

External Iliac Artery Dissection Described on Duplex Ultrasonography

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Case Description

This case involves a 73-year-old man with chronic limb-threatening ischemia who presented for a left lower extremity angiogram, which demonstrated high-grade stenosis of the distal superficial femoral artery and high-grade stenosis at the proximal anterior tibial artery with flow to the foot and collaterals to the posterior tibial (PT) artery. A long 7F sheath was only able to be advanced into the external iliac artery (EIA) during the procedure. Lesions were treated with balloon angioplasty and stent of the superficial femoral artery and angioplasty of the anterior tibial artery.

The patient was asymptomatic after the operation; on examination, however, he did not have dorsalis pedis or PT signals, which were previously biphasic signals. An arterial duplex was performed that demonstrated concern for a dissection of the left EIA and no flow in the mid and distal PT artery. Duplex spectral waveform demonstrated an increased peak systolic velocity, corresponding to a rapid systolic upstroke followed by a systolic cleft and dome, and minimal diastolic flow (Fig. 1). The “spike and dome” waveform reflects a high-pressure flow consistent with

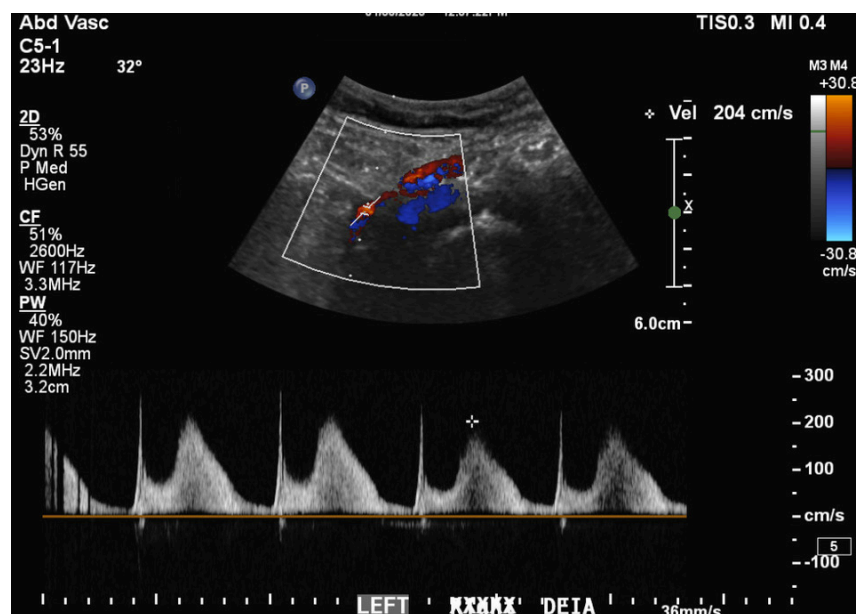


Fig. 1 Ultrasonographic image of the left external iliac artery demonstrating dissection flap with pulsed Doppler spectral waveform with a rapid systolic upstroke followed by a systolic cleft and dome.

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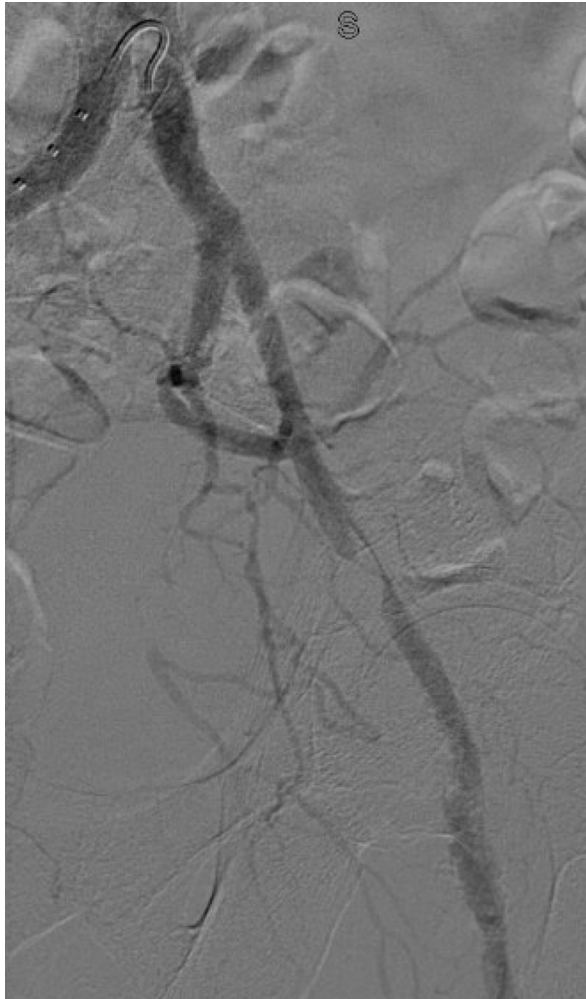


Fig. 2 Angiogram demonstrating dissection in the left external iliac artery.

Supplemental motion image is available for [Figure 2](#)

dynamic obstruction from the dissection flap. This pattern contrasts with normal external iliac waveforms, which demonstrate a triphasic flow pattern.

A heparin drip was started, and repeat left lower extremity angiogram demonstrated EIA dissection consistent with ultrasonography findings (Fig. 2). The distal EIA dissection was treated with an 8×5-cm Viabahn stent (Gore Medical) and dilated with a 7-mm balloon. Completion angiogram demonstrated resolution of the dissection and appropriate filling of the foot. Biphasic dorsalis pedis and PT signals were obtained postoperatively.

Abbreviations and Acronyms

EIA	external iliac artery
PT	posterior tibial

Comment

Similar spike and dome waveforms are a characteristic finding of high-resistance obstruction in hypertrophic cardiomyopathy and have also been described previously in the aorta and carotid arteries.¹ Peripheral arterial duplex ultrasonography is routinely and reliably used in preoperative arterial mapping before bypass surgery and in surveillance of arterial disease.²⁻⁴ Duplex has also been described as an accurate way to diagnose dissection of the aorta and carotid arteries but has rarely been described in a peripheral vessel such as the EIA.⁵ Thus, this case strengthens previous findings that duplex ultrasonography can be used as an accurate method of diagnosing peripheral arterial dissection and an aide to guide treatment options.⁶

Article Information

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References

1. Madhwal S, Yesenko S, Kim ES, Park M, Begelman SM, Gornik HL. Manifestations of cardiac disease in carotid duplex ultrasound examination. *JACC Cardiovasc Imaging*. 2014;7(2):200-203. doi:10.1016/j.jcmg.2013.09.015
2. Ascher E, Mazzariol F, Hingorani A, Salles-Cunha S, Gade P. The use of duplex ultrasound arterial mapping as an alternative to conventional arteriography for primary

- and secondary infrapopliteal bypasses. *Am J Surg.* 1999;178(2):162-165. doi:10.1016/s0002-9610(99)00151-8
3. Wain RA, Berdejo GL, Delvalle WN, et al. Can duplex scan arterial mapping replace contrast arteriography as the test of choice before infrainguinal revascularization? *J Vasc Surg.* 1999;29(1):100-107. doi:10.1016/s0741-5214(99)70352-6
 4. Pellerito JS. Current approach to peripheral arterial sonography. *Radiol Clin North Am.* 2001;39(3):553-567. doi:10.1016/s0033-8389(05)70297-9
 5. Adkins AL, Zelenock GB, Bendick PJ, Shanley CJ. Duplex ultrasound recognition of spontaneous carotid dissection—a case report and review of the literature. *Vasc Endovascular Surg.* 2004;38(5):455-460. doi:10.1177/153857440403800510
 6. Cruz J, Lipsitz EC, Berdejo GL. Diagnosis and ultrasound-guided repair of an iliac artery dissection. *J Vasc Ultrasound.* 2004;28(2):96-100. doi:10.1177/154431670401800206