In-Stent Thrombosis Due to Neoatherosclerosis: Insight From Optical Coherence Tomography

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ABSTRACT: Neoatherosclerosis is one of the multiple mechanisms that cause stent thrombosis, which is one of the rare but severe complications of drug-eluting stent implantation. This case study highlights the use of optical coherence tomography in identifying the precise mechanism of the stent thrombosis, which helped guide the appropriate intervention.

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Case Description
A 35-year-old man was admitted with acute inferior myocardial infarction. He was treated with drug-eluting stents to his distal right coronary artery 18 months ago. He had been non-compliant with all his medications for the past 8 months. Coronary angiography revealed occluded distal right coronary artery due to in-stent thrombosis. Thrombus aspiration was performed with 6 Fr Export thrombectomy catheter. Optical coherence tomography (OCT) was performed to identify the pathogenic mechanism for in-stent thrombosis. This revealed that the underlying mechanism was ruptured plaque due to neoatherosclerosis with significant neointimal hyperplasia. The patient was treated with a drug-eluting stent with excellent result confirmed on angiography and OCT. He was re-educated about medication compliance.

Discussion
Stent thrombosis is a rare but severe complication of drug-eluting stent implantation. Its mechanism has not been fully determined, but multiple risk factors have been identified, including: (1) procedure-associated (stent malapposition, persistent low flow);1,2 (2) patient factors (diabetes, low ejection fraction); (3) lesion and stent characteristics (in-stent restenosis, bifurcation, stent design); (4) premature cessation of antiplatelet therapy; and (5) neoatherosclerosis.3,4 Neoatherosclerosis is a process characterized by lipid-laden neointima with disruptions within the stent.2

The treatment for in-stent thrombosis may be different depending on the underlying mechanism. If it is due to incomplete stent apposition, balloon angioplasty dilatation alone without implantation of another stent is adequate. Meanwhile, plaque rupture due to neoatherosclerosis, the scenario in this case, necessitates stent implantation. This case study highlighted the use of OCT in identifying the precise mechanism of the stent thrombosis, which helped guide the appropriate intervention.

References