



Long Segmental Right Coronary Artery Dissection Successfully Treated by Percutaneous Coronary Intervention

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The pathogenic mechanism of acute myocardial infarction in majority is plaque rupture with acute thrombus occluding the culprit vessel, however, spontaneous coronary artery dissection, although rare, may result acute coronary syndrome and a catastrophic outcome. We report a 41-year-old male presenting to our emergency department because of chest pain. The electrocardiogram showed a sinus rhythm with a rate of 76 beats per min, Q wave and ST segment elevation in leads II, III, and aVF. Emergent coronary angiography revealed a dissection extending from the middle portion of the right coronary artery to the posterior descending branch. Successful percutaneous coronary intervention with stent implantation was performed with an optimal angiographic result.

Key words: spontaneous coronary artery dissection, acute myocardial infarction, percutaneous coronary intervention.

INTRODUCTION

Spontaneous coronary artery dissection is a rare condition that can result in unstable angina, myocardial infarction, and sudden cardiac death. It has been mainly reported in young women during or after pregnancy. The management of these patients remains controversial. It is often difficult to make a definite diagnosis before coronary angiography although there are case reports diagnosed by CT angiography.^{1,2} Here, we report a 41-year-old male with spontaneous coronary dissection who underwent successful primary percutaneous coronary intervention for myocardial infarction.

CASE REPORT

A 41-year-old male presented to our emergency room with chest pain on and off for about 4 days. The patient denied medical history of cigarette smoking, hyperten-

sion, diabetes mellitus, dyslipidemia, cocaine abuse, and chest trauma in the past. He didn't smoke and denied any familial premature coronary artery disease history. On physical examination, the patient displayed no ill-looking without significant cardiopulmonary distress. Vital signs included body temperature 37.0°C, heart rate 82 beats per minute, respiratory rate 19 per min, and blood pressure 130/80 mmHg. The examinations of the lung revealed minimal bilateral basal crackles. Cardiac auscultation revealed no obvious murmur. The remaining examinations were unremarkable. Pertinent laboratory data revealed Troponin-I 3.74ng/ml (upper limit of 0.5ng/ml). Other laboratory test including a renal function test, arterial blood gas, and coagulation test were all within normal limits. Twelve-lead electrocardiography (Figure 1) showed a sinus rhythm with a rate of 75 beats per min, Q wave and ST segment elevation at leads II, III, and aVF. Transthoracic echocardiography revealed hypokinesia at the inferior, inferolateral wall of the LV with an ejection fraction 40-45 %. There was no echocardiographic evidence of aortic dissection. Diagnostic coronary angiography (Figure 2A) revealed coronary dissection extending from the middle-third of the right coronary artery to the posterior descending branch. We used Judkins right 7Fr as the guide catheter, and advanced a 0.014 "Choice PT2 guidewire to the distal posterior descending branch and a 0.014" BMW guidewire to the distal posterior lateral branch. After kissing balloon inflation to the lesion for predilatation, direct stent implantation from middle por-

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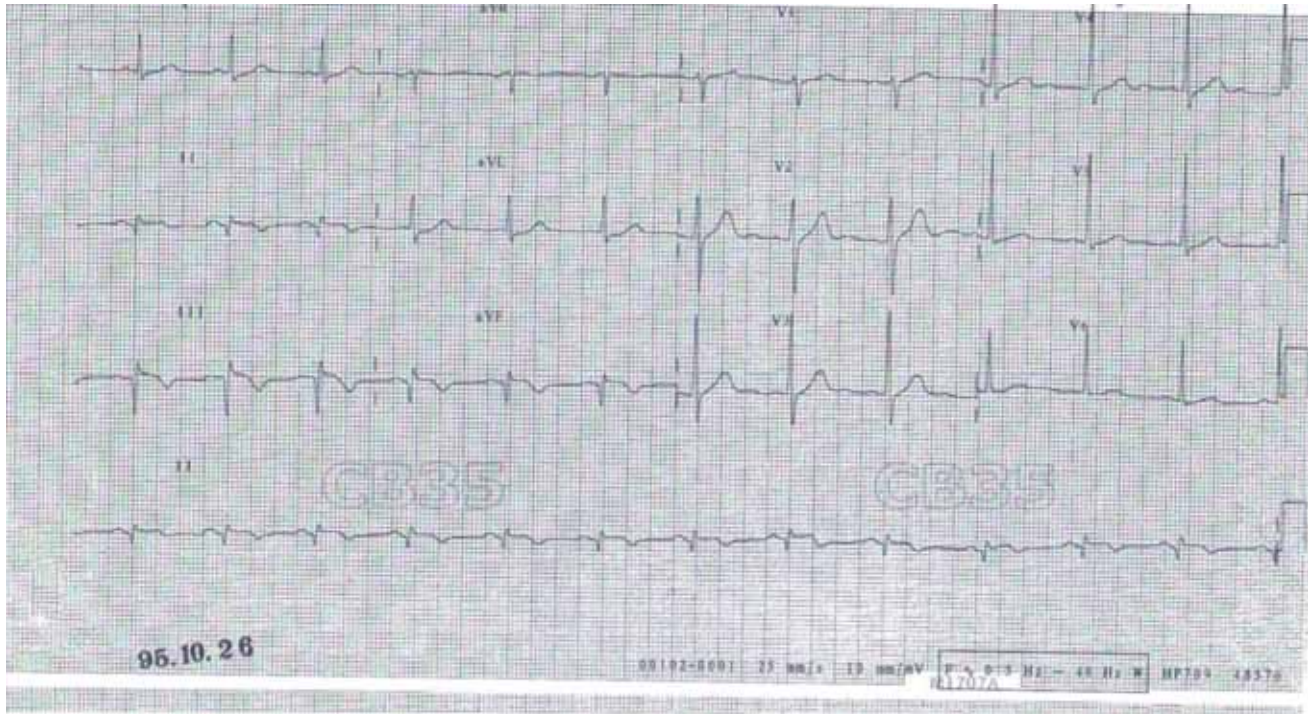


Fig. 1 Twelve-lead electrocardiography showed sinus rhythm with rate of 75beats per min, Q wave and ST segment elevation in leads II, III, aVF.

tion of right coronary artery to distal posterior descending branch was performed. The final angiographic result was optimal (Figure 2B). He was discharged 5 days later without any adverse events. He was doing well under medications of clopidogrel, aspirin, and statins in our outpatient department.

DISCUSSION

Spontaneous coronary artery dissection (SCAD) is a rare cause of acute coronary syndrome and sudden cardiac death. It had been observed in three groups of patients including women in pregnancy or peripartum periods, individuals with coronary atherosclerosis, and those without obvious association called "idiopathic".³ The overall incidence of SCAD in angiographic series ranges from 0.28% to 1.1%,⁴ about 70% are women, and about 30% occurs in peripartum. Dissection of the left anterior descending artery is the most common location in women, whereas right coronary artery dissection is most common in men.^{3,5}

SCAD is thought to be the consequence of an intramural haematoma of a coronary artery, resulting in a false lumen which compromises the true lumen, with subsequent myocardial ischaemia.⁵ Also, men tend to

have a better chance of survival than women, who have an even worse prognosis when they are not in the peri- or postpartum period.^{3,5} In general, it can be stated the long-term prognosis of patients with SCAD is favorable if they survive the acute phase.⁴ Although the survival rates and prognosis of patients who present with SCAD vary widely in the literature, data extracted from small series and case reports show survival rates between 70 and 90%.^{3,5} A review article by Kamineni et al reported 50% of patients with SCAD developed a recurrent dissection within two months.⁵

The pathophysiology of SCAD remains unclear, and the strong female predominance and association with pregnancy indicated hormonally based changes of media and hemodynamic stress as possible factors.⁶ Changes in the arterial wall during pregnancy are well documented, including fragmentation of the reticulin fibers, hypertrophy of the smooth muscles, and modifications of the extracellular matrix of the media. These alternations possibly weaken the media and predispose it to dissection. Some mechanisms are proposed including disruption and bleeding of the vasa vasorum and an underlying inflammatory process such as a combination of eosinophilic infiltrates, angiomas of the tunica adventitia and intimal tears, and finally no special findings.⁷

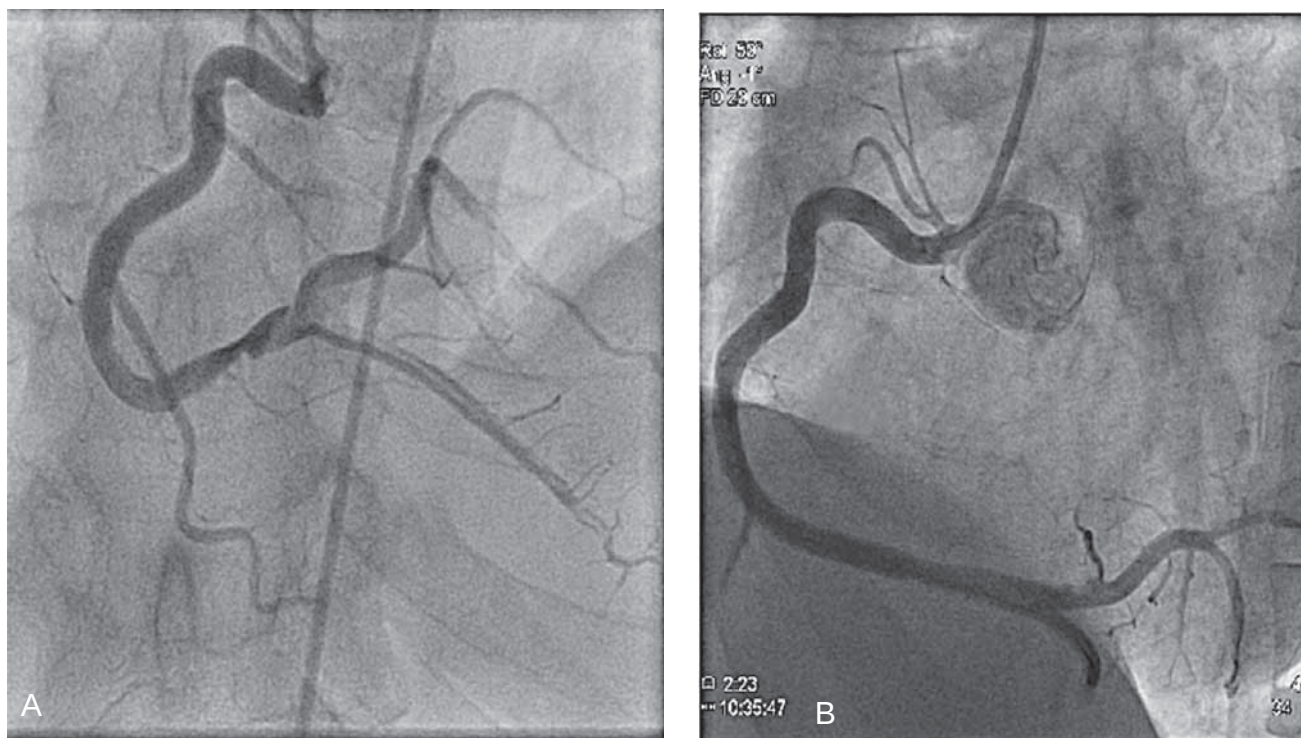


Fig. 2 **A:** Coronary angiography revealed spontaneous dissection from middle portion of right coronary artery to distal posterior descending branch. **B:** Coronary angiography revealed optimal result after stenting.

Treatment options for SCAD include medical therapy, percutaneous coronary intervention, or coronary bypass graft surgery. The decision to treat must be individualized and be based on both clinical and angiographic factors. Bypass surgery is usually reserved for patients with left main coronary artery dissection or multiple vessel dissection,⁸ and medical therapy including glycoprotein IIb/IIIa inhibitor plus clopidogrel is used in minor symptoms and a small dissection area.⁹

In conclusion, in patients without any cardiovascular risk factor presenting as acute coronary syndrome, early coronary angiography may help for early recognized spontaneous coronary artery dissection and decision making for the next step to prevent a catastrophic result. Percutaneous coronary intervention with stent implantation is a good choice but the physician should be familiar with the procedure and timing for bypass surgery.

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