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## Background

Peripheral arterial disease (PAD) is a prevalent disease in the United States, affecting 20% of adults >70 years of age and significant morbidity and limb loss.<sup>1,2</sup> It is due to a full or partial blockage in the lower extremity arterial circulation leading to decreased perfusion. It is usually due to atherosclerosis and is less commonly caused by radiation exposure, injury, or blood vessel inflammation.<sup>1</sup> Risk factors include smoking, diabetes, hypertension, hypercholesterolemia, family history of (PAD), heart disease or stroke, and obesity.<sup>2</sup> Diagnosis and treatment in a timely manner are vital as consequences are debilitating and can be fatal. We describe two cases of patients with PAD who both undergo proximal angioplasty prior to treatment.

## Cases

A male patient in his early 60's (Figures 1 and 2) presented for increasing right lower extremity pain and ulceration. He subsequently had a CTA runoff performed that was remarkable for right superficial femoral artery (SFA) extensive atherosclerosis with high-grade or near occlusive disease near the adductor canal. He was amenable to right lower extremity angiography with intervention, which showed short segment occlusion and multiple high grade stenoses of the right mid SFA. The diseased SFA proved difficult to traverse, and multiple balloon angioplasties were then performed throughout the proximal SFA to create a track to cross the lesion with a 5 x 100, 6 x 120 and 6 x 100 Mustang balloons and a 6 x 120 Sterling balloon. Afterwards, the lesions were addressed with two Eluvia 6 x120 stents.

Additionally, a female patient in her early 70's (Figures 3 and 4) presented with ischemic osteomyelitis of her right lower extremity, with a CTA runoff demonstrating multiple high-grade or near complete occlusions of the right mid and distal SFA. She subsequently underwent right lower extremity angiography which confirmed near total occlusion of the right SFA with large collateral filling into the popliteal artery in the P1 segment. Advantage guidewire and NaviCross was used across the chronically occluded SFA, but the wire was unable to pass distally. Balloon angioplasty with a 4 x 60 balloon was used to create a channel first, followed by advancement of 6 x 100 and 6 x 200 balloons to treat the lesion. There was some residual dissection noted, and two Eluvia stents measuring 7 x 120 were deployed.

## References

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4. Gerhard-Herman MD, Gornik HL, Barrett C, et al. 2016 AHA/ACC guideline on the management of patients with lower extremity peripheral artery disease: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines [published correction appears in *Circulation*. 2017;135(12):e791-e792]. *Circulation*. 2017;135(12):e726-e779.

## Imaging



Digital subtraction angiography (DSA) demonstrating occlusion of the mid SFA that prevented traversal of a wire into the distal SFA (Figure 1). Balloon angioplasty just proximal to the lesion allowed for passage of a wire and subsequent treatment of the lesion (Figure 2).



Digital subtraction angiography (DSA) demonstrating near total occlusion of the mid and distal SFA that prevented traversal of a wire distally (Figure 3). Balloon angioplasty just proximal to the lesion allowed for passage of a wire and subsequent treatment of the lesion (Figure 4).

## Discussion

PAD presents classically with intermittent claudication. Patients usually describe leg fatigue, cramping pain, pressure, aching, or weakness in their leg on walking, with relief upon rest. The muscle group affected with pain is usually one level distal to the artery narrowed or blocked by PAD.<sup>1</sup> For example, if there is an occlusion in the femoropopliteal artery, patients will have symptoms in their calf muscles. On physical exam, physicians may note ulceration, loss of pulses, pain on palpation, pallor, paresthesia, loss of hair, muscle atrophy, cool and cyanotic skin.<sup>3</sup> Arterial Ulcers will be well-demarcated, 'punched out,' and located on or in between tips of toes, heels, or on the lateral side of the ankle. The diminished or absent pulses are verified with ankle-brachial index (ABI).<sup>3</sup> To determine the site of blood flow occlusion and flow velocities, Doppler studies are done. When assessing if a patient is a candidate for angioplasty or bypass, a CT angiography or MR Angiography can be useful, as in the case of our two patients.<sup>1</sup>

### Medications<sup>3</sup>

Antiplatelet – Aspirin (75-325mg/d) or clopidogrel (75mg/d)	In symptomatic patients decrease risk of MI, Stroke or vascular death
Anticoagulation- low dose rivaroxaban (Xarelto; 2.5mg 2x/d)	Addition to aspirin to reduce symptomatic PAD, and CAD
Statin	In symptomatic patients with PAD reduces risk of adverse limb long term outcomes.
Antihypertensive	If patient has hypertension and PAD- decrease risk of stroke, MI, heart failure, and cardiovascular death.
Cilostazol	Relief of symptoms and improve circulation.

### Surgery

Patients that are unresponsive to lifestyle and medical therapy and experience severe symptoms are candidates for revascularization. Revascularization can be performed endovascular, surgical, or combined, and depends on both patient and surgeon factors.<sup>2</sup> Procedures include angioplasty with stenting, bypass grafting, and endarterectomy.<sup>3</sup> In our cases, the lesions were very large, and difficult to traverse with wire to directly perform angioplasty and stenting, and thus we performed proximal balloon angioplasty and slowly advanced to treat the lesion, and then placed the stents. Outcomes were positive and successful and no side effects were noted.

According to the American Heart Association/American College of Cardiology (AHA/ACC) there is no data to support endovascular treatment of patients with PAD to prevent claudication progressing to critical limb ischemia. In addition, there is no data to support patients with asymptomatic PAD undergoing revascularization.<sup>4</sup>

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