Successful deployment of a dislodged sirolimus-eluting stent with a small-balloon technique

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ABSTRACT
Stent dislodgement is a rare but recognized and potentially serious complication of percutaneous coronary intervention. Stent dislodgement was more frequent in the past when stents were manually crimped onto the balloon. Newer and improved balloon-mounted stents with better radio-opacity have reduced the incidence of stent dislodgement but do not completely eliminate it. We report a case of stent dislodgement which was successfully deployed with small-balloon technique. This patient however was successfully treated with small balloon technique at the desired site.

Learning objective: Newer and improved balloon-mounted stents with better radio-opacity have reduced the incidence of stent dislodgement but do not completely eliminate it.

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Introduction
Stent dislodgement is a rare complication of percutaneous coronary intervention (PCI) with a reported incidence ranging from 0.9 to 8.3% [1]. Factors that can increase the chances of stent detachment from the balloon catheter within a coronary artery can include tortuosity, calcification, and passage through a previous stent [1]. Complications of stent detachment within a coronary artery can include stent and artery thrombosis resulting in stroke, myocardial infarction, requirement for emergency coronary bypass surgery, and bleeding [1]. A number of stent retrieval or exclusion methods have been described in the past. These include the passage of a small distal balloon, the double-wire braiding technique or “knot” technique, the use of a snaring device over a second wire, and lastly, the stent-crush exclusion technique, whereby a second stent is used to crush the detached stent along the wall of the coronary artery [2–6].

Although the most desirable treatment is to remove the stent, this is not always feasible. We report a case of stent dislodgement which occurred during PCI and the same stent was successfully deployed at the desired site with the small-balloon technique.

Case report
A 55-year-old male was admitted to our hospital with history of exertional angina. The patient was diabetic and hypertensive. His clinical examination was normal and electrocardiogram (ECG) on admission showed no ST-T changes suggestive of ischemia and his treadmill test was positive for inducible ischemia. His initial coronary angiogram showed 75% stenosis in the left anterior descending (LAD) artery and 100% chronic total occlusion in the obtuse marginal artery (OM1) (Fig. 1). Right coronary artery (RCA) was normal.

Risks and benefits of multi-vessel PCI were explained to the patient and he opted for PCI. Percutaneous transulimal coronary angioplasty with stenting to OM1 was done using conventional approach. Left coronary ostia engaged by 7F Extra Back-Up guiding catheter (Medtronic Inc.; Minneapolis, MN, USA) and 0.014” coronary wire (X190 Balanced Middle Weight wire, Boston Scientific, Natick, MA, USA) was passed into the LAD and we decided to do direct stenting. We took a 3.5 mm × 24 mm sirolimus-eluting stent (Cordis, Johnson & Johnson, Bridgewater, NJ, USA), but could not negotiate it across the left main coronary artery (LMCA). The guiding catheter was not in coaxial alignment with the LMCA ostia. While we were repeatedly trying to negotiate the stent to the desired site, there was traction on stent balloon which caused the loss of stent through the balloon into the LMCA (Fig. 2). We took a 1.25 mm × 6 mm Sprinter® balloon (Medtronic Inc.) and passed it beyond the lost stent. Multiple attempts of stent retrieval were unsuccessful.

Initially, a 1.25 mm balloon was passed through the dislodged stent in an attempt to retrieve it, but accidentally it moved forward into the LAD. On seeing this we moved the dislodged stent to the desired site and inflated the stent. Thereafter a new 2.5 mm × 12 mm Sprinter® balloon was passed into the partially inflated stent and further inflated and subsequently the same stent.
balloon itself was passed up to the stent and optimally deployed at the stent desired site (Fig. 3). We then optimally deployed the stent using the same original 3.5 mm × 24 mm stent balloon at the site of lesion. Post-stenting showed Thrombolysis In Myocardial Infarction III flow with no residual stenosis (Fig. 4). Here we report for the first time re-deployment of this dislodged stent using serial usage of small to optimally sized balloon and finally the same uninflated stent balloon to successfully deploy the dislodged stent. The patient tolerated the procedure well and was discharged home after an uncomplicated hospital course. The patient was free of angina, reinfarction, or re-hospitalization after one month post-procedure.

**Discussion**

Stent dislodgement is explained by various mechanisms. Firstly, a stent can dislodge by being stripped off the balloon while crossing the tightest coronary artery; or, secondly, it can get partially stuck within the lesion and become separated from the balloon when it is withdrawn; and thirdly, when withdrawing a deformed stent, a stent tine may catch on the guide tip, leading to the stent being stripped from the balloon [7].

The reported incidence of stent dislodgement varies between 1.4 and 8% [8]. A review of the literature revealed differences in the reported incidence rates; before 1999, the incidence of stent loss was 0.9–8.3%, with a decrease to <0.2%
Conclusion

A dislodged stent occurring during interventional treatment can be successfully treated with non-surgical methods. Usually in coronary stent loss situations the lost stent is retrieved or crushed. In our case, we attempted to deploy the same stent successfully at the desired site which is rare.

References


