

Rotational Atherectomy in a Dissected Coronary Artery That Propagated Into the Sinus of Valsalva: Is This the Last Hope?

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Percutaneous coronary intervention (PCI) of a resistant, undilatable lesion can result in coronary dissection. Retrograde propagation of a dissection flap into the sinus of Valsalva is a rare phenomenon. It is commonly seen at the time of PCI to a right coronary artery (RCA) and is associated with potentially fatal consequences. Use of rotational atherectomy (RA) is contraindicated in the presence of a coronary dissection. Coronary dissection with preserved flow in asymptomatic patients should be managed conservatively until the dissection heals, but in the case presented here, as coronary flow was compromised, the patient complained of chest pain and ST elevation was observed on electrocardiogram.

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KEY WORDS

Coronary dissection • Sinus of Valsalva • Rotational atherectomy • Percutaneous coronary intervention

Percutaneous coronary intervention (PCI) of a resistant, undilatable lesion can result in coronary dissection. Retrograde propagation of a dissection flap into the sinus of Valsalva is a rare phenomenon. It is commonly seen at the time of PCI to a right coronary artery (RCA) and is associated with potentially fatal consequences.¹ Use of rotational atherectomy (RA) is contraindicated in the presence of a coronary dissection, as there is

we could not pass a balloon beyond the proximal lesion. We then used a GuideLiner® (Vascular Solutions, Minneapolis, MN) to increase back-

propagated back into the coronary sinus (Figure 1C). This was likely due to the hydraulic force of injecting contrast into a dissection plane

The next injection of contrast demonstrated a coronary dissection that propagated back into the coronary sinus.

Use of rotational atherectomy is contraindicated in the presence of a coronary dissection, as there is a concern that the dissection flap can wrap around the burr...

a concern that the dissection flap can wrap around the burr, potentially resulting in a catastrophe. In rare cases, when all other options fail, RA can be used as a last resort,² albeit with extreme care.

up support, but were not successful in passing a balloon across the proximal lesion. We then inflated a 1.25-mm Sprinter® Legend balloon (Medtronic, Minneapolis, MN)

that propagated retrograde into the sinus of Valsalva. The patient complained of chest pain and the electrocardiogram demonstrated ST segment elevation in the inferior leads.

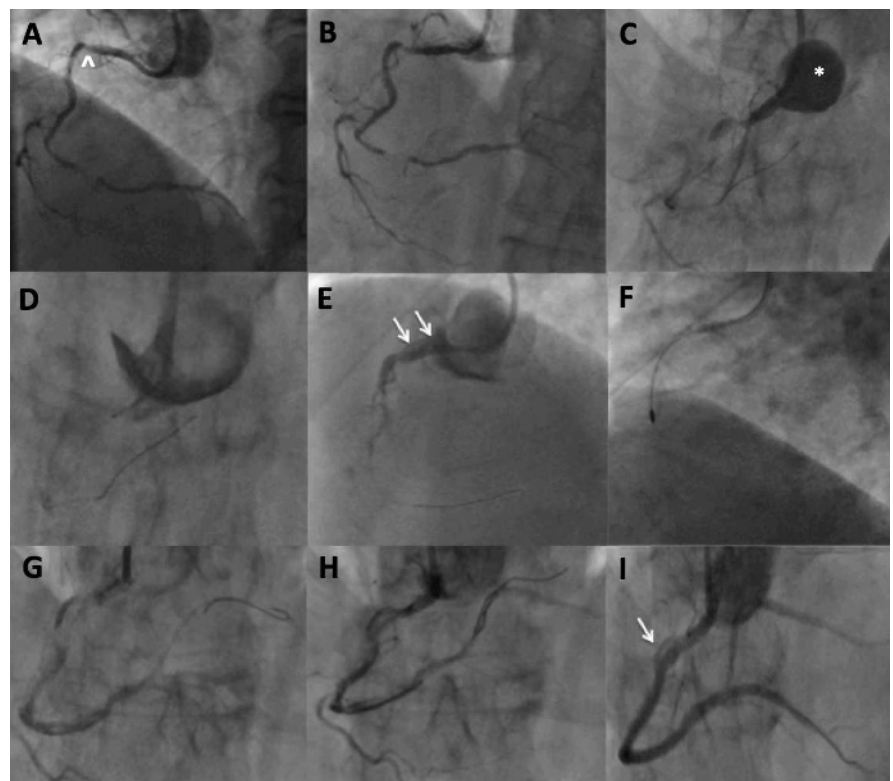
We deployed a 3.5 × 16-mm bare-metal stent in the ostium of the RCA, with the intention to seal the dissection flap (Figure 1D, Figure 1E), and opted to minimize contrast injection to avoid further propagation of the dissection. Several passes of a Corsair catheter (Ashahi Intecc, Santa Ana, CA)

at the site where it was becoming obstructed, with the intention of lesion modification. The next injection of contrast demonstrated a coronary dissection that

Presentation

A 66-year-old hypertensive man presented to the office with crescendo exertional chest pain (Canadian Cardiovascular Society class III). His exercise stress test result was positive for symptoms and electrocardiographic changes of ST segment depression in the inferior leads on moderate exercise that recovered slowly. Coronary angiography demonstrated minimal disease in the left coronary system, whereas an area of significant disease was noted in the distal RCA. There was focal disease of moderate severity in the proximal RCA (Figure 1A, Figure 1B). As this was single-vessel disease, we opted to perform PCI to the RCA through a right radial arterial approach. We used an Amplatz left guiding catheter to obtain better support. A Whisper™ coronary angioplasty guide wire (Abbott Vascular, Abbott Park, IL) crossed the lesion without difficulty, but

Figure 1. Diagnostic coronary angiography demonstrating moderate disease in the proximal and severe disease in the distal RCA (A, B), which dissected with balloon angioplasty and injection of contrast resulting in retrograde dissection of the artery into the sinus of Valsalva (C). After stenting of the RCA ostium (D), the dissection flap can still be observed (E). After failure to pass a balloon further, rotational atherectomy was used (F), after which the RCA was treated with multiple stents (G, H). The final angiographic result is shown (I). *Arrowhead* marks the site of the calcified lesion, beyond which the balloon did not pass. *Asterisk* defines the presence of contrast in the dissection plan in the sinus of Valsalva. *White arrows* mark the coronary dissection, outside the stented segment. RCA, right coronary artery.



through the proximal lesion made passage of a guide wire possible, but we could not pass any balloon through the proximal lesion. We ascertained position of the distal end of the guide wire by passing it into distal branches, as we wished to avoid further contrast injections. We treated the lesion with RA using 1.25-mm and 1.5-mm burrs (gentle, short runs) (Figure 1F). We used five drug-eluting stents

on echocardiography. The patient made an uneventful recovery.

Discussion

Use of RA is associated with transient regional myocardial dysfunction of longer duration in comparison with PCI alone.³ In addition, lack of significant angiographic coronary calcification did not warrant use of upfront RA in

the localized lesion is advised. An alternative option is an emergent single-vessel coronary artery bypass graft surgery. Limited dissection of the sinus of Valsalva can be managed conservatively, although carefully, as it can propagate along the length of the aorta. Computed tomography imaging of the ascending aorta demonstrated a localized dissection that healed 4 weeks later. ■

We used five drug-eluting stents to treat the full length of the RCA, including the distal bifurcation, with a satisfactory final angiographic result.

to treat the full length of the RCA, including the distal bifurcation (Figure 1G, Figure 1H), with a satisfactory final angiographic result (Figure 1I). Stent expansion and apposition were confirmed by intravascular ultrasound. There was mild troponin rise due to loss of the right ventricular branch artery postprocedure, but no wall motion abnormality was noted

this case. Coronary dissection with preserved flow in asymptomatic patients should be managed conservatively until the dissection heals, but as coronary flow was compromised and the patient had pain, we attempted RA despite the coronary dissection. Use of the smallest burr, shortest run-time, and gentle burr advancement to limited distance enough to modify

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The authors report no real or apparent conflicts of interest.

MAIN POINTS

- Percutaneous coronary intervention (PCI) of a resistant, undilatable lesion can result in coronary dissection. Retrograde propagation of a dissection flap into the sinus of Valsalva is a rare phenomenon, and is commonly seen at the time of PCI to a right coronary artery; it is associated with potentially fatal consequences.
- Use of rotational atherectomy (RA) is contraindicated in the presence of a coronary dissection, as there is a concern that the dissection flap can wrap around the burr.
- Use of RA is associated with transient regional myocardial dysfunction of longer duration in comparison with PCI alone. Use of the smallest burr, shortest run-time, and gentle burr advancement to limited distance enough to modify the localized lesion is advised.