Upfront 2-stent approach for bifurcation lesions: when and how?

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Provisional stenting is currently the standard recommendation for most of the bifurcation lesions treated with percutaneous coronary intervention. In most of the randomized trials comparing the effect of provisional strategy and upfront 2-stent strategy, upfront 2-stent strategy was not shown to be associated with lower rate of major adverse cardiac events. Recently, the DEFINITION II trial demonstrated that in patients with complex true bifurcation lesions, defined according to the DEFINITION criteria, upfront-2 stent strategy is associated with lower rate of target vessel failure, driven by lower rate of target vessel myocardial infarction and target lesion revascularization, compared with the provisional strategy. These findings suggest that upfront-2 stent strategy may not be beneficial for all true bifurcation lesions. However, for complex bifurcation lesions, upfront 2-stent technique is beneficial in reducing adverse cardiac events. According to the DEFINITION criteria, bifurcation lesions meeting one major criteria and two minor criterias are defined as the complex bifurcation lesions. The major criteria (side branch lesion length ≥ 10mm and diameter stenosis ≥70% for LM bifurcation and ≥ 90% for non-LM bifurcation) reflects the disease severity of the side branch. The six minor criterias cover other factors such as calcification, thrombus containing etc. For bifurcations that do not meet the criteria of complexity, if delivery of stent to the side branch is anticipated to be difficult after stenting for main vessel, the upfront 2-stent strategy may also be indicated. For bifurcation with critical stenosis at the ostium of side branch, indicating high risk of occlusion after stenting for main vessel, but the complexity does not meet the criteria, usage of the jailed balloon may secure the access to the side branch after stenting for main vessel and avoid upfront 2-stent technique.

When treating bifurcation lesions with the upfront-2 stent strategy, the most important issue is to do the procedure properly and completely no matter which 2-stent technique is used. The procedure of each 2-stent technique has been refined in the past decade. The procedure such as proximal optimization technique, rewiring through correct cell, sequential high pressure post-dilation and kissing balloon technique, are proposed to minimize overlapping of stent struts, minimize redundant struts at carina, avoid incomplete stent coverage, maximize the stent expansion and optimize the stent geometry. It is pivotal to understand extensively each step of different 2-stetnt techniques since adherence to best practice impact largely on acute and late clinical outcomes.