A Popliteal Artery Entrapment Syndrome after By-Pass Surgery

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A 36-year-old male was admitted to our radiology department with a presentation of claudication on the left side for two weeks after femoral artery to tibial artery by-pass surgery. Upon physical examination, the left leg appeared pale and cold. Left magnetic resonance angiography (MRA) with gadolinium was performed from the superficial femoral arteries through the proximal portion of the popliteal fossa. The images included the bilateral popliteal arteries during dorsiflexion, plantar extension and neutral positions. There appeared to be a left venous graft that was patent. It arose from the proximal popliteal artery and traveled to the anterior tibial artery. The graft was patent at the visualized aspect. There appeared to be a mild to moderate degree of stenosis of the popliteal artery in the neutral position. There was severe stenosis of the same segment of the popliteal artery during knee extension. The popliteal artery was compressed by the slip of the medial head of the gastrocnemius, which arose more laterally than normal (Figure 1 A-C).

Popliteal artery entrapment syndrome (PAES) is a rare congenital vascular pathology caused by a compression of the popliteal artery by adjacent muscle and tendon structures. This condition is most commonly observed in young men with ischemic symptoms of the lower extremities. Extrinsic arterial compression causes chronic vascular micro trauma, early arteriosclerosis and thrombus formation, leading to distal ischemia [1, 2]. The classic presentation, which includes calf or foot claudication or pain on exertion, can have many other etiologies, including atherosclerosis, exertional compartment syndrome, and other musculoskeletal or neurogenic disorders. The most commonly used classification of PAES was described by Love and Whalen [3]. Our case had type III PAES. The incidence of popliteal entrapment has been described to be between 0.165% and 3.5% [2, 4]. Noninvasive tests, such as duplex ultrasound and axial imaging, including multi detector computed tomography angiography (MDCTA) or MRA, can help identify the anatomical abnormalities [1, 4].

In conclusion, MRA MDCTA is a safe, rapid, and noninvasive diagnostic imaging technique that enables clinicians to determine the underlying pathology and the complications of PAES.

Figure 1. 3D gadolinium-enhanced MRA images reveal the mild degree of stenosis of the popliteal artery in the neutral and dorsiflexion positions (A, B); there is severe stenosis of the same segment of the popliteal artery in the extension position (C). These images indicate type III popliteal artery entrapment.
Conflict of interest statement: The authors declare that they have no conflict of interest to the publication of this article.

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