ABSTRACT: Bioresorbable vascular scaffold has many advantages over the metallic stent in the treatment of coronary stenotic lesions. It has added advantages in lesions that are close to the ostium of the culprit vessel, as in the left main coronary artery, right coronary artery, or left internal mammary artery, as in our case. As the hanging segments of the stent dissolve in 2 years, it reduces difficulty in engaging the vessel for future interventions if needed. To the best of our knowledge, this is the first case report of the Absorb bioresorbable vascular scaffold implanted in the left internal mammary artery from the left radial approach.

Case Description

A 57-year-old hypertensive female who underwent coronary artery bypass grafting 6 months prior was admitted with gradually progressive refractory angina for the last 1 month. Twelve-lead electrocardiogram revealed inverted T-waves in anterior precordial leads. Two-dimensional echocardiography revealed mild left ventricular systolic dysfunction (left ventricular ejection fraction, ~40%). After informed consent, coronary angiography through left radial artery approach was performed, which revealed native triple-vessel disease with saphenous vein graft (SVG) to diagonal totally occluded and patent SVG to right coronary artery (RCA). Left internal mammary artery (LIMA) to left anterior descending (LAD) artery showed 99% critical lesion near the ostium with TIMI-2 flow (Figure 1A; Video 1).
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available at www.invasivecardiology.com). Percutaneous coronary intervention to the LIMA-LAD was planned. The LIMA was engaged with a 6 Fr internal mammary guiding catheter (Launcher; Medtronic, Inc) and the lesion was crossed with a 0.014” BMW guidewire (Abbott Vascular) and subsequently predilated with a 2.5 x 15 Voyager PTCA balloon catheter (Abbott Vascular) at 12 atm (Figure 1B). The 3.0 x 18 mm Absorb scaffold (Abbott Vascular) was positioned across the lesion with the help of two platinum markers (Figure 2A, arrows) and deployed at 14 atm with TIMI-3 flow (Figure 2B; Video 2, available at www.invasivecardiology.com). The patient was discharged on dual-antiplatelet therapy in hemodynamically stable condition and was asymptomatic at 1-month follow-up.

Discussion

Bioresorbable vascular scaffold (BVS) has many advantages over metallic stents. The main advantage of the BVS in ostial lesions, as in our case, is that it reduces difficulty in re-engaging the vessel for future interventions if needed since there is no protrusion of struts after 2 years; however, the two technologies are similar in the initial 2 years from the index procedure until complete resorption of the scaffold. Similarly, if the BVS is deployed in a coronary artery with jailing of a major side branch, the patency of the jailed side branch may be recovered once the struts are completely resorbed. The other potential advantages include restoration of vasomotion and adaptive shear stress, reduction in late luminal enlargement and late or very late stent thrombosis, and the ability for non-invasive assessment (computed tomography or magnetic resonance imaging) of coronaries during follow-up since metallic stents produce excessive artifacts. It also facilitates future coronary percutaneous or surgical revascularization if required, since there will be no metallic cage once the scaffold is completely resorbed. In the future, this technology holds promise in pediatric patients as well, since it allows vessel growth and does not require eventual surgical removal of the implant. However, one of the major limitations of the BVS is its limited distensibility, which may lead to strut fracture if deployed at high pressure; therefore, the BVS should be implanted in an appropriately sized vessel.

Although this newer technology is in its infancy, it holds promise to revolutionize coronary interventions in the future. To the best of our knowledge, this is the first case reported with BVS in a LIMA-LAD graft.

References