echocardiography and CT. Transesophageal echocardiography (TEE) was performed to assess the cause of aortic regurgitation. TEE revealed prolapse of the right and left coronary cusps (Figure 1) with no intimal flap in the ascending aorta. Surgery was planned after medical control of heart failure.

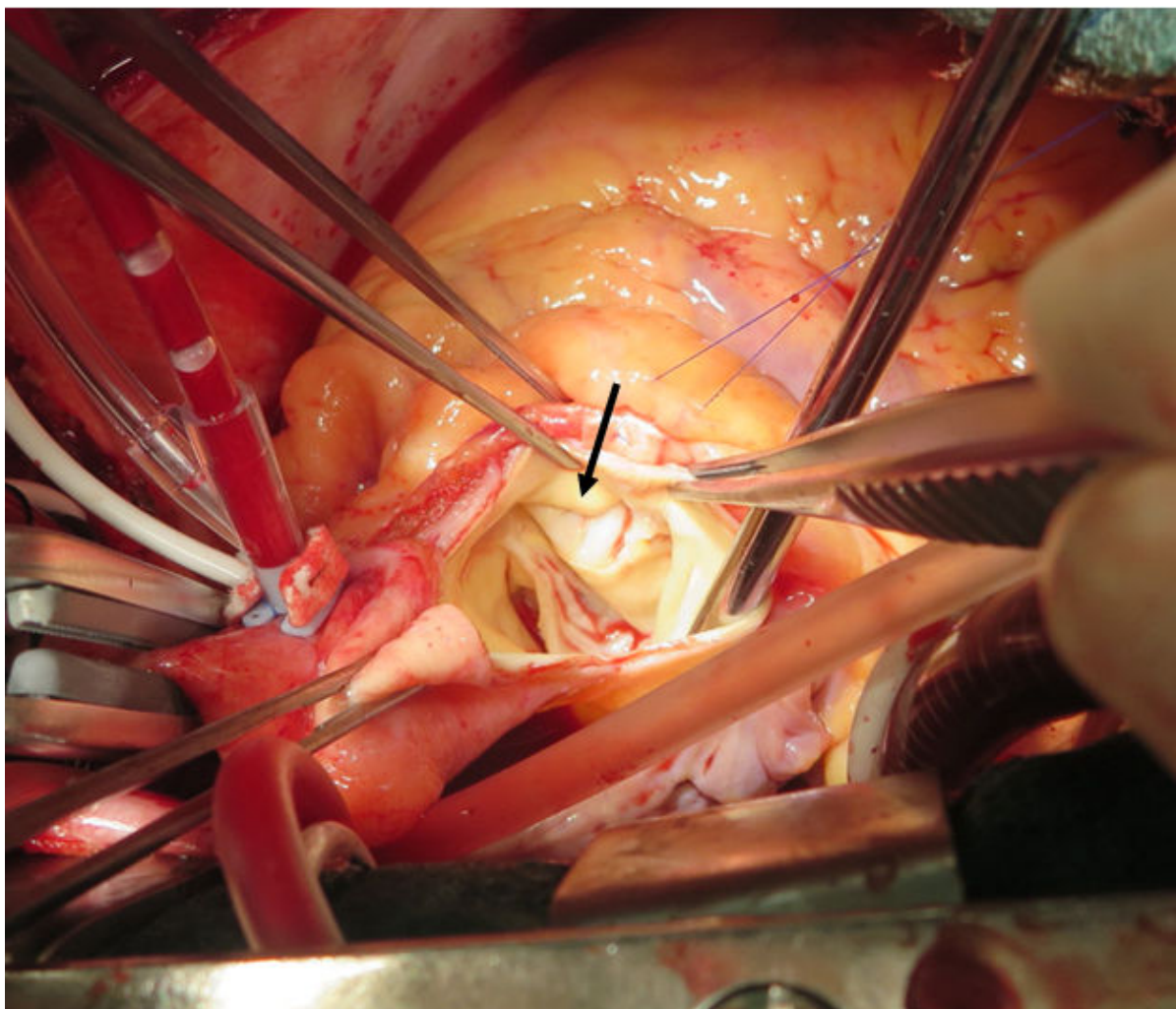
Median sternotomy was performed. When the pericardium was opened, serous effusion was observed. Moreover, tight adhesion between the ascending aorta and pulmonary artery was observed. Cardiopulmonary bypass was performed with ascending aortic and bicaval venous cannulations.



**Figure 1:** Transesophageal echocardiogram demonstrating prolapse of the right and left coronary cusps with no flap in the ascending aorta.

After the adhesion around the ascending aorta was dissected, an aortic clamp was applied and cardiac arrest was obtained. Mitral annuloplasty with a semi-rigid ring (size, 30 mm) was performed. The body temperature was decreased to 25°C, systemic perfusion was temporarily arrested, and retrograde cerebral perfusion was started. The ascending aorta was resected, and replaced with a 26-mm Triplex graft (Vascutek Terumo, Tokyo, Japan) with one branch. After completion of distal aortic anastomosis, systemic perfusion through the side branch of the graft was resumed. There was no dissection or intramural hematoma in the ascending aorta. However, there was dehiscence of the commissure between the right and left coronary cusps of the aortic valve (Figure 2). Valve leaflets were slightly atherosclerotic, and the aortic wall was normal. We performed aortic root replacement with a commercially available composite valved conduit (25–28 mm; Carboseal, CarboMedics, Austin, TX). The

postoperative course was uneventful and no neurological deficit occurred.



**Figure 2:** Intraoperative photograph showing local dehiscence of the aortic commissure between the right and left coronary cusps of the aortic valve. The arrow indicates local dehiscence.

## Discussion

Commissural dehiscence of the aortic valve is a rare cause of aortic regurgitation. Aortic regurgitation sometimes occurs secondary to acute aortic dissection. Aortic leaflet prolapse occurs when dissection extends into the aortic root, and disrupts normal attachment of leaflets to the aortic wall. In the present case, prolapse of the right and left aortic leaflets occurred by dehiscence of the commissure between the right and left aortic cusps. This condition has been documented in only a few case reports [1-5]. Although the cause of aortic commissural dehiscence is unknown, hypertension is considered to be the most likely cause [3].

Aortic valve replacement with or without fixation of the dehiscent aortic wall is a common procedure [1-3]. Another treatment of choice is aortic root replacement [1,4,5]. In the present case, aortic root replacement with a valved conduit was performed because the aortic root and ascending aorta were dilated. An aortic valve-sparing

operation may be an alternative procedure in patients without heart failure and other cardiac procedures (mitral valve annuloplasty and ascending aortic replacement).

In conclusion, commissural dehiscence of the aortic valve is a rare cause of aortic regurgitation. We should take this condition into account when prolapse of the aortic cusp is the cause of aortic regurgitation.

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