Concomitant use of drug-eluting balloon-expandable and self-expandable stents: An approach to avoid surgical revascularization

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Letter to the Editor

We report a patient in whom a balloon-expandable stent and a self-expandable stent were used for percutaneous revascularization of both coronary arteries as an alternative to surgical management.

A 50-year-old male with a history of heavy smoking was referred for coronary angiography. Two weeks earlier, he presented with an acute inferior myocardial infarction that was successfully treated with thrombolytic therapy at another institution. Left ventricular systolic function was mildly reduced by trans-thoracic echocardiography. Trans-thoracic echocardiography revealed severe stenosis of the proximal left anterior descending artery (LAD) (Ejection Fraction = 45%) with akinesis of the inferior wall. Coronary angiography was performed using the right transradial approach and performed pre-dilation using a 2.5 mm × 12 mm non-compliant Trek NC balloon (Abbott Vascular, Santa Clara, CA, USA) to 14 atm at the level of the distal part of the stent (Fig. 1G) and a 5 mm × 12 mm semi-compliant Trek PTCA balloon (Abbott Vascular, Santa Clara, CA, USA) to 12 atm at the distal half of the aneurysm within the deployed stent (Fig. 1H). The angiographic result was optimal with no residual stenosis or dissection (Fig. 1I). Intra-Vascular UltraSound (IVUS) demonstrated good apposition of the stent struts to the vessel wall and adequate shaping of the aneurysm (Fig. 2A, B, C & D). The patient was discharged in stable condition on a dual anti-platelet therapy.

Percutaneous coronary intervention (PCI) for atherosclerotic lesions associated with aneurysmal dilatation remains a challenging situation since the conventional balloon-expandable stents are not designed to shape an ectatic coronary artery. Even though conventional stents are capable of treating the stenosis, adequate strut apposition could be often achieved at the pre- or post-aneurysmal site especially when a significant diameter mismatch between the aneurysm and adjacent non-aneurysmal area exists. Self-expandable stents were primarily used in the early era of PCI; however a relatively high rate of thrombosis has led to a loss of enthusiasm regarding their use. Additionally, the balloon-expandable stents have proven to be practical and to have a lesser rate of thrombosis owing to variable inflation pressures.

A new generation of self-expandable stents was initially designed to treat bifurcation coronary lesions [1] thus reducing the risk of side-branch compromise and allowing full coverage of the carina and landing zone. STENTYS (STENTYS SAS, France) is a nitinol (nickel–titanium alloy) stent with a z-shaped mesh linked together by small interconnections that can be disconnected by balloon inflation between the struts to create a side branch access [2,3]. This metallic platform enables easy crossing and opening of stent cells and thus optimal scaffolding of the side branch ostium and implantation of balloon-expandable stent if needed. Also, this stent carries the property of self-expanding over

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time allowing optimal stent apposition even in vessels with a high discrepancy in size that are challenging to treat optimally with balloon-expandable stents. Furthermore, STENTYS is compatible with 6 Fr guiding catheter enabling its use via radial access.

Few cases of STENTYS implantation were reported in the setting of coronary lesions associated with ectasia or aneurysms [4–6]. Owing to a lesser need of pre-dilatation, it has the potential benefit of reducing the rate of distal embolization which could have a favorable clinical impact in the setting of ST elevation myocardial infarction [7]. Additionally, it has a lower rate of strut malaposition in acute myocardial infarction at day 3 as observed by an optical coherence tomography [8].

In our case, we combined the use of a balloon-expandable and a self-expandable stent to address two morphologically distinct lesions in a young patient thus avoiding surgical coronary revascularization.

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**Conflict of interest**

None.

**References**

Fig. 2. A, B, C & D — Fluoroscopy and Intra-Vascular UltraSound (IVUS) to the LAD showing good apposition of the stent struts to the vessel wall at the level of the distal part of the stent (c) and adequate shaping of the aneurysm (d).