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IMAGES IN CARDIOVASCULAR INTERVENTION

Coronary aneurysm formation after paclitaxel-coated balloon angioplasty for in-stent restenosis of first-generation sirolimus-eluting stent implanted 9 years ago

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A 60-year-old man implanted with a 4 Cypher™ sirolimus-eluting stent in his right coronary artery (RCA) 9 years ago was admitted due to effort angina. Coronary angiography (CAG) revealed in-stent restenosis (ISR) of the proximal RCA (Fig. 1A). Intravascular ultrasound (IVUS) (OptiCross™, Boston Scientific, MA, USA) showed thick plaque with ultrasonic attenuation at the culprit lesion (Fig. 1b). Balloon angioplasty was performed followed by paclitaxel application by a coated balloon (Fig. 1B). The final angiogram (Fig. 1C) showed acceptable re-dilatation of that stenotic lesion, and IVUS depicted greatly diminished neointimal tissues with no major vessel wall injury (Fig. 1a'–c'). Minimum lumen diameter post procedure of 3.24 mm was achieved. The 8-month follow-up of CAG revealed coronary aneurysm formation at the site of previously re-dilated lesion (Fig. 1D). IVUS showed remarkable asymmetric vessel enlargement (minimum and maximum lumen diameters: 3.19 and 5.70 mm, respectively) with 180° of malapposed stent struts (Fig. 1b'') and evaginations between the stent struts at the adjacent aneurysm site (Fig. 1a'', arrowheads). This patient was managed conservatively with prolonged dual antiplatelet therapy (DAPT). No adverse cardiac event has occurred for the following 32 months.

An optical coherence tomography study has shown vessel enlargement at the site of bare metal stent post dilated with paclitaxel-coated balloon (PCB); consequently, transient severe incomplete stent apposition was observed [1], but coronary aneurysm formation is very rare [2]. Specific mechanisms by which paclitaxel may induce vessel enlargement in coronary aneurysm remain speculative. Higher initial tissue concentrations of paclitaxel compared to drug-eluting stent might be a presumed etiology of aneurysm formation [2]. Interestingly, another abnormal vessel response of evaginations, which have been reported to associate with positive vessel remodeling [3] were detected near the aneurysm. Careful follow-up considering DAPT duration may be required for some ISR cases after PCB angioplasty. Further investigations will be needed.

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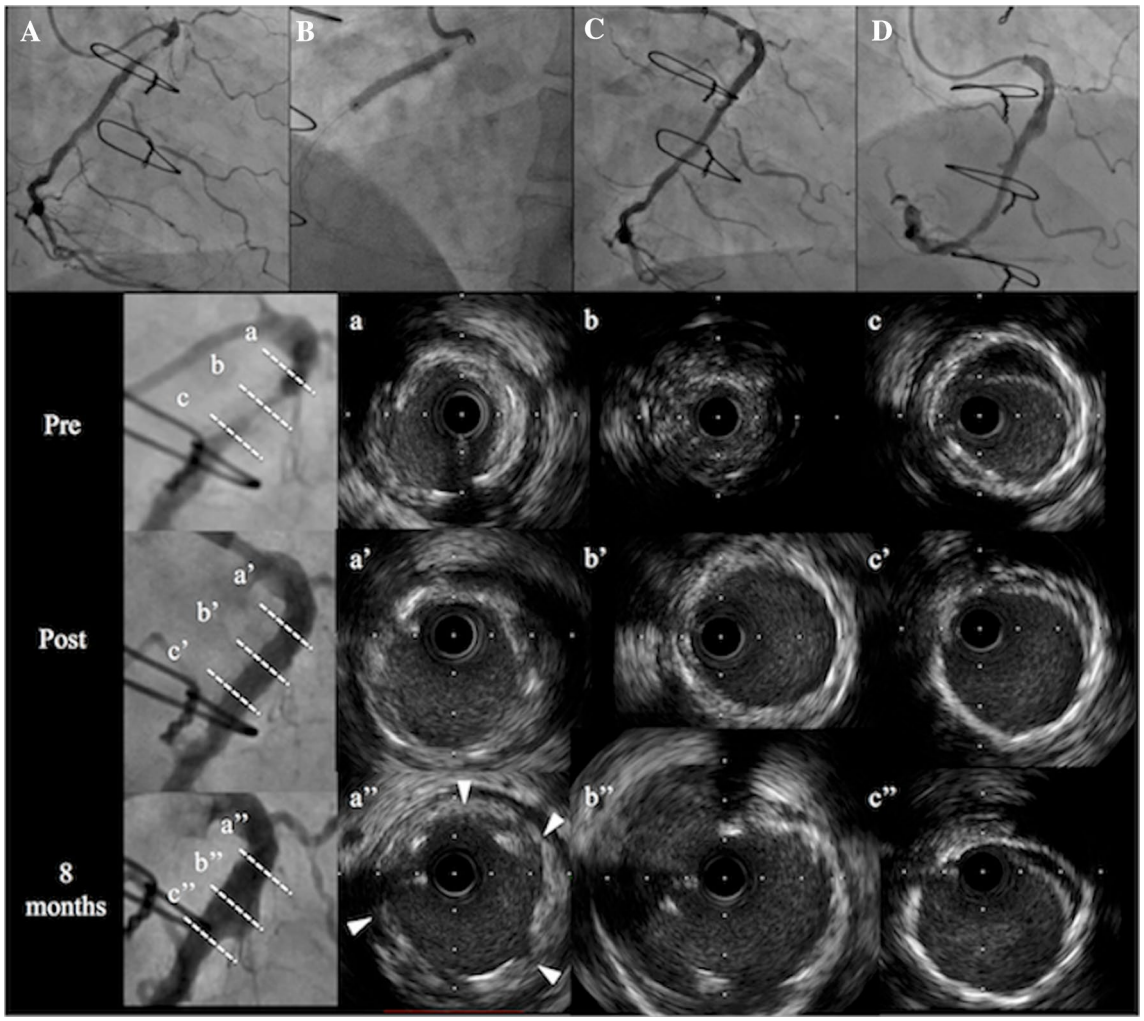

Fig. 1 Coronary angiograms and serial intravascular ultrasound (IVUS) images at the matched sites. **A**–**D** Each angiogram shows the right coronary artery in the right anterior oblique view; pre-angioplasty, paclitaxel-coated balloon dilatation, final angiogram just after angioplasty, and 8-month follow-up, respectively. The neoatherosclerotic lesion (**b**) was successfully re-dilated with no major vessel wall injury (**a**'–**c**'). Eight-month follow-up of IVUS images (**a**''–**c**'') depicted remarkable asymmetric vessel enlargement with 180° of malapposed stent struts (**b**'') and evaginations between apposed stent struts near the aneurysm (**a**'', arrowheads)

Compliance with ethical standards

Conflict of interest None of the authors have any conflicts of interest.

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