

CASE REPORT

Aortic Dissection Involving the Ostium of Left Main Coronary Artery

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ABBREVIATIONS

IRAD = International Registry of Acute Aortic Dissections
TEE = transesophageal echocardiography
TTE = transthoracic echocardiogram

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ABSTRACT

Surgical treatment of hypertrophic obstructive cardiomyopathy (HOCM) comprises septal myectomy which though has been limited to patients with refractory symptoms and high resting gradients. Results of surgical intervention are well documented with dramatic reduction in left ventricular outflow tract gradient and resultant relief of symptoms in about 95% of patients. Transcoronary ablation of septal hypertrophy with alcohol is a newer percutaneous technique, designed to ablate hypertrophied cardiac septal muscle through localized infarction, but its efficacy compared with that of surgical myectomy is uncertain. In the present article we briefly review the technique of septal myectomy and compare it with septal ablation, concluding that the standard septal myectomy still remains the preferred and proven therapy.

INTRODUCTION

Acute myocardial infarction due to extension of an acute aortic dissection is an infrequent but devastating event. In the majority of all known cases the right coronary artery is usually involved, manifesting as an acute inferior wall myocardial infarction. We herein report a case of an acute aortic dissection involving the left main coronary artery, initially diagnosed as a typical anterior wall acute myocardial infarction.

CASE REPORT

A 58-year-old hypertensive man was referred from another hospital with the diagnosis of acute myocardial infarction. He presented with a two-hour duration sudden onset of severe chest pain radiating to his interscapular region. Pain did not respond to intravenous (IV) administration of nitrates and morphine. His blood pressure was 110/70 mmHg and physical examination revealed no murmurs. The ECG showed extensive ST-segment elevation in the anterior and lateral leads suggesting acute anterior myocardial infarction.

A transthoracic echocardiogram (TTE) demonstrated a dilated ascending aorta with an intimal flap that extended from the aortic valve to the mid-ascending aorta (Fig. 1), consistent with a Stanford type A acute aortic dissection. A multiplane transesophageal

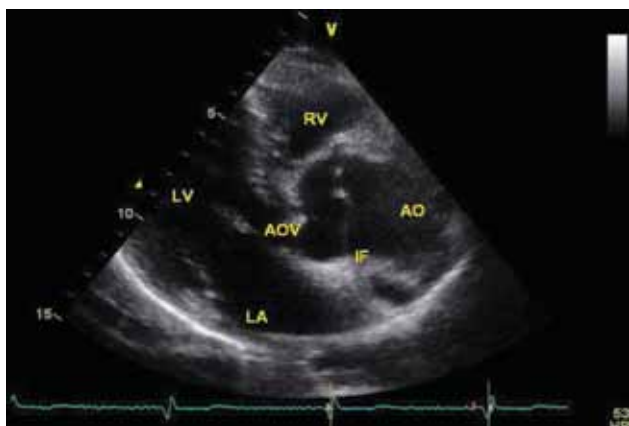


FIGURE 1. Transthoracic echocardiogram. Long axis view demonstrating a dilated ascending aorta with the intimal flap (IF). Ao= aorta; AoV= aortic valve; IF= intimal flap; LA= left atrium; LV= left ventricle; RV= right ventricle.



FIGURE 3. Transoesophageal echocardiogram. Extension of the intimal flap (IF) to the take-off of the left subclavian artery. FL = false lumen; TL = true lumen.

echocardiogram (TEE) was then performed which showed the aortic dissection extending into the aortic arch, the take-off of the left subclavian artery (Fig. 2) and the descending aorta (Fig. 3). The intimal flap was thin and smooth, and showed a pulsatile mobility with systolic convexity towards the false lumen (Fig. 4). Blood flow was present in the false lumen which was larger than the true lumen (Fig. 5).

The left coronary ostium seemed to be obstructed by prolapse of the intimal flap during diastole (Fig. 6). The aortic valve was normal and mild aortic regurgitation was noted caused by the aortic dilatation. Regional and global left ventricular function was normal. There was no periaortic or pericardial fluid detected. The patient was transferred for emergency surgery and the ascending aorta was successfully replaced by a supracoronary interposition of a prosthetic graft.

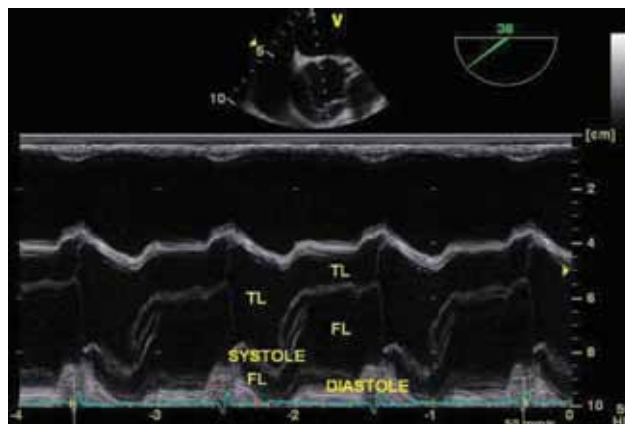


FIGURE 4. Transesophageal echocardiogram. Mobility of the intimal flap. FL = false lumen; TL = true lumen.



FIGURE 2. Transesophageal echocardiogram. Extension of the intimal flap (IF) to the take-off of the left subclavian (LS) artery.

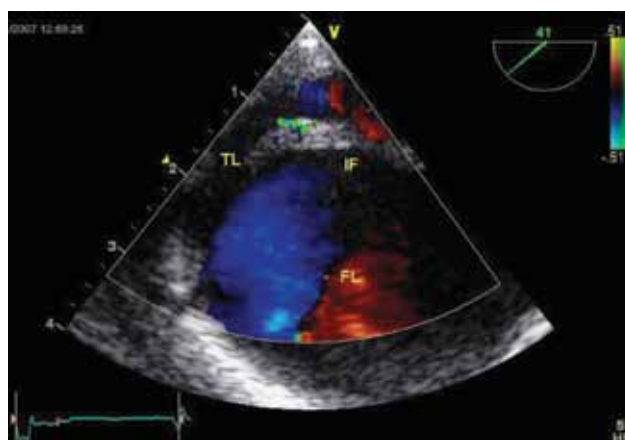


FIGURE 5. Transesophageal echocardiogram. Color flow Doppler in the false lumen (FL). IF = intimal flap; TL = true lumen.



FIGURE 6. Transesophageal echocardiogram. Prolapse of the intimal flap (IF) into the ostium of the left main coronary (LMC) artery during diastole. FL = false lumen; TL = true lumen.

DISCUSSION

Aortic dissection is a rare disease, with an estimated incidence of approximately 5-30 cases per 1 million people per year.^{1,2} Fewer than 0.5% of patients presenting to an emergency department with chest or back pain suffer from aortic dissection. Two thirds of patients are male, with an average age at presentation of approximately 65 years. A history of systemic hypertension, found in up to 72% of patients, is by far the most common risk factor. Atherosclerosis, a history of prior cardiac surgery, and known aortic aneurysm are other major risk factors.^{1,4} Acute myocardial infarction due to extension of an acute Stanford type A aortic dissection is an infrequent but devastating situation. Several case reports of an aortic dissection in combination with a myocardial infarction have been published.⁵⁻¹¹ In the majority of cases the right coronary artery was involved.⁵⁻⁸ We herein report a case of an aortic dissection involving the left main trunk of the coronary artery as a result of intimal flap prolapse, which initially was misdiagnosed solely as a common anterior myocardial infarction. Such misdiagnosis could lead to thrombolysis or primary percutaneous coronary intervention with catastrophic consequences.

Transthoracic echocardiography has limited value in the evaluation for acute aortic dissection, primarily because of its inadequacy in visualizing the distal ascending and descending aorta. Transesophageal echocardiography overcomes many of the limitations of TTE because of the proximity of the esophagus to the aorta. It is also widely available, relatively safe, and easy to perform at the bedside even in unstable patients. The sensitivity of TEE for acute aortic dissection has been reported to be as high as 98%, and specificity ranges from 63% to 96%.¹²⁻¹³ Multiplane TEE provides superb images of the pericardium

and detailed assessment of aortic valve function and it is also extremely effective at visualizing coronary artery involvement in comparison to computed tomography (CT) and magnetic resonance angiography. The area of the distal ascending aorta and of the aortic arch, where the trachea interposes between esophagus and aorta, is a blind spot in TEE.

Type A acute aortic dissection is a true surgical emergency, because these patients have a high risk of life-threatening complications including cardiac tamponade, acute aortic regurgitation, coronary flow obstruction, and occlusion of aortic branch vessels. The mortality rate is 1% to 2% per hour early after symptom onset.⁴ In a review of the International Registry of Acute Aortic Dissections (IRAD) of 547 patients who had type A dissection, the inhospital mortality rate of patients treated medically (reasons for nonsurgical treatment were comorbid conditions, old age, and patient refusal) was 56%, compared with 27% for those treated with surgery.¹⁴ This degree of difference may result in part from comorbid conditions in the medically treated patients. Because of high mortality with medical therapy alone, surgical treatment is indicated in all patients who have type A dissections, with the exception of patients who have serious concomitant conditions which, in the opinion of the surgical team, preclude surgery.¹⁵

CONCLUSION

Aortic dissection is a rare and acutely life-threatening cause of acute chest and back pain. Delays in diagnosis and misdiagnoses are common, frequently with catastrophic consequences. The key to diagnosis is maintaining a high index of suspicion for dissection, especially in patients who present with acute severe chest or back pain.

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