The femoral artery is the classic access route during diagnostic and interventional catheterizations, including primary percutaneous coronary intervention (PCI). Dissection of the femoral and iliac arteries occurs very infrequently (0.42%), although iatrogenic dissection may be under-reported, as the sheath removal allows the resumed flow to tack down the dissection flap. Dissections of the iliac arteries are typically stented, but stenting of the common femoral artery (CFA) is not routinely recommended in contemporary practice. We present a case of severe flow-limiting femoral artery dissection discovered at the end of a primary PCI procedure, bailed out with balloon angioplasty using a novel technique.

**CASE REPORT**

A 44-year-old man with a body mass index of 39.7 kg/m² and a history of smoking and diabetes was referred to our center with acute inferior myocardial infarction complicated by complete heart block. He presented at our catheterization laboratory at 3:30 AM and appeared confused, pale, sweaty, and irritable. His blood pressure was 75/43 mm Hg, and his heart rate was 35 to 45 beats/minute. From the right groin, a temporary pacemaker wire was successfully inserted into the right ventricular apex, with a pacing rate of 80 beats/minute. The right femoral artery was punctured using the Seldinger technique with good backflow. Initially, mild resistance was encountered during advancement of the guidewire; however, by changing the orientation of the needle bevel, we were able to advance the wire without appreciable resistance. A 6 Fr sheath (Cordis Corporation) was placed in the CFA over the guidewire. Primary PCI was successful for the totally occluded right coronary artery with large thrombus burden. The procedure was performed under full anticoagulation, with 10,000 IU heparin. Tirofiban bolus dose, followed by continuous infusion, was administered to improve distal coronary flow after stenting.

A final peripheral angiogram showed severe flow-limiting dissection of the distal segment of the right external iliac artery (EIA) and the whole CFA (Figure 1). After obtaining contralateral access, a 0.035" angled glidewire (Radifocus, Terumo) crossed through the true lumen down to the distal segment of the superficial femoral artery (SFA).

Repeated prolonged inflation of the Armada 6.0 × 40 mm (Abbott Vascular) and Armada 8.0 × 40 mm balloons, for a duration of 1 to 2 minutes several times, was unable to bail out the dissection, even after the retrograde sheath was retrieved to the maximum with a retrograde safety wire (Figure 2). Following the removal of the right-side retrograde femoral sheath and wire, the right CFA was sealed with the ExoSeal closure device (Cordis Corporation) and manually compressed for 2 minutes.

**Abstract:** Femoral artery dissection is a known complication in interventional cardiology. The contemporary practice is to avoid stenting of common femoral artery (CFA) lesions. This case demonstrates the steps of sealing a flow-limiting, iatrogenic CFA dissection during primary percutaneous coronary intervention, including a novel balloon angioplasty technique.

**Key words:** femoral access, dissection, balloon angioplasty

**Figure 1.** Baseline angiogram of the access site, in (A) left anterior oblique and (B) right anterior oblique projections showed severe flow-limiting dissection of the distal right external iliac artery and common femoral artery.
Prolonged inflation of the Armada 8.0 × 40 mm balloon still did not improve the flow (Figure 3). This balloon was inflated at the proximal EIA at 2 atm and was advanced, slowly under fluoroscopy, down to the dissection site and inflated up to 4 atm for 60 seconds, with good results and normal flow achieved (Figure 4). After 5 minutes, recheck angiogram showed persistent good flow. Clinical assessment, ankle-brachial index, and Duplex study before discharge, at 1-month follow-up, and at 3-month follow-up showed normal findings.

**DISCUSSION**

Occlusive dissection of the femoral or iliac artery may occur as a complication of catheterization. Such dissection is most common in the iliac arteries due to atherosclerotic occlusive disease and the tortuosity of these vessels. Simple removal of catheters and wires usually allows spontaneous resolution of dissection. If flow-limiting dissection occurs, angioplasty is performed, and if the result of balloon angioplasty is unsatisfactory, a stent may be deployed.6

The current guidelines of management of iliofemoral occlusive lesions state that a hybrid procedure combining iliac stenting and femoral endarterectomy or bypass should be considered.5

In the present case, the dissection was associated with marked flow limitation; therefore, optimal anticoagulation and immediate revascularization were indicated. An appropriately sized balloon catheter that matched the size of the target vessel was inflated inside the true lumen over a guidewire from the contralateral femoral access. However, the retrograde sheath and the retrograde wire might have prevented the antegrade balloon from tacking down the dissection flap. Removal of the retrograde sheath in a fully anticoagulated obese patient, as in our case, as well as the need to seal the dissected right CFA puncture site, results in long compression time and a very high risk of thrombosis that further threatens the downstream flow.

After careful consideration, an Exoseal closure was used to seal the arteriotomy with an extravascular collagen plug, leaving no intravascular components. Repeated and prolonged antegrade, appropriately sized balloon inflation still was unable to tack down
the dissection flap. Vascular surgery deemed the case high risk as
the patient had an acute myocardial infarction.

The novel technique of inflating the balloon at a low pressure
at the iliac artery proximal to dissection and slowly advancing
the balloon under fluoroscopy until reaching the dissected seg-
ment probably tacked down the dissection flap to cover its raw
area, bailed out the dissection, and improved the flow. The risk
of tearing the artery at its dissected segment was a significant
factor to consider. However, the balloon appeared optimally
sized in our patient, was inflated at low pressure, and was slowly
advanced without any resistance as it was carefully tracked under
fluoroscopy.

Limb salvage with stenting of the CFA using one of the modern
self-expandable nitinol stents was the final strategy available in
our case if we exhausted the balloon-only option. This strategy is
supported by a recent study of stenting or surgery of de novo CFA
stenosis that had shown comparable patency rates and freedom
from target-lesion and target-extremity revascularization over 24
months of follow-up.7

CONCLUSION

This case describes a stepwise critical intervention involving a
novel balloon angioplasty technique that successfully bailed out an
iatrogenic external iliac and common femoral arterial dissection. ■

Disclosure: The authors have completed and returned the ICMJE Form
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