

## Images in Cardiovascular Medicine



# Unexpected Stenosis within Significantly Enlarged Distal Vessel after Successful Coronary Chronic Total Occlusion Recanalization

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### Conflict of Interest

The authors have no financial conflicts of interest.

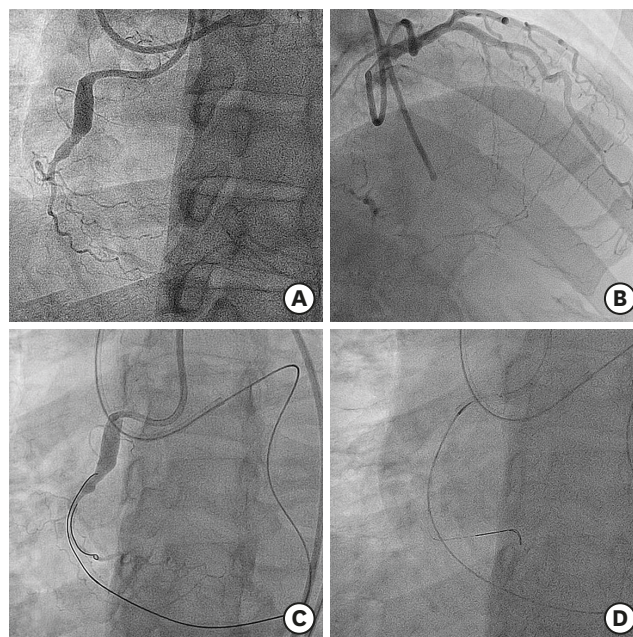
### Author Contributions

Conceptualization: Lee PH, Lee SW.

Methodology: Lee PH. Supervision: Lee SW.

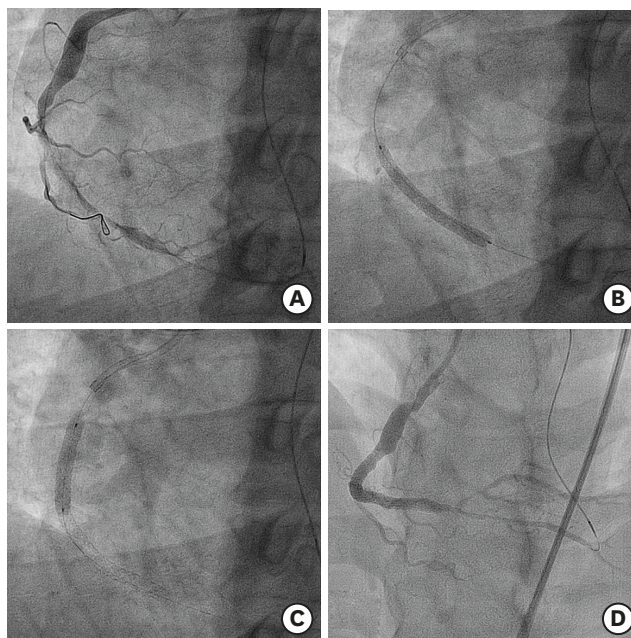
Coronary vessels distal to chronic total occlusion (CTO) are frequently accompanied by diffuse luminal narrowing induced by negative remodeling or atherosclerotic plaque. Although flow-mediated vasodilation is anticipated after effective antegrade flow restoration,<sup>1</sup> final vasomotor response of distal segment is often unexpected and should be considered in the stenting strategy.

A 48-year-old man, a heavy smoker with dyslipidemia and hypertension, was referred after failed percutaneous coronary intervention (PCI) of CTO in the right coronary artery (**Figure 1A**). CTO-PCI was attempted via primary retrograde approach through a septal collateral because

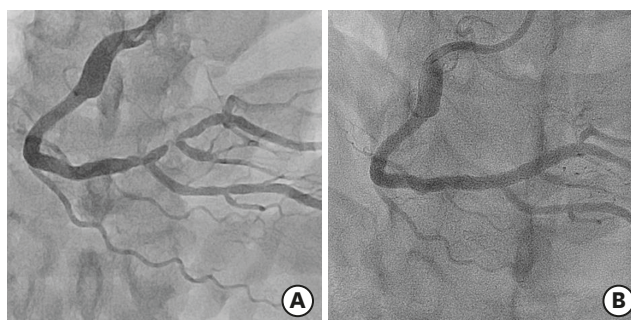


**Figure 1.** Baseline coronary angiography and procedure. (A) Diagnostic coronary angiography demonstrated CTO of the right coronary artery. (B) Because of the ambiguous proximal cap, a retrograde approach through a septal collateral was selected. (C) Direct wire crossing technique with an intermediate stiff Ultimate Bros 3 (Asahi Intecc, Aichi, Japan) guidewire was used to cross the CTO lesion. (D) Retrograde wire was externalized into the guiding catheter.  
CTO = chronic total occlusion.

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**Figure 2.** Stent implantation and final result. (A) A distal landing zone was identified after predilation of the CTO lesion. (B, C) Two drug-eluting stents (Resolute Onyx, 4.0×22 and 3.5×38 mm) were implanted in the middle segment of the right coronary artery. (D) Final result with angiographic evidence of diffuse luminal narrowing of distal bed (**Supplementary Video 1**). CTO = chronic total occlusion.



**Figure 3.** Angiographic follow-up. (A) A 9-month angiographic follow-up showed a significant improvement in the diameter of the whole distal bed, with an unexpected severe “true” stenosis within the enlarged vessel. (B) A 3.5×30 mm Resolute Onyx stent was used to treat the lesion (**Supplementary Videos 2 and 3**).

of ambiguous proximal cap (**Figure 1B-D**). PCI was successful with two drug-eluting stent implantation, 4.0×22 and 3.5×38 mm, in the middle segment (**Figure 2A-C**). Diffuse luminal narrowing at the distal bed persisted after flow restoration and repeated intracoronary nitroglycerin administrations (**Figure 2D, Supplementary Video 1**). Angiographic follow-up at 9 months showed significant improvement in the whole distal bed diameter with unexpected “true” tight stenoses within the enlarged vessel (**Figure 3A, Supplementary Video 2**). These lesions were successfully treated with another 3.5×30 mm stent (**Figure 3B, Supplementary Video 3**).

The treatment strategy has been inconsistent for luminal narrowing distal to CTO lesion, which undergoes variable degrees of diameter improvement after successful CTO recanalization.<sup>2)</sup> Predicting the original distal bed vessel size or differentiating the vessel shrinkage and plaque burden contribution to luminal narrowing is difficult owing to limited

practical methods,<sup>3)</sup> watchful waiting with follow-up angiography is a reasonable strategy to decide the final treatment for such lesions.

## SUPPLEMENTARY MATERIALS

### Supplementary Video 1

Persistent luminal narrowing of distal bed after flow restoration

[Click here to view](#)

### Supplementary Video 2

Unexpected “true” tight stenoses within the enlarged vessel at 9-month follow-up

[Click here to view](#)

### Supplementary Video 3

Successful implantation of a 3.5×30 mm stent in the distal segment

[Click here to view](#)

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