Invagination and Restenosis of an Interwoven Nitinol Stent — Multiple Imaging Modality Findings —

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Evaluations of endovascular therapy (EVT) with novel self-expanding interwoven nitinol stents (Supera; Abbott Vascular, Chicago, IL, USA) have shown that these stents are highly flexible and have high radial resistive strength. However, stent invagination has recently been reported following inadequate deployment.

A 72-year-old woman underwent EVT for an ischemic ulcer in the right lower limb. After predilatation with a non-compliant balloon (18 atm, 2 min, 3 times, 5.0 mm × 80.0 mm), a Supera stent (5.5 mm × 150.0 mm) was implanted in the severely calcified right femoropopliteal artery. At the mid-portion of the stent, stent invagination occurred during deployment. After high-pressure balloon dilatation (30 atm, 6.0 mm × 60 mm), final angiography revealed acceptable blood flow to below the knee. However, stent invagination was unchanged. The patient’s ulcer healed completely in 2 months, but an ulcer recurred in the right limb at 6 months. Angiography showed restenosis at the mid-portion of the stent, corresponding to the stent invagination. We evaluated the lesion using 3 different intravascular imaging modalities: intravascular ultrasound, optical coherence tomography (OCT), and angioscopy. OCT showed characteristics of homogenous tissue and angioscopy revealed a white plaque on the image at the stent invagination. The struts had a “spider’s web” appearance at the stent invagination and were almost totally covered with large amounts of neointima, leading to lumen loss (Figure A-1–4; Supplementary Movies 1,2).

This is the first report evaluating restenosis at the stent invagination of a self-expanding interwoven nitinol stent using multiple imaging modalities. These findings suggest that stent invagination may accelerate neointimal proliferation with a risk of late stent lumen loss.

Disclosures
M.I. is a member of Circulation Journal’s Editorial Team.

Conflict of Interest Statement
All authors have nothing to disclose.

References

Supplementary Files
Supplementary Movie 1. Intravascular ultrasound at re-endovascular therapy.
Supplementary Movie 2. Optical coherence tomography at re-endovascular therapy.

Received December 17, 2020; revised manuscript received January 6, 2021; accepted January 8, 2021; J-STAGE Advance Publication released online February 11, 2021. Time for primary review: 7 days Department of Cardiovascular and Renal Medicine, Hyogo College of Medicine, Nishinomiya, Japan. Mailing address: Masaharu Ishihara, MD, PhD. Department of Cardiovascular and Renal Medicine, Hyogo College of Medicine, 1-1 Mukogawa, Nishinomiya 663-8501, Japan. E-mail: ma-ishihara@hoyo-med.ac.jp All rights are reserved to the Japanese Circulation Society. For permissions, please e-mail: cj@j-circ.or.jp

ISSN-1346-9843

Figure. Angiography at initial endovascular therapy (EVT) and angiography, intravascular ultrasound (IVUS), optical coherence tomography (OCT), and angioscopy at repeated (re-)EVT. (A-1–3) There were large amounts of neointima at the stent invagination (A). (A-4) Schematic representation.