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Letter to Editor

# The Horrible Scenario in Cath Lab: Percutaneous Management of Guide Wire Entrapment During Coronary Intervention

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Dear Editor,

Advancements in invasive coronary angiography and accumulated experience have improved the success of interventions in challenging coronary artery lesions and associated complications. However, the approach and success in managing rare complications such as guide wire entrapment depend on the patient's hemodynamic status, continuity of coronary flow, capabilities of the angiography laboratory and the operator's expertise. In this letter, we present a case of guide wire entrapment during coronary intervention, the difficulties encountered during percutaneous removal attempts, and the finally applied conservative approach.

**Patient Information**

A 56-year-old male, known for active smoking and a history of three-vessel coronary bypass surgery four years ago, presented with pressing chest pain. The patient had undergone coronary angiography (CAG) a year ago, and medical follow-up was recommended. Due to the diagnosis of unstable angina pectoris, the patient underwent another angiography. Following the stent implantation for significant stenosis after the anastomosis in the saphenous-LAD graft, attempts to retrieve the guidewire resulted in stent deformation (Figure 1) and entrapment. Despite efforts to retract the guidewire, it was unsuccessful. Subsequently, the case was urgently taken over, maintaining the catheter and guidewire in a sterile manner (Figure 1). After obtaining cardiovascular surgical consultations, a decision was made to reattempt the procedure through percutaneous coronary intervention.

After ensuring proper field cleanliness, the procedure began by confirming the absence of catheter thrombus. It was observed that there was no distal flow in the first images (Figure 2). Attempts to enter the stent with a 1.0x12 mm Artimes balloon (Brosmed) were unsuccessful, and after the balloon's deformation, a second attempt was made with another balloon but was also unsuccessful. Microcatheters were used to enter the stent, but they got trapped, and only after various manipulations, the microcatheter could be retracted. Subsequent attempts with PT-2 and Fielder XT-A Guidewires for the buddy wire technique were unsuccessful due to entrapment between stent struts (Figure 1). Considering the thinness of the distal vessel and the chronic near 99% stenosis similar to previous CAG images, it was decided to attempt distal

wire detachment due to the high surgical risk in this patient. However, despite attempts, the wire did not detach. During the wire retraction, the heart shadow on fluoroscopy moved, and the patient experienced severe pain. Since repeated pull-backs were unsuccessful, consecutive and prolonged torques were applied to the wire, resulting in distal wire fracture (Figure 2). Echocardiographic control showed no effusion. The patient was transferred to the coronary intensive care unit. Following one day in the intensive care unit and two days in the cardiology service without symptoms, the patient was discharged with dual antiplatelet therapy. No anginal symptoms were reported during one-year follow-ups.

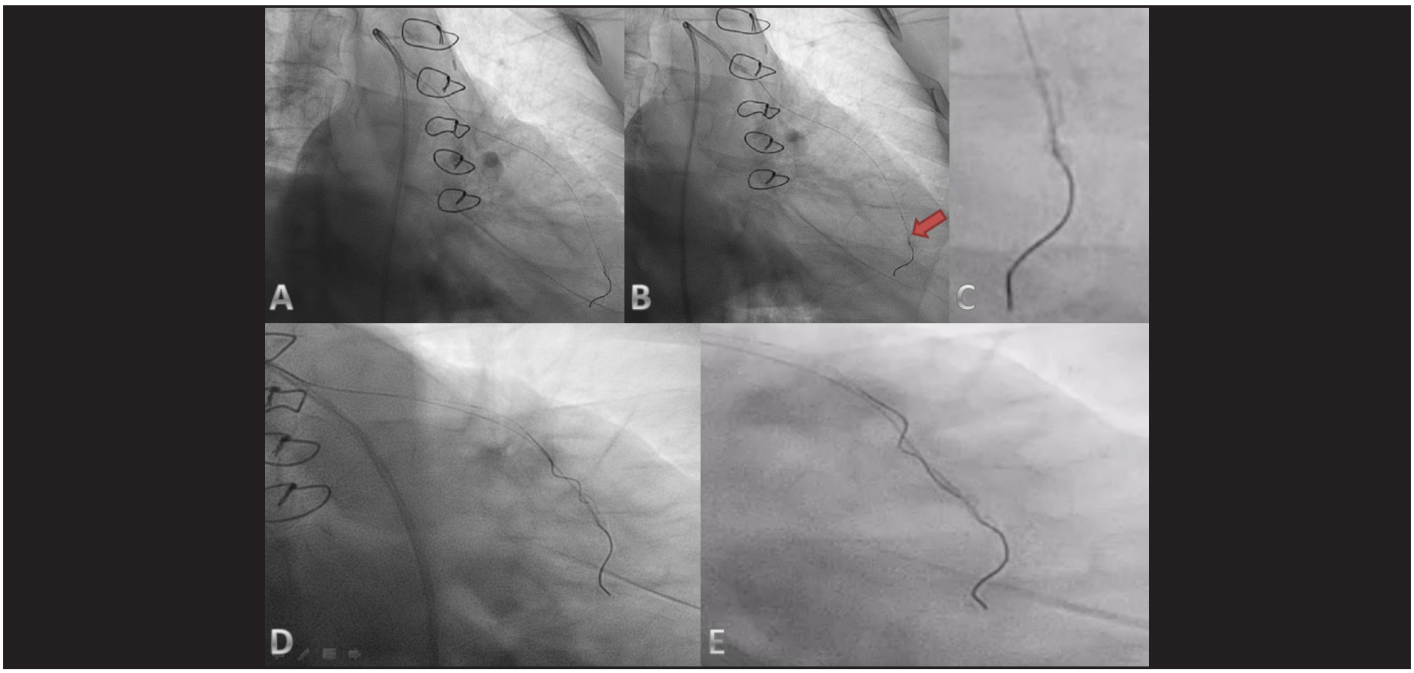


**Figure 1.** A: First image after transfer, B: Deformed stent view marked with red arrow, C: Zoomed image of deformed stent, D: Failure to send the second guide wire, E: Failure to send the second guide wire zoomed in

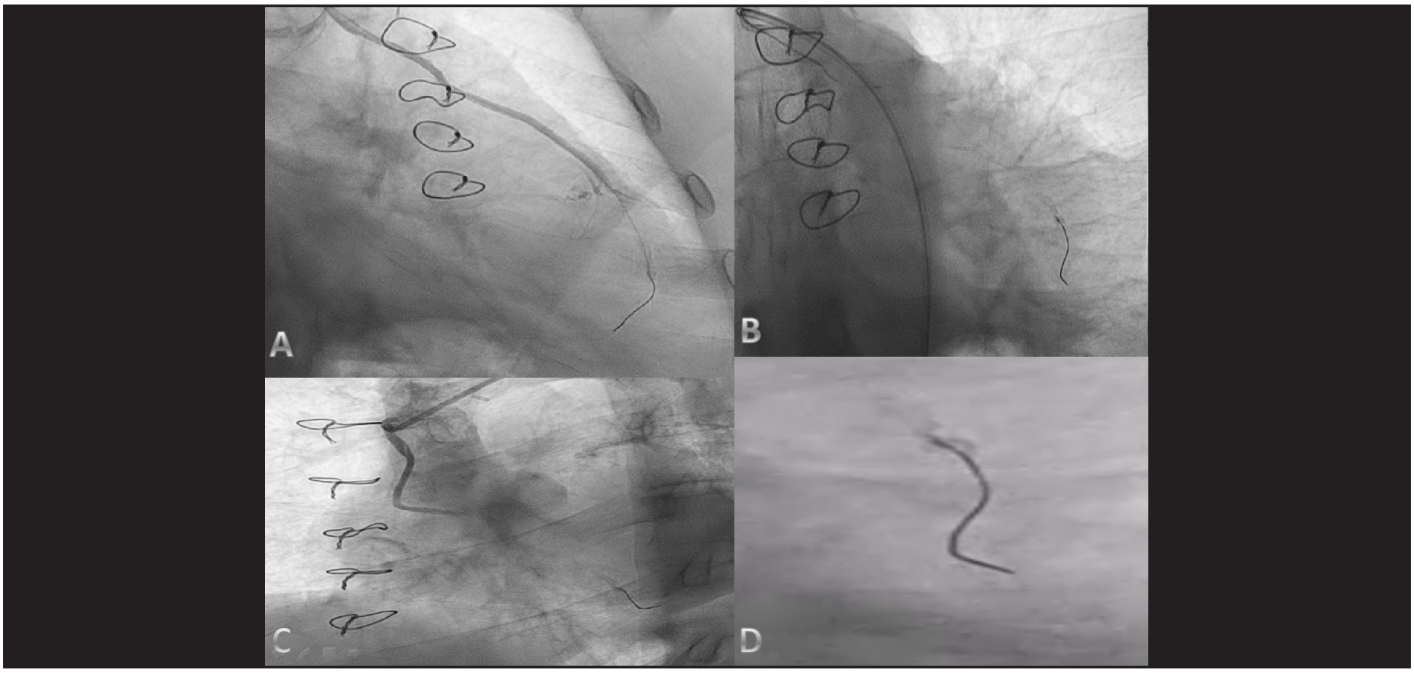


**Figure 2.** A: There is no distal flow in the coronary where the guide wire is located, B: Appearance of the broken wire after manipulation, C: Dissection line in saphenous RCA graft, D: Zoomed-in view of the broken distal part of the wire

## DISCUSSION

Prior to coronary intervention, determining the appropriate strategy based on coronary anatomy and lesion characteristics, along with selecting the appropriate guide wire, constitutes the initial step in preventing complications related to the guide wire. Guide wire entrapment is rare, with an incidence of approximately 0.1-0.2% [1]. The localization of the entrapped wire, the patient's hemodynamic status, and the continuity of coronary blood flow determine the approach to the complication. In a review of 48 reports involving 67 patients, guide wire entrapment was treated surgically in 29 cases (43.3%), percutaneously in 28 cases (41.8%) and conservatively in 10 cases (14.9%) [1]. Techniques such as the multiwire technique, snare loop capture, microcatheter support, and balloon inflation can be applied percutaneously to release the trapped wire [2]. Various approaches have been developed over the years for managing a broken guide wire, given concerns about thrombosis, dissection, distal or systemic embolization caused by a broken piece of the system.

Potential causes for guide wire breakage include aggressive manipulation, cutting with an atherectomy device, entrapment between stent struts, and wire deformation. Apart from percutaneous wire removal, surgical removal or conservative approaches may be considered depending on the patient's condition [3]. In cases where surgical decisions are made for additional reasons, surgical removal of the wire should be considered [4]. Complications such as hemodynamic deterioration and loss of coronary flow may necessitate urgent intervention. In hemodynamically stable patients, a conservative approach may be considered for wire fragments that do not affect coronary flow, especially those located distally or in insignificant side branches.

In our case, it was believed that the wire broke from the region where it was entrapped due to excessive manipulation. Applying torque to the wire while it was still inside the microcatheter during the wire-breaking stage seemed to be a more suitable approach as it was thought to cause less damage to the surrounding structures.

Evaluating the localization of the broken piece and its relationship with vessel and stent structures through intracoronary imaging (IVUS/OCT) is crucial for observation. In our case, the procedure was performed under urgent conditions, and we did not have a ready-to-use intracoronary imaging device. Due to the patient's stable hemodynamics after the distal wire manipulation and the wire's thin location in the distal vessel with chronic stenosis, we opted for a conservative approach. However, it is evident that our patient and we were fortunate due to the thin structure of the distal vessel and the small area affected by the flow. Complications would likely have a more fatal course in cases affecting larger feeding areas.

The patient was discharged with dual antiplatelet therapy due to stent implantation. However, even if a stent had not been placed, it would be appropriate to provide dual antiaggregant therapy in the first six months of follow-up to prevent platelet activation caused by the broken guide wire [5]. No additional intervention was considered during the one-year follow-up due to the absence of active complaints. While experience and treatment methods for guide wire-related complications vary, further research is necessary.

Yours sincerely,

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Each author takes responsibility for all aspects of there liability and freedom from bias of the data presented and their discussed interpretation.

Written informed consent was obtained from patient.

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