

IMAGES IN INTERVENTION

Early Collapse of a Magnesium Bioresorbable Scaffold



Hector Cubero-Gallego, MD, PhD, Bert Vandeloos, MD, Josep Gomez-Lara, MD, PhD, Rafael Romaguera, MD, Gerard Roura, MD, Joan A. Gomez-Hospital, MD, PhD, Angel Cequier, MD, PhD

A 56-year-old man with diabetes mellitus presented with inferior transient ST-segment elevation acute coronary syndrome. Coronary angiography showed a severe thrombotic lesion at the right coronary artery and a severe lesion at the left anterior descending artery. The lesion of the right coronary artery was pre-dilated with a 2.5 × 15.0-mm compliant balloon, followed by implantation of a 3.5 × 15.0-mm magnesium bioresorbable scaffold (BRS) (Biotronik AG, Bülach, Switzerland) at 16 atm, with optimal device expansion (Figures 1A to 1C). Due to the angiographic presence of thrombus post-dilation was not performed. Patient was discharged uneventfully on aspirin and prasugrel.

Elective percutaneous coronary intervention of the mid-left anterior descending artery was planned 8 days later. However, coronary angiography showed focal BRS collapse with substantial loss of the lumen dimensions (Figures 1D1 and 1D2). Optical coherence tomography (OCT) confirmed scaffold dismantling

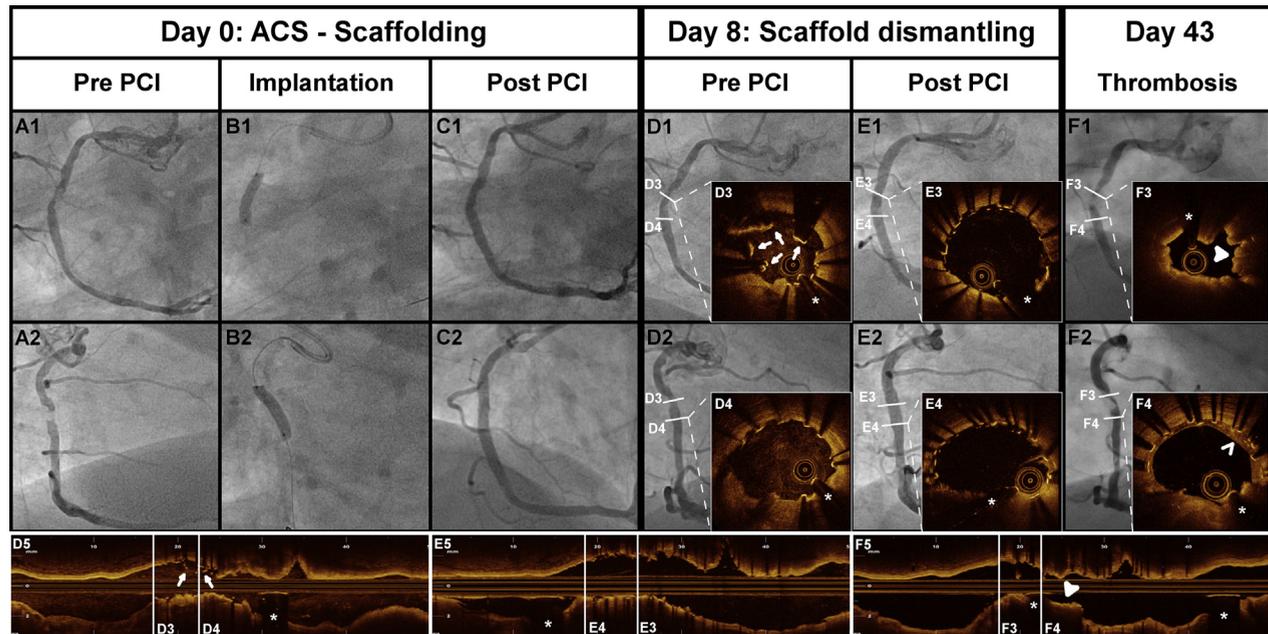
(Figures 1D3 to 1D5). A 3.5 × 23.0-mm cobalt chromium everolimus-eluting stent (Abbott Vascular, Santa Clara, California) was then deployed with excellent angiographic (Figures 1E1 and 1E2) and OCT result (Figures 1E3 to 1E5).

One month later, the patient presented with non-ST-segment elevation acute coronary syndrome. Coronary angiography showed late stent thrombosis with preserved Thrombolysis In Myocardial Infarction flow (Figures 1F1 and 1F2). OCT at the overlapped segment showed intraluminal thrombus, uncovered struts, and heterogeneous neointimal tissue (Figures 1F3 to 1F5). Thrombus-aspiration and dilatation with a 4 × 15-mm noncompliant balloon were then performed with good result. However, 6 weeks later, an elective coronary angiography showed severe in-stent restenosis, and the patient was referred for surgical revascularization.

This is the first description to our knowledge of premature dismantling and loss of radial force of

From the Hospital Universitari de Bellvitge, Institut d'Investigació Biomèdica de Bellvitge (IDIBELL), Universitat de Barcelona, L'Hospitalet de Llobregat, Barcelona, Spain. Dr. Vandeloos has received a Frans Van de Werf Fund for Clinical Cardiovascular Research scholarship. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose. Drs. Cubero-Gallego and Vandeloos contributed equally to this work.

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FIGURE 1 Angiography and OCT Images at Index, 8 Days, and 43 Days

(A1 and A2) Initial angiography. (B1 and B2) Optimal expansion of the scaffold delivery balloon. (C1 and C2) Final angiographic result after magnesium bioresorbable scaffold implantation. (D1 and D2) Angiography 8 days after implantation. White lines indicate locations of optical coherence tomography (OCT) images. (D3 and D5) OCT revealing scaffold dismantling (arrows). (D4) Well-apposed scaffold with minor distal edge dissection. (E1 to E5) Angiography and OCT after cobalt chromium everolimus-eluting stent implantation. (F1 and F2) Angiography 43 days later. (F3 and F5) OCT revealing intraluminal thrombus (filled arrowheads) and (F4) heterogeneous neointimal tissue (open arrowhead). The asterisk represents the wire artefact. ACS = acute coronary syndrome; PCI = percutaneous coronary intervention.

the current magnesium BRS. Strut corrosion is an exclusive phenomenon of magnesium BRS. Strut corrosion rate may vary between different individuals, and may be accelerated by scaffold malapposition, focal low pH between vessel wall and BRS struts and also by substantial hinging forces. Further investigation is warranted to recognize the frequency and mechanisms of this early failure.

ADDRESS FOR CORRESPONDENCE: Dr. Josep Gomez-Lara, Department of Interventional Cardiology, Hospital Universitari de Bellvitge, c/o Calle Feixa Llarga s/n, L'Hospitalet de Llobregat, Barcelona, Spain 08907. E-mail: gomezjosep@hotmail.com.

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