

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Vascular Diseases Quiz – Case 42

A 25-year-old man with no significant past medical history was seen in the outpatient clinic for the evaluation of aching pain, numbness, tiredness and cramping in the calf in his left leg while running or during vigorous exercise. He was otherwise healthy swimmer, did not smoke, took no medication and had no family history of premature cardiac or vascular disease. On physical examination he had no obvious trauma with intact ligaments and normal range of motion. Distal pulses at rest were normal but diminished when the patient actively plantar flexed his left foot. Recording pulse waveforms with Doppler flow analysis and calculating ankle-brachial indices were also impaired during contraction. A digital subtraction arteriogram (DSA) was requested and revealed popliteal artery deviation from the midline in the popliteal fossa with narrowing during plantar flexion (fig. 1).

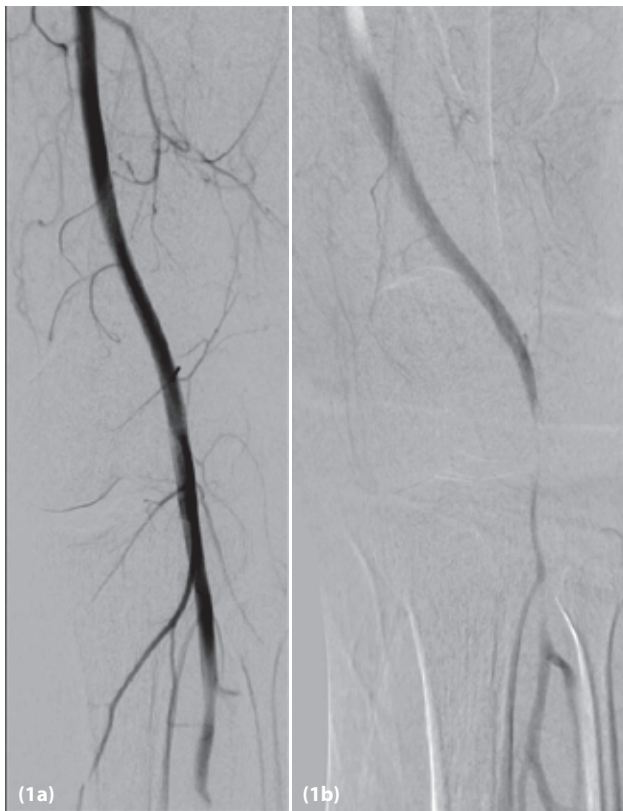


Figure 1. Angiograms demonstrate popliteal artery entrapment during plantar flexion (1b), but patent in the neutral position (1a). Case courtesy of Dr Andrew Dixon, Radiopaedia.org – Case ID: 9420.

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ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2017, 34(4):575–576

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What is the diagnosis?

1. Thromboangiitis obliterans (Buerger's disease)
2. Popliteal artery entrapment syndrome
3. Fibromuscular dysplasia
4. Popliteal adventitial cystic disease

What is(are) the proper diagnostic tool(s) for definitive diagnosis of this condition?

1. Computed tomographic scanning
2. Magnetic resonance imaging
3. Angiography (DSA)
4. Duplex Doppler imaging
5. All the above

What is the treatment?

1. Surgical exploration and bypass
2. Endoluminal intervention
3. Anticoagulation alone
4. All the above

Comment

Any young individual with exertional low extremity discomfort should be evaluated for popliteal artery entrapment syndrome (PAES). Although relatively rare vascular disease (1.6% to 3.5% of general population), the incidence of PAES in a young athlete with signs and symptoms of a vascular occlusion may be as high as 60%. A third of the patients with unilateral symptoms have been found to have anatomic abnormalities in both extremities.

PAES is an anatomic variant in the relationship of the popliteal artery to the other structures of the popliteal fossa. The current classification system describes six variants of PAES, types I to VI.

- *Type I: Popliteal artery has an aberrant medial course around medial head of gastrocnemius*
- *Type II: Artery is not displaced, but the medial head of gastrocnemius inserts more lateral than usual; the artery passes medial and beneath the muscle*
- *Type III: An accessory slip of medial head of gastrocnemius*

slings around the artery

- Type IV: Artery lies deep in popliteal fossa entrapped by popliteus or fibrous band
- Type V: Both popliteal artery and vein are entrapped
- Type VI: The popliteal artery is normal and entrapped by a normal positioned, hypertrophied gastrocnemius muscle (AKA: functional entrapment).

Claudication is usually fairly standard in its quality, frequency, and reproducibility. Prior to acquiring definitive invasive imaging studies, documentation of functional artery occlusion by noninvasive means is possible. This can be feasible on physical examination by palpating distal pulses as the patient actively plantar flexes his or her foot. Recording pulse waveforms with Doppler flow analysis and calculating ankle-brachial indices (prior to and during contraction) increase the sensitivity of this maneuver.

Differential diagnosis in otherwise healthy young patients incorporate rare etiologies of vascular claudication. Thromboangiitis obliterans, commonly known as Buerger's disease, is characterized by multiple segmental thrombotic occlusions of distal small and medium arteries and it is exclusively seen in smokers. Fibromuscular dysplasia is characterized by alternating segments of stenosis and dilatation and can be manifested with calf claudication in young individuals. However, is more common in female than man (9:1) and rarely affect the popliteal artery. Another possible cause includes popliteal adventitial cystic disease. This condition is characterized by a collection of mucinous material (mucous cysts) within adventitial wall of the affected vessel.

To make a definitive diagnosis accurate localization and mapping of the anatomy in the popliteal fossa is needed. Both computed tomographic scanning and magnetic resonance imaging provide excellent resolution and anatomic detail of this compartment, but angiography remains the mainstay of investigation for defining arterial anatomy. The diagnosis of PAES should be considered when

at least two of the following angiographic features are present: (a) Medial deviation of the proximal popliteal artery, (b) focal occlusion of the mid-popliteal artery and (c) post stenotic dilatation of the distal popliteal artery.

The fundamentals of intervention include release of arterial entrapment, restoration of normal anatomy, and restoration of arterial flow. This is best achieved with surgical intervention. Endovascular interventions and anticoagulation therapy do not deal with the muscular entrapment.

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Other answers: 5 and 1

Diagnosis: Popliteal artery entrapment syndrome