

Successful transcatheter closure of large coronary artery fistula

A 49-year-old man with severe dyspnea and chest pain was found to have coronary arteriovenous fistula by multi-slice computed tomography following evaluation of continuous murmur and a dilated left ventricle (Fig. 1). The left coronary angiogram showed large coronary artery fistula originating from the circumflex artery and draining into the coronary sinus and a poorly opacified left anterior descending and circumflex artery and branches (Fig. 2A, B and Video 1). There was no evidence of significant atherosclerotic coronary artery disease. Myocardial perfusion imaging showed an inferolateral ischemia, suggesting coronary steal. Firstly, we used retrograde approach through the coronary sinus for the device closure. Because of significant angulation of the coronary sinus to coronary fistula, wires could not be pass into distal angulation of the fistula. Then, we strived to pass distal angulation through antegrade fashion. Through the fistulous track, neither 0.035" hydrophilic wire nor 0.018" exchange-length wire could pass the angulation of the venous end, but only a 0.014" exchange-length wire with the of support microcatheter was negotiated into the coronary sinus and then into the right atrium. The tip of the wire was snared from the venous side using a 15 mm goose-neck snare. An arteriovenous loop was made, but a 6 Fr right Judkins catheter could not advance into the venous end of fistula.

Hence, we decided on antegrade approach through the circumflex artery for the device closure. A 0.035" super stiff 3 mm J-tip wire with a support 0.035" hydrophilic wire was introduced into the circumflex coronary artery and advanced into the fistula to reduce angulation of the proximal side of fistula (Fig. 3). Subsequently, an 8 Fr left Judkins catheter was introduced over the super stiff wire and positioned in the fistula. A16 and 14 mm AMPLATZER™ Vascular Plugs I (St. Jude Medical, MN -USA) (AVP) devices could not introduced from inside of catheter, but only 12 mm AVP was successfully deployed at the narrow-



Figure 2. Selective coronary angiogram in right caudal view shows dilated circumflex artery with an aneurysm and fistula draining into the coronary sinus. Note the poor opacification of the left coronary system, suggestive of coronary steal (A). Check angiogram shows no residual shunt, with good opacification of coronary arteries and the AMPLATZER™ Vascular Plug I devices in situ (B)

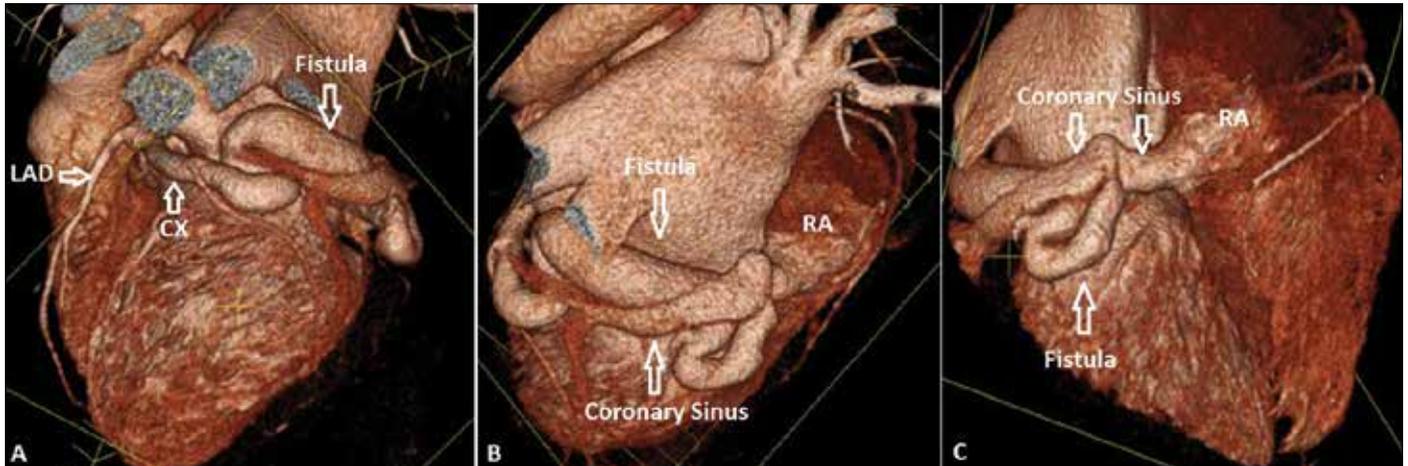


Figure 1. (A-C) MDCT coronary angiography of fistula from CX to coronary sinus
CX - circumflex artery; LAD - left anterior descending artery; RA - right atrium

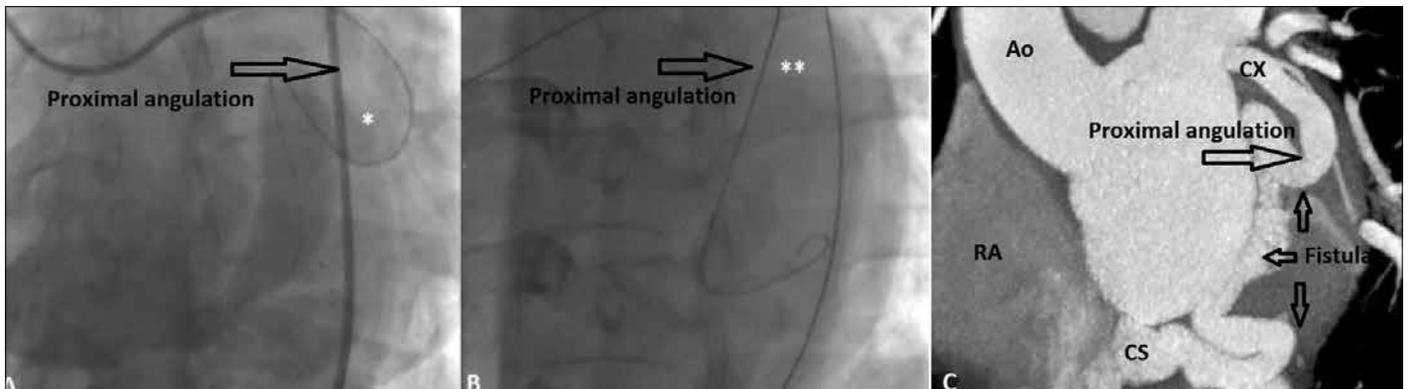


Figure 3. 0.035"Hydrophilic wire across the angulation of the fistula (A). 0.035"Super stiff 3mm J-tip wire across the angulation of the fistula and reduce angulation (B). MDCT coronary angiography of fistula from CX to CS (C)
Ao - aorta; CS - coronary sinus; CX - circumflex artery; RA - right atrium

est point in the proximal part of the fistula. However control angiogram showed residual flow in the fistula and we used 6 Fr right Judkins catheter to push forward AVP device inside of the 8 Fr left Judkins catheter. Eventually, a 14 and 16 mm AVP devices were deployed just below to circumflex branches.

Repeat angiogram showed complete closure of the defect as well as improved filling of the coronary branches (Fig. 2B, Video 2). The patient had an uneventful hospital course. At 3-month follow-up, the patient is asymptomatic and doing well.

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Video 1. Selective coronary angiogram in right caudal view shows dilated circumflex artery with an aneurysm and fistula draining into the coronary sinus. Note the poor opacification of the left coronary system, suggestive of coronary steal

Video 2. Check angiogram shows no residual shunt, with good opacification of coronary arteries and the AMPLATZER™ Vascular Plugs I devices in situ

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Giant right coronary artery aneurysm with atherosclerotic disease

Coronary artery aneurysm (CAA) is defined as dilatation of the coronary artery that is more than 1.5 times the diameter of normal adjacent segments. A coronary artery with a diameter more than 2 cm is

termed as 'giant aneurysm'. In adults, CAA is predominantly atherosclerotic in origin; however, other causes include Kawasaki disease, autoimmune disease, trauma, infection, dissection, congenital malformation and angioplasty.

A 63-years-old man was admitted to our hospital with chest pain. On physical examination, blood pressure was 145/90 mm Hg and pulse rate 70 beats/min. The rest of the physical examination was unremarkable. The 12-lead electrocardiogram showed Q waves in V1-4 leads. Transthoracic echocardiography demonstrated left ventricular ejection fraction of 40%, dilated left heart chambers and, an extra-cardiac mass was noted adjacent to the right atrium (Fig. 1). The patient was then referred for cardiac computed tomography (CT) angiography for further evaluation. A prospective ECG-gated contrast-enhanced CT angiogram was obtained on 64-slice multi-detector CT (MDCT). A giant atherosclerotic right coronary artery (RCA) aneurysm located and involving the proximal segments was confirmed. The aneurysm had a diameter of 32x22 mm (Fig. 2).

Diagnostic coronary angiography showed an aneurysm arising from the proximal segment of the RCA. There was total occlusion of the ostial left anterior descending artery and 70 % stenosis of the proximal circumflex artery (Fig. 3, Video 1-2).

Coronary artery bypass graft surgery for three vessels and coronary artery aneurysm ligation were performed (Fig. 4). The follow up period for one month was uneventful.

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Video 1. Right coronary angiogram showing the giant aneurysm of the proximal RCA

Video 2. Left coronary angiogram showing total occlusion of the ostial LAD artery and 70% stenosis of the proximal Cx artery

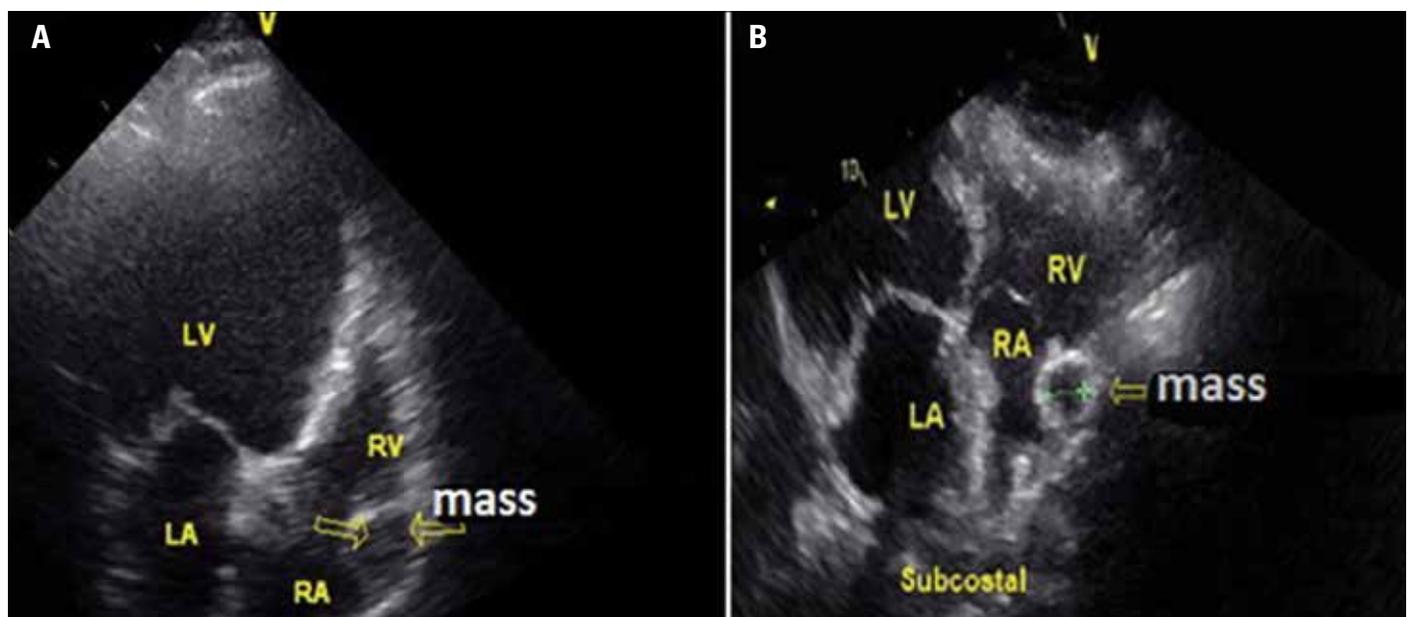


Figure 1. Echocardiogram; apical and subcostal four-chamber views showing an echogenic mass compressing the right atrium

LA - left atrium; LV - left ventricle; RA - right atrium; RV - right ventricle