

How long should dual antiplatelet therapy be applied after covered stent implantation? A case report on clinical implications of left anterior descending artery aneurysm treatment with covered stent implantation

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A 65-year-old male patient was admitted to the Department of Interventional Cardiology due to non-ST-segment elevation myocardial infarction (NSTEMI). Medical history revealed ST-segment elevation myocardial infarction (STEMI), anterior and percutaneous transluminal coronary angioplasty (PTCA) of the left anterior descending artery (LAD) with two drug-eluting stents (DES) implanted in 2017. Moreover, it showed anterior STEMI with acute very late thrombosis in the previously implanted stents, treated with balloon angioplasty (POBA) in 2020. Urgent coronary angiography revealed a newly formed LAD medial saccular coronary artery aneurysm (CAA) (8.08 mm × 5.64 mm) between the previously implanted stents (Figure 1A, 1B). Intravascular ultrasound (IVUS) confirmed the pseudoaneurysm character.

We performed successful implantation of a GraftMaster covered stent (3.5 mm × 19mm×16atm (a common off-label application of this device) with 3.5 mm × 20 mm × 20 atm balloon postdilatation (Figure 1C). The closure of the CAA was confirmed with IVUS (Figure 1D). The patient was initially treated with dual antiplatelet therapy (DAPT) (aspirin and ticagrelor). Control echocardiography showed a thrombus in the akinetic left ventricle apex. The bleeding risk was assessed as high because of coexisting active malignancy. Moreover, the thrombotic risk was qualified

as high due to the significant thrombotic potential of covered stents. Considering the above circumstances, the patient was qualified for continuation of ticagrelor therapy with initiated dabigatran therapy (aspirin was temporarily withdrawn). After one month, the thrombus dissolved, and the patient was switched to aspirin and ticagrelor; dabigatran was discontinued. Control coronary angiography after 6 months revealed the optimal effect of the previous procedures.

The patient was admitted to the ward approximately 11 months after the covered stent implantation because of anterior STEMI. Treatment with ticagrelor had been interrupted five days earlier because an urgent surgical procedure was needed. Coronary angiography showed late thrombosis in the previously implanted covered stent. Under IVUS guidance, we performed covered stent deployment optimization with POBA-LAD (3.25 mm × 15 mm × 20 atm and 4.0 mm × 12 mm × 20 atm). Finally, the optimal treatment effect was confirmed with IVUS (Figure 1E, 1F). The patient was qualified for prolonged DAPT.

The CAA is defined as the focal dilation of coronary segments of at least 1.5 times the adjacent normal segment. It occurs in 0.3%–5% of cases [1]. The mechanism of CAA formation after stent implantation includes deep vessel wall injury, localized hypersensitivity vasculi-

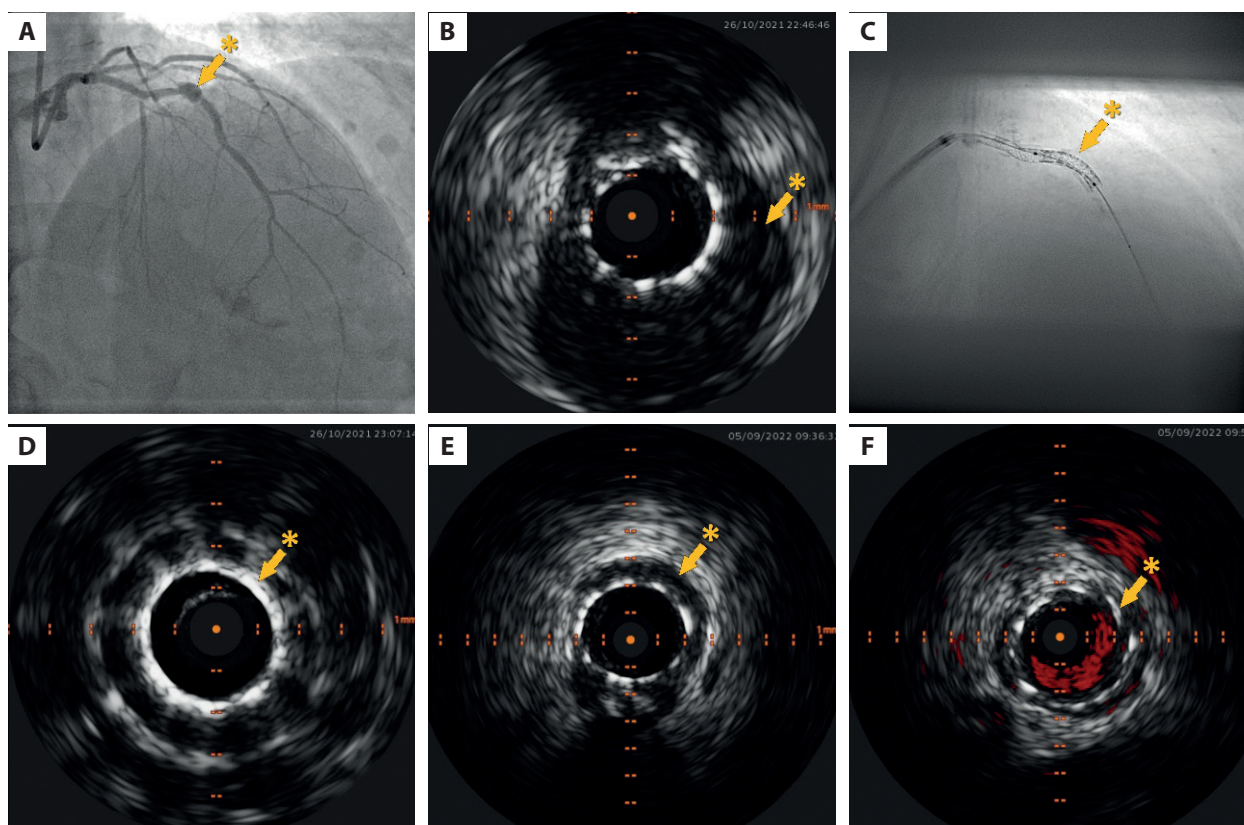


Figure 1. **A.** Angiography: a coronary artery aneurysm (CAA) (*) in the medial left anterior descending artery (LAD). **B.** Intravascular ultrasound (IVUS) imaging of the CAA (*). **C.** ClearStent view of the medial LAD after covered stent placement (*). **D.** IVUS imaging of the covered stent in the CAA (*). **E.** IVUS imaging of the covered stent — suboptimal stent expansion (*). **F.** IVUS imaging of the covered stent after optimization (*)

tis, focal infection, vessel remodeling, and DES malposition [2]. CAAs may cause clinical consequences, including myocardial infarction [3]. The covered stent implantation is one of the options for CAA treatment, especially dedicated to smaller CAAs. There are no standards for DAPT and NOAC treatment after covered stent implantation. The guidelines do not describe the combination of dabigatran and ticagrelor [4]. However, dabigatran was chosen because some clinical trials indicated that it reduces the overall risk of bleeding [5]. We observed that a combination of ticagrelor and dabigatran was sufficient to prevent acute covered stent thrombosis. A combination of aspirin and ticagrelor was also sufficient during the next ten months. Single antiplatelet therapy (SAPT) was insufficient to prevent acute covered stent thrombosis.

Based on the presented case, we would cautiously suggest that 12-month DAPT can be insufficient to prevent covered stent thrombosis and that prolonged DAPT should be considered as destination therapy in patients after covered stent implantation, especially in the low-bleeding risk group.

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