

## Acute vessel closure salvaged by use of the retrograde approach

Acute vessel closure is a percutaneous coronary artery complication with potential catastrophic consequences. In this article we report a case where the retrograde approach was used to salvage an acute vessel occlusion during a first obtuse marginal percutaneous coronary artery.

**Keywords:** complications • percutaneous coronary intervention • retrograde approach

### Case report

A 50-year-old man presented with unstable angina. Coronary angiography revealed a severe lesion in the first obtuse marginal branch (OM1, culprit lesion; Figure 1A) and the right posterior descending artery (Figure 1B). A 0.014" Whisper and a Pilot 200 wire (Abbott Vascular, CA, USA) could not cross the lesion and caused acute vessel closure causing severe chest pain and ST-segment elevation (Figure 1C). Attempts to re-enter into the distal true lumen with a StingRay balloon (Boston Scientific, MA, USA) failed (Figure 1D). A Sion wire (Asahi Intecc, Nagoya, Japan) was advanced through a Corsair microcatheter (Asahi, Intecc, Japan) from the distal left anterior descending artery into the OM1 through an epicardial collateral and then subintimally into the proximal circumflex (Figure 1E). Using the reverse controlled antegrade and retrograde tracking and dissection (reverse CART) technique, a Pilot 200 wire was advanced into the aorta (Figure 1F) and a R350 guidewire (Vascular solutions, MN, USA; Figure 1G) was externalized through a second 8-French EBU3 guide catheter. The proximal circumflex and OM1 branch were stented with three drug-eluting stents (Figure 1H), restoring antegrade flow (Figure 1I).

### Discussion

Acute closure is a potentially catastrophic percutaneous coronary intervention complication that can lead to acute myocardial infarction, emergency bypass surgery and death [1]. We recently reported the use of limited antegrade subintimal dissection/re-entry techniques to restore antegrade flow in a patient with abrupt coronary occlusion [2]. Use of extensive antegrade dissection/re-entry techniques, such as the subintimal tracking and reentry (STAR) technique [3], is another bailout option, but is ideally avoided because it carries high rates for restenosis and reocclusion, in part due to limited outflow and long stent lengths [4,5]. In the present report we demonstrate use of the retrograde approach [6] through an ipsilateral collateral for treating acute vessel closure. This strategy can only be used in sub-occlusive lesions where collaterals have developed allowing retrograde access to the distal vessel and is likely not feasible in less severe lesions with poorly developed collateral circulation.

Although the retrograde approach was successful in our patient, it should only be used as a last-resort approach by highly experience operators in this technique, since it carries significant risks (such as collateral vessel perforation) and can be time consuming to implement [7].

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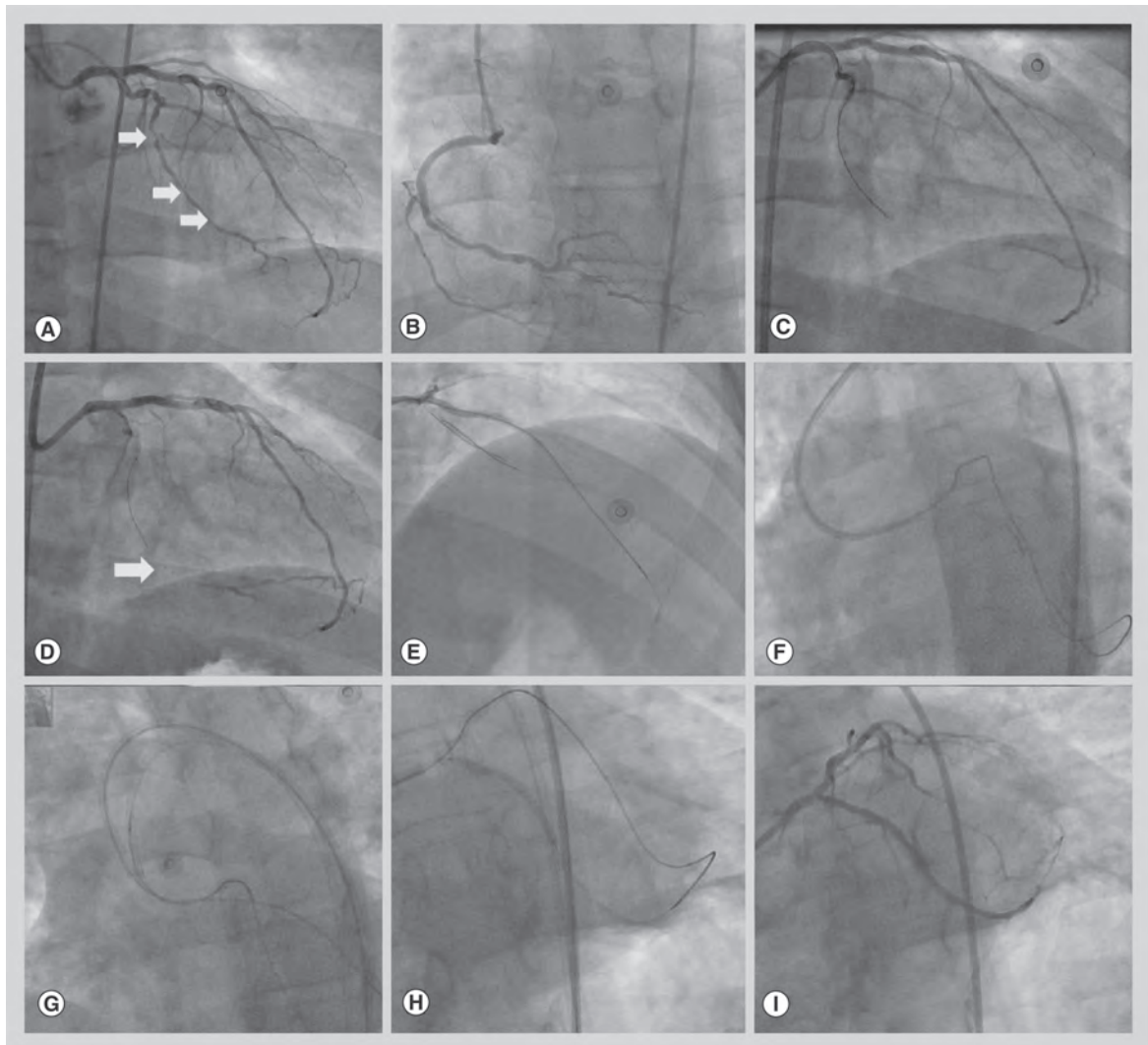
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**Figure 1. Coronary angiography.** (A) A severe lesion in the first obtuse marginal branch (OM1, arrow) and (B) diffuse disease in the right posterior descending artery is demonstrated. (C) During antegrade wiring attempts acute vessel closure occurred. (D) Multiple attempts for re-entry into the distal true lumen failed. (E & F) The OM1 was wired retrogradely via an epicardial collateral from the left anterior descending artery, followed by (G) successful wire crossing into the aorta. (H) The wire was snared and externalized allowing stenting of the OM1 and proximal circumflex, with (I) an excellent final result with restoration of antegrade flow.

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**Executive summary**

- Acute vessel closure can be a catastrophic percutaneous coronary intervention complication.
- Use of the retrograde approach can allow vessel recanalization in patients with acute vessel closure after all other attempts fail.
- Use of the retrograde approach for acute vessel closure is a last-resort method to be used only by experienced chronic total occlusion operators.

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