

## Editorial



# Improving the Outcomes of Complex Lesions of the Femoropopliteal Artery Using Atherectomy and Drug Coated Balloon

Sangmin Kim , MD

Regional Cardiovascular Center, Division of Cardiology, Chungbuk National University Hospital, Cheongju, Korea

## OPEN ACCESS

**Received:** Dec 28, 2021

**Accepted:** Dec 29, 2021

**Published online:** Jan 21, 2022

### Correspondence to

Sangmin Kim, MD

Regional Cardiovascular Center, Division of Cardiology, Chungbuk National University Hospital, 776, 1Sunwhan-ro, Seowon-gu, Cheongju 28644, Korea.

Email: sangmin3410@gmail.com

Copyright © 2022. The Korean Society of Cardiology

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0>) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ORCID iDs

Sangmin Kim 

<https://orcid.org/0000-0002-1300-6079>

### Funding

The author received no financial support for the research, authorship, and/or publication of this article.

### Conflict of Interest

The author has no financial conflicts of interest.

► See the article “Clinical Outcomes of Atherectomy Plus Drug-coated Balloon Versus Drug-coated Balloon Alone in the Treatment of Femoropopliteal Artery Disease” in volume 52 on page 123.

The femoropopliteal arterial segment is the most common site of disease in patients with peripheral arterial disease and corresponds to the superficial femoral-popliteal (FP) artery in the lower extremities.<sup>1,2)</sup> Endovascular therapy of the superficial femoral artery is challenging due to the unique dynamic motion of the vessel with daily function, including compression, elongation, flexion, and torsion.<sup>3)</sup> There are numerous interventional strategies for endovascular repair in the FP lesion, including plain old balloon angioplasty, drug-coated balloons, bare metal and drug eluting stents, covered stents, and atherectomy. With many current options for endovascular treatment, and disparate studies investigating individual devices, it can be difficult to determine if there is a clear standard of care, and variation is quite high.<sup>4)</sup>

The combination of directional atherectomy and drug coated balloon (DCB) angioplasty is an attractive strategy for FP revascularization because it addresses both major challenges to sustained patency in FP interventions: (1) mechanical forces caused by residual plaque burden or dissections and (2) biologic restenosis due to development of intimal hyperplasia.

The combination of these two modalities has been studied in the DEFINITIVE AR randomized controlled trial for evaluating the directional atherectomy in conjunction with DCB angioplasty.<sup>5)</sup> This study showed no statistically significant difference in primary patency between combination therapy with atherectomy plus DCB versus DCB alone at 12 months. In the REALITY trial,<sup>6)</sup> which is a single-arm, core-lab adjudicated study evaluating the combination of the directional atherectomy and DCB angioplasty for long, severely calcified lesions of the FP circulation has been studied. Interim results for the 102 patients in the trial demonstrate a mean lesion length of 17.9 cm and a Peripheral Arterial Calcium Scoring Scale score of 3 to 4 in 76.4% of patients. Interim analysis suggests a bailout stent rate of 4.9%, which is extremely low considering such complex lesions. The COMPLIANCE 360 trial<sup>7)</sup> investigated orbital atherectomy vs percutaneous transluminal angioplasty and did not report a significant difference in primary patency.

**Data Sharing Statement**

The data generated in this study is available from the corresponding author(s) upon reasonable request.

The contents of the report are the author's own views and do not necessarily reflect the views of the *Korean Circulation Journal*.

Stavroulakis et al.<sup>8)</sup> reported that preparation of the atherosclerotic common femoral artery lesion with directional atherectomy was not associated with statistically significantly higher primary patency or freedom from the target lesion revascularization compared to DCB angioplasty alone at 12 months. They showed that both modalities had promising outcomes in a primarily surgically treated vascular territory.

The field of endovascular FP revascularization has clearly made great strides over the past 2 decades; however, major limitations of the current data remain.<sup>9)</sup> The first is primarily because of the lack of head to head comparisons. The second major limitation of the current evidence is a lack of consensus over consistent clinical definitions of outcome measures, and a general lack of patient-centric measures used in FP intervention studies.

However, from Cha et al.'s study,<sup>10)</sup> we can find the real outcomes of actual treatments for the FP arterial segments using atherectomy and DCB available in Korea and confirm the insight.

**REFERENCES**

1. Diamantopoulos A, Katsanos K. Treating femoropopliteal disease: established and emerging technologies. *Semin Intervent Radiol* 2014;31:345-52.  
[PUBMED](#) | [CROSSREF](#)
2. Kasapis C, Gurm HS. Current approach to the diagnosis and treatment of femoral-popliteal arterial disease. A systematic review. *Curr Cardiol Rev* 2009;5:296-311.  
[PUBMED](#) | [CROSSREF](#)
3. MacTaggart JN, Phillips NY, Lomneth CS, et al. Three-dimensional bending, torsion and axial compression of the femoropopliteal artery during limb flexion. *J Biomech* 2014;47:2249-56.  
[PUBMED](#) | [CROSSREF](#)
4. Yin WH. Rotational atherectomy: an update. *J Geriatr Cardiol* 2013;10:211-2.  
[PUBMED](#)
5. Zeller T, Langhoff R, Rocha-Singh KJ, et al. Directional atherectomy followed by a paclitaxel-coated balloon to inhibit restenosis and maintain vessel patency: twelve-month results of the DEFINITIVE AR study. *Circ Cardiovasc Interv* 2017;10:e004848.  
[PUBMED](#) | [CROSSREF](#)
6. DeRubertis BD. Interim results of the REALITY trial. Presented at: VINNOVA Symposium (virtual); 2020 May 16; Beijing, China.
7. Dattilo R, Himmelstein SI, Cuff RF. The COMPLIANCE 360° trial: a randomized, prospective, multicenter, pilot study comparing acute and long-term results of orbital atherectomy to balloon angioplasty for calcified femoropopliteal disease. *J Invasive Cardiol* 2014;26:355-60.  
[PUBMED](#)
8. Stavroulakis K, Schwindt A, Torsello G, et al. Directional atherectomy with antirestenotic therapy vs drug-coated balloon angioplasty alone for common femoral artery atherosclerotic disease. *J Endovasc Ther* 2018;25:92-9.  
[PUBMED](#) | [CROSSREF](#)
9. Kansal A, Long CA, Patel MR, Jones WS. Endovascular treatment of femoro-popliteal lesions. *Clin Cardiol* 2019;42:175-83.  
[PUBMED](#) | [CROSSREF](#)
10. Cha JJ, Lee JH, Ko YG, et al. Clinical outcomes of atherectomy plus drug-coated balloon versus drug-coated balloon alone in the treatment of femoropopliteal artery disease. *Korean Circ J* 2022;52:123-33.  
[PUBMED](#) | [CROSSREF](#)