

Transcatheter closure of a large right coronary artery fistula in a patient with bacterial endocarditis

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This 45-year-old male, generally healthy patient was hospitalised with sepsis, due to endocarditis with a right atrial vegetation. On an ECG-gated coronary computed tomographic angiography (CCTA), the patient was found to have a large, right coronary artery to right atrium fistula which had considerable length

and tortuosity. Endocarditis was successfully treated with antibiotics. Closure of the fistula was considered two months later based on the episode of endocarditis and the left-to-right shunt.

The pulmonary artery pressure was normal. The mixed venous oxygen saturation ($(3 \times \text{SVC} + \text{IVC}) \div 4$) was 72% with a step up to 80% in the pulmonary artery. The right coronary ostium was engaged with a JR4 guide catheter (Boston Scientific, Natick, MA). A 260 cm (0.035") Terumo wire (Terumo Medical, Somerset, NJ) was advanced across the coronary, the fistula and into the right atrium. We then snared the end of the wire using a 25 mm Arrow vascular snare (Arrow International, Reading, PA) and withdrew the wire through the right femoral venous sheath. From the venous side, we advanced a 6F Cook Shuttle sheath (Cook Inc, Bloomington, IN). Over its introducer, we were able to advance the shuttle sheath through the fistula to a position near the fistula origin from the right coronary. A 12 mm Amplatzer Vascular Plug II (AGA Medical Corporation, Plymouth, MN) was deployed with a position in the fistula targeted to a position near the arterial origin, although the ultimate position achieved was somewhat short of the desired position due to retraction of the delivery sheath as the device was advanced. After device deployment, blood flow diminished within minutes. In post procedure recovery, the patient had an episode of atrial fibrillation and underwent cardioversion. Further in-hospital course was uneventful. One month after the procedure, a CCTA was carried out which showed complete occlusion of the fistula (fig. 1).

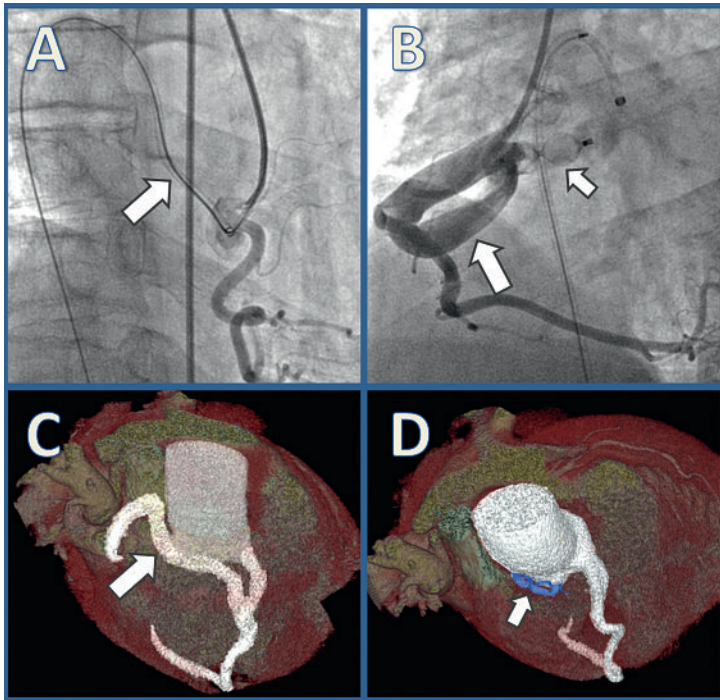


Figure 1
Transcatheter closure of a large right coronary artery fistula.

Large arrows point at the fistula. Small arrows point at the Amplatzer Vascular Plug II. A: A Terumo wire is advanced through the fistula via the right coronary artery, snared in the right atrium and pulled back through the inferior caval vein and out the right femoral venous sheath. B: An Amplatzer Vascular Plug II is deployed in the fistula through the delivery sheath placed via the right femoral venous access. C: MSCT 3-d volume rendered (VR) reconstruction of the fistula before the procedure. D: MSCT VR model after the procedure showing the vascular plug in place and no residual shunt.

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The literature reports an incidence of coronary artery in the range of 0.1% to 0.6% [1–3]. Patients with a small fistula typically remain asymptomatic. A larger fistula may be associated with symptoms or complications including congestive heart failure, pulmonary hypertension, spontaneous bacterial endocarditis, myocardial infarction, fistula rupture, or death later in life [3]. Therefore, if discovered in childhood, closure has been advocated to prevent such complications [3, 4]. While this has been carried out in children with low complication rates, the literature has reported a higher complication rate including myocardial infarction or death in patients over 20 years of age [3]. Therefore, management of asymptomatic coronary fistulae in adults remains controversial.

Traditionally, surgical correction has been the standard treatment for symptomatic patients. Although surgical treatment is safe and effective, a median sternotomy is needed. Transcatheter closure of coronary fistulae was first described by Reidy et al. [5] and has become an alternative to open heart surgery in anatomically suitable cases. In this case report, we

have reported about a 45-year-old male, who presented with endocarditis with a right atrial vegetation. We used a 12 mm Amplatzer Vascular Plug II to occlude a large coronary fistula between the right coronary artery and the right atrium. One month after the procedure, CCTA confirmed complete occlusion of the fistula.

References

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