

## Embolization of Neointimal Thrombus After Percutaneous Coronary Intervention Insights From Near-Infrared Spectroscopy Imaging and Histopathological Analysis

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An 85-year-old man was hospitalized because of ST-segment-elevation myocardial infarction 145 months after the implantation of sirolimus-eluting Cypher stent. Emergent coronary angiography identified in-stent restenosis at the body of sirolimus-eluting Cypher stent in the proximal right coronary artery (Figure [A]). Optical coherence tomography visualized rupture of lipidic neointima potentially containing cholesterol crystals (Figure [B]). Near-infrared spectroscopy (NIRS) combined with intravascular ultrasound showed extensive yellow signals indicating lipid accumulation, potentially both within and outside the stent, with a high, maximum 4-mm lipid core burden index with 880 (Figure [C] and [D]). After an implantation of cobalt-chromium everolimus-eluting stent, no-reflow phenomenon with thrombolysis in myocardial infarction flow grade 1 occurred. NIRS demonstrated a marked reduction of yellow signals at the target lesion (Figure [E]). He died because of sepsis 72 hours after percutaneous coronary intervention. Autopsy showed in-stent neointimal thrombus characterized by necrotic core formation within the sirolimus-eluting Cypher stent (Figure [F] and [G]) and multiple embolization of cholesterol crystal in the microvasculature within the myocardium (Figure [H]).

Lipid accumulation as detected by NIRS is known to be associated with increased risk of periprocedural myocardial infarction presumably attributed to distal embolization.<sup>1</sup> In stented coronary arteries, NIRS alone may reflect lipid accumulation either within or outside the stents, whereas combined NIRS intravascular ultrasound has shown a potential capability to detect in-stent neointimal thrombus.<sup>2</sup> The current

case for the first time demonstrated embolization of neointimal thrombus as detected by NIRS intravascular ultrasound with histopathologic confirmation. In-stent neointimal thrombus is an emerging problem contributing to late stent failure<sup>3</sup> along with distal embolization during percutaneous coronary intervention, where adjunctive preventive management should be required.

### Disclosures

None.

### References

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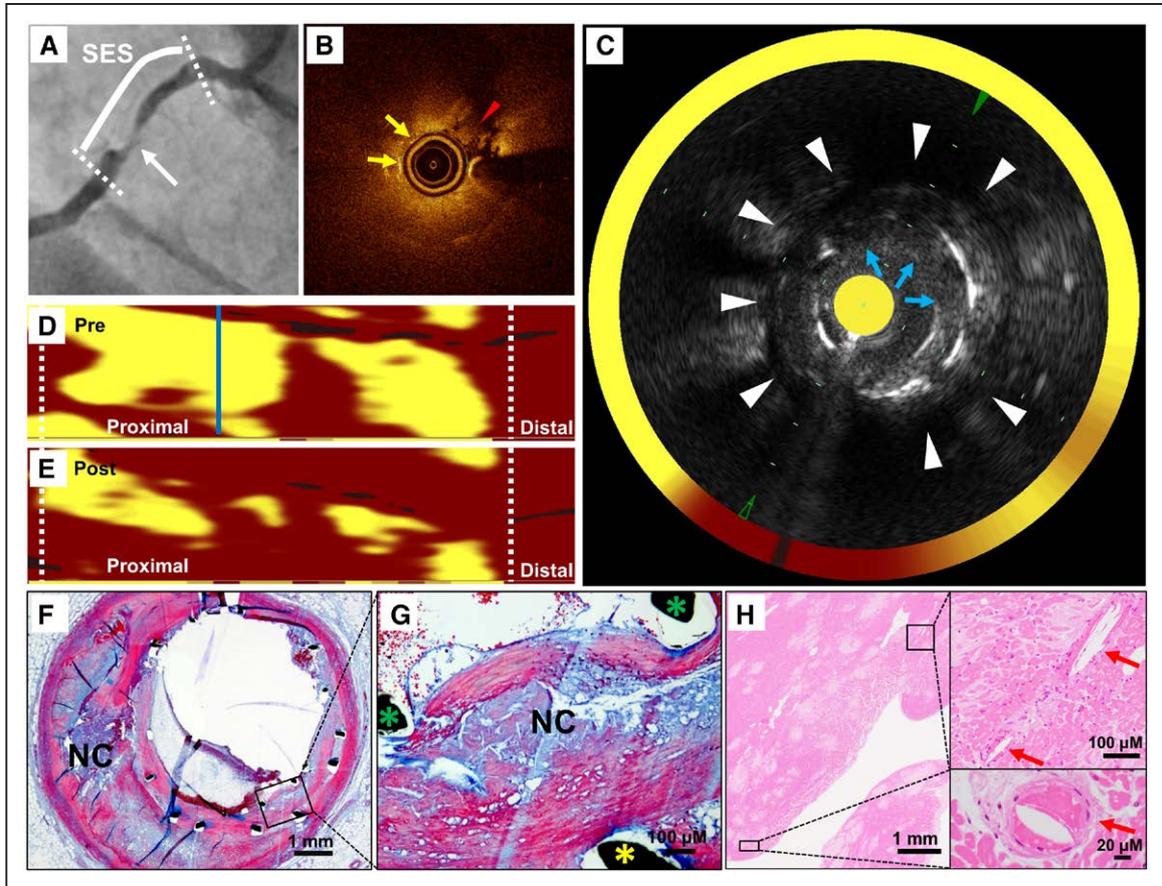
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**Figure.** Embolization of neoatherosclerosis as assessed by imaging modalities and histopathology. **A**, Coronary angiography: severe stenosis (white arrow) was identified within the sirolimus-eluting stent (SES [Cypher; Cordis Corporation, Miami Lakes, FL]) in the proximal right coronary artery. **B**, Optical coherence tomographic image: neointimal rupture with overlying thrombus (red arrowhead) and adjacent, linear, highly backscattering region suggestive of cholesterol crystals (yellow arrows) were observed within the SES. **C**, Combined near-infrared spectroscopy (NIRS) and intravascular ultrasound (IVUS) image: extensive yellow signals were observed on NIRS, whereas IVUS showed low-echoic underlying plaques outside the SES (white arrowheads) and low-echoic neointima within the SES (blue arrows). **D** and **E**, NIRS chemogram: maximum 4-mm lipid core burden index was 880 before percutaneous coronary intervention (**D**). Blue line in (**D**) corresponds with a cross-sectional NIRS-IVUS image in (**C**). Yellow signal was substantially reduced after implantation of cobalt–chromium everolimus-eluting stent (CoCr-EES [XIENCE Alpine; Abbott Vascular, Santa Clara, CA]; **E**). White dot lines indicate proximal and distal edges of the SES. **F** and **G**, Low- (**F**) and high-power (**G**) images of the histological section of the stented coronary lesion (Masson trichrome staining): necrotic core (NC) was identified in both outside the stent (**F**) and within the SES (**G**). Green asterisks indicate CoCr-EES struts, and yellow asterisk indicates SES strut. **H**, Low- and high-power images of the histological section of myocardium (hematoxylin and eosin staining): multiple cholesterol emboli plugging the microvasculature were observed (red arrows).

## Embolization of Neointimal Hyperplasia After Percutaneous Coronary Intervention: Insights From Near-Infrared Spectroscopy Imaging and Histopathological Analysis

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