Use of a Thrombectomy Catheter for Contrast Injection: A Novel Technique for Preventing Extension of an Aortocoronary Dissection During the Retrograde Approach to a Chronic Total Occlusion

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ABSTRACT: Percutaneous coronary intervention of a chronic total occlusion can be complicated by aortocoronary dissection. To prevent extension of the dissection, repeat contrast injections are discouraged; however, they are sometimes required to confirm optimal distal angiographic result. We describe use of a thrombectomy catheter for distal contrast injection in one such patient that allowed distal vessel visualization without propagating the aortocoronary dissection.

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Case Report. A 65-year-old woman with medically refractory angina was referred for percutaneous coronary intervention (PCI) of a right coronary artery (RCA) chronic total occlusion (CTO) (Figure 1A). The right posterior descending artery (PDA) filled by collaterals from the left anterior descending (LAD) coronary artery (Figure 1B) including a CC2 collateral from the LAD to the PDA (Figure 1C). A prior antegrade CTO PCI attempt had failed; hence, a primary retrograde approach was planned.

Bilateral femoral arterial access was obtained with 8 Fr sheaths. The left main was engaged with an XB 3.5 guide and the RCA with an AL1 guide catheter. The CC2 septal collateral was easily crossed with a Sion guidewire (Asahi Intec) through a Corsair microcatheter (Asahi Intec) (Figure 1D). Antegrade dissection was performed using a knuckle wire (Figure 1E), followed by successful retrograde guidewire crossing into the proximal RCA using the reverse controlled antegrade and retrograde tracking and dissection (reverse CART) technique. A R350 guidewire (Vascular Solutions) was externalized, followed by balloon angioplasty and stent implantation (Figure 1F). Antegrade injections caused an aortocoronary dissection (Figure 1G). We attempted to use intravascular ultrasound (IVUS) to determine whether additional stent implantation was required distal to the deployed stents, but the rotational IVUS catheter could not reach that coronary segment. Attempts to use a GuideLiner guide extension (Vascular Solutions) resulted in expansion of the dissection. A 7 Fr Export thrombectomy catheter (Medtronic, Inc) was advanced to the distal RCA and contrast injection was performed, confirming excellent distal angiographic result without extending the aortocoronary dissection. The patient had an uneventful recovery and complete angina relief.

Discussion. Aortocoronary dissection is a rare, yet potentially serious complication of CTO PCI because if it extends into the contralateral coronary ostium or the descending aorta, it may require emergency cardiac surgery for correction or can lead to death. Aortocoronary dissection of the donor vessel during CTO PCI is an especially severe complication, as it can rapidly result in acute hemodynamic collapse and/or death and requires immediate percutaneous treatment.

Once aortocoronary dissection occurs, it is of paramount importance to abstain from additional contrast injections that could result in extension of the dissection. Moreover, an ostial stent should be placed to cover the coronary ostium, which can be confirmed using IVUS. IVUS can also be used to ensure adequate distal vessel recanalization, but did not reach the target distal vessel in our patient. In four published aortocoronary dissection cases in CTO PCI series, 3 patients were treated conservatively and 1 patient was treated with covered stent implantation. We demonstrate a creative solution to confirming an adequate distal angiographic result by distal insertion of a thrombectomy catheter and localized contrast injection, which does not back flow into the proximal part of the dissected vessel and does not extend the dissection. A 7 Fr thrombectomy catheter was used in our case (since we were already using an 8 Fr guide catheter for CTO PCI); however, a smaller 6 Fr thrombectomy catheter and even a large-lumen microcatheter or over-the-wire balloon could also provide adequate visualization of the distal true lumen and could be easier to deliver through the previously deployed stents. Follow-up aortic imaging (with transesophageal echocardiography or computed tomography) may still be required to ensure resolution of the dissection.
References


Figure 1. Coronary angiography demonstrating a proximal right coronary artery chronic total occlusion (A), with the distal vessel filling via septal collaterals (B, C). Retrograde guidewire crossing was successful via a septal collateral (D) followed by use of the reverse CART technique (E) and wire externalization (F). After stenting, aortocoronary dissection became evident (G). A 7 Fr thrombectomy catheter was inserted into the distal right coronary artery and contrast injection confirmed adequate distal angiographic result without propagating the aortocoronary dissection (H).