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Recurrent myocardial infarction caused by under-expanded and malpositioned coronary stent identified by OCT

Seena Darwin Nirmala
Southend University Hospital, United Kingdom

Background: Late stent-related complications such as under-expansion and malapposition are associated with recurrent myocardial infarction and stent thrombosis. These mechanical issues may be angiographically subtle, necessitating intravascular imaging for accurate diagnosis.

Case Summary: We report the case of a 75-year-old woman with a history of multivessel coronary artery disease, previous non-ST elevation myocardial infarctions (NSTEMIs) in 2021 and 2023, and prior drug-eluting stent (DES) implantation in the left anterior descending artery (LAD). She presented in 2025 with recurrent chest pain and dynamic troponin elevation (peak 1500 ng/L). Electrocardiography demonstrated subtle anterior ischemic changes. Coronary angiography revealed patent LAD stents with intraluminal thrombus at the proximal segment, raising suspicion for a mechanical stent issue.

Optical coherence tomography (OCT) identified significant stent under-expansion and incomplete strut apposition, with struts visibly protruding into the vessel lumen. Targeted percutaneous coronary intervention was performed using high-pressure non-compliant balloon dilatation, resulting in improved stent expansion and apposition. Post-procedural OCT confirmed satisfactory mechanical correction. The patient had no recurrent symptoms, demonstrated preserved myocardial function, and was discharged on optimized medical therapy.

Discussion: This case underscores the diagnostic and therapeutic value of OCT in detecting occult stent failure contributing to late thrombotic events. Angiographically inconspicuous mechanical complications can be clarified with high-resolution intravascular imaging, allowing for precision-guided interventions. Adequate stent sizing and expansion at the index PCI remain paramount to long-term success.

Conclusion: Recurrent ischemia in stented segments should prompt a low threshold for intravascular imaging. OCT is an indispensable tool in diagnosing and managing late stent failure, guiding effective re-intervention and improving patient outcomes.

Keywords: Stent thrombosis, Optical coherence tomography, Coronary artery disease, Under-expanded stent, Intravascular imaging, PCI complication

Biography

Seena Darwin Nirmala obtained her MBBS degree from Weifang Medical University, China, in 2020. She began her clinical career in India before relocating to the United Kingdom, where she joined the General Medicine team at Altnagelvin Area Hospital in Derry/Londonderry, Northern Ireland. During her time there, she developed a strong interest in cardiology, which led her to pursue a dedicated career in the specialty. She is currently working as a Junior Clinical Fellow in Cardiology at Southend University Hospital in England.

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