Correction of myocardial ischaemia after transcatheter embolisation of a small left coronary artery venous fistula

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Abstract

A 50 year old woman presented with a history of angina and palpitation. She had a positive exercise test and thallium scintigraphy showed reversible ischaemia in the territory of the left anterior descending coronary artery. Coronary angiography showed a small coronary arteriovenous fistula arising from the bifurcation of the left main stem—that is, the origin of the left anterior descending and circumflex coronary arteries—with no evidence of coronary stenosis. The aberrant coronary artery was embolised with platinum microcoils delivered by a percutaneous, transcatheter, coaxial technique. The patient was subsequently symptom free with no evidence of ischaemia on exercise testing or thallium scintigraphy.

This case suggests that when there is clear evidence of myocardial ischaemia even small coronary arteriovenous fistulas should be treated by embolisation.

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Management of coronary artery fistulas is difficult because they are often asymptomatic in young individuals and have a high surgical complication rate in older patients with symptoms.¹⁻³ We describe a patient in whom percutaneous embolisation of an aberrant coronary artery fistula was successful and abolished her symptoms. The procedure was uncomplicated and offered a better alternative than surgical ligation.

Case report

A 50 year old woman presented with a two year history of increasing classic angina on effort, palpitation, and dyspnoea. In the past she had a history of an embolism to her left arm for which she was anticoagulated. The anticoagulation had to be discontinued because of subsequent gastrointestinal bleeding. There were no important risk factors for coronary artery disease. On examination she was normotensive, in sinus rhythm, and had clinical evidence of mitral valve prolapse which was confirmed on echocardiography. Further investigations showed a normal chest x ray. A conventional exercise (Bruce protocol) test produced 2 mm ST depressions in the inferolateral leads. Reversible ischaemia was seen in the territory of the left anterior

descending coronary artery on exercise thallium scintigraphy. At cardiac catheterisation, left ventricular angiography was normal and coronary arteriography showed no stenotic disease. A small arteriovenous fistula arose from the bifurcation of the left main stem coronary artery and drained into the main pulmonary artery (fig 1). In view of the clear evidence of reversible myocardial ischaemia on two thallium scintigrams we decided to embolise the fistula. A 5F-JL 4 catheter was inserted through the right common femoral artery and positioned in the proximal left coronary artery. A Tracker 18 catheter was passed coaxially through this and directed into the fistulous artery so that the tip was well into it. A single embolisation coil (0.018 inch Hilal platinum coil) was placed at this point. Though this reduced flow, it did not produce complete occlusion, so that a month later a second embolisation procedure was performed when two further coils were placed in the fistulous artery by the same technique. Follow up coronary angiography showed that the fistula had been completely occluded (fig 2).

This case shows that even a small coronary arteriovenous fistula can cause considerable myocardial ischaemia and that transcatheter embolisation is an effective treatment.

She became angina free, with a negative exercise test. Repeat thallium scintigraphy was normal with no residual ischaemia. Subsequently the patient was weaned off all antianginal medication. Repeat thallium scintigraphy and coronary angiography one year later were unchanged from the results immediately after embolisation.

Figure 1 Coronary angiogram, right anterior oblique projection, showing the coronary artery fistula.

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Figure 2 Coronary angiogram, right anterior oblique projection, with the coil in situ.

Discussion

Coronary artery fistulas, though developmental in origin, usually do not cause symptoms until about the age of 20.¹ In a review of 13 patients, 91% of those aged <20 were symptom free whereas 55% of the group aged >20 had symptoms.¹ The complications reported are myocardial ischaemia (seen in 38%) congestive cardiac failure, and bacterial endocarditis.¹ Ischaemia is known to occur with otherwise normal coronary arteries as well as in those with significant narrowing.¹ This has been attributed to "coronary steal" secondary to the fistula.^{1,4,5} Myocardial infarction is still

a rare complication.² Experience of embolisation of coronary arteriovenous fistulas and anomalies is limited and most of the arteriovenous fistulas have been large. Successful transcatheter embolisation was achieved in almost all patients with the use of detachable balloons and platinum microcoils.⁵

In a case that resembled ours, Bennett and Maree⁶ embolised a small left coronary arteriovenous fistula that was associated with evidence of ischaemia based on exercise electrocardiography and symptoms. We showed ischaemia on thallium scintigraphy and its abolition after embolisation. The use of Ivalon, which is not radio-opaque, may not be ideal, especially because arteriovenous fistulas often recanalise. A platinum microcoil seems to be effective and safe.⁵

Our case shows that even a small coronary arteriovenous fistula can cause considerable myocardial ischaemia and that transcatheter embolisation was an effective and low risk treatment.

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