Editorial

Treatment of long coronary lesions with single stent: BioMime Morph sirolimus-eluting tapered coronary stent system

The success of interventional cardiology practice lies in its ability to reduce the severity of disease and to extend and improve the quality of life in patients with coronary artery disease. [1] Treatment of complex lesions in coronary arteries with tapered shape remains challenging due to high-risk and vessel-stent diameter mismatch. Although interventional cardiologists try to avoid the problems of mechanical mismatch between the stent and coronary artery, it becomes a particular concern in cases where arterial diameter changes to a significant degree over the length of a coronary lesion. Such diameter changes are commonly encountered due to natural tapering of coronary artery or due to a need to deploy a stent from parent vessel into its narrower branch. [2]

Angiographic data suggested that left anterior descending (LAD) and right coronary arteries (RCA) taper approximately 14% and 9%, respectively, along their lengths. A study analyzed tapered coronary anatomy, 1 cm proximal as well as distal to the stenosis, in 100 consecutive coronary arteries. They observed that 23% of the arteries had ≥1 mm taper and 19% arteries had a 0.5–0.99 mm taper. Such a tapered coronary anatomy poses a significant challenge during percutaneous coronary intervention, especially in long coronary lesions. I4I

Currently available balloon-expandable stents exhibit limitations such as stent malapposition, conformability, no self-adjustment to tapered lesions, stent overexpansion, stent underexpansion, edge dissection, and immediate vascular injury while treating long lesions in tapered coronary arteries. A novel dedicated long-tapered drug-eluting stent (DES) may overcome these challenges of deploying stents in coronary arteries with the tapered shape. He long-tapered DES is particularly designed to resolve length and tapering issues of long and diffusely diseased segments. The tapered stent provides better safety approach over overlapping stents and also saves the time of intervention cardiologist as well as the cost of patients. [7,8]

BioMime Morph™, Meril Life Sciences, India, is the world's first commercialized tapered DES system intended to deal with the aforementioned unmet clinical needs for long and

tapered lesions without any change in core stent design. The purpose of this system is to deploy the stent into the coronary arteries such as LAD and RCA with de novo lesions of ≤56 mm lengths. It is possible to treat multiple blockages of the tapered coronary artery as well as the long length lesions with the implantation of the single BioMime Morph long sirolimus-eluting stent (40-60 mm). This stent is used to position in the proximal, mid, and distal segments of the diseased coronary artery with adaptability to artery anatomy, i.e., vessel conformability, homogenous radial force, mechanical stress, and stent-arterial wall ratio along the stented segment. Furthermore, this stent has features such as flexibility, vessel wall coverage, and deployment accuracy to ensure lesion coverage. This long and tapered stent system allows the interventional cardiologist to safely expand the stenosed segment to the diameter of the artery. It is mounted on a long and tapered percutaneous transluminal coronary angioplasty balloon catheter, especially designed to suit the tapered artery.

Safety and efficacy of the BioMime Morph have been documented in real-life patients. Recently, Valero et al. shared their experience of treating coronary lesions (a long and diffuse disease with >48 mm of length or multiple tandem lesions with >48 mm of total length) with 60 mm-long BioMime Morph. Deployment of the stent was achieved in 92% cases despite unfavorable anatomical conditions. It should be noted that no major adverse cardiac event was observed in a median follow-up of 275 days. [6] Similarly, the use of long sirolimus-coated stents demonstrated safety and efficacy in long lesion of the coronary arteries with lower risk of repeated revascularization of the target lesion and other adverse cardiovascular events.[8] Moreover, the technical feasibility of BioMime Morph stent has been documented for the treatment of long diffused lesions in patients with chronic total occlusion.[7]

However, the efficacy of the BioMime Morph stent has not been yet documented in clinical conditions such as unresolved vessel thrombus at the lesion site, coronary artery reference vessel diameters <2.25 mm or >3.50 mm, lesion length >56 mm, lesions located in saphenous vein grafts,

lesions located in unprotected left main coronary artery, ostial lesions, lesions located at a bifurcation, previously stented lesions, excessive tortuosity proximal to the lesion, recent acute myocardial infarction, or evidence of thrombus in the target vessel and in-stent restenosis.

CONCLUSION

The novel BioMime Morph long-tapered sirolimus-eluting stent is designed to treat *de novo* long lesions in native coronary arteries with tapered anatomy.

SURESH V PATTED

Department of Cardiology, KLE Academy of Higher Education and Research Centre, Belgaum, Karnataka, India

Address for correspondence: Dr. Suresh V Patted, Department of Cardiology, KLE Academy of Higher Education and Research Centre, Belgaum, Karnataka, India. E-mail: drpatted@yahoo.com

REFERENCES

- Byrne RA, Joner M, Kastrati A. Stent thrombosis and restenosis: What have we learned and where are we going? The Andreas Grüntzig Lecture ESC 2014. Eur Heart J 2015;36:3320-31.
- Timmins LH, Meyer CA, Moreno MR, Moore JE Jr. Mechanical modeling of stents deployed in tapered arteries. Ann Biomed Eng 2008;36:2042-50.
- Zubaid M, Buller C, Mancini GB. Normal angiographic tapering of the coronary arteries. Can J Cardiol 2002;18:973-80.
- 4. Banka VS, Baker HA 3rd, Vemuri DN, Voci G, Maniet AR. Effectiveness

- of decremental diameter balloon catheters (tapered balloon). Am J Cardiol 1992;69:188-93.
- Wessely R, Amoroso G. Self-expanding coronary stents: Rationale, clinical status, future prospects. Eur Med J 2015;3:94-106.
- Valero E, Consuegra-Sánchez L, Miñana G, García-Blas S, Rodríguez JC, Moyano P, et al. Initial experience with the novel BioMime 60 mm-long sirolimus-eluting tapered stent system in long coronary lesions. EuroIntervention 2018;13:1591-4.
- Zivelonghi C, van Kuijk JP, Nijenhuis V, Poletti E, Suttorp MJ, van der Heyden JA, et al. First report of the use of long-tapered sirolimus-eluting coronary stent for the treatment of chronic total occlusions with the hybrid algorithm. Catheter Cardiovasc Interv 2018; p. 1-9.
- Matchin YG, Atanesyan RV, Kononets EN, Danilov NM, Bubnov DS, Ageev FT, et al. The first experience of using very long stents covered with sirolimus (4060 mm) in the treatment of patients with extensive and diffuse lesions of the coronary arteries. Kardiologiia 2017;57:19-26.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online	
	Quick Response Code
Website: www.heartindia.net	
DOI: 10.4103/heartindia.heartindia_24_18	

How to cite this article: Patted SV. Treatment of long coronary lesions with single stent: BioMime Morph sirolimus-eluting tapered coronary stent system. Heart India 2018;6:113-4.