

IMAGES IN INTERVENTION

Orbital Atherectomy-Induced Coronary Fistula

Complication and Treatment



Shriti M. Mehta, MD,^a Paul M. Johnson, MD,^a Joel E. Schneider, MD^b

Orbital atherectomy was developed to facilitate percutaneous treatment of severely calcified coronary lesions. The most common complications of orbital atherectomy have been dissection, perforation, and no-reflow (1). Although iatrogenic coronary arteriovenous fistula is

a rare complication of percutaneous coronary intervention, it has been reported after balloon angioplasty, stent placement, and rotational atherectomy (2-4). We present the first case report, to our knowledge, of an orbital atherectomy-induced fistula between the circumflex artery and coronary sinus.

FIGURE 1 Initial Lesion



Ninety percent proximal to mid circumflex calcified stenosis. See [Online Video 1](#).

FIGURE 2 Post-Orbital Atherectomy and Stent



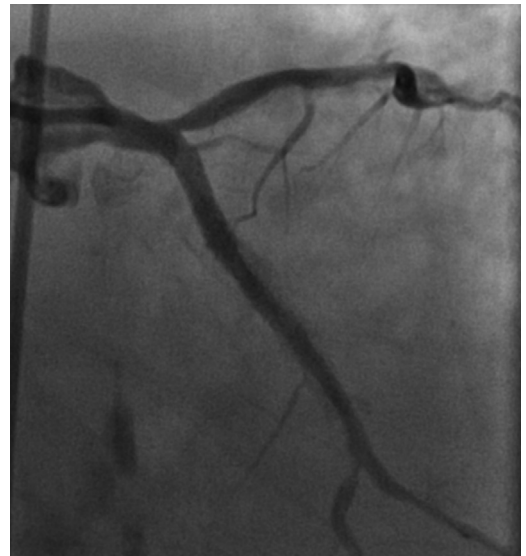
Persistent contrast staining around the proximal circumflex without epicardial perforation. See [Online Video 2](#).

From the ^aDivision of Cardiology, Department of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina; and the ^bNorth Carolina Heart and Vascular/UNC Health Care, Raleigh, North Carolina. The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

Manuscript received June 13, 2016; accepted June 20, 2016.

FIGURE 3 Fistula

Presentation 2 months later with fistula between circumflex and coronary sinus/cardiac veins. See [Online Video 3](#).

FIGURE 4 Fistula Closure

Exclusion of fistula with 2 GRAFTMASTER covered stents (Abbott Vascular, Santa Clara, California). See [Online Video 4](#).

A 71-year-old woman presented with persistent chest pain and dyspnea despite medical therapy. Cardiac catheterization revealed a calcified 90% proximal to mid circumflex stenosis ([Figure 1](#), [Online Video 1](#)). Because an initial attempt to pass an angioplasty balloon was unsuccessful, the patient was referred for atherectomy. The lesion was treated with a CSI Diamondback 1.25 mm orbital atherectomy device (CSI, St. Paul, Minnesota). After placement of 2 drug-eluting stents, persistent contrast staining was noted around the proximal circumflex ([Figure 2](#), [Online Video 2](#)). Echocardiography showed no pericardial effusion. The patient was discharged 3 days later, with resolution of her symptoms.

However, she presented 2 months later with progressive dyspnea, edema, and chest tightness. She was found to have moderate pericardial effusion and bilateral pleural effusions. Despite diuresis, she had persistent hypoxemia. Catheterization revealed patent proximal to mid circumflex stents and a fistula between the proximal/mid circumflex artery and the

coronary sinus/venous system ([Figure 3](#), [Online Video 3](#)). The fistula was successfully excluded with the placement of 2 covered stents ([Figure 4](#), [Online Video 4](#)).

This case illustrates a rare complication of the use of orbital atherectomy for treatment of calcified coronary lesions. Operators should be aware that such arteriovenous fistulas can present as a late complication of atherectomy. Closure of the fistula may be performed with covered stents, coil embolization, or vascular plugs.

REPRINT REQUESTS AND CORRESPONDENCE: Dr. Shriti M. Mehta, University of North Carolina at Chapel Hill, Interventional Cardiology, 160 Dental Circle, CB#7075, 6th Floor, Burnett-Womack Building, Chapel Hill, North Carolina 27599-7075. E-mail: skmasrani@gmail.com.

REFERENCES

- Chambers JW, Feldman RL, Himmelstein SI, et al. Pivotal trial to evaluate the safety and efficacy of the orbital atherectomy system in treating de novo, severely calcified coronary lesions. *J Am Coll Cardiol Intv* 2014;7:510-8.
- Narasimhan S. Coronary arteriovenous fistula secondary to percutaneous coronary intervention of chronic total occlusion. *Case Rep Vasc Med* 2013;2013:1-3.
- Chen WH, Lee PY, Wang EP. Left anterior descending artery to right ventricle fistula and left ventricular free wall perforation after rotational atherectomy and stent implantation. *J Invas Cardiol* 2005;17:450-1.
- Kiernan T, Yan BP, Rosenfield K, Gupta V. Coil embolization of an iatrogenic coronary artery to cardiac vein fistula after rotational atherectomy. *J Interv Cardiol* 2008;21:410-3.

KEY WORDS coronary fistula, orbital atherectomy

APPENDIX For supplemental videos and their legends, please see the online version of this article.