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Letter to the Editor

Multiple stent strut fracture-induced restenosis in a diffuse long lesion treated with overlapping heterogeneous drug-eluting stent

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Abstract

Coronary stent fracture can be a potentially serious complication to stenting leading to various complications, such as restenosis, and even occlusion. We reported multiple stent fracture of overlapping paclitaxel and sirolimus-eluting stent. Although an overwhelming majority of stent fracture was reported from sirolimus-eluting stent, our case showed that fracture of paclitaxel-eluting stent could occur by similar mechanisms as in sirolimus-eluting stent. So angiographic follow-up with intravascular ultrasound should be performed to elucidate the clinical significance of stent fracture of DES regardless of DES type.

Keywords: Stent fracture; Overlapping DES; Restenosis

1. Introduction

Despite technical improvements in percutaneous coronary interventions (PCI), treatment of diffuse long lesions remains difficult and is associated with an unfavorable outcome. Drug-eluting stents (DES) have greatly reduced the possibility of in-stent restenosis by inhibiting neointimal growth and attenuated the relationship between the stent length and rate of restenosis. But recently stent fracture has emerged as a complication of DES, especially in long coronary lesion with sirolimus-eluting stent (SES). Coronary stent fracture can be a potentially serious complication to stenting leading to various complications, such as restenosis, and even occlusion. We reported multiple stent fracture of overlapping paclitaxel and sirolimus-eluting stent in diffuse long coronary lesion.

2. Case report

A 63-year-old female patient visited our hospital due to angina chest pain. She has hypertension and diabetes. But, she denied any history of smoking or hyperlipidemia. In 1998, she has been admitted due to stable angina and implanted bare-metal stent (BMS, Nir stent 2.75 × 16 mm) at distal right coronary artery (RCA). Until she readmitted for evaluation of recurred chest pain ten months ago, there has been no clinical event for 8 years after PCI. On 2nd admission, there was no interval change of ECG findings compared to previous ones and no laboratory abnormality. However, because the chest pain was typical for angina pectoris, we performed coronary angiogram. Coronary angiography showed diffuse 50% stenotic lesion at left anterior descending artery (LAD) with grade II collateral flow to RCA and tubular 80% stenosis at obtuse marginal (OM) artery. And Total occlusion was noted at proximal RCA. Two DESs (paclitaxel-eluting stent, PES 2.75 × 28 mm,

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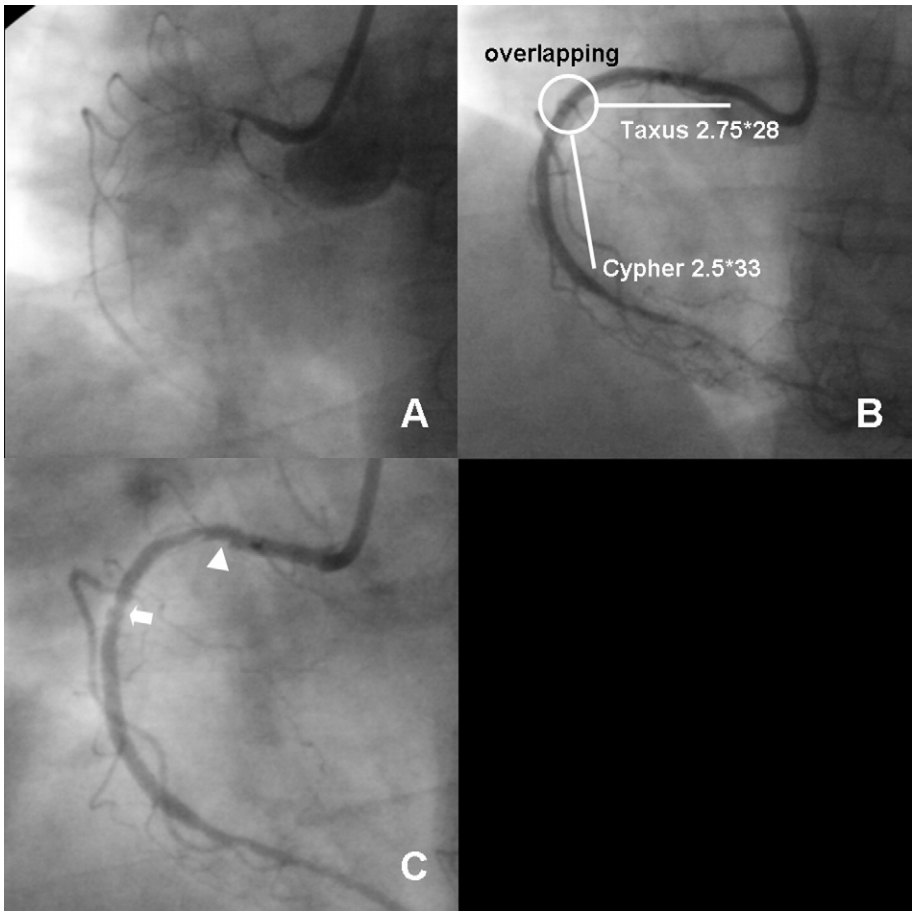

Fig. 1. On 2nd admission, coronary angiogram showed total occlusion of proximal RCA (A). Two DESs (PES 2.75×28 mm, SES 2.5×33 mm) were implanted at proximal to mid RCA lesion with overlapping technique (B). Ten months after discharge, the patient readmitted for recurred chest pain. Coronary angiogram revealed severe stenosis of mid PES with stent fracture and moderate stenosis with another stent fracture just below the overlapping site of proximal SES (C).

sirolimus-eluting stent, SES 2.5×33 mm) were implanted at proximal to mid RCA lesion with overlapping technique. Follow-up angiogram showed good distal flow without residual stenosis or dissection (Fig. 1 A,B). During follow-up period, the patient complained intermittent chest pain relieved by administration of sublingual nitroglycerin. Ten months after discharge, the patient readmitted for recurred chest pain. Coronary angiogram revealed that there were no interval changes of left coronary arterial lesion compared to a previous study. However, severe stenosis with stent strut fracture at mid PES area was noted and moderate stenosis with another stent strut fracture just below the overlapping site was also noted at the proximal SES area (Fig. 1C). IVUS investigation revealed significant neointimal formation at the point of the angiographic stenosis with lumen compromise and absence of stent struts corresponding to fracture of the stent at both sites. There was a very effective suppression of the neointimal formation throughout the rest of stent length and also in the stents deployed proximal and distally (Figs. 2–4). Based on these findings, the lesion including both fracture sites was treated with implantation of 2.75×18 Endeavor stent deployed at 12 atm and post-dilated with a 3×15 mm balloon up to 16 atm. Follow-up angiogram showed good distal flow without residual stenosis or dissection.

3. Discussion

To our knowledge, this is the first report of multiple and simultaneous fracture of SES and PES in a diffuse long lesion treated with overlapping heterogeneous two DESs. The stenosis of lesion in PES fracture is more severe than that in SES fracture because PES was deployed at angulated lesion and dislocation of each segment occurred after fracture resulted in more increased irritation of vascular wall. This complete dislocation of stent was helpful to identify fracture of PES. Otherwise, it was difficult to identify PES fracture due to its less radioopacity. Most of stent fracture was reported from SES except one case [1–5]. Possible explanations for this phenomenon were that the relatively less radioopacity and more intimal growth of PES compared to SES may devote the lower observation of PES