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1-Year Follow-Up Optical Frequency Domain Imaging of Multiple Bioresorbable Vascular Scaffolds for the Treatment of Spontaneous Coronary Artery Dissection

Jonathan Watt, MB, ChB, MD, Mohaned Egred, MB, ChB, MD, Ayush Khurana, MB, ChB, Alan J. Bagnall, MB, ChB, PhD, Azfar G. Zaman, MB, ChB, MD

A 32-year-old woman with chest pain and anterior ST-segment elevation myocardial infarction was referred to our institution for primary percutaneous coronary intervention. Coronary angiography showed severe left main stem (LMS) and left anterior descending coronary artery (LAD) stenosis (**Figures 1A and 1B**). Intravascular ultrasound (IVUS) revealed spontaneous coronary artery dissection (SCAD) with extensive intramural hematoma (IMH) (**Figures 1C and 1D**). Four minimally overlapped Absorb bioresorbable scaffolds (BRS) (Abbott Vascular, Abbott Park, Illinois) were implanted from the distal LAD to the LMS (3.0 × 28 mm; 3.5 × 28 mm; 3.5 × 12 mm, and 3.5 × 28 mm) and post-dilated with 3.5 mm and 4.0 mm noncompliant balloons with a good final result achieved (**Figures 1E and 1F**). Optical coherence tomography showed excellent expansion and well-apposed scaffolds. After 1 year, the patient complained of throat tightness, therefore repeat angiography was performed showing widely patent BRS (**Figures 2A and 2B**). Optical frequency domain imaging showed good scaffold expansion with tissue coverage of all BRS struts (**Figure 2C**), although malapposition was prevalent, predominantly near bifurcations (**Figure 2D**, Online Video 1). No further intervention was performed, but continuation of dual antiplatelet therapy was recommended.

SCAD can often be treated conservatively, but in refractory ischemia, BRS are an appealing way to avoid a permanent implant (1). To our knowledge, no follow-up intracoronary imaging for SCAD treated with BRS has been reported. We have shown that multiple BRS are feasible to treat extensive SCAD. After 1 year, malapposition of BRS struts may occur; this is likely caused by resorption of IMH (2). BRS may be preferable to life-long malapposition of metallic stents. Optimal scaffold expansion and strut tissue coverage are likely to reduce the risk of late thrombosis. We intend to continue dual antiplatelet therapy until BRS resorption after 2 years. We believe that implantation of BRS may represent an attractive strategy when intervention for SCAD is absolutely necessary.

REPRINT REQUESTS AND CORRESPONDENCE: Dr. Jonathan Watt, Cardiothoracic Centre, Freeman Hospital, Freeman Road, Newcastle upon Tyne NE7 7DN, United Kingdom. E-mail: j.watt@nhs.net.

From the Cardiothoracic Centre, Freeman Hospital, Newcastle upon Tyne, United Kingdom. Dr. Egred is a proctor for Abbott Vascular. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

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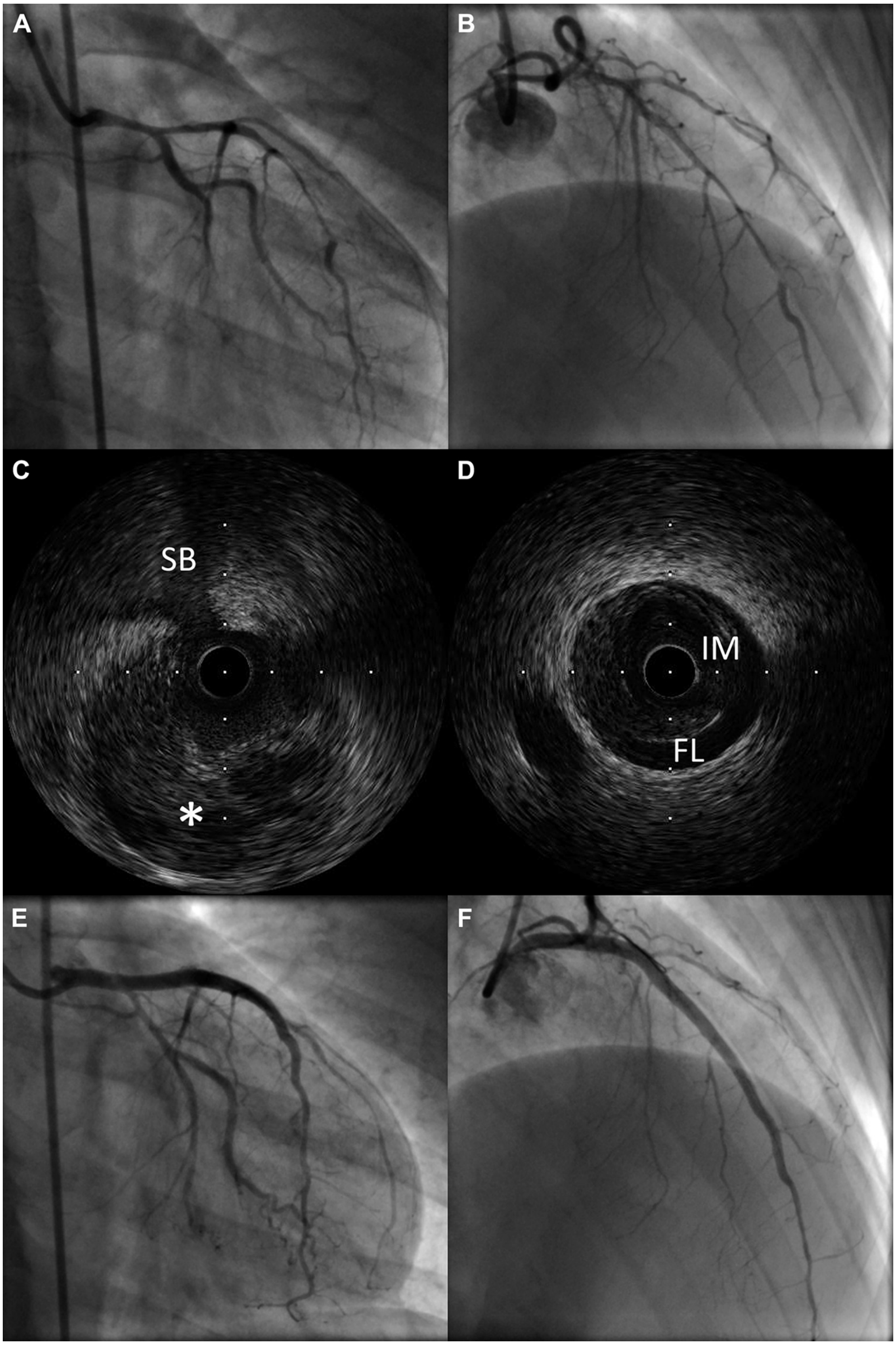
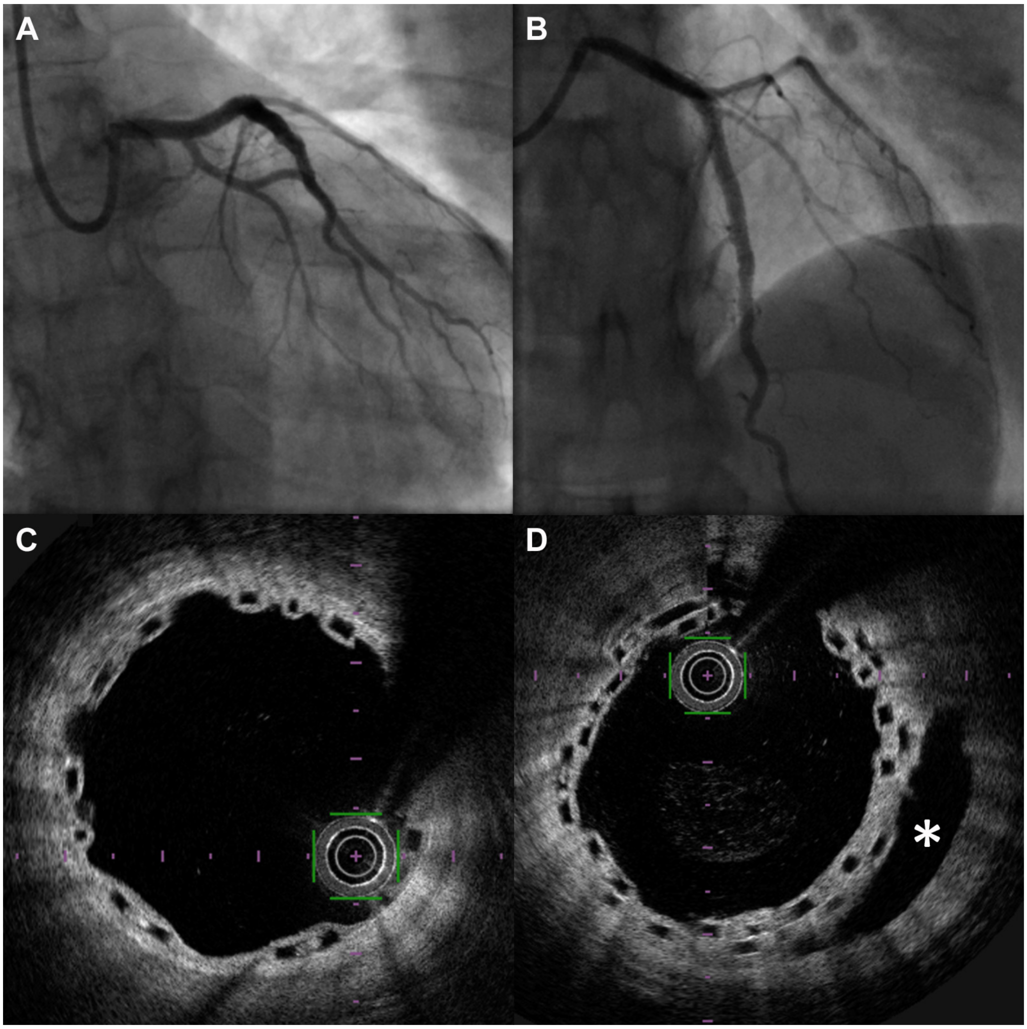
FIGURE 1 **Coronary Angiography and IVUS of Presenting Case**



Right anterior oblique (RAO) caudal **(A)** and cranial **(B)** views showing severe luminal compression extending to the distal left anterior descending coronary artery (LAD). **(C)** Intravascular ultrasound (IVUS) showing intramural hematoma (IMH) **(asterisk)** in the proximal LAD, where a side branch (SB) exits the true lumen. **(D)** IVUS showing an intimomedial membrane (IM) and false lumen (FL) in the mid-LAD. RAO caudal **(E)** and cranial **(F)** views showing excellent results after 4 bioresorbable scaffold implantation.

FIGURE 2 **Coronary Angiography and OFDI Images 1 Year After Implantation of BRS for SCAD**



Posteroanterior caudal **(A)** and cranial **(B)** views showing widely patent bioresorbable scaffolds (BRS). **(C)** Still frame of optical frequency domain imaging (OFDI) in the left main stem showing a well-expanded BRS with tissue coverage of struts. **(D)** Evidence of malapposition **(asterisk)** of BRS in the proximal LAD (maximum distance 530 μm). There was no evidence of persistent dissection or IMH (Online Video 1). SCAD = spontaneous coronary artery dissection; other abbreviations as in **Figure 1**.

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KEY WORDS bioresorbable scaffold, optical coherence tomography, spontaneous coronary artery dissection, stenting

APPENDIX For a supplemental video and its legend, please see the online version of this article.