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Proper Support: Right Coronary Artery Chronic Total Occlusion Treated Via a Bi-Radial Approach

Use of the R2P DESTINATION SLENDER Guiding Sheath (Terumo) can increase support and attenuate tortuosity, enabling operators to perform complex cases.

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While the trend in percutaneous coronary intervention has been towards the use of smaller access and a radial artery approach, the technical challenges posed by chronic total occlusions have offered resistance to this transition for the bulk of operators. Most operators rely on dual femoral access with 8 French (Fr), 45 cm or longer sheaths that provide maximum support and straighten iliac artery tortuosity. There are, however, several disadvantages to the femoral approach, including peripheral artery disease that can increase the difficulty of access, absence of femoral access, increased minor and major bleeding risk, and inability to use closure devices, which can increase the length of patient hospital stay and cost of the overall procedure. Due to these disadvantages, operators may rely on a combination approach, using both femoral and radial access. A bi-radial access can also be used, but has been routinely criticized for insufficient support, frequently required to cross chronic calcified lesions, overcome tortuosity, and deliver devices. Fortunately, the introduction of the 75 and 85 cm R2P™ DESTINATION SLENDER™ Guiding Sheath (Terumo) offers the ability to attenuate subclavian tortuosity and maximize support at the tip of the guide. Here, we present a case of a right coronary artery chronic total occlusion treated via a bi-radial approach with two 85 cm R2P DESTINATION SLENDER Guiding Sheaths.

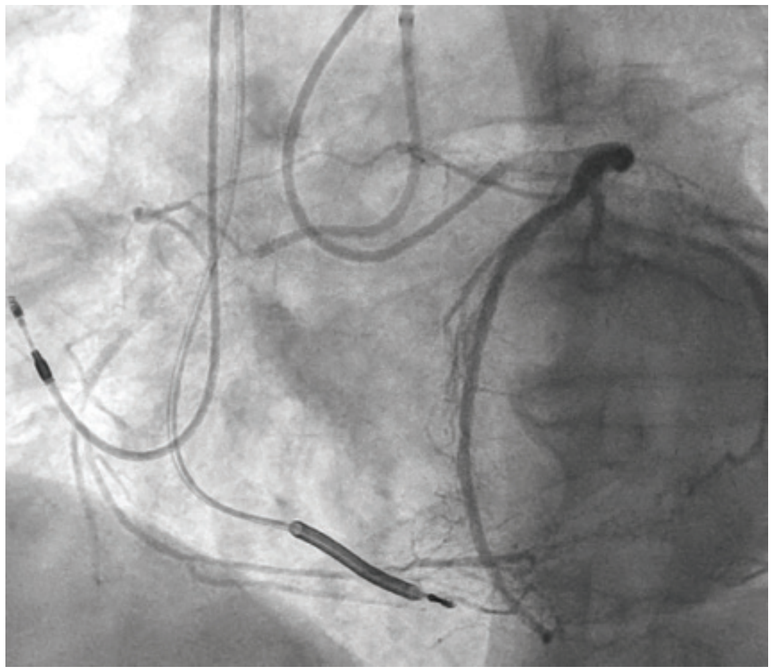

Figure 1. Left anterior oblique (LAO) projection demonstrating bi-radial approach using two 6 French, 85 cm DESTINATION SLENDER Guiding Sheaths (Terumo) and showing a right coronary artery chronic total occlusion with left to right collaterals.

Clinical Case

A 68-year-old gentleman presented initially with an out-of-hospital cardiac arrest and received immediate cardiopulmonary resuscitation in the field with return of spontaneous circulation on arrival to the cardiac catheterization laboratory. During the initial cardiac catheterization, he was diagnosed with severe two-vessel coronary artery disease involving a likely culprit lesion in the proximal left anterior descending artery and a chronic total occlusion of the right coronary artery. The culprit lesion was treated with one drug-eluting stent at the index coronary angiogram. His ejection fraction recovered to near normal and he was discharged with follow-up. On the follow-up, he complained of ongoing stable Canadian Cardiovascular Society class III symptoms and was treated initially with antianginal therapy (metoprolol tartrate 100 mg BID, isosorbide mononitrate 120 mg, amlodipine 10 mg, lisinopril 20 mg, and ranolazine 1000 mg). Despite optimal medical therapy, he continued to remain extremely symptomatic and presented for percutaneous coronary intervention of his chronic total occlusion.

Procedure

A 6 Fr, 10 cm GLIDESHEATH SLENDER® Introducer Sheath (Terumo) was used to gain access in the right radial and left distal radial arteries. Two hundred (200) mcg of intra-arterial nitroglycerin and 200 mcg of intra-arterial nicardipine were given for each access. Each access point was exchanged for a 6 Fr, 85 cm R2P DESTINATION SLENDER Guiding Sheath (Terumo) over a 180 cm, .035-inch J-tipped guidewire. A 6 Fr Amplatz Left (AL) 0.75 VISTA BRITE Guiding Catheter (Cordis) was used to engage the right coronary artery and a 6 French XB 3.5 ADROIT™ Guiding Catheter (Cordis) was used to engage the left coronary artery. A Twin-Pass® Dual Access microcatheter (Teleflex) was advanced over the RUNTHROUGH® NS Coronary Guidewires (Terumo) into the proximal right coronary artery. A Fielder® XT-A (Asahi Intecc) was then used in an attempt to engage the proximal cap, but was without success. It was exchanged for a MIRACLEBROS® 6 (Asahi Intecc), which penetrated the proximal cap, but was unsuccessful at crossing the distal cap. The Twin-Pass Dual Access microcatheter was exchanged for a Turnpike® LP microcatheter (Teleflex) but was also without success. The Turnpike was then exchanged for a Fielder XT-A, then a HI-TORQUE PILOT™ 200 guidewire (Abbott Vascular), and finally, a CONFIANZA® Pro 12 guidewire (Asahi Intecc), all of which were unable to cross the distal cap true-to-true lumen. Instead, a HI-TORQUE PILOT 200 guidewire was knuckled, and used to perform subintimal tracking and re-entry technique into the mid right coronary artery. The HI-TORQUE PILOT 200 guidewire was first exchanged for a RUNTHROUGH NS Extra Floppy guidewire to wire the RV marginal branch and then exchanged for a GRAND SLAM® guidewire (Asahi Intecc). A 2.5 mm x 20 mm EMERGE PTCA Dilation Catheter (Boston Scientific) was used to pre dilate the lesion, followed by a 3.0 mm x 20 mm NC EMERGE PTCA Dilation Catheter (Boston Scientific). Angiography showed antegrade flow into the RV marginal, but not into the posterior descending artery or the posterolateral branches. Two SYNERGY EES PtCr coronary stents (Boston Scientific), a 3.5 mm x 38 mm and a 3.5 mm x 12 mm, were deployed proximally. A RUNTHROUGH NS Extra Floppy coronary guidewire with a Turnpike LP was then used to wire the posterior descending artery/posterolateral branches and the RUNTHROUGH NS Extra Floppy coronary guidewire was exchanged for a GRAND SLAM guidewire. The Turnpike LP was removed using a DOC Guide Wire Extension (Abbott Vascular). A 2.75 mm x 38 mm SYNERGY EES PtCr coronary stent was deployed from the posterolateral into the distal right coronary artery, followed by a 3.5 mm x 38 mm SYNERGY EES PtCr coronary stent. All stents were deployed at nominal pressure. The first GRAND SLAM coronary guidewire was removed. A 3.5 mm x 20 mm SYNERGY EES PtCr coronary stent was then deployed, overlapping the first and second 3.5 mm x 38 mm stents. These stents were then post dilated with a 4.0 mm x 20 mm NC EMERGE PTCA Dilation Catheter. A 3.5 mm x 12 mm SYNERGY EES PtCr coronary stent was deployed at the ostium of the right coronary artery and post dilated with a 4.0 mm x 20 mm NC EMERGE PTCA Dilation Catheter. Final angiography showed TIMI-III flow, no residual stenosis, and no perforation or dissection.

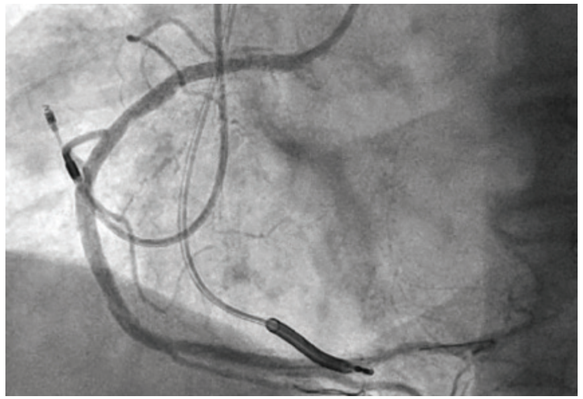

Figure 2. Retrograde injection in the LAO projection demonstrating a microcatheter in the true lumen of a RV marginal branch.to right collaterals.

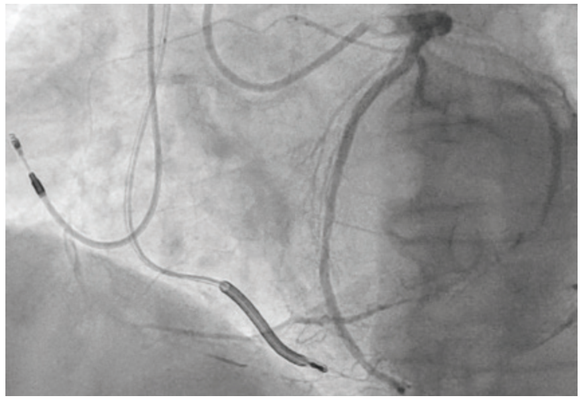

Figure 3. Antegrade injection in the LAO projection demonstrating a RUNTHROUGH NS Extra Floppy Coronary Guidewire (Terumo) in the true lumen of a posterolateral branch.

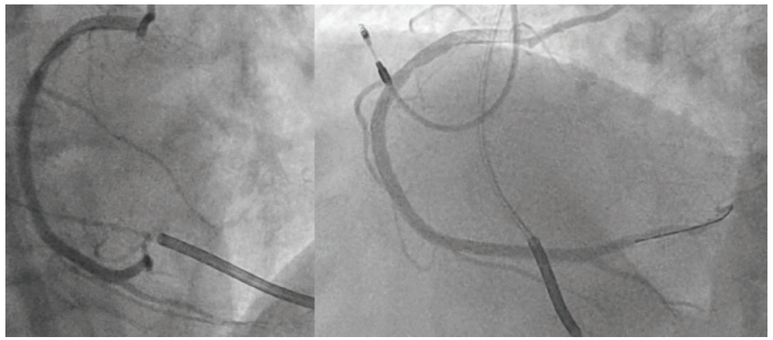

Figure 4. LAO (at left) and right anterior oblique (RAO) (at right) projections demonstrating final angiography of the recanalized right coronary artery.

Conclusion

Use of the R2P DESTINATION SLENDER Guiding Sheath can increase support and attenuate tortuosity, enabling operators to perform complex cases including chronic total occlusions via bi-radial access, thereby reducing length of patient hospital stay and overall cost, and minimizing bleeding complications associated with a femoral access strategy. ■

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