

# Successful Endovascular Retrieval of a Stent Fragment from the Femoral Artery

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## Abstract

The use of peripheral angiography is very common in the diagnosis and treatment of peripheral artery disease. In this case, we retrieved the fragment of a stent that had fractured during the procedure for peripheral artery treatment. To our knowledge, there is no similar case in the literature. A 58-year-old male patient with diabetes mellitus (10 years) and peripheral artery disease (3 years), who also had a history of coronary artery bypass grafting surgery, applied to our hospital with a complaint of claudication. The ruptured stent fragment in the superficial femoral artery was retrieved using a snare catheter during peripheral angiography (with appropriate modifications). Successful retrieval, no early or late complications, and no problems in follow-up.

**Keywords:** Endovascular treatment, superficial femoral artery, fragmented stent

## Introduction

Endovascular treatment techniques that have been established to have significant success in femoropopliteal segment diseases are being adopted by new centers worldwide; however, risks such as vascular patency lesions persist after the procedure<sup>(1)</sup>. New approaches are being developed to address these problems, including a

promising “nothing left behind” strategy with the help of advanced technologies<sup>(2-3)</sup>.

Although a number of different management options have been described in the literature, today, endovascular treatment (with snare catheters) and surgical exclusion bypass are the most popular methods due to their favorable results in various studies<sup>(2-4)</sup>.



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In this case report, successful retrieval of a ruptured stent graft fragment in a patient, who was not eligible for major surgical intervention, is described. Stent graft fracture or rupture are extremely rare occurrences that may have severe consequences. While surgical methods have been used in the past for the management of such complications, nowadays, retrieval of the embolized catheter fragment via endovascular techniques is frequently preferred, as it has been proven to be easier and safer than surgical methods<sup>(3,5-10)</sup>. In this case report, we present a patient who was initially asymptomatic after an intervention in which the stent graft fractured and a piece migrated to the right external iliac artery. Endovascular retrieval of the stent graft fragment from the right external iliac artery using a snare catheter was successfully performed without development of any complications.

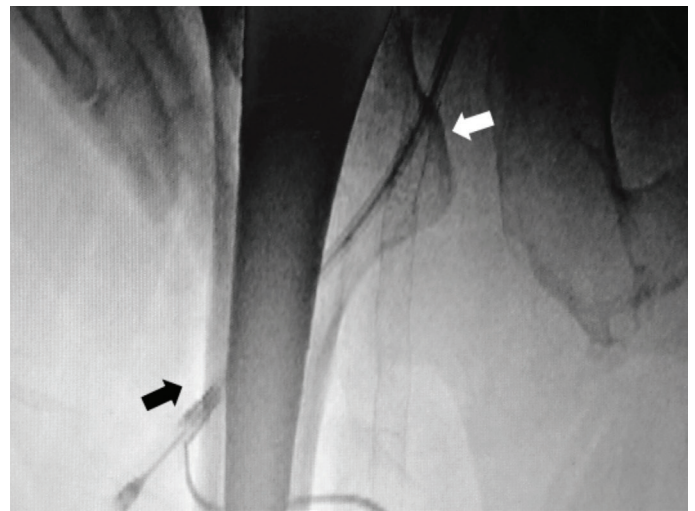
Embolization of all or some of the materials used during percutaneous intravascular interventional procedures is a rare complication with a serious risk of morbidity and mortality. Snare catheter is usually used in cases with stent migration as identified by coronary angiography. To our knowledge, the snare catheter has not been tried in peripheral artery interventions so far. In our case, we used a snare catheter to retrieve the lost fragment; thus, showing that these catheters can be used in peripheral artery interventions.

## Case Report

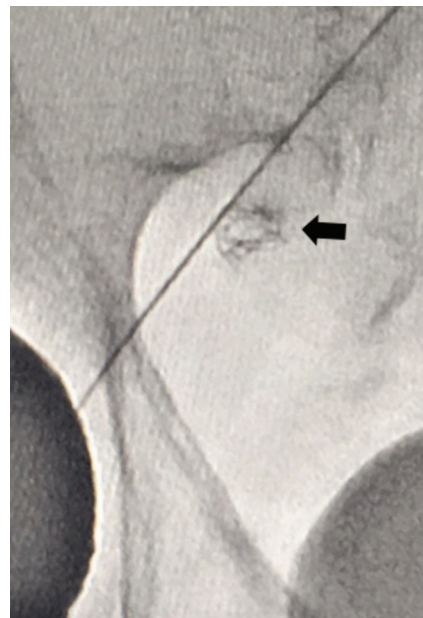
A 58-year-old male patient having diabetes mellitus for 10 years and peripheral artery disease for 3 years applied to our hospital with a primary complaint of recently developing claudication. The patient's history revealed that he was a recipient of prosthesis for both hips and he had a history of coronary artery bypass grafting surgery. Due to his complaints and confirmatory results showing the presence of stenosis in the right superficial femoral artery, a stent graft was placed on the patient's right leg. Peripheral angiography was recommended to the patient because of severe claudication on the left leg and very weak pulse from the left femoral artery. Pulse was normal

in the right femoral artery. During the procedure, it was planned to enter the right common femoral artery and return to the left femoral artery. A 6F sheath was placed, but with considerable difficulty. Control scopy showed that the sheath was observed to pass through the stent graft (Figure 1).

The presence of a foreign body was suspected in subsequent imaging. It was later discovered that this was a fragment of the stent graft (Figure 2).



**Figure 1.** Image showing entry through the stent graft in the right femoral artery

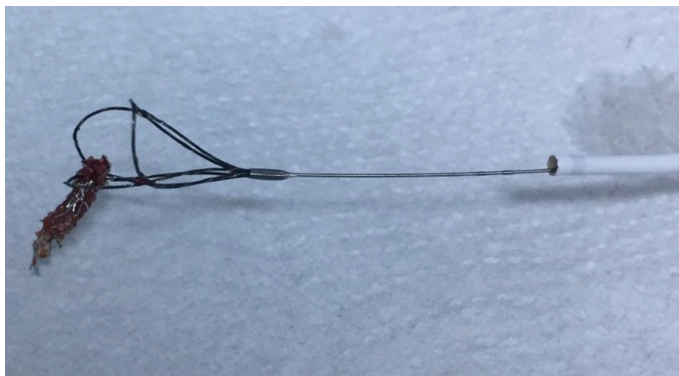


**Figure 2.** Stent fragment is seen in the external iliac artery

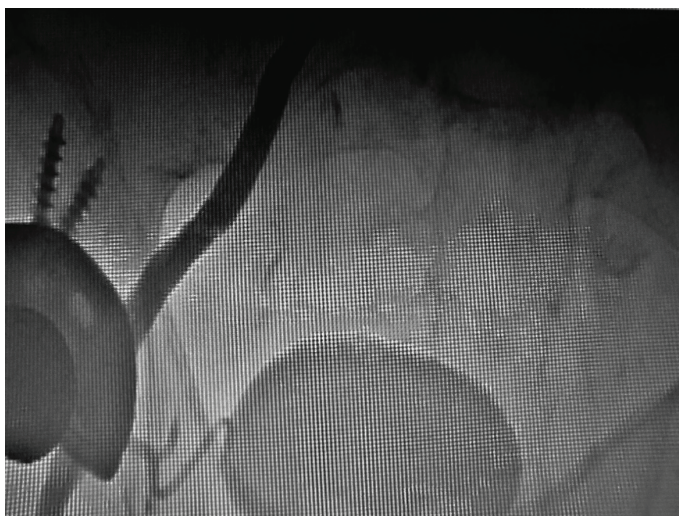
The general condition of the patient was good and vital signs were stable. The patient did not have any complaints or pain. We planned to retrieve the stent fragment using a snare catheter with the endovascular technique. A large-diameter snare was chosen in order to ensure that it could hold the ruptured stent fragment; however, a large diameter snare cannot pass through a 6F sheath. Therefore, the 6F sheath in the right femoral artery was replaced with an 8F sheath catheter. We were able to retrieve the stent fragment using a 6 mm snare catheter (Figure 3).

Afterwards, an image was taken with scopy. Flow was normal and no complications developed (Figure 4).

Then we continued with the procedure as usual by inserting a 0.35 hydrophilic guide wire that was turned towards the left femoral artery, and drug coated



**Figure 3.** Snare catheter and stent fragment are seen



**Figure 4.** Image of external iliac artery after the procedure

balloon was applied to the area with stenosis in the left superficial femoral artery and the stenosis was opened. The procedure was terminated by replacing the 8F sheath in the right femoral artery with a 6F sheath. Finally, the sheath was retrieved 4 hours later. No bleeding or hematoma occurred. The patient was followed with a regular schedule for 3 months.

## Discussion

While open surgery was the only choice in the retrieval of broken and migrated catheters in the past, nowadays, percutaneous transcatheter retrieval of ruptured stent fragments through the use of interventional endovascular techniques have become the primary method of retrieval. They have high success rates and much lower morbidity and mortality rates compared to surgical methods in adult patients. The reported success rate of percutaneous retrieval of intravascular ruptured fragment in the literature is 71-100%<sup>(7,11,12)</sup>. There are also several alternative tools used for the retrieval intravascular foreign bodies, such as endovascular forceps, retrieval baskets, and pigtail and ablation catheters. However, snare-loop catheter is the most popular option<sup>(8-12)</sup>.

In this case, the right femoral artery was used for entrance to access the lesion in the left femoral artery. This approach was chosen because we knew there was a stent in the right femoral artery. We entered from the upper region, namely, the common femoral artery. However, we recommend performing the procedure under ultrasonography guidance as well as scopy in such cases where stents are present. In fact, it may also be feasible to use the deep femoral artery as a route of entrance; after all, the catheter would be forwarded towards the iliac artery followed by routine approaches. However, since the patient had significant comorbidities, entry from the brachial artery was not considered. Entry from the left lower limb was also out of the question, as the patient had lesions in both the common femoral artery and the popliteal artery on this side. Since the intervention is through the sheath, the sheath can be replaced with a smaller size (e.g., 6F)



to avoid complications when the sheath is retrieved at the end of the procedure.

### Ethics

**Informed Consent:** The patient signed the consent form.

**Peer-review:** Externally peer-reviewed.

### Authorship Contributions

Concept: B.D., E.K., Design: B.D., E.K., Data Collection or Processing: B.D., E.K., Analysis or Interpretation: B.D., E.K., Literature Search: B.D., E.K., Writing: B.D., E.K.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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