

Case Report

Use of the Twin-Pass Catheter for Wiring a Jailed Side Branch

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Wiring through stent struts into a jailed side branch can be challenging. We describe a case of double-barrel left main coronary artery stenting into the first obtuse marginal branch that resulted in significant ostial circumflex coronary artery stenosis. We were unable to wire the jailed large distal circumflex artery. We introduced the Twin-Pass catheter over the first obtuse marginal wire, placing the proximal lumen tip over the distal circumflex ostium. The distal circumflex artery was successfully wired, allowing balloon dilatation and successful completion of the case.

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Stenting the main branch with provisional angioplasty or stenting of the side branch is currently the preferred treatment of coronary bifurcation lesions.¹ No bifurcation stent is currently commercially available in the United States.² Wiring through a jailed side branch may be challenging. We report a case of double-barrel unprotected left main stenting into the first obtuse marginal branch resulting in jailing of the large distal circumflex. We were unable to wire the distal circumflex due to multiple layers of left main stents. Use of the Twin-Pass catheter (Vascular Solutions, Minneapolis MN, USA) allowed advancement of a coronary guide-wire through the left main stents into the distal circumflex.

Case presentation

A 64-year-old man presented with an acute leukemic crisis and severe rest angina. Coronary angiography demonstrated severe stenosis of the left main ostium and a severe bifurcation lesion at the origin of the large first obtuse marginal branch (Figure 1). He was not considered to be a candidate for coronary artery bypass graft

surgery because he required urgent chemotherapy. Due to the severity of the symptoms, the patient elected to proceed with percutaneous coronary intervention.

A 600 mg loading dose of clopidogrel was administered and anticoagulation was achieved with bivalirudin. The left main coronary artery was engaged with an 8 French 3.5XB guide catheter (Cordis, Warren NJ, USA). The left anterior descending (LAD), first obtuse marginal, and distal circumflex arteries were sequentially wired with an Asahi Soft (Abbott Vascular), Pilot 50 (Abbott Vascular, Santa Rosa CA, USA), and Runthrough (Terumo, Somerset NJ, USA), respectively. Kissing balloon inflation of the left main coronary artery was performed with a 2.5 × 15 mm Firestar balloon (Cordis) advanced into the first obtuse marginal branch and a 3 × 20 mm Voyager balloon (Abbott Vascular) advanced into the proximal LAD (Figure 1B). With every balloon inflation, the patient developed profound ST depression and hypotension. The mid circumflex artery was pre-dilated with a 2.5 × 15 mm Firestar balloon (Cordis).

A strategy of double-barrel stenting of the left main coronary artery was selected to allow continuous wire access to

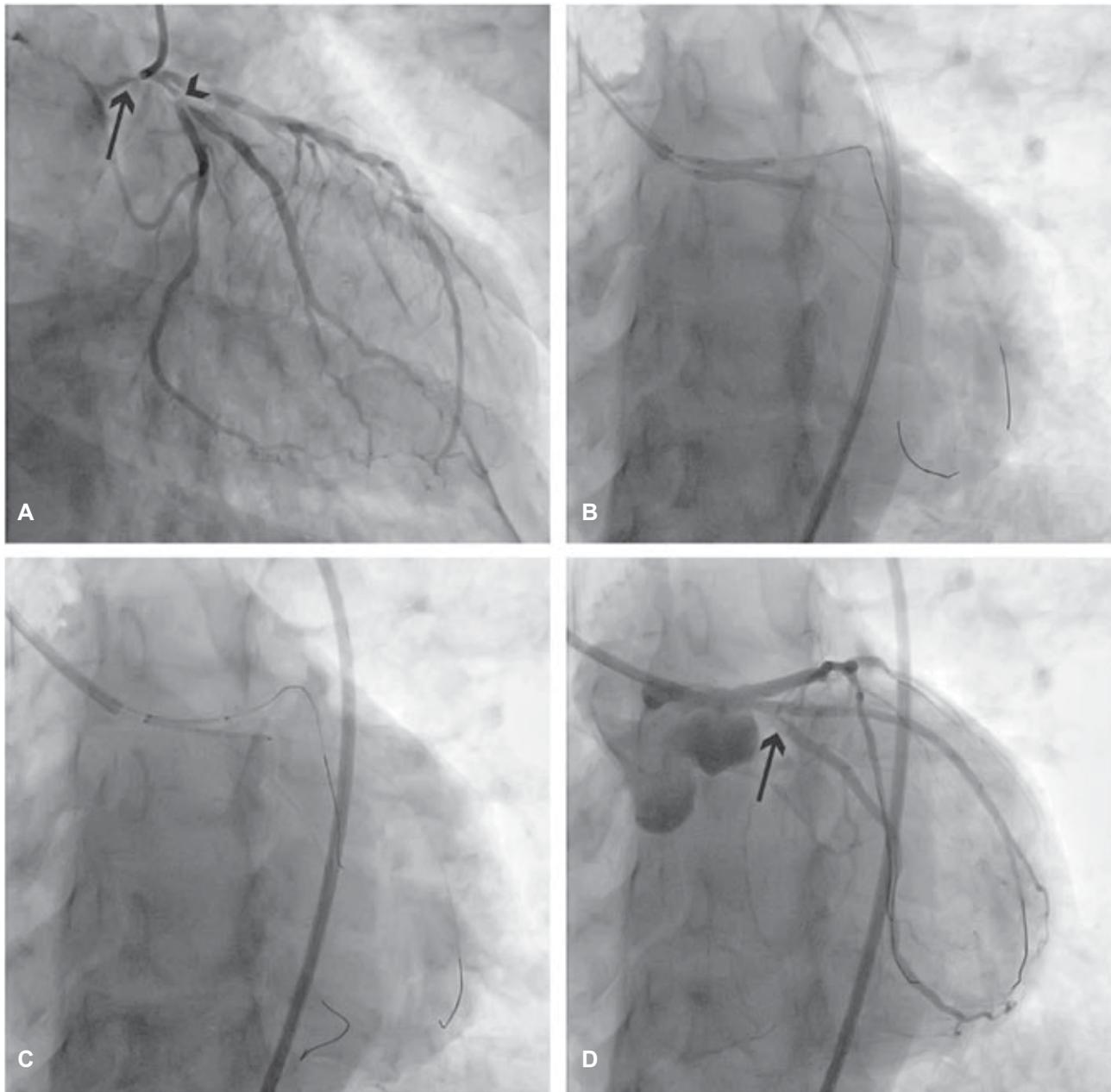


Figure 1. Diagnostic coronary angiography, demonstrating severe ostial left main coronary artery stenosis (arrow, panel A), and a bifurcation lesion at the origin of the first obtuse marginal branch (arrowhead, panel A). Kissing balloon inflation in the left anterior descending, and first obtuse marginal branch (panel B). Positioning of two coronary stents in the left anterior descending, and first obtuse marginal branch (panel C), followed by kissing balloon deployment. Severe jailed mid circumflex stenosis (arrow, panel D) after stent deployment.

the circumflex. A 2.0×23 mm Multi-link Vision stent (Abbott Vascular) was inserted into the first obtuse marginal branch and a 3.0×15 mm Multi-link Vision was deployed into the LAD (Figure 1C), resulting in stenosis of the jailed mid-circumflex artery (Figure 1D), which did not have significant stenosis prior to stenting. Bare metal rather than drug-eluting stents were used, since the patient was known to require

chemotherapy that could result in thrombocytopenia and because of the need to discontinue thienopyridine administration to minimize the risk of bleeding. In spite of using multiple guidewires (Runthrough, Terumo and Whisper, and Cross it 100, Abbott Vascular) we were unable to wire the mid-circumflex, probably because of the multiple layers of left main stents. The rapid exchange delivery lumen of a Twin-Pass catheter

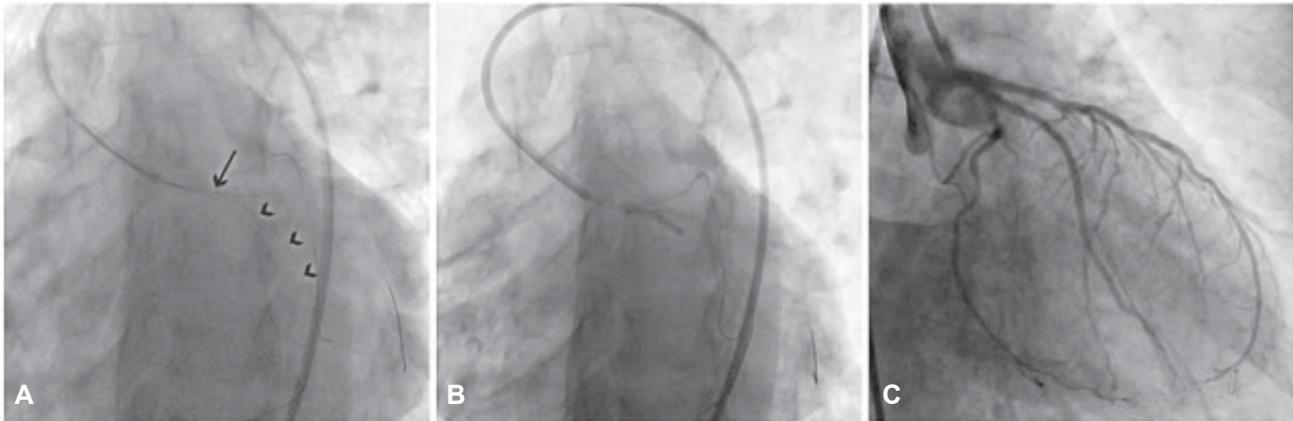


Figure 2. Positioning of the Twin-Pass catheter over the obtuse marginal guidewire with the proximal marker band positioned at the ostium of the circumflex artery (arrow, panel A), allowing successful advancement of the guidewire to the distal circumflex (arrowheads, panel A). Dilatation of the jailed circumflex artery (panel B). Final angiographic result showing excellent left main coverage without significant residual circumflex stenosis (panel C).

ter (Vascular Solutions) was inserted over the obtuse marginal guidewire. The proximal radiopaque marker band of the Twin-Pass catheter, which corresponds to the exit point of the over-the-wire lumen, was positioned close to the circumflex ostium (Figure 2A). A 300 cm Asahi Soft guidewire (Abbott Vascular) was easily advanced via the over-the-wire Twin-Pass lumen through the obtuse marginal stent struts into the distal circumflex, allowing balloon angioplasty of the mid circumflex with a 2.5×15 mm Voyager balloon (Abbott Vascular) (Figure 2B).

A 2.5×12 mm Multi-link Vision stent (Abbott Vascular) was deployed in the mid LAD. Finally, kissing balloon inflation was performed in the left main stents with 3.0×18 mm and 3.0×13 mm Powersail balloons (Abbott Vascular) in the obtuse marginal and LAD, respectively, with an excellent final angiographic result (Figure 2C). The patient subsequently underwent chemotherapy and has remained angina-free during 9 months of follow up.

Discussion

Our case illustrates an innovative use of the Twin-Pass catheter for wiring a jailed side branch. The Twin-Pass is a dual lumen catheter consisting of a rapid exchange delivery system in the distal segment and an over-the-wire lumen that runs the length of the catheter. A radiopaque marker band identifies the distal tip of each lumen; the distal band corresponds to the exit point of the rapid exchange segment and the proximal band marks the exit point of the over-the-wire lumen. The Twin-Pass is indicated “to facilitate placement

and exchange of guidewires and other interventional devices” (Twin-Pass, instructions for use). Our case demonstrates that the Twin-Pass can be used to successfully access jailed side-branches in bifurcation lesions by preventing inadvertent movement of the guidewire behind the deployed stent struts, allowing directional guidewire control, and providing extra support during guidewire advancement. It also allows removal and repositioning of the guidewire to reshape the tip, and guidewire exchange while maintaining intracoronary position. The Twin-Pass catheter has a low profile (3 French) and is very malleable, thereby allowing advancement through tortuosity without causing pseudo-lesions. Its two band markers allow excellent visibility and precise positioning. As in our case, a recent report demonstrated successful use of the Twin-Pass to cross an angulated, calcified, chronic total occlusion.³ Alternative strategies to access a jailed side branch include use of the Venture deflectable-tip catheter (Proxis, Maple Grove MN, USA) or the Steer-It steerable guidewire (Cordis).⁴

In summary, our report demonstrates that the Twin-Pass catheter is a simple and easy-to-use device that can be of great help to interventionalists performing complex coronary interventions in bifurcation and angulated lesions.

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