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IMAGES IN CARDIOVASCULAR INTERVENTION

Pathological findings of late total occlusion after Zilver PTX stent implantation in restenosis lesion of bare-metal nitinol stent for superficial femoral artery

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Case

A 73-year-old man developed lower limb ischemia treating after underwent left femoropopliteal bypass (FP bypass) surgery for treatment of left superficial femoral artery (SFA) total occlusion. One year later, since the FP bypass graft was becoming totally occluded, recanalization was attempted using endovascular therapy (EVT). Bare-metal nitinol stent (BNS) of two SMART stents (Cordis, Miami, FL; 7.0 × 120 mm, 6.0 × 150 mm) and one Misago stent (Terumo, Tokyo, Japan; 7.0 × 60 mm) were deployed to cover the entire lesion (Fig. 1a). The patient was discharged with prescriptions for oral anticoagulant (warfarin) and antiplatelet agents (aspirin 100 mg, clopidogrel 75 mg). At 9 months after first EVT, angiography showed total occlusion of the left SFA. Four Zilver PTX stents; paclitaxel-coated stent (PCS) (Cook Medical, Bloomington, Indiana; 7.0 × 60 mm, 7.0 × 100 mm, 7.0 × 100 mm, 7.0 × 100 mm) were deployed to cover all lesions with BNS and one Express stent (7.0 × 27 mm) was interpolated for under expansion lesion of PCS (Fig. 1a). Six months after second EVT, due to progressive limb ischemia, above-the-knee amputation of the left limb was performed and the specimen harvested.

Microscopic observation revealed massive thrombus formation, mainly on the luminal side of the stent struts (Fig. 1b). Existing neointimal tissue exhibited remarkable shedding and disappearance from the luminal surface of the PCS and most of which consisted of amorphous necrotic tissue (Fig. 1b, c). Nuclear ghosts were scattered among amorphous material consisting of necrotic tissue and fibrin components (Fig. 1d).

Discussion

To our knowledge, this is the first pathologic report of late ST of PCS implanted following development of ISR lesions of BNS. In real clinical settings, treatment of femoropopliteal ISR with PCS resulted in favorable outcomes [1]. In contrast to good outcomes, Iida et al. [2] reported that the incidence of ST with PCS was as high as 2% in a year. In a pathological study, Soga et al. [3] also reported delayed healing and presence of uncovered struts with necrotic tissue caused by paclitaxel exposure, resulting in late ST 10 months after implantation of PCS in native arteries. At the necrotic tissue site in this study, most components of the material on the necrotic tissue were fibrin deposits, which is a burden of thrombus formation. Although favorable outcomes for ISR lesion was reported, we should be more cautious about using PCS even in ISR lesions to avoid the risk of ST. The use of PCS is the risk of ST even if using several antithrombotic agents.

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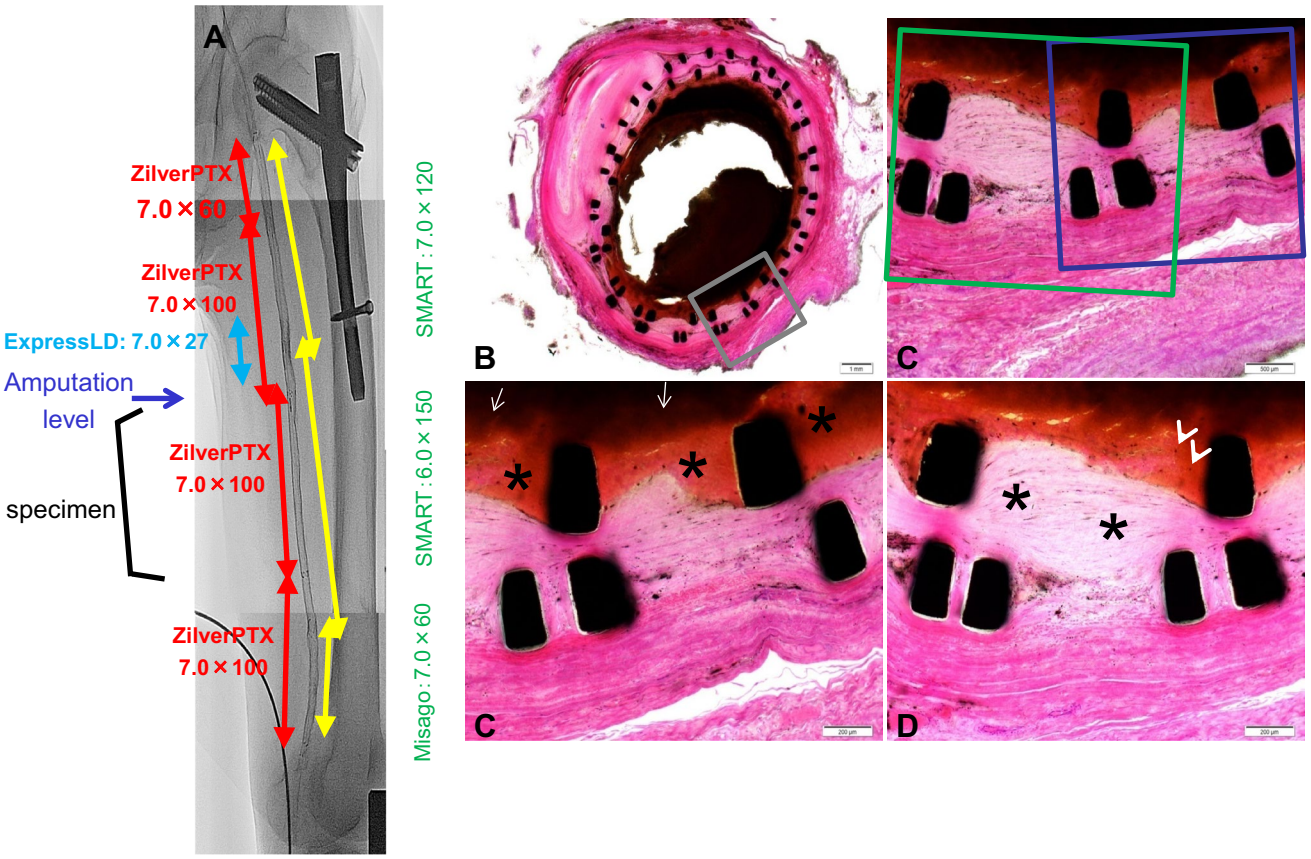

Fig. 1 **a** Endovascular treatment (EVT) for left superficial femoral artery (SFA). **b** Histopathology of cross-section of mid portion of the stent. SMART and Zilver PTX stents overlapping the lesion filled with blood components. **c** High-power views of the blue boxed area in **b**. Zilver PTX stent is covered by necrotic tissue (asterisk) with thrombus (white arrow). **d** High-power views of the green boxed area in **b**. Neointimal proliferation is only recognized on the surface of the bare-metal nitinol stent (asterisk) and nuclear ghosts (white arrow heads) are scattered in amorphous material consisting of necrotic tissue and fibrin components

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