

Percutaneous Angioplasty of Coronary Bifurcation Stenoses Types 0-1-0 and 0-0-1

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Received: November 16, 2018; **Published:** April 22, 2019

Abstract

Intervention treatment of coronary bifurcation lesions comprises a major challenge to any interventional cardiologist despite the multitude of available techniques. The technique I am describing here is a modified by me T-technique with one stent. It is appropriate for stenosis type 0-1-1 and 0-0-1. It is quick and easy to apply, and in any case it protects the neighbouring coronary segment, undamaged so far by atherosclerotic plaque. This gives me grounds to promote it for implementation in current day-to-day clinical practice, moreover now, when a new generation of DES is being used and new, more secure antiplatelet medications are available.

Keywords: *Bifurcation Stenoses, Interventional Procedure*

Introduction

Intervention treatment of coronary bifurcation lesions comprises a major challenge to any interventional cardiologist despite the multitude of available techniques. Currently the most common of them is provisional stenting. This technique, as others described in medical publications, poses risks of failure as well as of unsatisfactory results. To a great extent, it leads to complications, at the early or later stages of treatment.

The necessity of creating specific techniques for treating bifurcation stenoses stems from the phenomenon plaque shift. It manifests itself when a balloon or stent in the main vessel swells and part of the plaque goes into the side branch, which might get significantly narrowed or even clogged. Bifurcation techniques are applicable when there is a major side branch. It is normally a branch with a diameter over 2.5 mm and sufficiently long so that it can provide blood to significant part of the myocardium. Currently there is no rule how to define when a branch is significant enough, so it is left to the operator to decide which one is this, based on their previous experience and expertise.

We modified T-technique with one stent as a new technique for bifurcational lesions. It is quick and easy to apply, and in any case it protects the neighbouring coronary segment, undamaged so far by atherosclerotic plaque. It does not entail either extension in procedure duration, or any greater amount of the contrast material used. Neither does it lead to an increase in periprocedural complications in any respect. The procedure is performed with guiding catheter 6F, through which both a stent and an intracoronary balloon can be implanted. This allows working through radial artery without any further problems. I have performed 619 interventional procedures of coronary lesions types 0-1-0 and 0-0-1.

Hereinafter is used the common Medina's classification of bifurcation lesions. The techniques I am currently describing refer to stenoses types 0-1-0 and 0-0-1 [1-11].

Material and Methods

Over the period 2000 - 2018, I have performed 619 interventional procedures of coronary lesions types 0-1-0 and 0-0-1. They have comprised bifurcation stenoses of LAD and a diagonal branch, as well as Rcx and a marginal branch. The procedure type 0-1-0 has been performed as follows:

1. Introduction of two coronary wires: one in the main vessel and one in the side branch.
2. Implantation of a coronary stent in the main vessel, conformable to its size.
3. Implantation of a coronary balloon in the side branch, conformable to its size.
4. Implantation of the stent immediate above the stenosis, no more than 1 mm above it.
5. Implantation of the balloon so that its proximal part stays in the main vessel while its distal part remains in the side branch.
6. Simultaneous inflation of the stent to atmospheres conformable to the vessel's size as well as of the balloon up to 8 atm.

The stepwise procedure with stenosis type 0-0-1 is as follows:

1. Introduction of two coronary wires: one in the main vessel and one in the side branch.
2. Implantation of a coronary stent in the side branch, conformable with its size.
3. Implantation of a coronary balloon, 15 mm of length, in the main vessel, conformable to its size.
4. Stent implantation immediately onto the side branch's ostium. The stent might overextend by 1 mm towards the main vessel's lumen
5. Balloon implantation in the main vessel so that its mid-part coincides with the side branch's ostium.
6. Simultaneous inflation of the stent to atmospheres conformable to the vessel's size as well as of the balloon up to 8 atm.



Figure 1: Stenosis of LAD type 0-1-0.



Figure 2: The final result after stenting.



Figure 3: Modified T technique with simultaneous inflated balloon from LAD to first diagonal and inflated stent in LAD.

In order to implement the procedure without further complications, it is recommendable to apply it to patients without any or at least with less calcination around the place of atherosclerotic plaque. It is highly recommendable to select an angiographic position which allows for clear visualization of either the plaque and the side branch's ostium. As for LAD and a diagonal branch, most often such a position is cranial, while with Rcx and a marginal branch - caudal. The side branch should be significant, according to the operator, i.e. a branch that they do not want to lose in the operational aftermath.

Results

The procedure described above boasts 100% rate of positive results. 38% of the implanted stents are BMS, while the rest are DES. Of the patients included here 98% have been clinically followed up, while 62% are followed-up angiographically. Follow-up coronographies

have been done when a necessity of planned intervention on another vessel has arisen within 6 months to a year after the intervention (or in cases of clinical data). Restenosis has been identified in 7% of the earlier stented cases with BMS. An acute thrombosis has been registered in one case, where a new generation of DES was used. Later thromboses have not been registered

Discussion

The advantages of the suggested technique are the following:

1. There is no need of guide's jailing.
2. There is no need to go through the struts of the stent
3. This leads to shortening the duration of procedure and X-ray exposure as well as to reduction in excessive use of contrast material.
4. The technique guarantees passability and functionality of the side branch, as well as future accessibility of main vessel and side branch.
5. The work is done with the help of guiding catheter 6 F, which allows radial access.

Conclusion

The suggested here modified T-technique with one stent for bifurcation stenoses types 0-1-0 and 0-0-1 is easy to apply, highly effective and with a low percentage of either early or further complications. This gives me grounds to promote it for implementation in current day-to-day clinical practice, moreover now, when a new generation of DES is being used and new, more secure antiplatelet medications are available.

Bibliography

1. Latib A and Colombo A. "Bifurcation disease: what do we know, what should we do?" *JACC: Cardiovascular Interventions* 1.3 (2008): 218-226.
2. Latib A., *et al.* "Bifurcation stenting: current strategies and new devices". *Heart* 95.6 (2009): 495-504.
3. Latib A., *et al.* "When are two stents needed? Which technique is the best? How to perform?" *EuroIntervention* 6 (2010): J81-J87.
4. Stankovic G., *et al.* "Percutaneous coronary intervention for bifurcation lesions: 2008 consensus document from the fourth meeting of the European Bifurcation Club". *EuroIntervention* 5.1 (2009): 39-49.
5. Singh JS., *et al.* "A modified provisional stenting approach to coronary bifurcation lesions: Clinical applications of the "Jailed-Balloon Technique"". *Journal of Interventional Cardiology* 25.3 (2012): 289-296.
6. Oviedo C., *et al.* "Intravascular ultrasound classification of plaque distribution in left main coronary artery bifurcations: where is the plaque really located?" *Circulation: Cardiovascular Interventions* 3.2 (2010): 105-112.
7. Patel Y., *et al.* "Long-term outcomes with use of intravascular ultrasound for the treatment of coronary bifurcation lesions". *American Journal of Cardiology* 109.7 (2012): 960-965.
8. Rogacka R., *et al.* "A IVUS-guided stent implantation to improve outcomes: A promise waiting to be fulfilled". *Current Cardiology Reviews* 5.2 (2009): 78-86.
9. Koo BK., *et al.* "Physiologic assessment of jailed side branch lesions using fractional flow reserve". *Journal of the American College of Cardiology* 46.4 (2005): 633-637.

10. Koo BK and De Bruyne B. "FFR in bifurcation stenting: what have we learned?" *Eurointervention* 6 (2010): J94-J98.
11. Bezerra HG., *et al.* "Intracoronary optical coherence tomography: a comprehensive review of clinical and research applications". *JACC: Cardiovascular Interventions* 2.11 (2009): 1035-1046.

Volume 6 Issue 5 May 2019

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