

CORONARY, PERIPHERAL, AND STRUCTURAL INTERVENTIONS

HOW WE DID IT

Retrieving a Stent

Navigating Deep Complications



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ABSTRACT

OBJECTIVE The authors describe a case of an infrequent complication of percutaneous coronary intervention in a patient with acute ST-segment elevation myocardial infarction and discuss considerations for its prevention, recognition, and treatment.

KEY STEPS Diagnostic coronary angiography confirmed an acute total occlusion of the proximal right coronary artery. Angioplasty and stenting were performed without complications. A second stent was advanced to treat a distal lesion. During the advancement, stent dislodgement from the guidewire, with entrapment in the struts of the previously placed stent and migration to the proximal aorta, was identified. A multisnare device was used for stent retrieval, with embolization to the right femoral artery during the process.

POTENTIAL PITFALLS Operators should be aware of this potential complication and its management techniques. Stent dislodgement and migration should be rapidly identified and addressed because these adverse events can lead to embolization, thrombosis, and vascular damage. (JACC Case Rep. 2025;30:103098) © 2025 The Authors. Published by Elsevier on behalf of the American College of Cardiology Foundation. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Stent migration, loss, and dislodgement are rare complications of percutaneous coronary intervention (PCI) procedures.¹ These events are related to several procedural conditions, such as stent deformation during deployment, unsuccessful retraction into guiding catheters, and stent dislodgement

during crossing through a previously implanted proximal stent because of the stent's strut entrapment. Structural arterial characteristics associated with this complication include severely calcified atherosclerotic lesions and/or severe tortuosity of the coronary arteries.^{2,3}

Stent loss can cause embolization and coronary flow reduction, leading to type 4a myocardial infarction, emergent coronary surgery, and death. It can also result in extracoronary embolization with thrombosis and vascular injury.³

Approaches to dealing with stent loss include retrieval or crushing stent techniques. When feasible, stent retrieval is the preferred approach. There are

TAKE-HOME MESSAGES

- Stent migration, although uncommon, should be promptly recognized using appropriate imaging techniques.
- A multisnare catheter can be a valuable tool in retrieving migrated stents.

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**ABBREVIATIONS
AND ACRONYMS****PCI** = percutaneous coronary intervention**RCA** = right coronary artery

2 main techniques for stent retrieval. The first one is the small balloon technique, where a small balloon is crossed through the dislodged stent, inflated distally to a greater diameter than the stent lumen, and then both components are pulled back into the guiding catheter. The second technique uses loop snares to catch the stent.^{1,2,4} This latter method was used in our case. Other alternatives for managing a lost stent when retrieval is not feasible include the stent crushing technique with a second stent, if its location is suitable, which was not possible in our case because it was in the right coronary artery (RCA) ostium protruding to the ascending aorta.^{3,5,6}

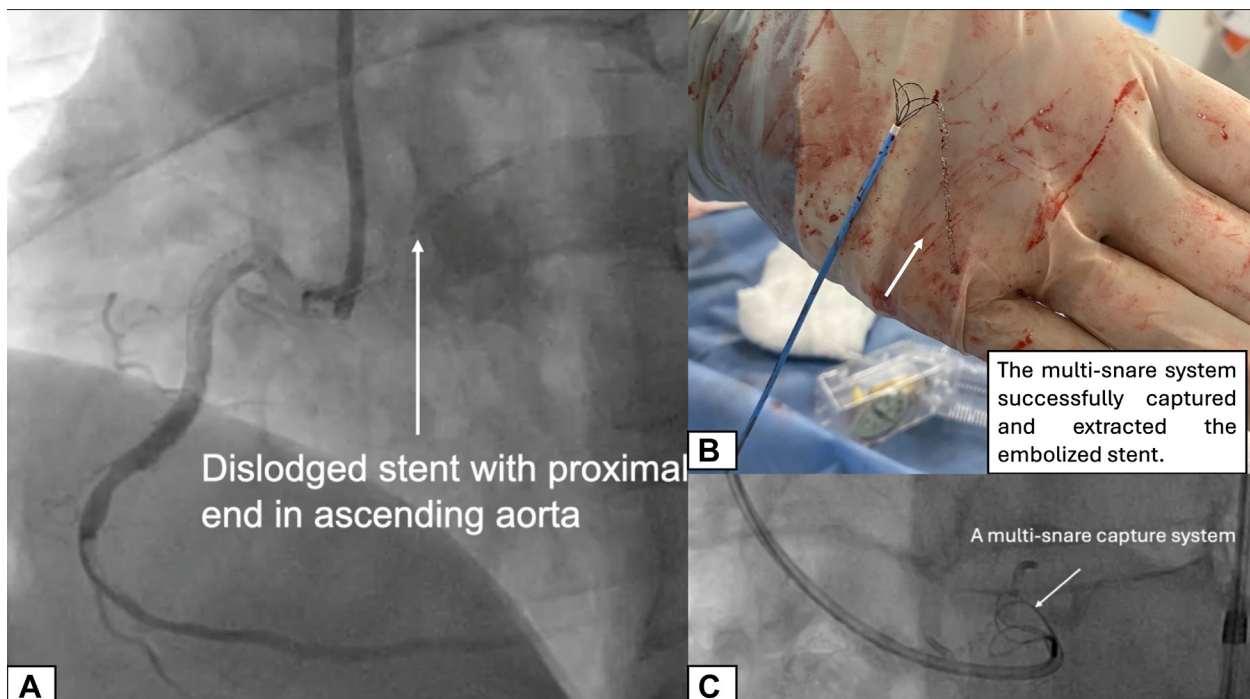
CASE SUMMARY

A 66-year-old man with no prior medical history was referred to our center with 18 hours of chest pain and a witnessed syncope. On evaluation, he was diagnosed with acute coronary syndrome (ST-segment elevation myocardial infarction outside the

immediate reperfusion window). At his arrival, the electrocardiogram showed sinus bradycardia, Q waves in the inferior leads, and elevated troponin I levels (Figure 1). Medical treatment was initiated according to national guidelines, and an early invasive strategy was determined.

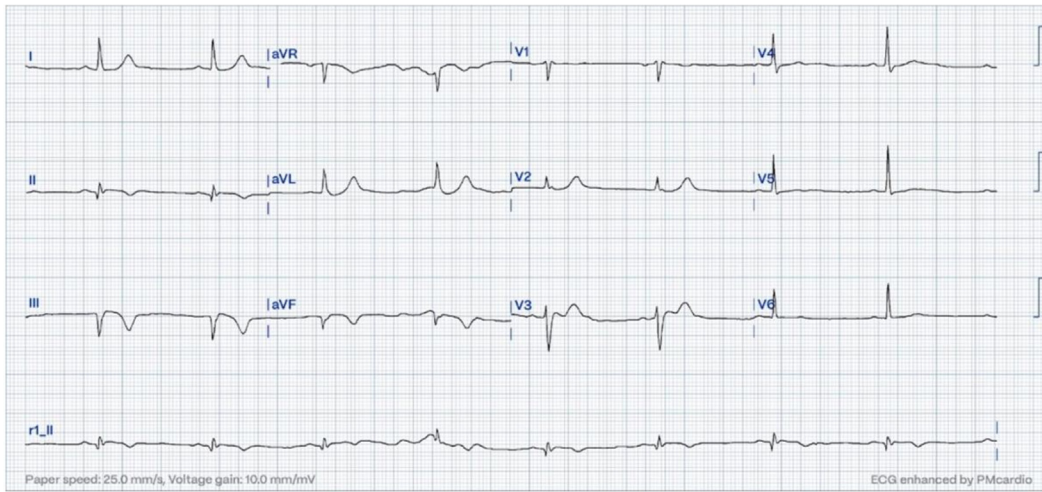
The patient was transferred to the catheterization laboratory. The diagnostic angiography, performed through a radial approach, revealed a total occlusion of the proximal RCA (Video 1), left anterior descendant and circumflex arteries with no significant obstructive lesions (Video 2).

During PCI attempt, a run-through guidewire was successfully navigated through the RCA occlusion. Subsequently, a drug-eluting stent was successfully implanted in the proximal segment of the artery followed by balloon dilation using a noncompliant balloon, and an erroneous proximal to distal approach was attempted by a junior operator (Videos 3 and 4). A second stent placement was attempted to advance distally from the proximal stent and noted to dislodge from the guidewire with its distal end seized

VISUAL SUMMARY Dislodged Stent: Procedural Steps With Multi-Snare System for Retrieval

(A) The dislodged stent with its distal end seized into a proximal strut of the previously deployed stent and the proximal end protruding to the proximal ascending aorta. (B and C) The multisnare device during capture attempts and with the captured stent.

FIGURE 1 Patient's Admission Electrocardiogram



The initial electrocardiogram depicts inferior Q waves.

FIGURE 2 Multi-Snare System With the Extracted Stent



The stent is finally retrieved from the right femoral artery and extracted inside the multisnare device.

into a proximal strut of the previously deployed stent and the proximal end protruding to the proximal ascending aorta (Video 5).

PROCEDURAL STEPS

STENT MIGRATION RECOGNITION. Stent migration or dislodgment is identified through fluoroscopic imaging techniques or intravascular ultrasound. It can be suspected when there is an unexpected loss of stent visualization during the procedure or when an entrapment and strip-off sensation occur during stent advancement. The patient may exhibit acute chest pain, electrocardiographic changes indicative of myocardial ischemia, or vascular deficits in the case of embolization.

STENT MIGRATION MANAGEMENT. After stent dislodgement was recognized, femoral access was obtained, and a second guidewire was attempted to pass through the stent lumen to snare the end of the wire. A multisnare catheter was then used for stent retrieval, but the efforts were unsuccessful (Video 6). During the attempts for stent crossing, the dislodged stent detached from the implanted stent causing embolization to the right femoral artery, enabling its capture with a multisnare system without further

complications (Video 7). This approach allowed for the safe retrieval of the migrated stent without causing additional vascular injury (Figure 2).

COMPLETING THE PCI

The procedure concluded with the implantation of 2 more drug-eluting stents in the proximal and mid thirds of the RCA, followed by successful postdilation with a noncompliant balloon. The patient's condition improved steadily throughout his hospital stay, and he was subsequently discharged in stable conditions.

POTENTIAL PITFALLS

- Stent loss: it is important to maintain a distal to proximal order of PCI to avoid stent loss from the guidewire.
- Vascular injury: manipulation of the catheters and snares within the vessel could result in dissection, perforation, or thrombosis, which in some cases requires emergent surgical intervention.
- Failure to retrieve migrated stent: initial unsuccessful attempts to capture the stent could lead to prolonged procedure time and potential complications such as vessel injury or distal embolization.

Conservative management has been described in the treatment of stent migration when retrieval is not

technically possible. Some case reports propose antiplatelet therapy combined with anticoagulation.⁷ Retrieval is the most recommended approach to limit the possibility of limb ischemia or vascular injury; moreover, stent deployment in peripheral sites has been described as an alternative treatment option in similar cases.^{8,9}

CONCLUSIONS

Stent migration is a rare but serious complication that requires prompt recognition and management. There are several approaches to manage this complication. This case demonstrates the importance of being prepared for unexpected complications and having a clear strategy for managing them.

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KEY WORDS percutaneous coronary intervention, stent migration, vascular complications

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