

Case Report

Symptomatic Large Coronary Artery Aneurysm Associated with Sirolimus - Eluting Stent Implantation

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Kuwait Medical Journal 2007, 39 (2):190-192

ABSTRACT

We report a case of a symptomatic large aneurysm in the left anterior descending coronary artery in a 55-year-old female one year and five months after implantation of a

sirolimus-eluting stent. This is a rare complication of a drug-eluting stent.

KEYWORDS: aneurysm, angioplasty, drug-eluting stent, sirolimus

CASE REPORT

A 55-year-old lady presented to Cardiology department in June 2005 with crescendo angina and early positive exercise stress test. Coronary angiography demonstrated good left ventricular systolic function and mild diffuse atherosclerotic plaques in the right and left circumflex coronary arteries. There was a 90% long proximal left anterior descending coronary artery (LAD) stenosis (Fig. 1A). Planned percutaneous coronary intervention was performed using a 3.0 mm x 33 mm Sirolimus-eluting stent (Cypher). The end result was good with no residual stenosis (Fig. 1B). Aspirin and clopidogrel (300 mg) were started 24 hours before the procedure. Glycoprotein IIb IIIa inhibitor was used during the procedure.

During hospital stay, the patient evolved with no precordial pain and no electrocardiographic or enzymatic alternations were observed. Twenty-four hours after stent implantation, the patient was discharged from the hospital with a clopidogrel prescription of 75 mg / day for one year and aspirin 81 mg / day indefinitely.

The patient presented with a similar precordial pain two months later to a hospital in India during her vacation. Coronary angiography revealed a patent LAD stent.

Over the last year the patient continued to complain of the same precordial pain and was referred for exercise stress test with nuclear imaging. Exercise stress testing was positive with horizontal 1.5 mm ST segment depression in leads V2 - V6 in stage 2 of the Bruce protocol. Thallium imaging demonstrated medium size area of

reversible ischemia involving the antero-lateral wall. The patient was referred for coronary angiography.

Coronary angiography revealed good left ventricular systolic function. Angiographic appearance of the left main coronary artery was normal. Mild to moderate atherosclerotic plaques in the right and left circumflex coronary arteries were observed.

There was a large coronary aneurysm in the LAD artery in the intra-stent distal portion (Fig. 2). Intravascular coronary ultrasound (IVUS) imaging was performed (Fig. 3) and this demonstrated the large aneurysm, stent malapposition and a 70% in-stent re-stenosis proximal to the aneurysm.

Considering the character of the aneurysm and the involvement of a large diagonal branch the patient was advised to undergo coronary artery bypass grafting (CABG).

DISCUSSION

Randomized studies with the use of drug-eluting stents have demonstrated an inhibition of neointimal hyperplasia in majority of patients^[1,2]. With the increasing use of these stents, information on their longterm effect is extremely important.

The formation of a coronary aneurysm, defined as a dilation of the coronary artery that exceed 1.5 times the reference diameter of the adjacent coronary segments that are angiographically normal^[3], has been reported after coronary angioplasty, direct coronary atherectomy and laser angioplasty at a frequency that varies from 2 to 10%^[4]. At the STRESS study^[3], the presence of a

(This article was presented at the 12th International Conference of the Kuwait Medical Association, April 1-4, 2007)

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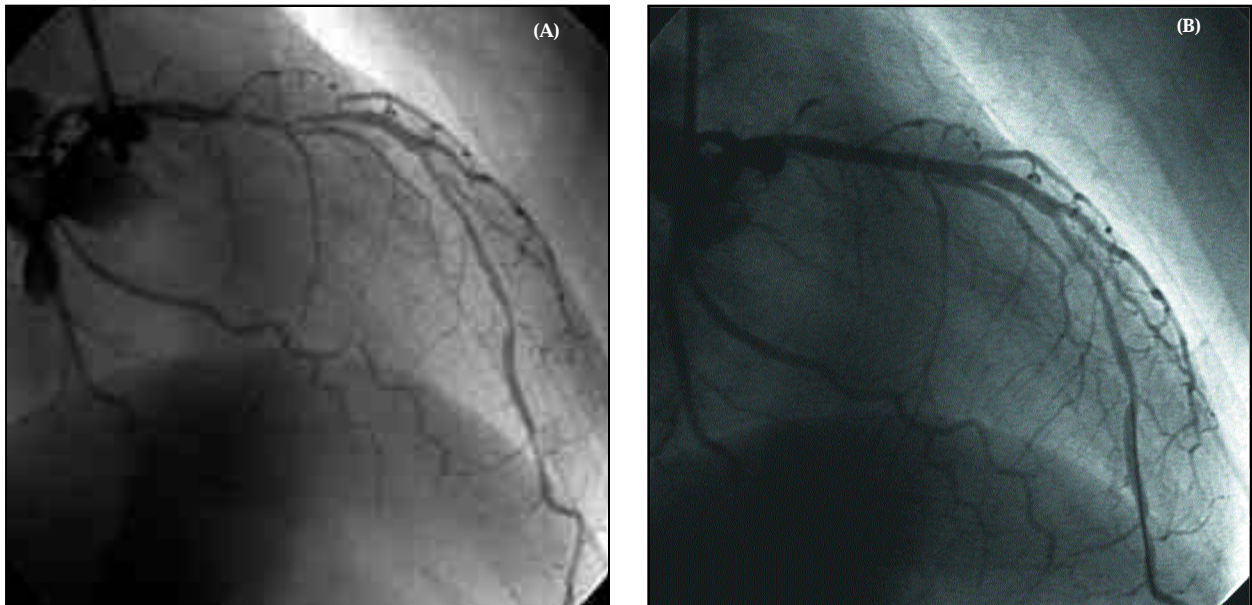


Fig.1: RAO cranial view showing (A) pre- and (B) post-stent implantation



Fig.2: Coronary angiography showing a large LAD aneurysm

coronary artery aneurysm was observed in 3.9% patients submitted to Palmaz-Schatz stent implant.

The mechanism involved in prevention of restenosis by drug eluting stents and the antimitotic effects of the anticancer drugs were considered responsible for the delayed healing effects following balloon dilation resulting in aneurysm formation.

Rab *et al*^[5] have reported the occurrence of coronary artery aneurysms in 32% patients submitted to stent placement, when corticoid drugs and colchicine were administered after the implant. These investigators concluded that the aneurysm formation was probably increased due to the concomitant use of anti-inflammatory agents.

Regarding the present case, another possible

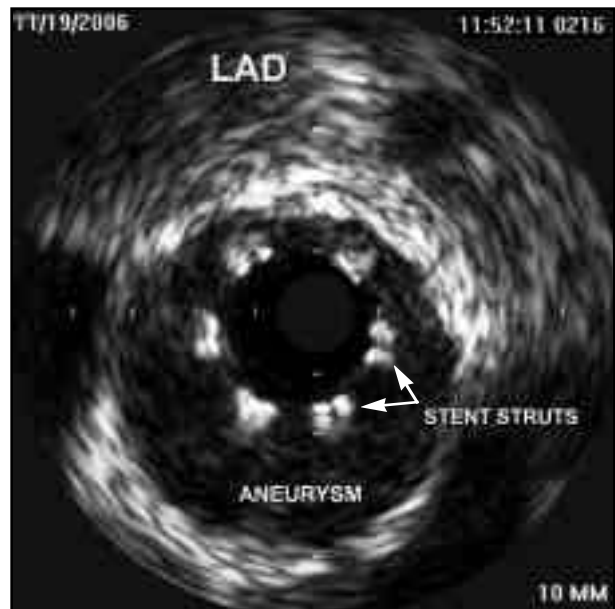


Fig.3: IVUS image showing malapposition of the stent and the large aneurysm

explanation for the aneurysm formation is the late incomplete apposition of the stent filament. This is defined as a separation of one or more stent filaments from the intima with no overlap on the lateral branch and evidence of blood flow behind the filament. It occurs in 4 to 5% of non-eluting stents and at an unknown frequency in drug-eluting ones. Many hypotheses have been formulated to explain its origin, such as positive regional vascular remodeling, plaque regression, late dissolution of the thrombotic material captured by the stent filaments, cell necrosis, apoptosis, and allergic reaction to sirolimus^[6].

Intravascular ultrasound would be essential in planning a therapeutic strategy. One could verify

whether it was a pseudoaneurysm or true aneurysm by the presence of the three-layered appearance typical of the coronary artery^[7]. Simply stenting over the origin of the dilated segment will often cover the entrance of the dilated system resulting in closure of the aneurysm area. A polytetrafluoroethylene (PTFE) covered stent could be employed to seal off the area. A recently presented method by Iakovou *et al*^[8] used a custom-modified PTFE-covered stent. Our patient, however, was advised to undergo CABG because there was in-stent re-stenosis as well as involvement of a large diagonal branch.

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