POPLITEAL ARTERY ENTRAPMENT SYNDROME

Clinical History:

A 21 year old female professional footballer presented with history of bilateral calf claudication, the left being worse than the right. The claudication was brought on after 45 minutes of playing football and she was unable to carry on playing in the second half.

Imaging Findings:

21 year old professional female footballer presented with a 4 month history of worsening bilateral calf claudication, the left calf was more severely affected than the right. The claudication prevented her from playing beyond the first 45 minutes and was being substituted everytime. This was severely affecting her professional footballing career. She was otherwise fit and healthy and no other medical illnesses. Her clinical examination was normal, with normal pulses down to the dorsalis pedis. A lower limb arterial duplex examination did not reveal any significant abnormality and she was referred for a transfemoral arteriogram. The angiogram showed normal appearances of the iliac, Common femoral and the superficial femoral arteries bilaterally. The popliteal arteries appeared normal in the neutral position of the feet (Fig.1) but on plantar flexion marked tapered narrowing of the above knee popliteal artery on the left and mild narrowing of the right mid-popliteal artery are demonstrated (Fig.2). The appearances are typical of popliteal artery entrapment.

Discussion:

Popliteal artery entrapment syndrome is an important albeit infrequent cause of serious disability among young adults and athletes with anomalous anatomic relationships between the popliteal artery and surrounding musculotendinous structures. Most cases occur in younger athletes, possibly because of vigorous training that can lead to functional hypertrophy of the gastrocnemius. The other causes may include a tight or immobile, hypersensitive or spasmodic popliteal artery.

Clinical Features: Claudication with pain provoked by some level of work is the most common presenting symptom in 90% of patient reports. Repeated popliteal artery compression causes trauma to the arterial wall, leading to premature localized atherosclerosis. As the pathology progresses, acute ischemia can occur if there is an occlusion of the artery or thrombosis within an aneurysm. Symptoms of acute or chronic ischemia, such as paresthesias, discoloration, temperature change, pain at rest, or tissue necrosis, account for the remaining 10% of patient reports. Popliteal entrapment is bilateral in 25% to 43% of patients.

Investigations: Diagnosing popliteal entrapment can be difficult. Diagnostic studies are needed if the history or clinical exam suggests popliteal artery entrapment. Initially, blood pressures of the dorsalis pedis and posterior tibial arteries should be obtained with Doppler ultrasonography or Duplex 1,2. Evaluation of ankle pulses with active plantar flexion and passive dorsiflexion can be helpful, because the pulses are significantly diminished or absent in patients who have entrapment. Arteriography 3 can confirm positive Doppler or duplex studies but often appear
normal when the ankle is in a neutral position; therefore, evaluations must be done with the ankle actively plantar and dorsiflexed. MRI can distinguish a structural entrapment (caused by an aberrant course of the popliteal artery) from a functional entrapment\(^4\), but in either case the treatment will be surgical. ¶Surgical Choices: Several surgical approaches available\(^5\). The least invasive surgery for functional entrapment is exploration and release of the fibrous bands and arterial branches tethering the artery. Unfortunately, the less invasive procedure provided only short-term relief and ultimately the patient may need myectomy of the medial gastrocnemius head. Other approaches include plantaris muscle resection and surgical release of the medial soleus from its tibial attachments. If arterial damage or occlusion is found, more invasive procedures, such as a saphenous vein bypass, may be needed.

**Differential Diagnosis List:** Popliteal artery entrapment syndrome

**Final Diagnosis:** Popliteal artery entrapment syndrome

**References:**


Description: Transfemoral Angiogram with the feet in neutral position showing normal appearances of the popliteal arteries. Origin:
Description: Transfemoral Angiogram with the feet in the planter flexed position showing marked tapered narrowing of the left above knee popliteal artery and mid narrowing of the mid-popliteal artery on the right. 

Origin: