JACC: CARDIOVASCULAR INTERVENTIONS
VOL. 5, NO. 7, 2012

ISSN 1936-8798/$36.00
PUBLISHED BY ELSEVIER INC.
http://dx.doi.org/10.1016/j.jcin.2011.12.019

IMAGES IN INTERVENTION

Suspected Hypersensitivity Reaction Following Drug-Eluting Stent Implantation

Novel Insights With Optical Coherence Tomography

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A 66-year-old woman who previously underwent coronary artery bypass surgery was admitted due to anginal symptoms. Coronary angiography (CAG) revealed a severe stenosis of the right coronary artery at the anastomotic site of a saphenous vein graft (SVG) and a residual stenosis of the posterior descending artery (PDA) (Fig. 1A). Paclitaxel-eluting stents (Taxus, Boston Scientific, Natick, Massachusetts) were implanted for these lesions (Fig. 1B). However, she developed angina recurrence 6 months after stent implantation. CAG showed in-stent restenosis (ISR) at the proximal edge of the Taxus stent within the mid-PDA lesion (Fig. 2A). A sirolimus-eluting stent (Cypher, Cordis, Johnson and Johnson, Bridgewater, New Jersey) was implanted with coverage of the Taxus stents (Fig. 2B). Follow-up CAG 2 years after this procedure revealed an ISR at the overlapping stented site of PDA (Fig. 3). To assess this ISR lesion, optical coherence tomography (OCT) and fractional flow reserve measurement were performed. OCT revealed the diffuse neointimal tis-

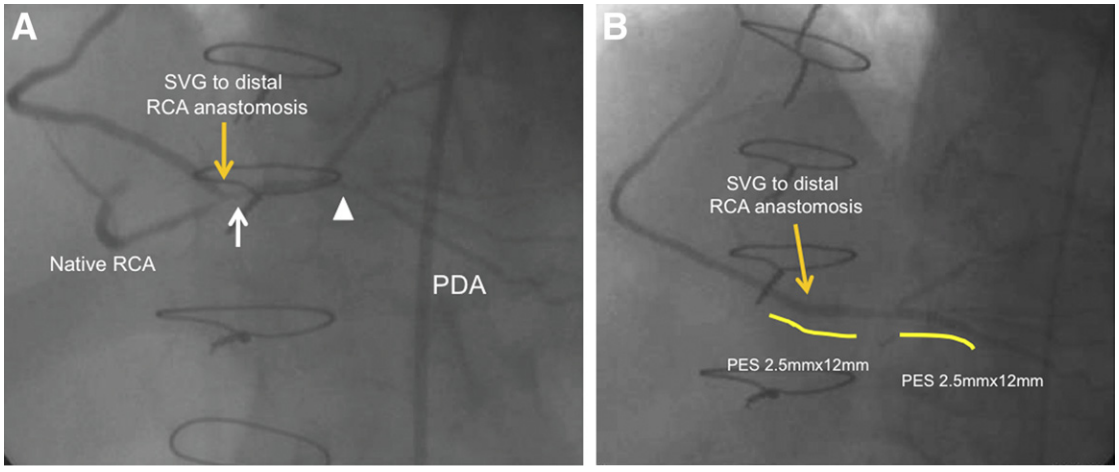

Figure 1. CAG Images Before and After Implantation

(A) Coronary angiography (CAG) image for 2 stenoses in right coronary artery (RCA) before percutaneous coronary intervention. CAG showed a severe stenosis of the distal RCA at the anastomotic site of a saphenous vein graft (SVG) **(arrow)** and a residual stenosis of the mid-portion of the posterior descending artery (PDA) **(arrowhead)**. **(B)** CAG image after 2 paclitaxel-eluting stent (PES) implantations. Two 2.5 mm ×12 mm PES were implanted for these 2 lesions, respectively.

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Manuscript received December 7, 2011, accepted December 22, 2011.

Figure 2. CAG Images of Proximal Edge of PES Before and After SES Implantation

(A) Focal in-stent restenosis at the proximal edge of PES in mid-PDA region. CAG showed focal in-stent restenosis at the proximal edge of the Taxus stent within the mid-PDA region **(arrow). (B)** CAG image after SES implantation. A 2.5 mm × 13 mm sirolimus-eluting stent (SES) was implanted overlapping the previously implanted stents. Abbreviations as in Figure 1.

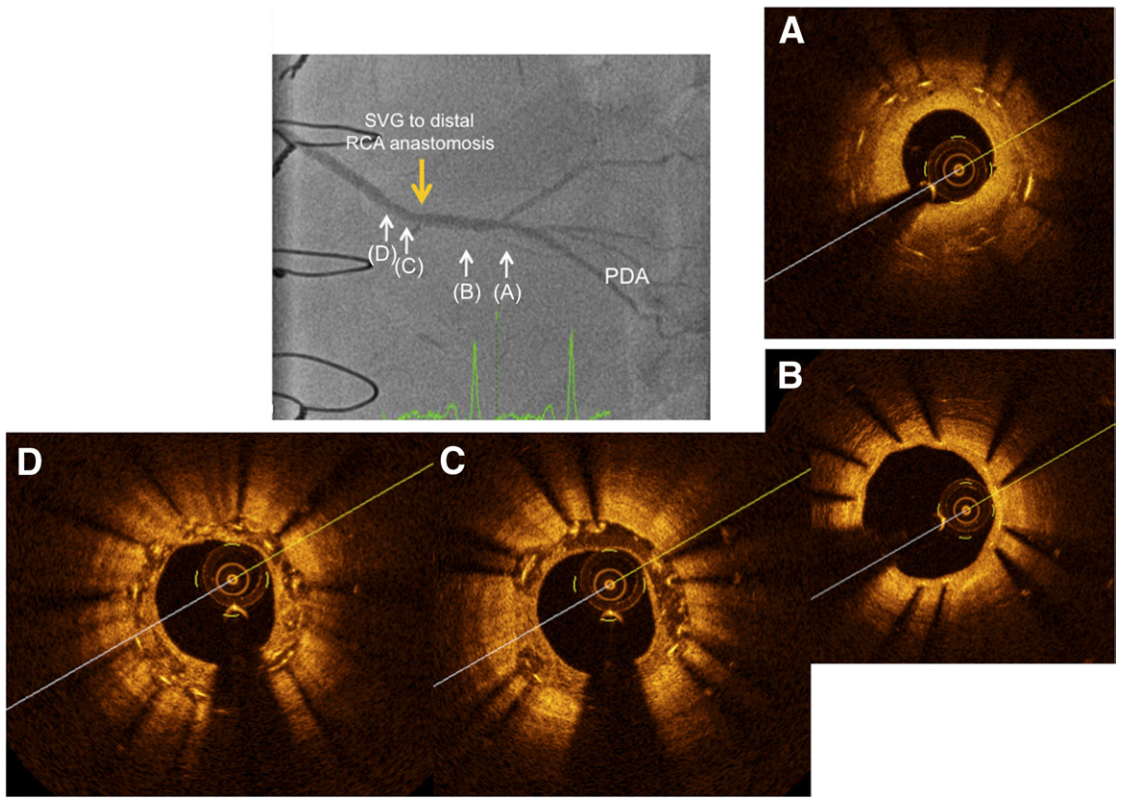

Figure 3. Follow-Up CAG Image for Focal ISR Lesion and OCT Images

(Inset) CAG showed a moderate and focal in-stent restenosis (ISR) at the overlapping stented site of PDA **(A). (A)** The minimum lumen area assessed by optical coherence tomography (OCT) was 1.44 mm^3. **(B)** Neointimal tissue was observed within the stent. **(C, D)** Heterogeneous low-intensity signals were observed around the struts of the proximal portion of the previously implanted Taxus stent at the anastomotic site of SVG. Also see accompanying Online Video 1. Abbreviations as in Figure 1.

sue within the entire stented segment. Interestingly, heterogeneous low-intensity signals were observed around the struts of the proximal portion of the Taxus stent at the anastomotic site of SVG (Fig. 3, Online Video 1). All stent struts apposed well to the vessel wall without thrombus. As the fractional flow reserve was found to be 0.88, percutaneous coronary intervention was not performed.

Recent pathological studies have demonstrated that hypersensitivity reaction, such as marked inflammatory reaction with eosinophilic and T-cell infiltration surrounding stent struts is frequently observed in patients who experienced late stent thrombosis following drug-eluting stent implantation (1,2). The present OCT images appear to correspond with prior photomicrograph images revealing hypersensitivity following drug-eluting stent implantation in these pathological studies. Although lacking pathological validation, we believe that our findings pertain to a hypersensitivity reaction to the implanted Taxus stent. The present image also highlights the potential for OCT to continue to yield novel insights regarding the complex reactions following drug-eluting stent implantation.

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REFERENCES

1. Virmani R, Guagliumi G, Farb A, et al. Localized hypersensitivity and late coronary thrombosis secondary to a sirolimus-eluting stent: should we be cautious? Circulation 2004;109:701–5.
2. Nebeker JR, Virmani R, Bennett CL, et al. Hypersensitivity cases associated with drug-eluting coronary stents: a review of available cases from the Research on Adverse Drug Events and Reports (RADAR) project. J Am Coll Cardiol 2006;47:175–81.

APPENDIX

For the accompanying video, please see the online version of this paper.