

Coronary Stenting Through 4 French Diagnostic Catheter

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A first case of coronary stent implantation through a 4 French diagnostic catheter is described. © 2011 Wiley Periodicals, Inc.

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INTRODUCTION

The intuitive quest for ever smaller catheters for percutaneous coronary interventions was carried one step further by the introduction of a new stent system.

CASE REPORT

A 46-year-old construction foreman was admitted for emergency coronary angiography with the symptoms of an acute posterolateral myocardial infarction lasting for 7 hr. The culprit lesion was an occluded large first marginal branch (MB) of the left circumflex coronary artery. It was recanalized with a BioMatrix stent (3.5 × 18 mm, Biosensors, Singapore). Incidentally, a significant stenosis in the dominant right coronary artery (RCA) at the takeoff of a large right ventricular branch (RVB) was also fitted with a BioMatrix stent (3.0 × 14 mm). The RVB remained patent but displayed slightly slowed flow.

Five months later, the patient started to experience dyspnea on exertion accompanied with slight chest pain. An exercise stress test showed 3.3 mm ST-elevation at peak exercise in leads V₁₋₃.

Repeat cardiac catheterization showed a practically normalized left ventricle compared to the former posterolateral hypokinesia and an excellent result of both stents (MB and RCA). However, there was a subtotal stenosis with delayed filling at the takeoff of the RVB from the RCA stent (Fig. 1). It was assumed that this large RVB was responsible for exertional ischemia in the right ventricle and thus for the symptoms and the exertional electrocardiographic changes.

After 5,000 units of intravenous heparin a Svelte Acrobat stent-on-a-wire (3.0 × 18 mm, Svelte, New Jersey) was introduced through the 4 French (F) diagnostic left Amplatz 2 coronary catheter used for visualization of the RCA. The Svelte Acrobat fixed-wire-balloon stent is a hybrid design (closed cells with

J-like connectors) cobalt chromium bare metal stent (strut thickness 81 μm) crimped on a balloon-on-a-hypotube with a collapsed leading stent profile of 0.030 inch and a flexible, shapeable, and steerable (system rotates as a unit) 0.012 inch coil-wire tip of 22 mm length. It comes in diameters of 2.5, 2.75, 3.0, or 3.5 mm at 13, 18, and 23 mm of length. Its rated burst pressure is 18 bar. The diagnostic 4 F catheter (Infiniti Vestar Nylon, internal lumen 0.038 inch, Cordis, Miami, FL) was introduced through the right femoral artery using a standard 4 F sheath (Cordis, Miami, FL). Predilatation or postdilatation was not an option as there are no balloons on the market approved for 4 F diagnostic catheters. Figure 2 shows the placement of the stent. The angiographic result was excellent (Fig. 3). The patient left the hospital the same day and he had an improved clinically negative exercise test a few days later.

DISCUSSION

Although balloon angioplasty through 4 F catheters has been around for almost 20 years [1], it has not gained popularity because of the impossibility to introduce stents and the phasing out of balloons compatible with 4 F diagnostic catheters.

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Conflict of interest: Dr. Meier is an advisor for Svelte. The other authors have nothing to report.

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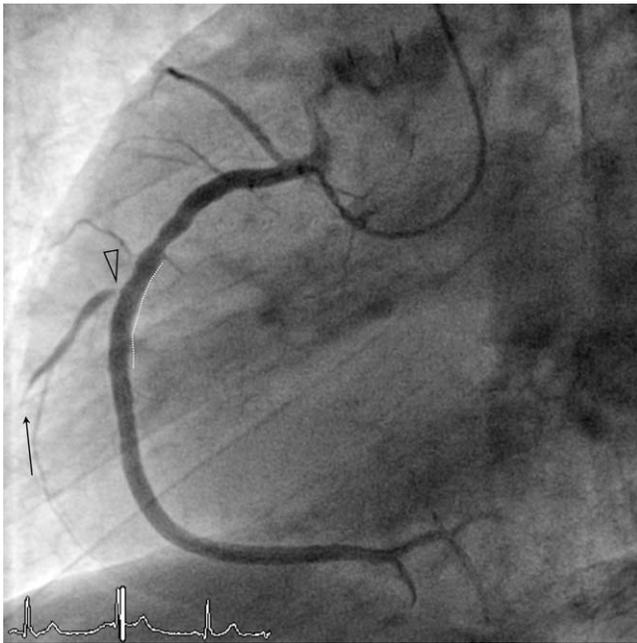


Fig. 1. Good result of the stent in the RCA (dashed line) with subtotal occlusion of the RVB (arrow head) with slow flow (arrow).

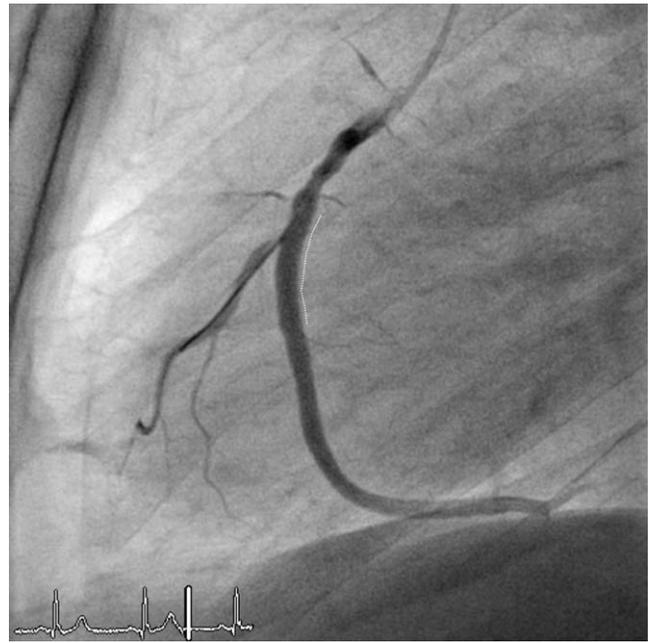


Fig. 2. Contrast medium injection during placement of a Svelte Acrobat stent-on-a-wire (3.0 × 18 mm) into the stenosis at the overstented (dashed line) orifice of the large RVB. The stent was introduced through the 4 F diagnostic coronary catheter. Its smallness still allowed sufficient opacification of the vessel.

In Japan, dedicated 4 F guiding catheters have been used in conjunction with conventional balloons and stents [2,3] and even virtual 3 F [4] and 2 F [5] stenting has been reported. It corresponds, however, to 5 F [4] and 4 F [5] in external diameter, respec-

tively. The Svelte Acrobat stent-on-a-wire was designed to place stents more easily in tight spots (e.g., through jailing stents into side branches,

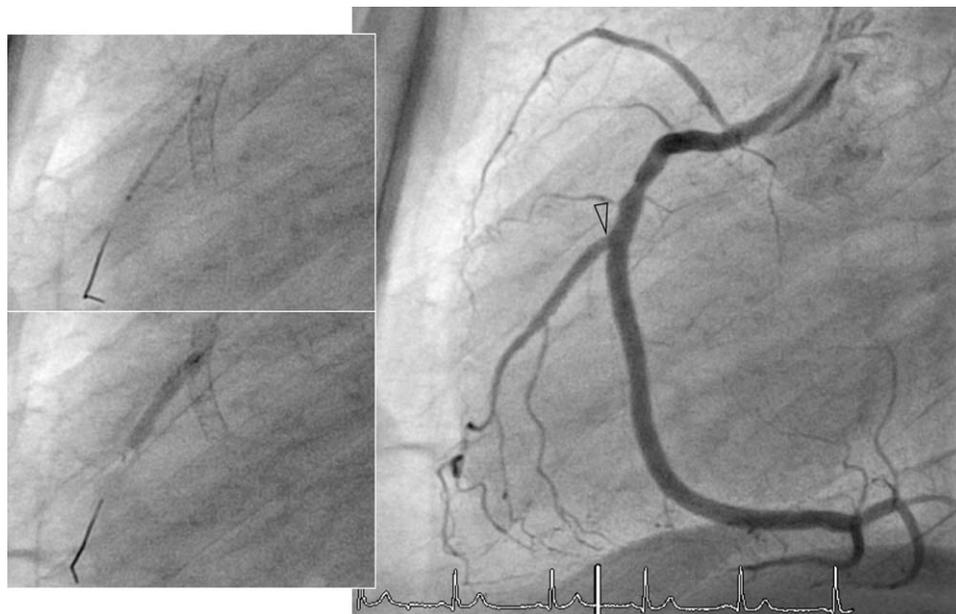


Fig. 3. Result after stenting (arrowhead). Insert left top: stent placement before inflation. Insert left bottom: stent inflation at 8 bar (lower than the recommended implantation pressure of 16 bar because the selected 3.0 mm balloon was considered rather large for the vessel).

otherwise unstentable lesions, etc.). Because of its smallness it allows stenting through diagnostic 4 F catheters, obviating the need for changing over to a costly guiding catheter for simple lesions to be stented ad hoc. To facilitate the advancement of the stent in spite of limited back-up, the stent-on-a-wire can be continuously torqued (screwed in) while being advanced through a tight spot. This was used in the presented case. Postdilatation with a high pressure balloon and most additional therapeutic maneuvers are not possible with the described setup and require exchange to a larger catheter.

CONCLUSIONS

Stenting through 4 F diagnostic catheters offers the option (particularly attractive for radial approach) to

stent coronary arteries through a puncture hole as small as 1.4 mm when omitting the introducer sheath [6].

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