embolic disease. Our case is unique in that the patient had prior aneurysmal disease with growth of the aneurysmal wall masquerading as recurrent contained rupture. Although chemotherapy agents are available as adjunctive treatments, the primary therapy is extirpative resection.

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Clinical Significance of Chronic Venous Insufficiency When Treating Chronic Exertional Compartment Syndrome

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Objectives: Chronic venous insufficiency (CVI) may be an underrecognized factor contributing to lower leg pain in individuals diagnosed and treated for chronic exertional compartment syndrome (CECS). Although small series have reported healing of venous stasis ulcers after compartment release procedures, studies have not assessed postoperative symptom relief in individuals with simultaneous CVI and CECS. We review our outcomes in individuals treated with CECS release who were also diagnosed with CVI.

Methods: A retrospective review of our data was performed to identify all patients screened for CVI with duplex ultrasound imaging from January 2013 to December 2013 who underwent CECS release. For individuals who screened positive for CVI, postoperative outcomes were assessed.

Results: Compartment release surgery was performed on 39 patients who were screened for CVI. Of the 39 patients, 23 (59%) tested positive for deep or superficial venous insufficiency, or both. An electronic medical record review produced 100% follow-up. Median follow-up after the first procedure was 19 months. CECS release was performed in 24 patients, in 11 (48%) for recurrent and in 13 (57%) for new-site releases. Venous ablation therapy was performed in eight patients (35%). All patients diagnosed with CVI were placed in medical-grade compression support. Complete symptom relief was present in only four (17%), and 16 (57%) received partial symptom relief. The most common continued symptoms were generalized lower leg pain in eight (33%) and swelling in seven (29%).

Conclusions: Patients with CVI and CECS appear to have less favorable outcomes after compartment release, and expectations must be tempered in this population. Our historic outcomes data suggest a recurrence rate of ~6% and a new-site prevalence of ~20%. The combination of CVI and CECS may be associated with higher rates of recurrence, new symptomatic compartments, and continued pain and swelling. Noninvasive screening for CVI with duplex ultrasound imaging should be considered as part of the workup for apparent symptomatic CECS because it is not always apparent on physical examination. Further long-term outcomes studies are indicated in this unique patient group.

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Intravascular Ultrasound to Diagnose Functional Popliteal Artery Entrapment Syndrome

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Objectives: Popliteal artery entrapment syndrome (PAES) is an uncommon cause of lower extremity claudication. Cross-sectional imaging with computed tomography (CT) and magnetic resonance can identify all but functional PAES with excellent diagnostic accuracy. Angiography with flexion and extension maneuvers is supposed to identify all arterial forms of PAES. We present two patients with no demonstrable compression of the popliteal artery on cross-sectional imaging or angiography with dynamic maneuvers. Significant dynamic arterial compression was identified using intravascular ultrasound (IVUS) imaging and confirmed at surgery.

Case history: Patient 1 was a 27-year-old healthy man with left calf claudication, normal pulse examination, and an ankle-brachial index of 1.17 that dropped after exercise to 0.17. CT showed no anatomic abnormalities. Angiography with active and passive flexion and extension maneuvers was normal. IVUS imaging with flexion and extension showed significant compression of the popliteal artery (Fig 1). Surgery confirmed compression of the popliteal artery by an enlarged popliteus muscle and a slip of medial gastrocnemius muscle tendon that inserted on the lateral contralateral condyle (Fig 2). Postoperatively, his symptoms resolved. Patient 2 was a 54-year-old man who presented to another hospital with acute limb ischemia. CT angiography showed plaque in the popliteal artery and occlusion of the tibioperoneal, posterior tibial, and peroneal arteries. He underwent successful thrombolysis but continued to have disabling claudication. CT did not show abnormal muscle, artery, or vein locations. Diagnostic angiography with active and passive flexion and extension maneuvers of the foot showed an ulceration in the popliteal artery but no evidence of entrapment. IVUS imaging confirmed the ulceration and external arterial compression with flexion and extension of the foot. Operative exploration noted compression of the popliteal artery by a popliteus muscle at the area of the luminal ulceration. The popliteus muscle was resected. Endarterectomy and patch angioplasty were performed. The patient is asymptomatic in follow-up.

Conclusions: Axial imaging and catheter directed angiography with dynamic maneuvers remains the method of diagnosis of PAES. We present two patients with functional popliteal artery entrapment that was only seen with IVUS imaging. IVUS should be used in the setting of high clinical suspicion and normal provocative maneuvers.

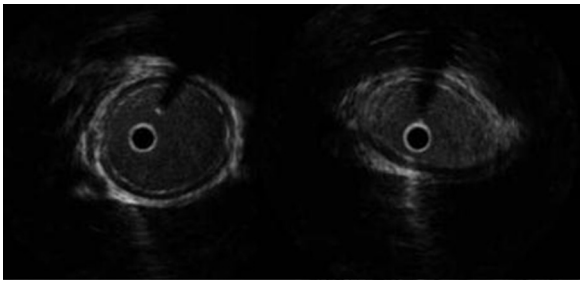

Fig 1. Intravascular ultrasound (IVUS) of the popliteal artery showing compression on the right with dynamic maneuvers.

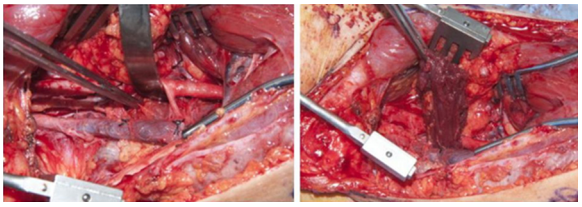

Fig 2. Intraoperative photo of the popliteal fossa with resection of the popliteus muscle.

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The Supraclavius Muscle: A Novel Muscular Anomaly Crossing the Supraclavicular Space Observed in Two Cases of Thoracic Outlet Syndrome

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Objectives: Various anomalous muscles and fibrofascial structures have been described in relation to the anatomy of thoracic outlet syndrome (TOS). We describe here, as observed in two separate cases, a previously undescribed anomalous muscle originating from the superior surface of the clavicle and crossing the supraclavicular space, which we term the supraclavius muscle.

Case history: One patient was a male high school baseball player who underwent right paraclavicular thoracic outlet decompression with subclavian vein patch angioplasty for venous TOS. After mobilization of the scalene fat pad, a "supraclavius muscle" was discovered with its medial attachment to the deep superior aspect of the clavicle, separate from and lateral to the clavicular head of the sternocleidomastoid muscle. Its lateral extent was joined to the trapezius muscle, yielding a distinct muscle ~7 cm long and 2 cm wide (Fig). The second patient was a 60-year-old woman who underwent right supraclavicular thoracic outlet decompression for neurogenic TOS. A similar anomalous supraclavius muscle was encountered, which originated from the superior undersurface of the clavicle and passed laterally toward the trapezius muscle. In this case, the muscle had to be dissected off the anterior aspect of the brachial plexus.