

MINI-FOCUS ISSUE: CORONARY & STRUCTURAL INTERVENTIONS

BEGINNER

IMAGING VIGNETTE: CLINICAL VIGNETTE

# Aneurysmal Dilatation of the Superficial Femoral Artery After Endovascular Intervention



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## ABSTRACT

A patient with occlusion of the left superficial femoral artery (SFA) underwent endovascular intervention. Six-month follow-up angiography revealed aneurysmal dilatation of the previously stented artery. This finding may be a result of maladaptive vascular remodeling or arterial injury resulting in aneurysmal dilatation secondary to subintimal crossing, atherectomy, and paclitaxel therapies. (**Level of Difficulty: Beginner.**) (J Am Coll Cardiol Case Rep 2021;3:425-6)  
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## INTRODUCTION

A 65-year-old woman with lifestyle-limiting claudication of the left lower extremity after failed exercise and guideline-directed medical therapy was referred for endovascular revascularization. Angiography revealed chronic total occlusion (CTO) of bilateral superficial femoral artery (SFAs) (**Figure 1**). The left SFA CTO was crossed by means of antegrade dissection and reentry technique, and treated with balloon angioplasty, atherectomy, and sequential drug-coated balloon (DCB) and paclitaxel drug-eluting stent (DES). Care was taken to minimize geographic miss and overlap. She was treated with dual-antiplatelet therapy for 3 months, followed by aspirin monotherapy.

At the 6-month follow-up, the patient reported worsening right lower extremity symptoms despite medical and exercise therapy. Access angiography and run-off of the left SFA showed patent stent with aneurysmal dilatation in the areas treated with DCB and DES (**Video 1**). Ultrasound revealed stent malapposition and adverse vascular remodeling.

## DISCUSSION

This case shows SFA aneurysmal malformation 6 months after CTO intervention. These pathophysiologic changes of positive remodeling, malapposed stent, and slow flow within the stent lumen might contribute to incomplete endothelialization and late stent thrombosis. Vascular remodeling might be associated with major adverse limb events and increased mortality (1).

Bisdas et al. (2) showed an 8% incidence of arterial aneurysms after treatment with DES in the femoropopliteal artery. Arterial degeneration after DES was attributed to T-cell-mediated inflammatory and hypersensitivity processes leading to delayed vascular healing and endothelialization. Peripheral arterial aneurysms have also been associated with directional atherectomy and reported to be around 7% (3).

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**ABBREVIATIONS  
AND ACRONYMS**

**CTO** = chronic total occlusion

**DCB** = drug-coated balloon

**DES** = drug-eluting stent(s)

**IVUS** = intravascular  
ultrasound

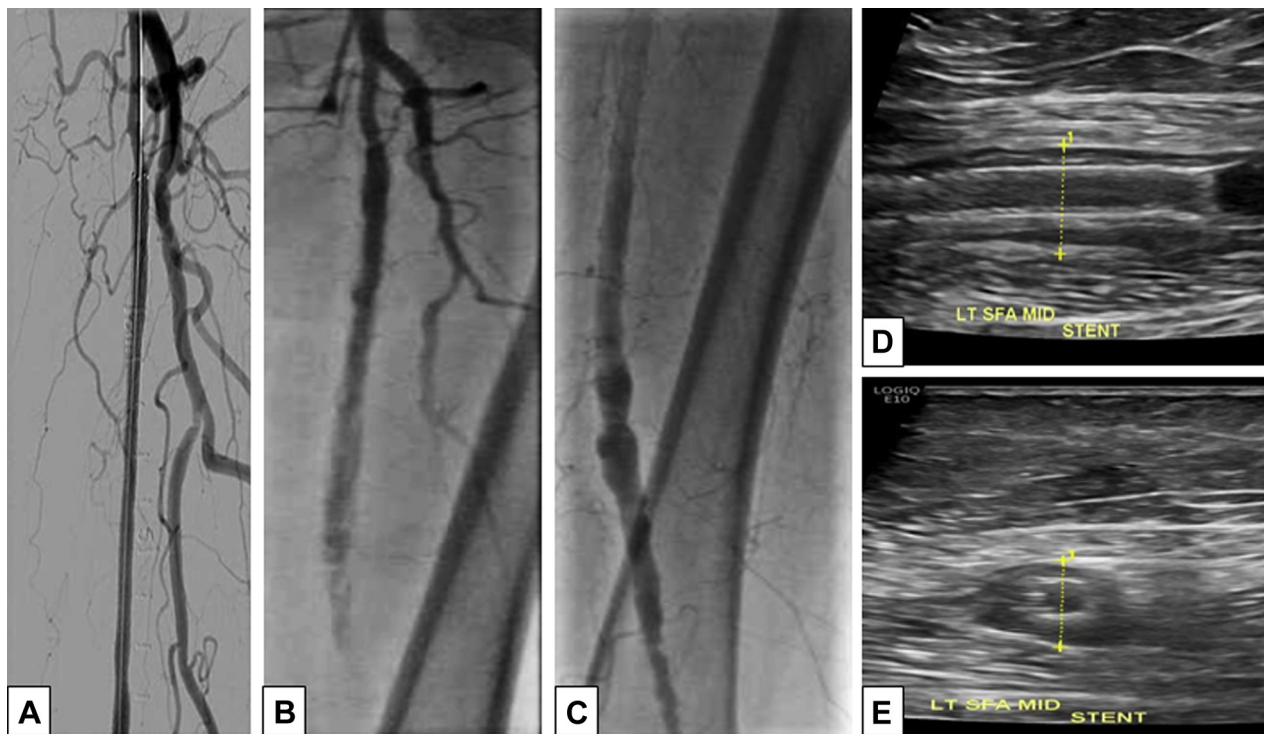
**SFA** = superficial femoral  
artery

Mechanisms that contribute to pathologic arterial remodeling might involve vascular smooth muscle cell migration and proliferation, elastin degradation, collagen deposition, and calcification of the extracellular matrix. Clinical factors that may increase risk for such remodeling may include subintimal passage of wires, arterial wall injury from atherectomy, paclitaxel-induced smooth muscle apoptosis, hypersensitivity reactions, inflammation, and inadequate medical therapy. In this case, likely the combination of arterial injury due to atherectomy or subintimal crossing potentiated the toxic effect of paclitaxel, thereby increasing the risk of aneurysm formation.

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**FIGURE 1** Aneurysmal Dilatation of the Paclitaxel Treated SFA Chronic Total Occlusion Segment Over 6 Months



(A) Peripheral angiogram of the superficial femoral artery (SFA) chronic total occlusion segment treated with directional atherectomy, drug-coated balloon distally and drug-eluting stent proximally. Contrast injection of the left SFA 6 months after the procedure revealed patent stent with (B) slow flow and (C) aneurysmal segments. (D) Longitudinal and (E) cross-sectional views of malapposed paclitaxel drug-eluting stent 6 months after implantation as observed on ultrasound.

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**KEY WORDS** atherosclerosis, drug-coated balloon, peripheral vascular disease

**APPENDIX** For a supplemental video, please see the online version of this paper.