

Overcoming Stent Dislodgment in Coronary Intervention: A Case Retrieval and Revascularization

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ABSTRACT

Introduction: Stent dislodgement is rare but represents one of the serious complications during complex PCI, potentially leading to severe consequences such as myocardial infarction, stroke, or death.

Case summary: A 69-year-old male patient with triple-vessel coronary artery disease and heart failure with reduced ejection fraction (30%) underwent percutaneous coronary intervention. During deployment of a stent in the proximal left circumflex artery, the device became dislodged and embolized to the common iliac artery bifurcation. The migrated stent was subsequently retrieved successfully using the twirling wire technique.

Discussion: The twisted guidewire technique is one of the simple methods for retrieving a dislodged stent. Although, it carries the risk of intimal injury or distal migration of the fragment, this technique potentially leads to serious complications. In this case, the procedure was successful and the patient remained stable.

Conclusion: The operators must be proficient in recognizing and managing both common and rare complications that may occur during PCI. The interventional team should be well prepared and maintain effective teamwork to ensure prompt and appropriate responses to any unexpected events during PCI.

Keywords: Percutaneous coronary intervention; calcified coronary lesions; coronary atherectomy; stent dislodgement retrieval; guidewire techniques



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Introduction

Percutaneous coronary intervention (PCI) is an established strategy for coronary revascularization with a high procedural success rate. However, complications may still occur, particularly in complex coronary anatomy such as calcified and tortuous lesions.¹ Stent dislodgement is a rare but potentially serious complication that can lead to adverse outcomes, including myocardial infarction or peripheral embolization, depending on the site of migration.² This complication is often associated with inadequate lesion preparation, poor guide support, or challenging vessel characteristics. Prompt recognition and localization of the dislodged stent are essential to guide appropriate management and prevent further complications. Several retrieval techniques are available, including snare, balloon-assisted, and guidewire-based methods, each with specific advantages and limitations.³

We report a case of stent dislodgement during PCI with embolization to the iliac artery bifurcation, which was successfully managed using the twisted guidewire technique. This case highlights the importance of rapid decision-making and technical expertise in managing rare PCI complications.

History of presentation

A 69-year-old man was admitted to the emergency department complaining of ongoing chest pain. The pain had previously resolved with rest. He also reported several days of easy fatigue and shortness of breath with heavy activity. The patient was hemodynamically stable.

Past medical history

The patient was first diagnosed with anterior MI in 2023 and had undergone PCI. He also has dyslipidemia and congestive heart failure with reduced ejection fraction (EF 30%). A recent exercise test showed anterior Q waves and a positive stress result consistent with ischemia.

Differential diagnosis

The electrocardiographic findings were consistent with a diagnosis of lateral wall myocardial infarction. Other differential diagnoses for an elderly patient with these symptoms included unstable angina, acute decompensated heart failure, valvular impairment, or arrhythmia.

Investigations

Electrocardiography demonstrated T-wave inversion in leads I, aVL, V5, and V6. Laboratory evaluation revealed elevated high-sensitivity troponin and low-density lipoprotein cholesterol levels. Chest radiography indicated pulmonary congestion along with evidence of aortic atherosclerosis. Coronary angiographic assessment identified a chronic total occlusion of the proximal right coronary artery. The left coronary system showed approximately 50% tubular narrowing in the distal segment.

A previously implanted stent extending from the proximal to mid left anterior descending artery remained patent, while significant stenosis of about 70% was observed in the proximal left circumflex artery.

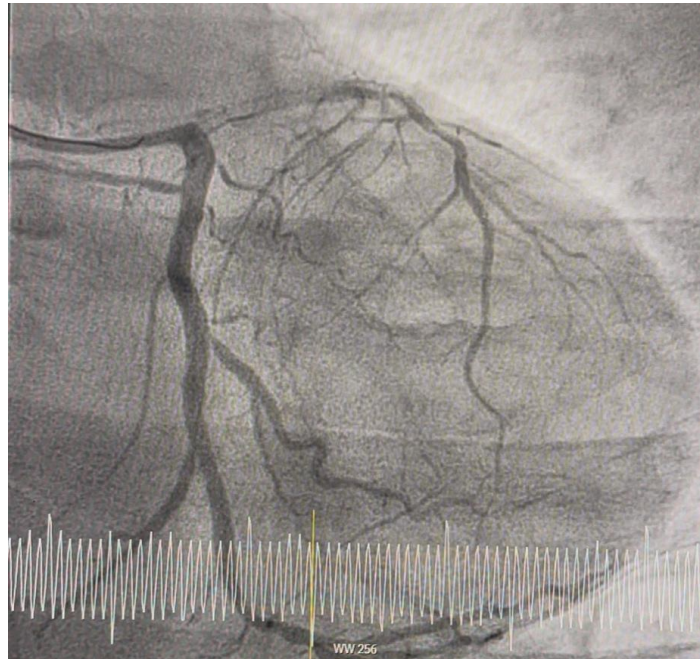


Figure 1. Coronary Angiography before Stent Deployment

Management

Following initiation of the acute coronary syndrome protocol, the patient proceeded to undergo percutaneous coronary intervention. Direct stenting was attempted using a Supraflex Cruz 3.0 × 32 mm drug-eluting stent (DES). However, the stent could not pass through the lesion in the proximal LCx due to the tortuous arterial anatomy. The stent subsequently detached from the stent body, migrated into the abdominal aorta, and eventually reached the bifurcation of the common iliac arteries.

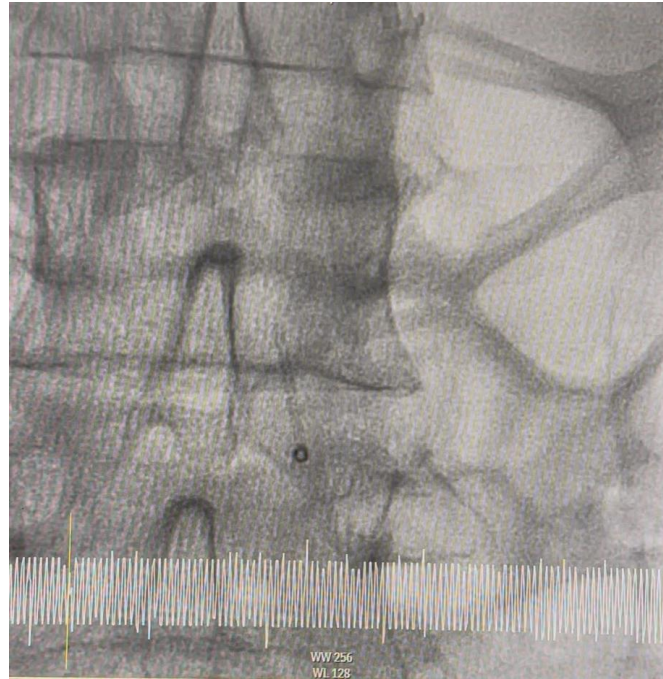


Figure 2. The dislodged stent was detected at the iliac artery bifurcation

After the stent dislodgement was recognized, prompt clinical judgment and immediate implementation of a percutaneous retrieval strategy were essential. The migrated stent was carefully tracked fluoroscopically along the vascular pathway until its final position at the bifurcation of the common iliac arteries was identified. During this tracing process, a thorough assessment of the vessel lumen was performed to identify possible complications. No evidence of vessel injury from the stent fragment was observed, and there were no signs of bleeding or significant obstruction that could potentially lead to ischemia.

We elected to retrieve the migrated stent using the twisted guidewire technique. A second guidewire, introduced via the right femoral artery together with a 4F 5 mm snare, was advanced toward the site of embolization. The first guidewire, which had been placed through the right radial artery during the initial procedure, was simultaneously maneuvered until both wires converged at the location of the displaced stent.

Both coronary guidewires were carefully advanced through the lumen of the migrated stent and rotated concurrently in the same direction to intertwine and firmly entrap the device between the twisted wires. After secure capture was confirmed, the entire assembly was slowly withdrawn as a single unit under fluoroscopic visualization, allowing controlled extraction while reducing the risk of further vascular trauma. Using this method, the stent was successfully captured and removed. The stent was then repositioned and successfully deployed in the proximal LCx, with the patient remaining hemodynamically stable. The occurrence of stent dislodgement represents one of several potential complications during PCI, including coronary dissection, perforation, no-reflow phenomenon, and distal embolization, all of which

require prompt recognition and management to prevent adverse outcomes.

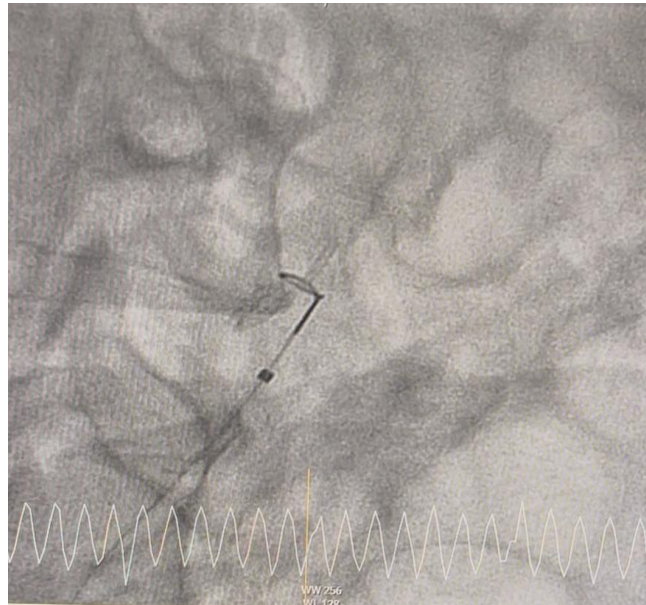


Figure 3. Retrieval of the stent from the body

Discussion

Stent dislodgement during PCI is an uncommon but clinically significant complication, with a reported incidence of approximately 1% in contemporary practice, largely attributable to advancements in stent design and delivery systems.^{1,2} However, the risk remains higher in complex lesions, particularly those characterized by severe calcification and marked tortuosity. In addition, coronary tortuosity increases technical difficulty and has been associated with approximately 4% stent delivery failure during PCI.³

Several procedural and anatomical factors contribute to stent dislodgement, including inadequate lesion preparation, suboptimal stent sizing, excessive vessel angulation, and insufficient support from the guiding system.^{4,5} In tortuous and sclerotic coronary arteries, careful consideration of stent diameter, length, and expansion characteristics during inflation is critical, as inappropriate sizing or excessive force during advancement may increase the likelihood of stent stripping from the delivery balloon.^{6,7}

The clinical consequences of stent dislodgement depend on the site of embolization. Coronary embolization may result in acute vessel occlusion and myocardial infarction, whereas peripheral embolization may lead to limb ischemia or require emergent vascular intervention if not promptly managed.^{8,9} Therefore, rapid identification of the stent's final position, as performed in this case, is a critical early step before attempting retrieval.

There is no universally accepted standard technique for stent retrieval. Available approaches include snare retrieval, small-balloon trapping, forceps extraction, multipurpose retrieval baskets, and the twisted guidewire technique.^{10,11} The selection of technique should consider stent location, vessel diameter, operator experience, and the availability of equipment.¹² Compared with alternative strategies, the twisted guidewire technique offers a rapid and low-profile solution that can be performed using readily available

equipment, making it particularly useful in time-sensitive situations or resource-limited settings.¹³

In the present case, the use of dual guidewires introduced from different vascular access sites enabled effective entrapment of the dislodged stent. Controlled twisting of the wires allowed secure capture and safe retrieval without vascular injury. This technique involves advancing a second guidewire to engage the stent and subsequently twisting both wires to entangle the device before withdrawal.¹⁴ Potential risks such as vessel injury or distal embolization must be considered, although these complications were successfully avoided in this case.¹⁵ The favorable outcome highlights the importance of early decision-making, appropriate technique selection, and effective coordination within an experienced interventional team.¹⁶

From a procedural perspective, several preventive strategies should be emphasized. Adequate lesion preparation using adjunctive techniques such as buddy wire support, microcatheters, or atherectomy may facilitate stent delivery in complex anatomy.¹⁷ In addition, continuous fluoroscopic monitoring is essential to detect early signs of stent deformation or delivery failure.¹⁸ Importantly, excessive force during stent advancement should be avoided, as it increases the risk of device dislodgement.¹⁹

Follow up

During hospitalization, the patient reported no post-procedure complaints. The patient was counseled to continue GDMT for the CTO of the RCA. He received aspirin 80 mg, clopidogrel 75 mg, ramipril 2.5 mg, and bisoprolol 2.5 mg. At the 1-month follow-up, he did not report any symptoms.

Conclusion

The twisted guidewire technique represents an effective and practical option for retrieving a dislodged stent during PCI. However, it should be considered as part of a broader spectrum of retrieval strategies, including snare and balloon-assisted techniques, with the optimal approach determined by anatomical conditions, device availability, and operator experience.

Abbreviations and acronyms

Abbreviations	Acronyms
CHF	Congestive Heart failure
EF	Ejection Fraction
CAD	Coronary Artery Disease
VD	Vascular Disease
PCI	Percutaneous Coronary Intervention
MI	Myocardial Infarction
LCx	Left Circumflex Artery
CTO	Chronic Total Occlusion
RCA	Right Coronary Artery

Conflicts of Interest

There is no conflict of interest

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There is no funding source

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Take home messages

Operators performing PCI should be able to promptly recognize and manage both common and rare complications, including stent dislodgement. Appropriate technique selection, procedural planning, and effective team coordination are critical to achieving optimal outcomes.

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