Chronic Total Occlusion (CTO) Percutaneous Coronary Intervention (PCI) Program at UPMC

Case Study

An increasingly common scenario that is encountered at the UPMC CTO PCI Program is that of patients with remote prior coronary artery bypass graft (CABG) surgery who develop aggressive disease in their vein grafts (SVG), ultimately leading to closure. While PCI of the SVG is often initially feasible, the rate of recurrent events is very high. Thus, it becomes preferable to consider treating the native coronary artery CTO rather than the SVG, as the long-term patency of a CTO PCI compares favorably to that of an SVG. Furthermore, the old vein graft can be used as a conduit for retrograde access for the native coronary PCI.

The following case describes a 72-year-old-woman with a history of hypertension and coronary artery disease post-CABG in 2003. She had multiple presentations with unstable angina leading to PCI of her SVG to the right coronary artery (RCA) in 2012 with recurrent stent restenosis and disease progression, and four additional PCIs in the same graft. In 2016, in the context of recurrent symptoms, she was found again to have diffuse disease in her SVG to the RCA and was referred to us for PCI of her chronically occluded RCA rather than a repeat procedure on the vein graft.

Her initial angiograms are represented in Figure 2. The SVG to RCA is diffusely diseased and the RCA has a CTO in the mid segment. Using dual arterial access, we initially started with an antegrade approach in the subintimal space. Next, in a retrograde manner, we traversed from the vein graft into the RCA (Figure 3).

(continued)

Program at a Glance

- Inception: November 2013
- Total Cases: Over 350 cases
- Technical success rate of 91 percent
- Favorable program results compared to peers (see Figure 1; data from the Progress CTO Registry)

Figure 1A-B: Program Results.

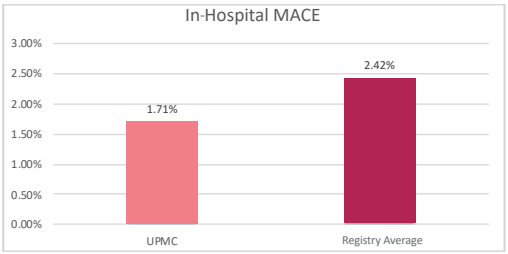

Figure 1A. In-Hospital MACE.

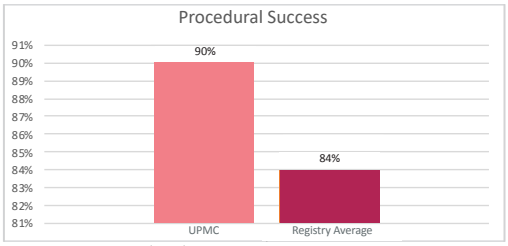

Figure 1B. Procedural Success.

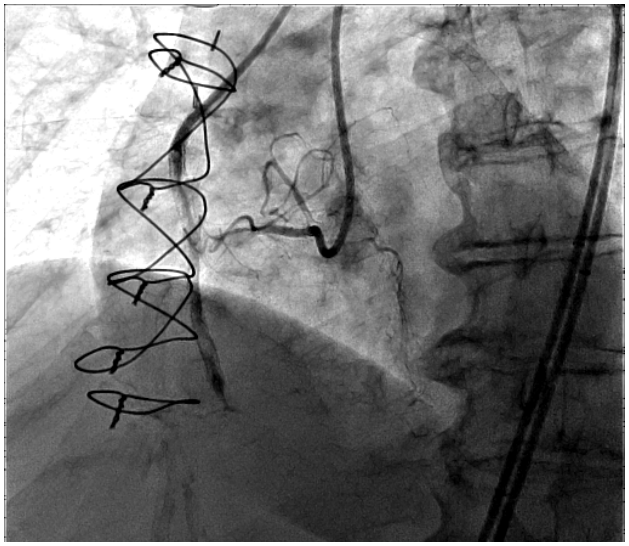

Figure 2. Occluded RCA with diffusely diseased SVG.

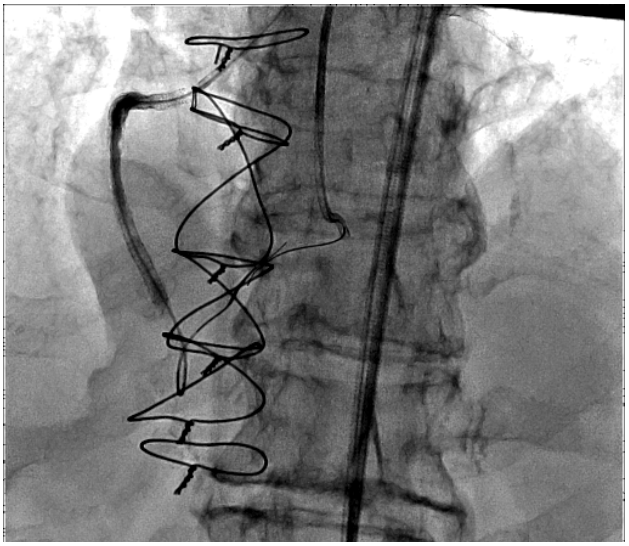

Figure 3. Retrograde access through the SVG with reverse CART in the CTO segment.

True lumen re-entry with the retrograde wire was achieved following balloon dilatation of the subintimal space antegrade (a procedure known as reverse CART) and the retrograde wire was externalized via the antegrade guide, followed by angioplasty and stenting with a good result (Figure 4). A repeat cardiac catheterization two years later revealed excellent patency of the RCA with no significant ISR (Figure 5), very different than the recurrent disease in the SVG, which is now closed.

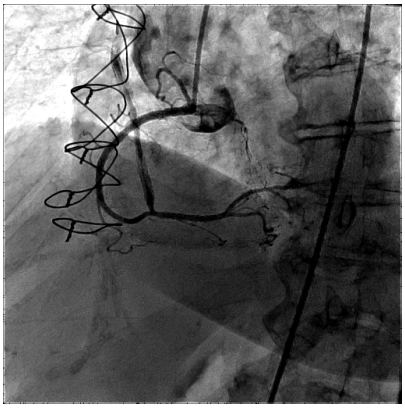

Figure 4. Final result after stenting the RCA.

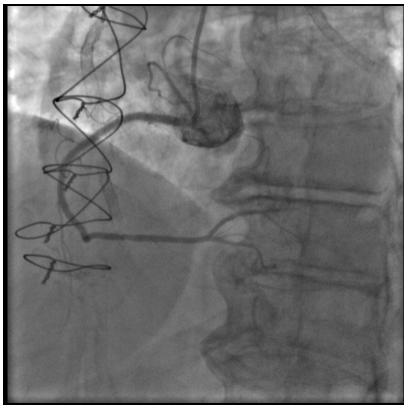

Figure 5. Stable PCI result two years later.

Conclusion

This case illustrates that native coronary PCI, even in the setting of a CTO, is a viable alternative to PCI of the SVG. Old vein grafts can often be used to provide retrograde access to the CTO and facilitate the intervention.

Meet the Experts

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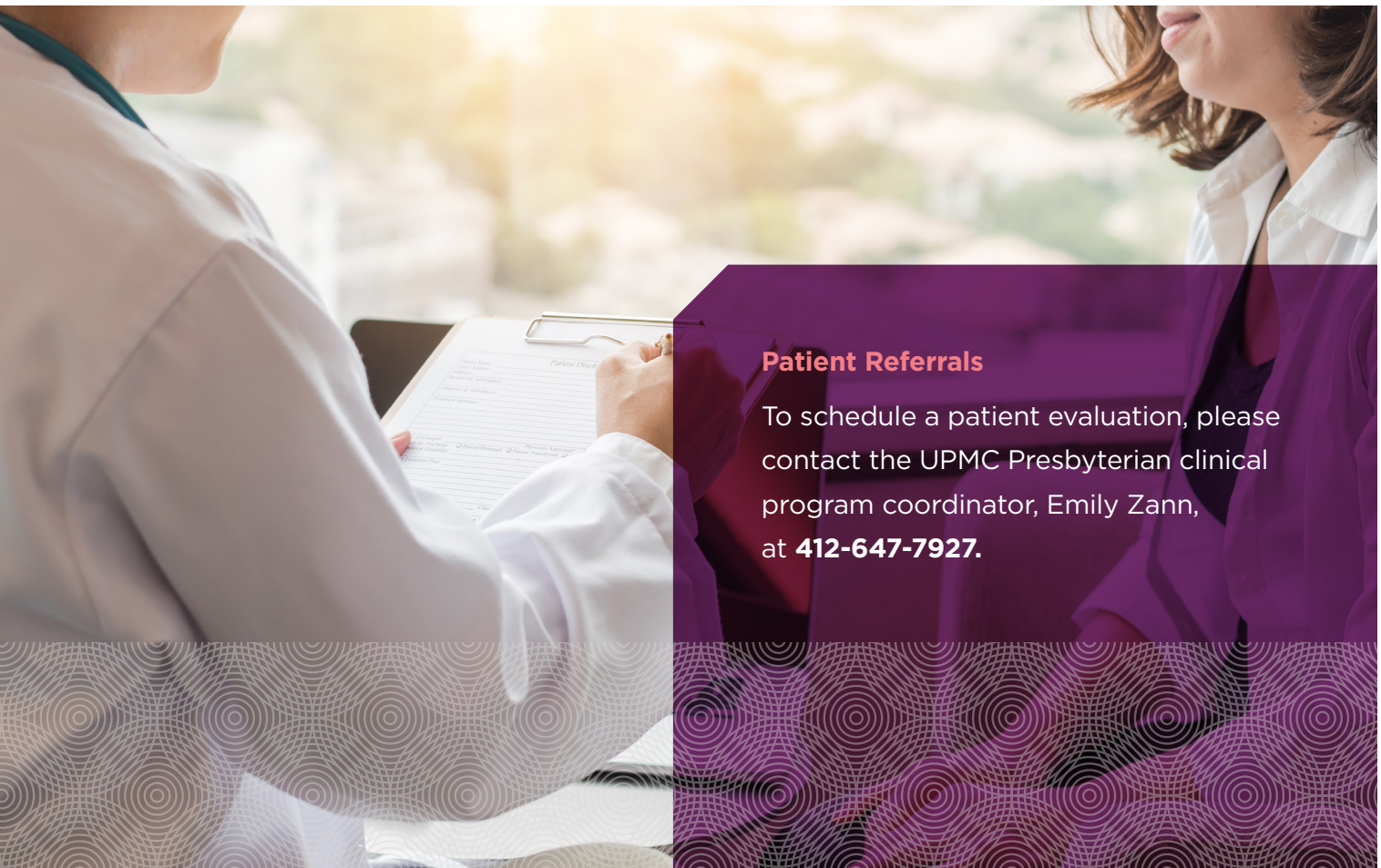

Patient Referrals

To schedule a patient evaluation, please contact the UPMC Presbyterian clinical program coordinator, Emily Zann, at **412-647-7927.**