

Transcatheter Coil Embolization of Coronary Artery Fistula

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A 46-year-old man was admitted with chief complaint of chest pain and fatigue on exertion for the last 2 years. Physical examination was normal. Transthoracic echocardiography showed mild right ventricular dilatation and ejection fraction of 50%. Coronary angiogram (CAG) was done that revealed significant lesion at mid part of left anterior descending artery (LAD) and a fistula arising from the mid part of LAD artery communicating with main pulmonary artery. Transcatheter coil embolism was successfully performed. The patient was free of symptoms during 12 months follow up.

Introduction

Coronary artery fistula is characterized by a fistulous communication between coronary artery with the atria, ventricle, or pulmonary artery. The incidence of coronary artery fistula was found to be 0.18% of adult patients undergoing coronary angiography in one large series.¹ The majority of fistulas drain into the right heart, with 15% into the pulmonary artery, 7% into the coronary sinus and rarely into the left heart.² The cause of coronary artery fistulas may be either congenital or acquired.

Most coronary artery fistulas are congenital in origin, but they have been reported to be acquired as complications of chest trauma, coronary angioplasty, and bypass surgery.² Because most patients are initially asymptomatic, these fistulas are usually discovered incidentally on coronary angiography or are found at autopsy.² Presence of congenital coronary artery fistulas can be suspected on the basis of transthoracic and transesophageal Doppler echocardiographic findings.³ Treatment of coronary artery fistulas has included surgical ligation.⁴ More recently, treatment with balloon-expandable polytetrafluoroethylene-covered coronary graft stents and expandable electrolytically detachable platinum coil has been described.⁵

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Case report

A 46-year-old man was referred to our center with chief complaint of chest pain and fatigue on exertion since 2 years ago. Physical examination was normal with no audible murmur. Electrocardiography (ECG) showed normal sinus rhythm with no significant ST-T changes. Transthoracic echocardiography revealed mild right ventricular dilatation and ejection fraction of 50%. Coronary angiogram (CAG) revealed significant lesion in mid part of left anterior descending artery (LAD) and a high-flow coronary artery fistula arising from the mid part of LAD artery communicating with main pulmonary artery (Fig. 1). Transcatheter coil embolism was used for treatment of fistula.

The left anterior descending artery (LAD) was engaged with a 7F, JL 4.0 (cordis, USA) guiding catheter. A run-through guide wire (terumo, Japan) together with a microcatheter was passed through this guiding catheter to the LAD. Having removed the guide wire, a large microcoil (cook) (6mm x 5mm) was released to embolize the fistula that proved insufficient, but the repeat of the procedure was successful. Repeated angiography 15 minutes later showed satisfactory result (Fig. 2). The patient was free of symptoms during 12 months close follow up.

Discussion

Coronary artery fistulas, defined as abnormal vascular communication between any coronary



Figure 1. Coronary angiogram shows a high-flow coronary artery fistula arising from the mid part of left anterior descending artery communicating with the main pulmonary artery.

artery and any of the cardiac chambers or great vessels, are uncommon. Most patients are initially asymptomatic but even if a patient is initially asymptomatic, dyspnea and fatigue may develop in future.⁶ Cardiomyopathy, heart failure and atrial fibrillation can occur as late findings.⁶ Other complications related to coronary fistulas include myo-

cardial ischemia (from steal phenomena or from embolization due to thrombus formation within aneurysmal segments), endocarditis and cardiomegaly with enlargement of the right chambers.⁵ Indications for fistula closure include myocardial ischemia, large left-to-right shunts, and congestive heart failure.³ Surgical ligation had been the treat-

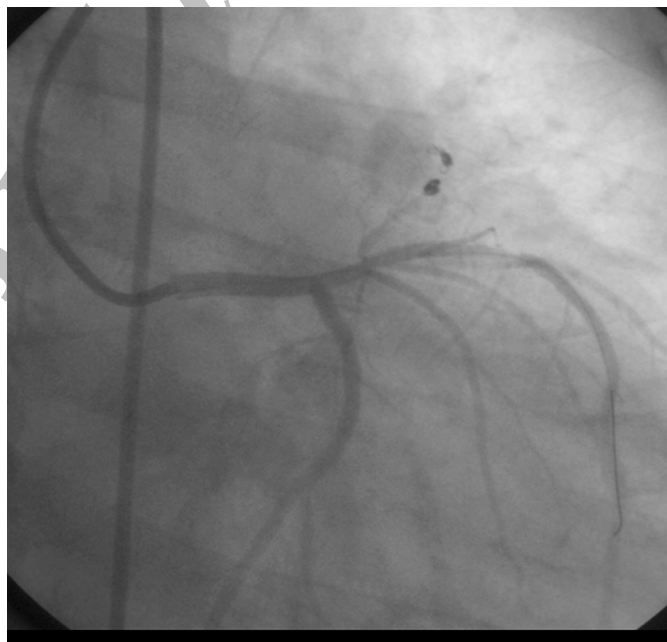


Figure 2. Coronary Angiography after coil embolization shows satisfactory result with no fistula between left anterior descending artery and pulmonary artery.

ment of coronary artery fistulas, but more recently, coil embolization has been described.⁵

In conclusion, we successfully treated a complicated, high-flow coronary artery fistula by transcatheter coil embolization. Therefore, catheter coil embolization is an effective and safe treatment for coronary artery fistula in strictly selected cases.

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References

- 1 Yamanaka O, Hobbs RE. Coronary artery anomalies in 126,595 patients undergoing coronary arteriography. *Cathet Cardiovasc Diagn* 1990;**21**:28-40. [2208265]
- 2 Ogden JA. Congenital anomalies of coronary arteries. *Am J Cardiol* 1970;**25**:474-9. [5438244]
- 3 Lai MC, Chen WJ, Chiang CW, Ko YL. An unusual case of dual coronary artery fistulas to main pulmonary artery. *Chang Gung Med J* 2002;**25**:51-55. [11926587]
- 4 Kamiya H, Yasuda T, Nagamine H, et al. Surgical treatment of congenital coronary artery fistulas: 27 years experience and a review of literature. *J Cardiol Surg* 2002;**17**:173-9. [12220072]
- 5 Goldberg SL, Makkar R, Duckwiler G. New strategies in the percutaneous management of coronary artery fistulas; a case report. *Catheter Cardiovasc Interv* 2004;**61**:227-32. [14755818]
- 6 Perloff JK. Congenital coronary artery fistula in: The clinical recognition of congenital heart disease, 1st ed. Philadelphia, PA: Saunders; 1994. p.562-80.