

Images in cardiovascular medicine

Coronary spasm resistant to intracoronary nitrates following successful stent implantation

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A 58-year-old man with a history of asthma and mild hypercholesterolemia was admitted to our Department because of a high risk, non-ST segment elevated acute coronary syndrome. The patient was treated with aspirin (150 mg), unfractionated heparin (initial bolus 4000 IU), oral beta-blockers, intravenous nitrates and tirofiban (initial bolus 0.4 $\mu\text{g}/\text{kg}/\text{min}$ for 30 min followed by infusion at 0.1 $\mu\text{g}/\text{kg}/\text{min}$). Thirty hours after admission to the coronary care unit a coronary angiography was performed. A 16 mm long stenosis occluding 73% of the diameter (at automated quantitative computerized analysis) of the proximal left anterior descending coronary artery (LAD) with a TIMI 2 flow was diagnosed. The minimal luminal diameter at the lesion site was 0.5 mm (Fig. 1). Left ventricular angiography showed a preserved

left ventricular systolic function, without segmental wall motion abnormalities.

Following balloon inflation angioplasty (2.5 \times 20 mm balloon inflated at 15 atm), an improvement in TIMI flow was observed, despite a suboptimal angiographic result (residual 40% stenosis) (Fig. 2). A BiodivYsio stent (3.5 \times 15 mm, Biocompatibles Ltd, Farnham, UK) inflated at 16 atm was deployed in order to optimize the angiographic result. The angiographic check-up showed a striking spasm of the LAD (Fig. 3) associated with electrocardiographic signs of ischemia on the precordial leads (ST segment horizontal down-sloping) and with angina. Intracoronary nitroglycerin (300 μg) and an adjunctive bolus (10 $\mu\text{g}/\text{kg}$) of tirofiban were ineffective. Afterwards, intracoronary verapamil (1 mg) was administered, and a TIMI



Figure 1. Before balloon angioplasty: significant stenosis of the left anterior descending coronary artery with hampered flow.

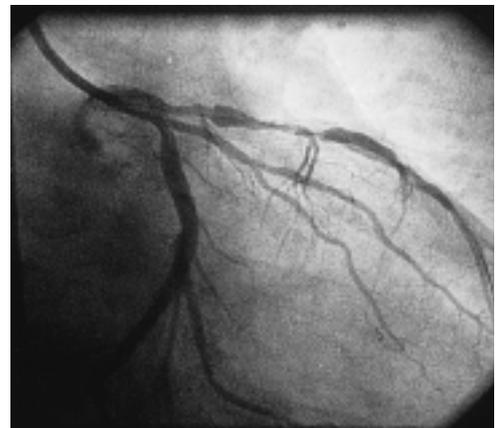


Figure 2. After balloon angioplasty: the angiographic result is suboptimal, but the coronary artery flow is restored to TIMI 3.

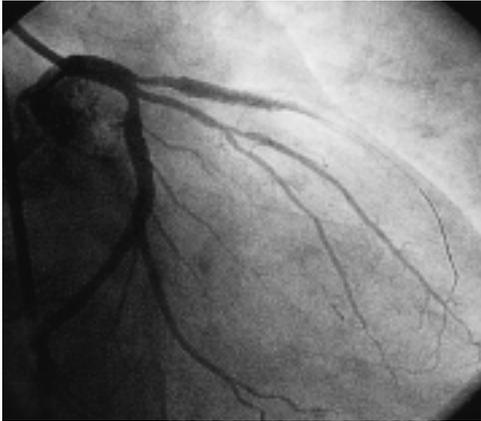


Figure 3. After stenting: striking spasm.



Figure 4. Approximately 2 min after intracoronary verapamil administration (1 mg): the coronary artery flow is restored to TIMI 3.

3 flow was immediately achieved. Angiography did not reveal dissection or occlusive thrombi in the LAD; a septal perforator appeared blunted (Fig. 4). The chest pain as well as the electrocardiographic signs of ischemia subsided. Following an intracoronary bolus of verapamil, a 2:1 atrioventricular block developed and lasted 20 min. The patient was sent back to the coronary care unit in

conditions of hemodynamic stability and with no complications. Angiographic follow-up performed at 24 hours confirmed the persistence of the result; cineventriculography did not show any modification. A slight, not significant elevation in creatine phosphokinase-MB serum levels was observed. At 6 months of follow-up, our patient is in good health and free of symptoms.