

Revascularization of Long EIA-CFA-SFA CTO Complicated with Previous Total Hip Arthroplasty – A Rare Case Report

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Abstract

Rehabilitation is always important for patients with lower extremity artery disease (LEAD). Decreased physical activity of patients with LEAD contributes to worse outcome and higher mortality rate. Here we present the case of a 75 year-old man with long chronic total occlusion (CTO) from the external iliac artery (EIA) to the superficial femoral artery (SFA) with previous total hip arthroplasty, who received endovascular therapy with recanalization of CTO successfully via subintimal approach. If the vessel diameter is greater than 4mm, the subintimal approach seems to be a reasonable choice with higher technical success rates and similar mid-term primary patency rates compared with the intraluminal approach.

Keywords:

Introduction

Physical activity is a strong predictor of all-cause mortality in patients with lower extremity arterial diseases (LEAD).¹ Although total hip arthroplasty (total hip replacement) is popular surgery to replace a worn out or damaged hip joint, lack of rehabilitation or lower physical activity of patients with LEAD worsens the prognosis and increases the mortality rate.² Here we present a rare case of long chronic total occlusion (CTO) from the external iliac artery (EIA) to the superficial femoral artery (SFA) complicated by previous total hip arthroplasty.

Case Report

A 75 year-old man who had received bilateral total hip arthroplasty thirty years prior had difficulty with self-ambulation after the surgery. He was a heavy smoker with hypertension without medication control. Progressive resting leg pain developed for one year and multiple wounds of the bilateral toes were discovered. He suffered from fever with wound pain for days and visited our emergency department. The initial angiogram of the bilateral lower extremities showed long CTO from the right EIA to the distal SFA and CTO of the left distal SFA. We also saw

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the loosening of the femoral stem of the bilateral femoral prostheses, and a remarkable helix shape of his left proximal SFA (Figure 1).

Due to the patient's condition we decided to undertake staged endovascular therapy (EVT). In the first EVT we treated the left distal SFA CTO with one SUPERA stent successfully; we also put self-expandable stents into the bilateral EIA. In the second EVT we approached bilaterally with 6Fr. Destination guiding sheath inserted via the left common femoral artery (CFA) and the right distal SFA. After having successfully advanced a 0.014" guidewire with microcatheter into the SFA via retrograde approach, we advanced the system to the CFA area that was near the artificial acetabular cup. We advanced the retrograde guidewire under the guidance of intravascular ultrasound (IVUS) deployed antegradely in the CFA with the 0.014" guidewire (Figure 2). After we switched the retrograde guidewire to 0.018" ASTATO 30, we passed through the CFA. The Rendezvous technique was executed at the right CFA and the 0.018" guidewire was passed into the guiding sheath (Figure 3). We then checked IVUS



Figure 1. Arteriography showed helical appearance of left proximal superficial femoral artery (white arrow); the loosening of femoral stem of the prosthesis was also shown (black arrow).

and the images revealed subintimal tracking from the proximal SFA to CFA (Figure 4). Balloon angioplasty was applied from right EIA to right SFA. Two SUPERA stents were deployed at SFA; two self-expandable stents were put from the right EIA to the right CFA. Final angiography showed no residual stenosis with good distal runoff (Figure 5), and the patient's symptoms gradually relieved a few days later.

Discussion

Rehabilitation is always as important as EVT when treating patients with LEAD.³ Due to the immobility, run-off from the lower-extremity arteries of this patient was compromised and the bilateral femoral prostheses had loosened. Furthermore, the abnormal helical presentation of the left proximal SFA (and possibly also the right SFA) increased the complexity of revascularization of both arteries. Although total

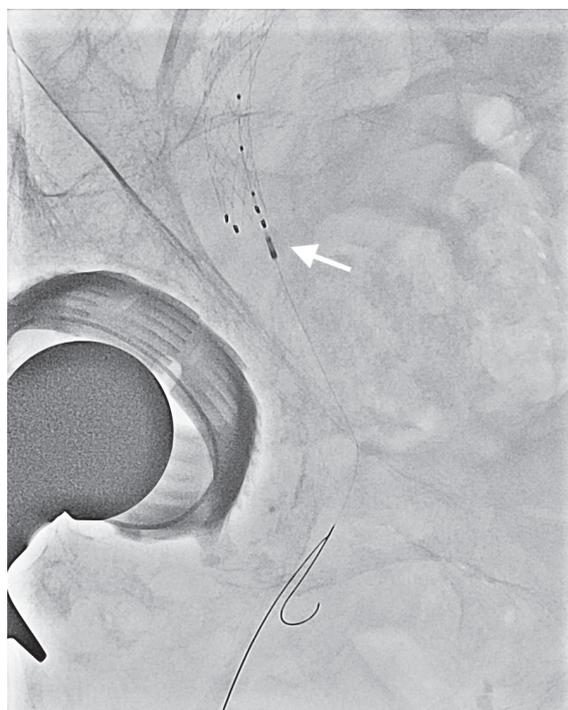


Figure 2. The retrograde 0.014" guidewire was advanced under the guidance of intravascular ultrasound (IVUS) (white arrow).



Figure 3. The Rendezvous technique was executed at the right CFA and the 0.018" guidewire was passed into the guiding sheath.

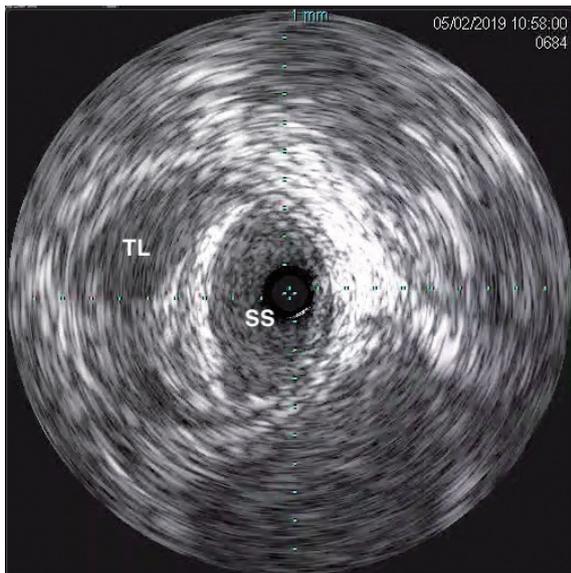


Figure 4. The image of IVUS revealed subintimal tracking after the Rendezvous technique. TL: True Lumen; SS: Subintimal Space.

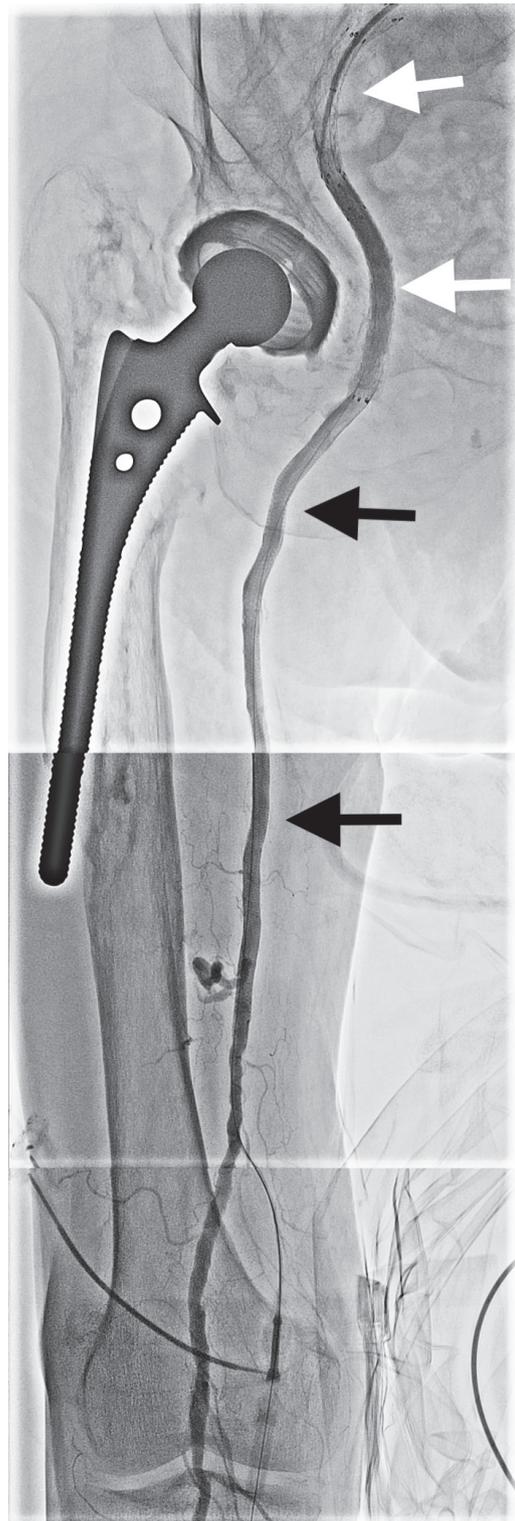


Figure 5. Final angiography showed completely recanalized SFA with good distal run-off to popliteal artery. Black arrows: two SUPERA stents. White arrows: two self-expandable stents.



hip arthroplasty has been performed frequently in past decades, there is no evidence supporting the relationship between this surgery and the acute complications related to LEAD.

There is still some debate regarding the suitability of the intraluminal approach vs. subintimal approach when treating the SFA CTO. Ko YG reviewed several registry studies and concluded that both strategies have comparable mid-term primary patency rates, however, the subintimal approach appears to have a higher technical success rate than the intraluminal approach.⁴ Considering the complexity of the SFA anatomy of this patient, a subintimal approach may be the only option for recanalization.

While on the topic of subintimal approach; stent implantation after the angioplasty seems to be inevitable in order to prevent acute vessel closure or early restenosis. However if the vessel diameter of SFA is smaller than 4mm, the three year stent restenosis rate is significantly higher; vessel diameter ≤ 4 mm is an independent predictor of stent restenosis.⁵ Therefore if the estimated vessel diameter of the target lesion is smaller than 4mm, subintimal approach should be reconsidered, since stent implantation is not always to be recommended in order to avoid poor long-term EVT outcomes.

Conclusion

We present a case with immobility and critical limb ischemia, for whom recanalization of EIA-CFA-SFA CTO was done successfully via the subintimal approach. If the vessel diameter is bigger than 4 mm, the subintimal approach seems to be a reasonable choice with higher technical success rates and similar mid-term primary patency rates compared with the intraluminal approach.

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