

IMAGES IN INTERVENTION

ST-Segment Elevation Myocardial Infarction Due to Optical Coherence Tomography-Detected Coronary Artery Compression Following Supravalvular Pulmonary Artery Patchplasty 18 Years After Switch Procedure



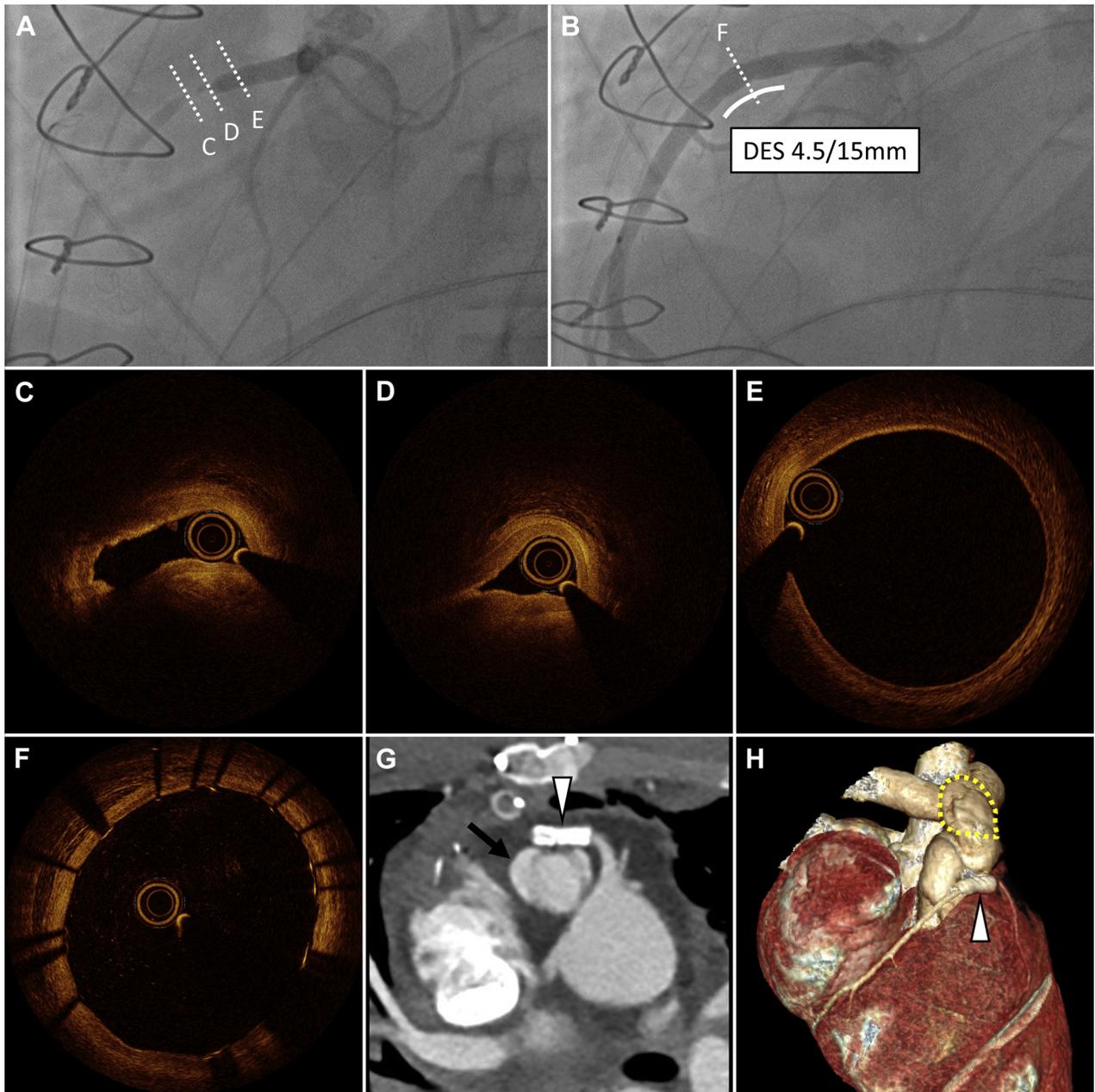
Yasushi Ueki, MD,^a Alexander Kadner, MD,^b Christoph Gräni, MD, PhD,^a Lorenz Räber, MD, PhD^a

An 18-year-old man underwent correction of a supravalvular pulmonary artery (PA) stenosis after neonatal correction of a dextrotransposition of the great arteries by a switch procedure. The coronary pattern presented with a common ostium for the left anterior descending artery and right coronary artery (RCA) after the transfer of the coronary (R1,A1;C2). The procedure was performed with a beating heart and normothermic bypass. The PA stenosis was corrected with a patchplasty of the anterior aspect of the pulmonary bifurcation and the PA main stem, staying above the level of the valvular commissures (Figure 1H, yellow dotted circle). After transferring to intensive care unit and extubation, the patient complained of chest pain and electrocardiogram showed ST-segment elevations in inferior leads that were not present during surgery. Emergent coronary angiography showed a

subtotal occlusion in the proximal RCA (Figure 1A). After gentle pre-dilatation with 1.5-mm balloon and injection of nitroglycerine to the RCA, optical coherence tomography showed a slit-like narrowing of the vessel (Figures 1C and 1D) without atherosclerosis (Figure 1E, proximal reference). Percutaneous coronary intervention using a drug-eluting stent (4.5 mm × 15 mm) resulted in an adequate expansion (Figures 1B and 1F). Cardiac computed tomography after percutaneous coronary intervention (Figures 1G and 1H) showed the RCA (white arrowhead: implanted stent) passed just in front of a pulmonary sinus (black arrow). This finding implied that the supravalvular patch-enlargement of the main PA allowed for the expansion of the valvular sinus (might be explained by PA pressure change after extubation) leading to external compression of the proximal RCA.

From the ^aDepartment of Cardiology, Bern University Hospital, Bern, Switzerland; and the ^bCenter for Congenital Heart Disease, Department of Cardiovascular Surgery, Bern University Hospital, Bern, Switzerland. All 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, Optical Coherence Tomography, and Computed Tomography Findings

(**A and B**) Coronary angiography before and after stent implantation. (**C to E**) Optical coherence tomography demonstrated a slit-like narrowing of the vessel without evidence of atherosclerosis. (**F**) Stent implantation resulted in an adequate expansion. (**G and H**) Cardiac computed tomography and 3-dimensional reconstruction after percutaneous coronary intervention showed the right coronary artery (**open arrowheads**: implanted stent) passed just in front of a pulmonary sinus (**solid arrow**). Patchplasty was performed at the anterior aspect of the pulmonary bifurcation (**yellow dotted circle**). DES = drug-eluting stent(s).

This case highlights that intracoronary imaging can be useful to unravel a nonatherosclerotic etiology of acute myocardial infarction in a setting where atherothrombosis is unlikely. Furthermore, the case illustrates the importance of understanding the anatomic complexity in patients with congenital heart disease, which may be facilitated by the use of cardiac computed tomography.

ADDRESS FOR CORRESPONDENCE: Prof. Lorenz Räber, Department of Cardiology, Bern University Hospital, 3010 Bern, Switzerland. E-mail: lorenz.raeber@insel.ch.

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