Very late stent thrombosis presenting with ST-segment-elevation myocardial infarction: serial optical coherence tomography observations

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Case description

A 41-year-old man was diagnosed with anterior ST-segment-elevation myocardial infarction (STEMI) and subsequently underwent primary percutaneous coronary intervention (PCI) for the left anterior descending artery with the implantation of a 3.5 × 18 mm everolimus-eluting stent 3 years before. Dual antiplatelet therapy (DAPT) with aspirin and prasugrel was discontinued 3 years after the initial PCI because of haematuria and single antiplatelet therapy (aspirin) was continued thereafter with good adherence. Three-year follow-up coronary angiography (CAG) showed no significant angiographic restenosis, although optical coherence tomography (OCT) examination revealed the progression of stent malapposition and evagination with subclinical thrombosis. Two months later, he presented with anterior STEMI and emergent CAG showed a total occlusion at the stented segment of the proximal left anterior descending artery, suggestive of very late stent thrombosis (VLST). Since Thrombolysis in Myocardial Infarction (TIMI) flow grade 3 was obtained after balloon angioplasty, no stent was implanted. Dual antiplatelet therapy had been resumed and prescribed for a year. Coronary angiography and OCT 18 months after the second PCI revealed no angiographic restenosis and neointimal coverage without thrombus attachment (*Figure 1*) (Supplementary videos 1-3).

The VLST remains a major concern in the era of newer-generation drug-eluting stents including everolimus-eluting stents.[1] Previous OCT studies reported the association between incomplete stent apposition and the incidence of intracoronary thrombus formation.[2] However, the probability of subclinical stent thrombosis developing into clinically significant thrombosis is still unknown. In the present case, although VLST occurred 2 months after the follow-up CAG, it was uncertain whether the occurrence of VLST could have been prevented if DAPT was resumed or if any other interventional procedure was applied. Follow-up OCT examination after the second PCI indicated that neointimal coverage without thrombus attachment was acquired by modifying stent malapposition by balloon angioplasty. Our serial OCT observations imply that the optimization of stent apposition and prolonged DAPT prescription for subclinical stent thrombosis may reduce the risk of clinically manifest stent thrombosis.

Lead author biography

Kodai Sayama is a clinical fellow in the Department of Cardiovascular Medicine of Tsuchiura Kyodo General Hospital, Ibaraki, Japan. His main clinical research interest is clarifying the contributing factors for prognosis in the patients with acute coronary syndrome using imaging modalities.

Supplementary material

Supplementary material is available at *European Heart Journal – Case Reports* online.

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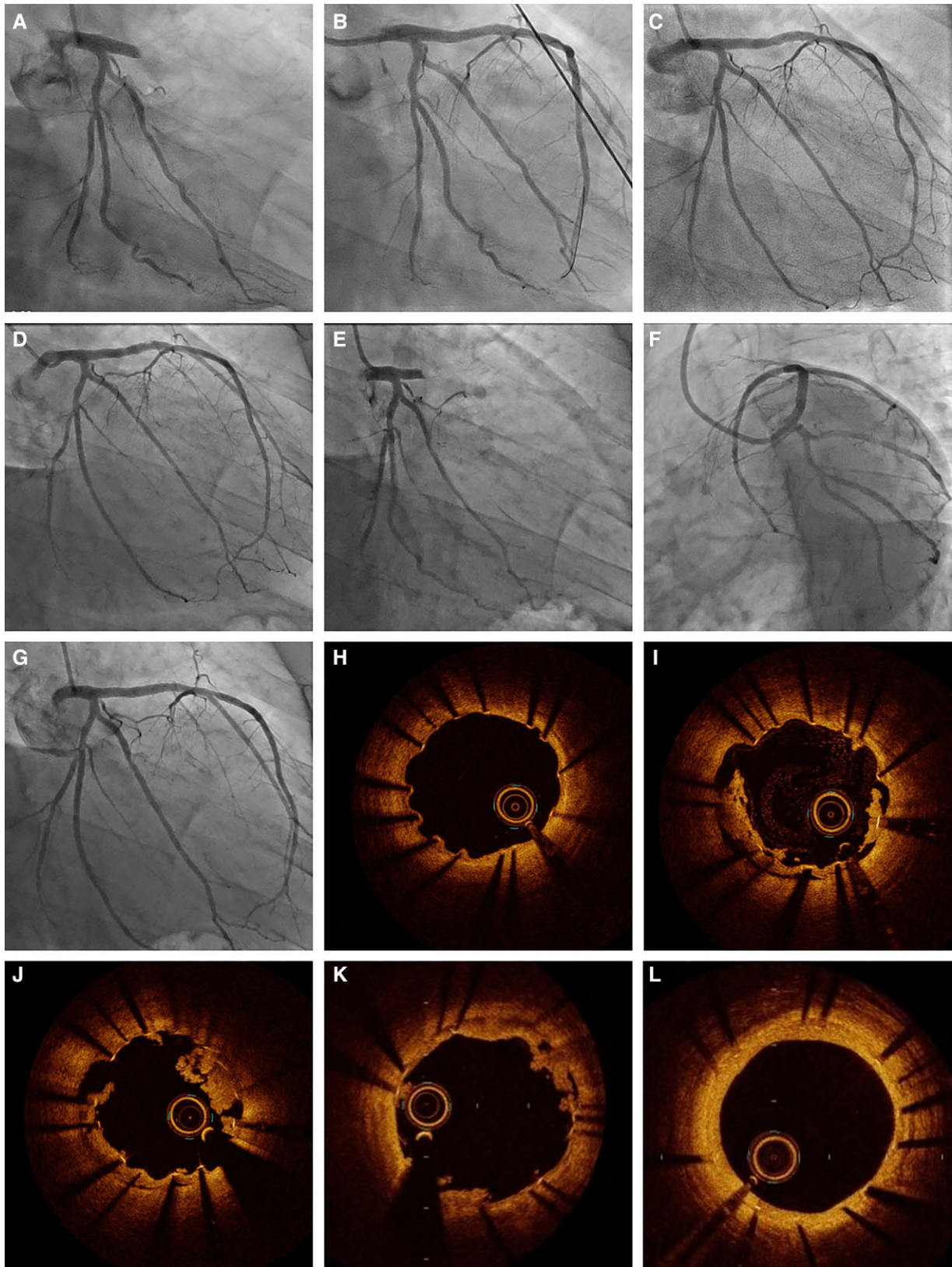
Figure 1 (*A*) Coronary angiogram revealed a total occlusion at the proximal segment of the left anterior descending artery at the first episode of anterior ST-segment-elevation myocardial infarction. (*B*) Primary percutaneous coronary intervention was performed and TIMI flow grade 3 was

Data availability

The data underlying this article will be shared on reasonable request to the corresponding author.

References

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Figure 1 Continued

obtained. (*C*) Follow-up coronary angiogram 1 year after the initial percutaneous coronary intervention showed no angiographic restenosis. (*D*) Follow-up coronary angiogram 3 years after the initial percutaneous coronary intervention showed no angiographic restenosis. (*E*) At the second episode of anterior ST-segment-elevation myocardial infarction, emergent coronary angiogram revealed a total occlusion at the stented segment of the proximal left anterior descending artery, suggestive of very late stent thrombosis. (*F*) Plain old balloon angioplasty was performed and TIMI flow grade 3 was obtained. (*G*) Follow-up coronary angiogram 18 months after the second percutaneous coronary intervention showed no angiographic restenosis. (*H*) Optical coherence tomography 1 year after the initial percutaneous coronary intervention showed evagination and stent malapposition (maximal malapposition distance of 260 μm; minimal stent area of 7.22 mm^2). (*I*) Optical coherence tomography 3 years after the initial percutaneous coronary intervention revealed the progression of stent malapposition (maximal malapposition distance of 450 μm; minimal stent area of 7.11 mm^2) with white thrombus and evagination. (*J*) At the second episode of STEMI, optical coherence tomography examination after thrombus aspiration revealed stent malapposition with evagination and a large amount of residual white and mixed thrombus. (*K*) Optical coherence tomography examination after balloon angioplasty indicated improved stent apposition (maximal malapposition distance of 170 μm; minimal stent area of 8.83 mm^2) with reduction of intracoronary thrombus. (*L*) Optical coherence tomography 18 months after the second percutaneous coronary intervention showed stent struts well apposed and covered with thin homogenous neointima without thrombus attachment.