Coronary Orbital Atherectomy at the Ostium of an Anomalous Right Coronary Artery A Double-Edged Sword

Yamamoto, Hiroyuki
Takaya, Tomofumi
Uzu, Kenzo
Takahashi, Yu
Kawai, Hiroya

(Citation)
JACC: Cardiovascular Interventions,13(24):2937-2939

(Issue Date)
2020-12-28

(Resource Type)
journal article

(Version)
Version of Record

(URL)
https://hdl.handle.net/20.500.14094/90008294

JACC: CARDIOVASCULAR INTERVENTIONS VOL. 13, NO. 24, 2020

IMAGES IN INTERVENTION

Coronary Orbital Atherectomy at the Ostium of an Anomalous Right Coronary Artery

A Double-Edged Sword

Hiroyuki Yamamoto, MD, PhD,[a] Tomofumi Takaya, MD, PhD,[a,b] Kenzo Uzu, MD, PhD,[a] Yu Takahashi, MD,[c] Hiroya Kawai, MD, PhD[a,b]

A 75-year-old man previously treated with a 4.0/23-mm bare-metal stent for the midpart of the right coronary artery had worsening angina. Coronary angiography and electrocardiographically gated noncontrast cardiac computed tomography showed severe calcified stenosis at the proximal part of the anomalous high right coronary artery originating from the ascending aorta (**Figures 1A to 1C**). Because rotational atherectomy was unsuitable for this bent lesion because of difficulty in making the guide catheter coaxial, we performed orbital atherectomy (OA) using a Diamondback 360 coronary OA system (Cardiovascular Systems, St. Paul, Minnesota). We advanced the crown backward starting from the distal position of the culprit lesion 5 times at 80,000 rpm and 7 times at 120,000 rpm. We performed OA starting at the calcified lesion at 120,000 rpm under guide-catheter control and advanced the crown forward, whereupon we heard a strange high-pitched noise. We removed the OA device from the patient's body and confirmed crown detachment (**Figures 1D and 1E**, Video 1). We inserted another wire and performed pre-dilatation using a 3.5-mm scoring balloon at the ostium. The 4-mm Amplatz Goose Neck snare (Medtronic, Minneapolis, Minnesota) was inserted along with the ViperWire (Cardiovascular Systems) and the disconnected crown retrieved (**Figure 2**). We delivered a 4.0/26-mm drug-eluting stent at the culprit lesion (**Figures 1F to 1H**). Intravascular ultrasound imaging revealed optimal lesion preparation and stent expansion (**Figure 3**).

Debulking devices are effective for adequate stent expansion in severely calcified lesions. However, rotational atherectomy can sometimes cause complications, including burr entrapment, coronary perforation, and deep dissection, rendering it unsuitable for such bent arteries (1). Advancing OA forward from

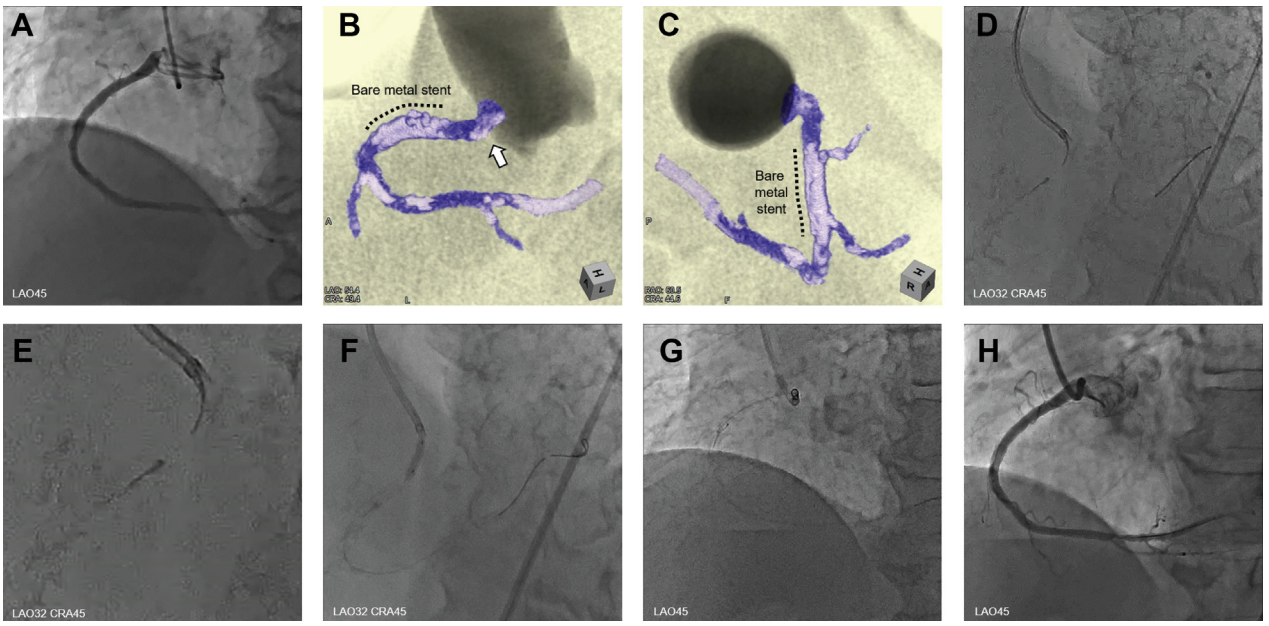
From the [a]Division of Cardiovascular Medicine, Hyogo Brain and Heart Center, Himeji, Japan; [b]Division of Cardiovascular Medicine, Department of Exploratory and Advanced Search in Cardiology, Kobe University Graduate School of Medicine, Kobe, Japan; and the [c]Division of Cardiovascular Medicine, Department of Internal Medicine, Kobe University Graduate School of Medicine, Kobe, Japan.

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

Manuscript received August 19, 2020; accepted August 25, 2020.

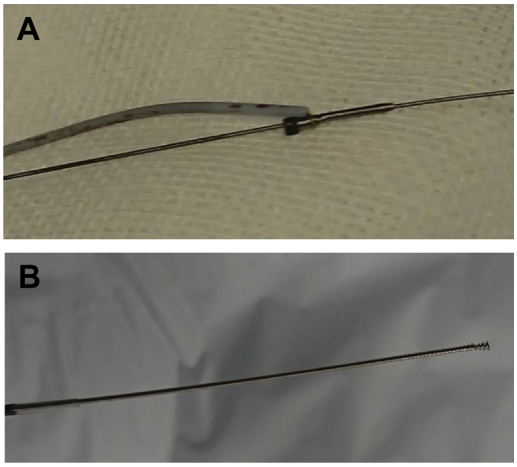
ISSN 1936-8798 https://doi.org/10.1016/j.jcin.2020.08.034

FIGURE 1 Coronary Angiography and Noncontrast Computed Tomography



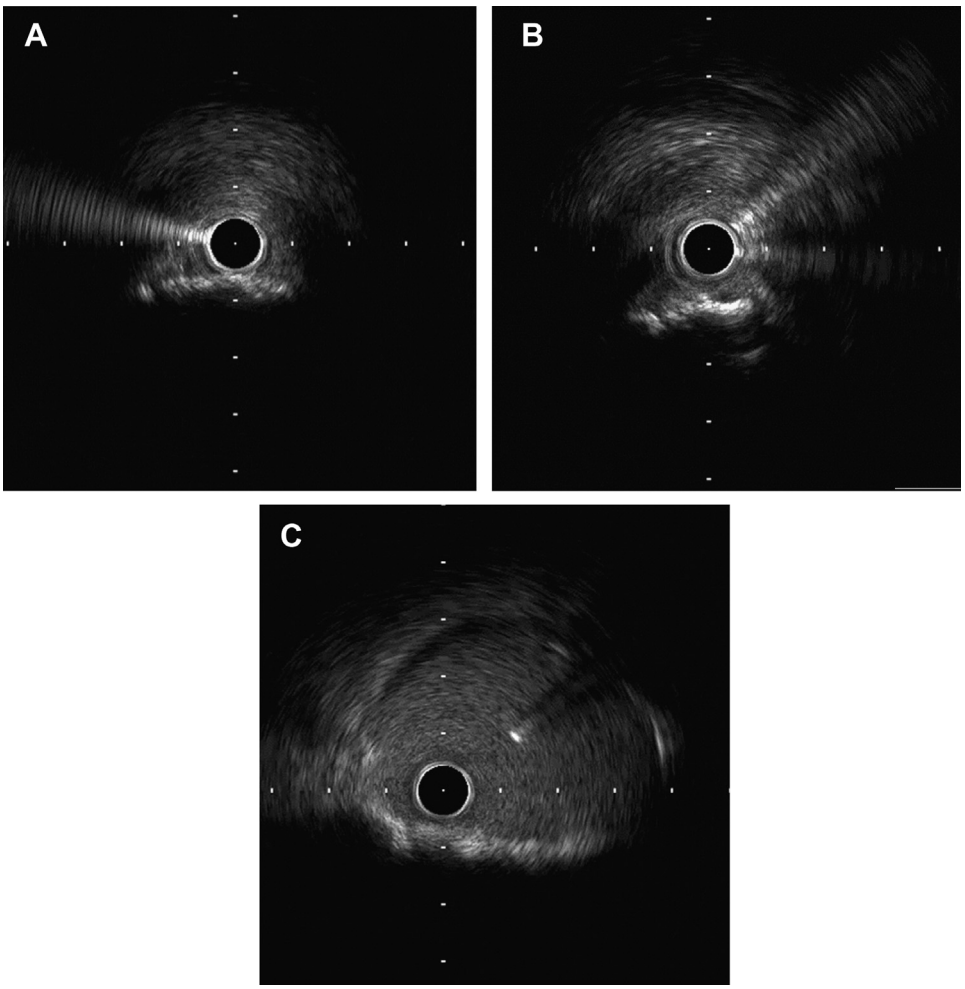
(A) Initial angiogram. **(B and C)** Distribution of calcification (**white arrow** points to calcification). **(D and E)** Dislodged crown. **(F)** Scoring balloon. **(G)** Amplatz Goose Neck snare. **(H)** Final angiogram.

FIGURE 2 Dislodged Orbital Atherectomy System



(A) Dislodged crown and Amplatz Goose Neck snare. **(B)** Shaft.

FIGURE 3 Intravascular Ultrasound Imaging of the Right Coronary Artery Ostium



(A) Initial. **(B)** After orbital atherectomy. **(C)** Final.

the culprit lesion in bend arteries might stress the crown, resulting in crown detachment. Debulking with OA, similar to rotational atherectomy, is also unstable for noncoaxial bent arteries. In such cases, advancing the crown exclusively backward starting distally to the culprit lesion seems safe and effective. We must remember this "double-edged sword" for debulking with OA, especially in anomalous ostial lesions.

AUTHOR DISCLOSURES

The authors have reported that they have no relationships relevant to the contents of this paper to disclose.

ADDRESS FOR CORRESPONDENCE: Dr. Tomofumi Takaya, Division of Cardiovascular Medicine, Hyogo Brain and Heart Center, 520 Saisho-Kou, Himeji 670-0981, Japan. E-mail: toto54@hotmail.com.

REFERENCE

1. Matthew IT, Annapoorna SK, Samin KS. Current status of rotational atherectomy. J Am Coll Cardiol Intv 2014:345–53.

KEY WORDS anomalous origin of the coronary artery, calcified lesion, detachment, orbital atherectomy system

APPENDIX For a supplemental video, please see the online version of this paper.