Percutaneous Closure of Left Main Coronary Artery Fistula Using AMPLATZER Vascular Plug II and AMPLATZER Duct Occluder I

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A coronary artery (CA) fistula is a rare entity reported in ~0.1% to 0.2% patients undergoing angiography. A 3-year-old asymptomatic child was diagnosed with a large coronary artery fistula arising from the left main CA, leading to coronary steal. We report our experience of successful transcatheter closure of the coronary arterial fistula arising from the left main CA and draining into the superior vena cava-right atrium (SVC-RA) junction using 2 devices, the AMPLATZER Vascular Plug II (AVP II) and

FIGURE 1 2D Echocardiogram (Short Axis View) Demonstrating the Fistula

A 2-dimensional echocardiogram (short-axis view) showing an aneurysmally dilated left main coronary artery (CA) with the presence of a large coronary cameral (CC) fistula originating in the left main CA. Reprinted with permission from Bagul et al. (1).
the AMPLATZER Duct Occluder I (ADO I) (St. Jude Medical, St. Paul, Minnesota).

A 3-year-male child presented with an incidentally detected continuous murmur during evaluation for respiratory tract infection. Two-dimensional echocardiography showed an aneurysmally dilated left main CA with the presence of large coronary cameral fistula originating from the left main CA (Figure 1) (1).

The procedure was done with the patient under general anesthesia. Bilateral femoral arterial access was obtained. Bilateral femoral arterial access was obtained. A 3-F Berman catheter was used to perform the procedure. A 0.035-inch exchange length angle-tipped guidewire (Terumo Corporation) was passed over a 5-F end-hole catheter to the distal end of the fistula into the superior vena cava and the guidewire being snared with 15-mm gooseneck snare passed through the venous end (Online Video 2).

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Fluro image showing continuous arteriovenous loop and Berman catheter placed in the aortic root.
were secured. Unfractionated Heparin, 100 U/kg, was administered before the procedure. An aortic root angiogram was obtained to profile the CAs and demonstrate the coronary steal. An angiogram of the fistula was obtained using a 5-F Berman catheter (Arrow-Berman Angiographic Catheter; Teleflex, Morrisville, North Carolina) with distal balloon occlusion. The fistula showed 2 constrictions: 1 proximal and 1 distal before it opened into the SVC-RA junction (Figure 2, Online Video 1). Through a 5-F

(AMPLATZER Duct Occluder I delivered via the same sheath across the distal constriction. AVP II — Amplatzer Vascular Plug II; ADO I — Amplatzer Duct Occluder I.)

Follow-up angiogram after 2 years showing good opacification of the coronary arteries with complete occlusion of the fistula. LCA — Left Coronary artery; other abbreviations as in Figure 5 (Online Video 7).

Post-procedure angiogram showing the device in a good position with no residual shunt and better opacification of the coronary arteries (Online Video 6).

A 2-dimensional echocardiogram (short-axis view) demonstrating complete occlusion of the fistula and well-placed devices. Arrow showing the device in situ. RA — right atrium; RV — right ventricle (Online Video 7).
end hole catheter, an 0.035-inch exchange length angle-tipped guidewire (Terumo Corporation, Tokyo, Japan) was passed to the distal end of the fistula into the SVC (Figure 3, Online Video 2). The distal end of this angled-tip guidewire was snared in the SVC and exteriorized from the right femoral venous sheath, using a 15-mm gooseneck snare (Online Video 3). A continuous atrioventricular (AV) loop was hence created (Figure 4). Check angio shoots were taken with the help of a 5-F pigtail catheter via the right arterial access (Online Video 4). A 6-F AMPLATZER patent ductus arteriosus sheath was passed over the Terumo guidewire from the venous side and positioned in the fistula just proximal to (on the arterial side of) the proximal constriction. The AV loop circuit was broken. A 12-mm AVP II was deployed in the proximal constriction (Figure 5, Online Video 5). The distal constriction was occluded with the help of an ADO I device (Figure 6). A repeat angiogram showed that the device was in a good position with no residual shunt and better opacification of the CAs (Figure 7, Online Video 6). The procedure was uneventful. An electrocardiogram showed no abnormality. The patient was started on aspirin 5 mg/kg/day for 6 months and annual follow-up. A follow-up angiogram done after 2 years showed complete occlusion of the fistula and good flow in the left anterior descending and circumflex arteries (Figures 8 and 9, Online Video 7).

We report this case because a proximal fistula arising from the left main CAs is a very rare entity (2) as is the percutaneous closure of such a defect. To the best of our knowledge, this is the first case of a left main CA fistula being closed percutaneously. We would also like to highlight the precise selection of the devices: the AVP II in the proximal part of the fistula and the ADO I in the distal constriction. Intermediate-term follow-up, both clinically and angiographically, were satisfactory.

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**REFERENCES**


**KEY WORDS** AVP II, ADO I, left main coronary fistula, percutaneous

**APENDIX** For supplemental videos, please see the online version of this article.