Very late thrombosis in a bare metal stent: An under-recognized problem

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Recent publications have emphasized the concept that restenosis of a bare metal stent is not as clinically benign as previously believed. A case of very late (seven years) thrombosis after implantation of a bare metal stent is described. While doubts on the long-term safety of drug-eluting stents are debated, registry data and clinical reports suggest that the long-term safety of coronary bare metal stent implantation should also be reconsidered.

Key Words: *In-stent restenosis; Thrombosis*

In 1999, a 61-year-old man, normocholesterolemic, nondiabetic, mild smoker with a history of postinfarct angina and hypertension was admitted to the catheterization laboratory at the University Hospital of Siena (Siena, Italy) for acute inferior myocardial infarction. He underwent implantation of a Nir royal stent (3 mm × 16 mm, Boston Scientific, USA) in the right coronary artery and was subsequently discharged on acetylsalicylic acid (100 mg once daily), ticlopidine (250 mg twice daily for one month) and a statin (simvastatin 20 mg once daily). Seven years later, he was admitted again for chest

Thrombose très tardive d'une endoprothèse de métal nu : Problème sous-diagnostiqué

De récentes publications ont fait ressortir le fait que la resténose de l'endoprothèse de métal nu n'est pas aussi bénigne sur le plan clinique qu'on l'a d'abord cru. Les auteurs décrivent ici un cas très tardif (sept ans) de thrombose après implantation d'une endoprothèse de métal nu. Et si on s'interroge sur l'innocuité à long terme des endoprothèses à élution de médicament, les données des registres et les rapports cliniques donnent à penser que l'innocuité à long terme des endoprothèses coronariennes de métal nu mérite aussi une réévaluation.

pain and electrocardiogram evidence of ST segment elevation myocardial infarction in the inferior leads. He reported strict adherence to the therapy prescribed, and no relevant anamnesis was reported during those seven years.

On admission, emergency coronary angiography revealed thrombotic occlusion of the previously stented segment of the proximal mid-right coronary artery with no major retrograde collaterals from the left coronary system (Figure 1). The rest of the coronary tree was not significantly different from that of seven years earlier. After

Figure 1 **A** Angiography showing thrombosis of the stent implanted seven years before (arrow), as well as hemodynamically nonsignificant in-stent restenosis. **B** Result after glycoprotein IIb/IIIa infusion and thrombus retrieval

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administration of a glycoprotein IIb/IIIa inhibitor (intravenous bolus of abciximab), the total occlusion was easily crossed with the use of a floppy guidewire, and the Medtronic Export system (Medtronic Inc, USA) retrieved the intraluminal thrombus. The lesion was dilated at 8 atm with a 3 mm × 15 mm Maverick balloon (Boston Scientific), yielding a good angiographic result. A bolus of clopidogrel (600 mg orally) was administered. The clinical course was unremarkable, and echocardiography on day 3 confirmed akinesia of the inferior wall. The patient was discharged on double antiplatelet therapy (acetylsalicylic acid 100 mg plus clopidogrel 75 mg once daily), which was to be continued for at least one year.

DISCUSSION

We describe a case of in-bare-metal-stent (BMS) thrombosis seven years after percutaneous coronary intervention. To our knowledge, seven years is the longest interval ever reported between stent implantation and stent failure. Although a role of the gold coating of the Nir Royal stent cannot be excluded, cases of late in-BMS thrombosis were observed in our laboratory also with Nir Elite and BX Velocity (Cordis, USA) stents. In the pre-drug-eluting-stent (DES) era, late thrombosis of a BMS was considered to be a very rare event, and safety studies mostly focused on the issue of restenosis. In contrast, the possibility of very late thrombosis (ie, in-stent thrombosis occurring one year after implantation or longer) has led to unresolved discussions regarding the appropriate timing of the interruption of combined antiplatelet therapy, as well as to a broad debate on the safety of DES; some studies suggest an increased cardiovascular risk late after DES implantation (1,2). Of note, Hasegawa et al (3) recently reported clinical and histopathological evidence suggesting atheromatous degeneration of the neointima, followed by plaque rupture occurring up to five years after BMS implantation (3). Their findings suggest that the formation and progression of a new plaque over a previously healed vascular intima within the implanted stent may represent a potential mechanism for in-BMS thrombosis. In this hypothesis, while in-DES thrombosis is the consequence of a drug-induced delay (or impairment) in the re-endothelialization of the stent struts, late in-BMS thrombosis would follow a maladaptive formation of pathological neointima, which would then rupture and cause thrombosis.

CONCLUSION

We believe that this type of event and pathophysiology should not be considered a rarity. Recent publications have emphasized the concept that restenosis of a BMS is not as clinically benign as previously believed. Case reports (4,5) and data from two real-world registries (6,7) report an approximately 30% incidence of acute coronary syndromes in patients presenting with in-BMS restenosis. This presentation is consistent with the presence of a thrombotic component, and it clearly challenges the traditional view that restenosis in a BMS is a progressive condition that is due to in-stent fibrotic proliferation and whose clinical correlate is stable angina. We conclude that while doubts on the long-term safety of DES are debated, registry data and the clinical case presented here suggest that this debate should also be extended to coronary BMS implantation.

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