

## Popliteal artery entrapment syndrome: multislice CTA vs DSA.

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**Section:** Cardiovascular

**Imaging Technique:** CT

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Case Type: Clinical Cases

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**Patient:** 28 years, male

### Imaging Findings:

A 28 year old man was sent to our department because of a right calf pain following long periods of driving and cramping after intensive physical training. After preliminary physical examination, a color Doppler US of both legs was performed which revealed a compression of the right popliteal artery during hyperextension of the foot. A popliteal artery entrapment syndrome was considered and further vascular studies were performed. The patient underwent either multislice spiral CT angiography (Fig. 1a, 2a) or DSA (Fig. 1c) during stress. DSA and axial CTA images allowed to demonstrate the presence and level of arterial obstruction and to assess the presence of collateral vessels; no cause of obstruction could be demonstrated, and therefore the 3D CTA data set was post-processed to evaluate the relationship between the popliteal artery and the gastrocnemius muscle. The patient successfully underwent surgery as demonstrated by post-procedure CTA study (Fig. 3a).

### Discussion:

Popliteal artery entrapment syndrome is increasingly described in the world literature as a cause of lower limb arterial impairment. It is caused by the anomalous interrelationship between the popliteal artery and its surrounding muscular and/or tendinous structures. A variety of anatomical abnormalities may produce an external compression of the popliteal artery, resulting in a thrombotic occlusion. Multislice Spiral CTA allowed to acquire a very large anatomic region in a extremely short time, with excellent arterial enhancement and no venous superimposition. The scanned volume, from the celiac trunk to the distal arteries of the ankles, was acquired and then the data set was transferred to a dedicated workstation where images were postprocessed using different algorithms to better visualize the structures of interest. 3D Volume Rendering techniques allowed to easily demonstrate the relationship between bony structures and vessels; MPRs reconstructions on different oblique planes permitted to separate the anomalous origin of the medial head of the gastrocnemius showing its relationship with the popliteal artery. A small fibrous band linking the medial head of the gastrocnemius muscle to the lateral condyle of the femur, crossing behind the popliteal artery was demonstrated by sagittal thick MPR (Fig. 2a).

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

**Final Diagnosis:** Popliteal artery entrapment syndrome

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**Figure 1**

**a**



**Description:** 3D Volume Rendering reconstruction, on posterior view, demonstrates legs' vascularization with the obstruction of the right popliteal artery and the presence of collateral vessels

**Origin:**

**b**



**Description:** 1mm thin slice 3D reconstruction allows to evaluate the fine vascular anatomy of the knee

**Origin:**

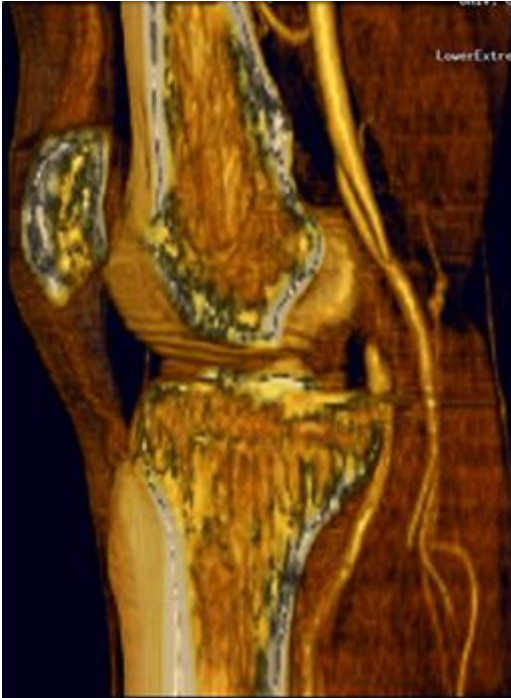
**c**



**Description:** DSA image shows the presence of the obstruction of right popliteal artery during hyperextension of the foot **Origin:**

**Figure 2**

a



**Description:** Sagittal thick MPR image, using a soft tissue reconstruction algorithm allows an excellent demonstration of a small fibrous band linking the medial head of the gastrocnemius muscle to the lateral condyle of the femur, crossing behind the popliteal artery producing occlusive compression of the vessel during stress. **Origin:**

**Figure 3**

a



**Description:** Post-procedure CTA shows residual intimal thickening of the right popliteal artery even if the vessel patency is obtained. **Origin:**