

Acute Aortic Regurgitation Resulting from Dehiscence of the Aortic Valve Commissures

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A 62-year-old man with a history of hypertension complained of cough and dyspnea and was admitted to a family doctor. He was transferred to our hospital for further investigation and therapy, a result of his doctor's suspicions of aortic regurgitation (AR) with infective endocarditis. During the operation, acute AR was found to be caused by dehiscence of the aortic valve commissures, and the valve was replaced with a mechanical valve. Postoperative course was uneventful. We reviewed reported cases of acute AR resulting from dehiscence of the aortic valve commissures. (Ann Thorac Cardiovasc Surg 2010; 16: 294–296)

Key words: acute aortic regurgitation, dehiscence, aortic valve commissures

Introduction

Acute aortic regurgitation (AR) is most commonly caused by bacterial endocarditis, aortic dissection, or blunt chest trauma. Other causes are quite rare. We present a rare case with acute AR resulting from dehiscence of aortic valve commissures.

Case report

A 62-year-old man with a history of hypertension complained of cough and dyspnea and consulted a family doctor. Chest radiography revealed bilateral pulmonary congestion and cardiothoracic ratio of 53%. Transthoracic echocardiography showed a dilated left ventricle and severe aortic regurgitation with localized thickness of the flapping valve. Aortography showed a significant degree of graded aortic regurgitation. Computed tomography

showed no dissection in the ascending aorta. The diagnosis was acute cardiac failure with infective endocarditis because of increased C-reactive protein (CRP) and white blood cell (WBC) count. He was then transferred to our hospital for further investigation. Upon admission, his physical examination was unremarkable except for exertional dyspnea and diastolic heart murmur in the aortic area. A blood test showed elevated WBC count (13440/ μ L) and CRP concentration (2.23 mg/ml). No bacteria were detected from the blood culture. Transthoracic echocardiography showed similar results during a prior hospitalization, and an abnormal shadow similar to vegetation was detected. We cannot control heart failure by medical therapy, and the patient therefore underwent an operation.

Under general anesthesia, the chest was opened by median sternotomy and a standard cardiopulmonary bypass was accomplished. The aorta was cross-clamped, and a transverse aortotomy was performed. Cardioplegic arrest was then achieved, and the aortic valve was exposed. There was completely a dehiscence of commissure between the right and left cusps from the aortic wall, prolapsed into the ventricle (Fig. 1). The vegetation was not clearly detected. The valve was excised and replaced with a mechanical valve. The leaflets and commissure were histologically almost normal (Fig. 2). Histological examination of the commissure revealed that erosion and thrombus formation were seen over the surface area, in

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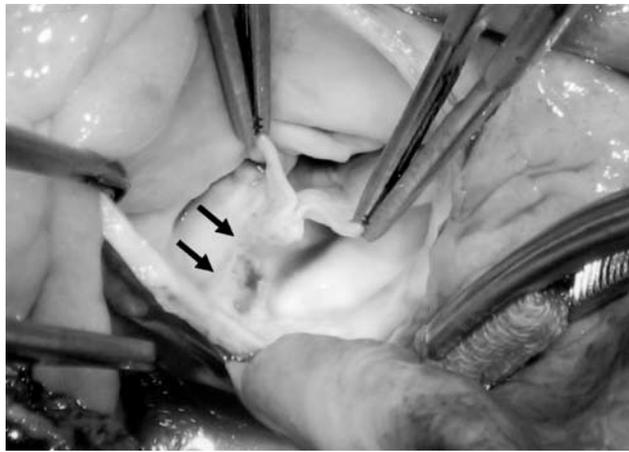


Fig. 1. Photograph at operation showing a normal appearance of aortic root. The commissure between the right and left cusps had dehiscenced from the aortic wall (black arrow).

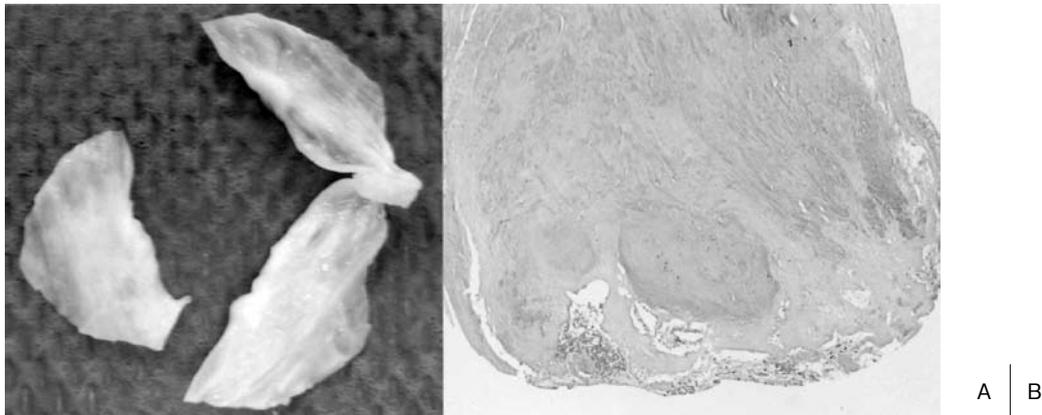


Fig. 2. (A) Macroscopic appearance of the surgically excised aortic valve cusps and the dehiscenced commissure showing their normal appearance. (B) Photograph of the dehiscenced portion. An erosion and thrombus formation are seen over the surface area, in addition to the neovascularization and minute lymphocytic infiltration. Atherosclerotic changes are not clearly seen.

addition to the neovascularization and minute lymphocytic infiltration. Atherosclerotic changes were not clearly seen, and there was no evidence of connective tissue abnormality, such as a description of the elastic fiber or mucoid degeneration.

His postoperative course was uneventful. Transthoracic echocardiography before discharge revealed a normally functioning mechanical valve without leakage.

Discussion

Aortic regurgitation results from malcoaptation of the aortic leaflets caused by abnormalities of the leaflets, their supporting structures, or both. Acute AR is most

commonly caused by bacterial endocarditis, aortic dissection, or blunt chest trauma.¹⁻⁴⁾

Other lesser causes of acute AR include nonbacterial endocarditis, laceration of the aorta, pseudoxanthoma elasticum, degenerative disease, and atheromatous plaque, fenestrated aortic valves, and disorders of connective tissue.⁴⁻¹³⁾ We have reported acute severe AR resulting from dehiscence of aortic commissure. Particular pathological changes in sections of aortic wall or the aortic cusps were not present in our case. This is a rare condition and has been documented in some reports (Table 1).^{5-9, 12)} The hypertension is considered to be the most probable cause of aortic commissural dehiscence⁵⁻⁷⁾ however, the patients without hypertension were observed.

Table 1. Summary of reported acute aortic regurgitation resulting from dehiscence of the aortic valve without pathological changes

Author/date	Age	Gender	Operation	Hypertension	Follow-up
Silverman et al. / 1979 ⁹⁾	47	Male	(-)	(-)	Death
Silverman et al. / 1979 ⁹⁾	73	Female	(-)	(-)	Death
Satokawa et al. / 1986 ⁸⁾	25	Male	AVR	(-)	Alive
Aoyagi et al. / 1995 ⁵⁾	55	Female	AVR	(+)	Alive
Aoyagi et al. / 1995 ⁵⁾	50	Male	AVR	(-)	Alive
Sakakibara et al. / 2000 ⁷⁾	56	Male	AVR	(+)	Alive
Newcomb et al. / 2004 ⁶⁾	72	Male	AVR	(+)	Alive
Fukui et al. /2008 ¹²⁾	67	Male	Aortic root replacement	(-)	Alive

AVR, aortic valve replacement

In the literature,^{5, 7)} echocardiographic findings were useful for preoperative diagnosis of this condition. In our case, infective endocarditis was suspected by echocardiographic findings. During the operation, aortic regurgitation as a result of dehiscence of the aortic valve commissures was diagnosed. Preoperative diagnosis of this condition is difficult.

Sudden death because of pulmonary edema, ventricular arrhythmias, electromechanical dissociation, or circulatory collapse is common in acute severe AR. Urgent surgical intervention is recommended.¹⁻³⁾ Death as a result of congestive heart failure has been reported in acute AR with aortic commissural dehiscence.⁹⁾

Surgical intervention for aortic commissural dehiscence includes repair of the commissure of with valve,¹⁰⁾ replacement of aortic valve and of aortic root replacement.¹²⁾ In the literature, aortic valve replacement (AVR) is a common procedure.^{7, 8)} Sakakibara and colleagues⁷⁾ reported that an AVR with a reinforcement of the aortic wall outweighs aortic valvuloplasty.

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