

Plantar Flexion-Induced Entrapment of the Dorsalis Pedis Artery in a Teenaged Cross-Country Runner

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Background: Symptomatic peripheral artery disease of the lower extremity rarely affects young adults and, when present, typically has a nonatherosclerotic etiology. Anatomical variants have manifested as symptomatic foot ischemia in four cases in the literature. We describe the case of a 17-year-old girl presenting with foot pain upon plantar flexion due to dynamic dorsalis pedis (DP) artery entrapment by fibrous bands and the extensor hallucis brevis (EHB) tendon.

Methods: The patient was a 17-year-old girl who presented with right foot pain upon plantar flexion, which resolved upon returning to the neutral position. The potential site of compression was identified on MRI where the DP artery ran deep to the EHB tendon near the first and second tarsometatarsal joints. On diagnostic arteriogram, there was notching of the dorsalis pedis over the talus bone. The dorsalis pedis Doppler signal was obliterated upon plantar flexion. A longitudinal incision was made over the artery in the area of compression. The flexor retinaculum was incised. Abnormal fibrous bands were identified, which were lysed anterior to the artery. The EHB tendon was released and transferred distally to the extensor hallucis longus tendon.

Results: A completion angiogram showed a persistently patent dorsalis pedis artery with plantar flexion. She was discharged one day postoperatively without issues. On follow-up, the patient was ambulatory with complete resolution of her pain. Arterial duplex demonstrated normal velocities through the dorsalis pedis in all positions.

Conclusions: Symptomatic peripheral artery disease is a rare presentation in young adults and is usually due to nonatherosclerotic pathophysiology. We present a rare case of dorsalis pedis artery entrapment syndrome. Given the mechanical nature of obstruction, surgical correction was an effective treatment.