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Letter to the Editor

Simultaneous multivessel acute drug-eluting stent thrombosis

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Abstract

Stent thrombosis (ST) in the era of bare metal stents (BMS) using high-pressure stent deployment and combined anti-platelet therapy is an uncommon but feared complication.

There is concern for an elevated risk of stent thrombosis (ST) with drug-eluting stents (DES). We describe a case of simultaneous multivessel drug-eluting stent thrombosis 8 h after deployment of paclitaxel-eluting stents in the right coronary (RCA) and left anterior descending (LAD) arteries.

Keywords: Stent thrombosis (ST); Drug-eluting stents (DES); Percutaneous coronary intervention (PCI); Acute coronary syndrome (ACS)

1. Introduction

Stent thrombosis (ST) is a feared complication of percutaneous coronary interventions (PCI). Data from the bare metal stent (BMS) era shows an ST frequency of 1–2%. There is a concern for an increased risk of ST in the drug-eluting stent (DES) era, although convincing data is lacking. We report an unusual case of acute ST in separate coronary arteries following multivessel stent placement. We discuss the potential mechanism of ST in this patient and highlight the need for extra vigilance with respect to anti-platelet therapy in the DES era.

2. Case report

A 58-year-old male was referred for cardiac catheterization following presentation with a 2-week history of unstable angina and an electrocardiogram that demonstrated anterolateral ST wave depression (Fig. 1). There was no evidence of myonecrosis. His past medical history was significant for coronary artery disease (CAD) with multiple myocardial infarctions (MI), two prior percutaneous coronary interventions (PCI), diabetes mellitus (DM), hypertension (HTN), and hyperlipidemia.

The patient was on chronic aspirin (ASA) therapy and was pre-loaded with clopidogrel (300 mg) the day before the initial procedure. Coronary angiography showed that the left anterior descending artery (LAD) had a focal area of severe in-stent restenosis (80%) at the distal margin of a previously placed BMS (Fig. 2A). The circumflex artery had no significant disease. The right coronary artery (RCA) was dominant and had a 90% stenosis in its mid segment (Fig. 2B). Based on the angiographic findings, the patient underwent LAD and RCA stenting.

The periprocedural antithrombotic regimen consisted of a 3500 unit bolus of unfractionated heparin (UFH) to a target ACT of 250–300 s. A 6 Fr AR2 guiding catheter (Vistabrite, Cordis, Miami, FL) was used to engage the RCA. An Asahi soft 0.014″ × 300 cm guidewire (Abbott Vascular Laboratories, Abbott Park, IL, USA) was used to cross the lesion. The lesion was predilated with a 2.5 × 12 mm Maverick balloon (Boston Scientific, MA, USA) at 8 ATM and stented with a 3.5 × 28 mm Taxus Express Stent (Boston Scientific, MA, USA) which was deployed at 14 ATM. Angiography demonstrated 0% residual stenosis, TIMI III flow, and no dissection (Fig. 2C).

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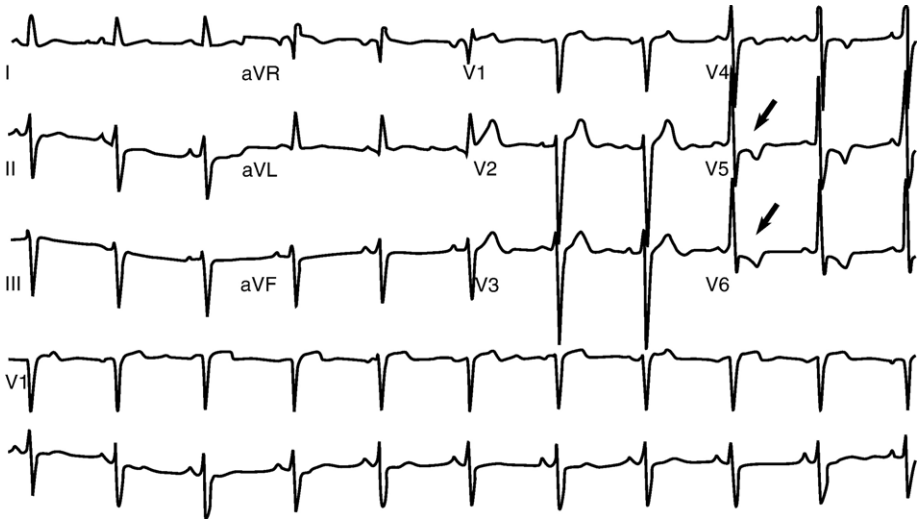

Fig. 1. Baseline electrocardiogram (ECG) showing lateral ischemia with ST depression in the precordial leads V5–V6 (see arrows).

A 6 Fr 3.75 EBU guiding catheter (Medtronic, Minneapolis, MN, USA) was used to engage the LCA. An Asahi soft 0.014″ × 300 cm guidewire (Abbott Vascular Laboratories, Abbott Park, IL, USA) was used to cross the LAD lesion. Direct stenting was performed with a 3.0 × 24 mm Taxus Express Stent (Boston Scientific, MA, USA) which was deployed at 14 ATM. Post-dilation was performed with a 3.5 × 15 mm Quantum Maverick balloon (Boston Scientific, MA, USA). Angiography demonstrated 0% residual stenosis, TIMI III flow, and no dissection (Fig. 2D). Final ACT was 270 s.

Post intervention, the patient was admitted to the ICU for observation. After 8 h he developed acute sub-sternal chest pain and a subsequent electrocardiogram (ECG) showed anterior and inferior ST segment elevations (Fig. 3). At this point it was unclear if this represented ST of the wrap-around LAD and/or the RCA. Abciximab was started (bolus and infusion) and the patient was taken emergently to the cardiac catheterization laboratory. He was hemodynamically stable during this period.

Angiography of the LAD showed ST with TIMI 3 flow (Fig. 4A). Angiography of the RCA demonstrated a proximal thrombotic occlusion (Fig. 4B), with faint left-to-right collaterals to the PDA on injection of the LCA.

A 7 Fr AR2 guiding catheter (Medtronic, Minneapolis, MN, USA) was used to engage the RCA. A Whisper 0.014″ × 300 cm guidewire (Guidant Corporation, St Paul, MN, USA) was used to cross the RCA lesion. A 3.5 × 12 mm Stormer (Medtronic, Minneapolis, MN, USA) NC (non-compliant) balloon was used to dilate the lesion. Cineangiography demonstrated TIMI III flow, but there was persistent evidence of significant thrombus at the distal and proximal margins of the previously placed stent. A 3.5 × 16 mm Taxus Express Stent (Boston Scientific, MA, USA) was deployed at 14 ATM at the distal margin of the stent. A 3.5 × 12 mm Taxus Express Stent (Boston Scientific, MA, USA) was deployed at 14 ATM at the proximal margin of the initial stent. The overlap areas were dilated with a 3.75 × 21 mm Stormer (Medtronic, Minneapolis, MN, USA) NC (non-compliant) balloon. Angiography demonstrated 0% residual stenosis, TIMI III flow, and no dissection (Fig. 4C).

A 7 Fr 3.75 EBU guiding catheter (Medtronic, Minneapolis, MN, USA) was used to engage the LCA. A 0.014″ × 300 cm Patriot guidewire (Boston Scientific, MA, USA) was used to cross the LAD lesion. An Atlantis SR Plus 40 MHz intra-vascular ultrasound (IVUS) catheter interrogation of the LAD revealed no dissection, good stent apposition, and the presence of an intraluminal filling defect consistent with thrombus. A 2.75 × 15 mm Sprinter balloon (Medtronic, Minneapolis, MN, USA) was used to dilate the lesion. Following angioplasty, there was evidence of a dissection at the distal edge of the previously placed stent, which was treated with a 3.0 × 12 mm Taxus Express Stent (Boston Scientific, MA, USA). The overlap area between these stents was dilated with a 3.25 × 21 NC Stormer (Medtronic, Minneapolis, MN, USA) NC (non-compliant) balloon. Cineangiography demonstrated 0% residual stenosis, no dissection, no thrombus, and TIMI III flow (Fig. 4D). The patient was hemodynamically stable. There were no vascular complications and the patient was discharged 72 h later on aspirin and clopidogrel 75 mg twice a day for 3 months, and then once a day for a further 9 months.

3. Discussion

Simultaneous multivessel ST is a rare, and to our knowledge, a previously unreported phenomenon. The angiographic result at the time of the index intervention showing no residual stenosis or dissection, and the presence of adequate stent apposition in the LAD by IVUS at the time of repeat intervention, clearly argue against mechanical factors as being responsible for this event. During the stent thrombosis event, the patient was hemodynamically stable, arguing against secondary thrombosis of one stent due to hypotension