



Case 14793

Adventitial cystic disease of the popliteal artery

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Section: Musculoskeletal System

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Patient: 56 year(s), male

Clinical History

A 56-year-old male presents with hypoesthesia in the calf and lateral foot, corresponding to the innervation of the tibial nerve and pain in the popliteal fossa since many years. Since 2 months, the patient also suffers from claudication, causing pain in his lower extremities after a walking distance of 200 meters (stage IIa, Fontaine classification).

Imaging Findings

Ultrasound (Fig. 1) shows a multilocular hypoechoic structure with retro-acoustic enhancement surrounding the popliteal artery. There is absence of flow in the lesion on color Doppler examination.

Subsequent CT angiography (Fig. 2) shows an occlusion of the popliteal artery. There are no significant signs of degenerative atherosclerosis.

MRI (Fig. 3) confirms an extensive multilocular cystic lesion adjacent to the popliteal artery with a connecting stalk to the joint space. There is significant mass effect on the neurovascular bundle.

Discussion

Cystic adventitial disease (CAD) is a rare vascular disease causing focal stenosis or even occlusion in absence of generalized atherosclerotic degeneration. It consists of an accumulation of mucinous material between the adventitia and the middle layer of the vessel wall, compressing the lumen of the affected vessel. It was first described in 1947, at the external iliac artery (1). Further reports revealed that the popliteal artery is by far the most common affected vessel, accounting for 80 % of cases (1).

Typically, CAD affects young to middle-aged men with no or minimal cardiovascular risk factors and absence of atherosclerosis, presenting with a short history of progressive claudication (2). Hypoesthesia due to nerve compression may be seen as well.

Color Doppler ultrasound is regarded as the initial imaging tool. Most commonly, a hypo- or anechoic mass, depending on the amount of mucinous content, is seen adjacent to or originating from the affected vessel. Color Doppler adds important information by showing arterial stenosis or occlusion (2). Similar to ultrasound, these lesions typically appear as cystic structures on MRI (high T2 and low T1 signal), again adjacent to or originating from the affected vessel. CT and/or MRI angiography may provide additional information on the morphology and size of the cyst, possible communication with the adjacent joint and stenosis or occlusion of the affected artery (3). All three modalities can give information about absence or presence of atherosclerotic changes. Since conventional angiography does not depict the cyst and less invasive angiography techniques (CT and MRI) are available, it does not have a place in primary diagnostics of CAD.

There are several treatment options. Percutaneous aspiration has been proven unsuccessful because aspiration of viscous content is difficult. Moreover, there is a high recurrence rate (4). Endovascular repair by angioplasty or stenting is also disappointing and may even increase the risk of injuring the intima of the artery (5). Best results are obtained by surgical resection of the cyst and -in case of total occlusion- bypass with autologous vein graft (6). Our patient was treated with cyst resection and femoropopliteal bypass with resolution of his claudication and hypoesthesia complaints. Histopathology confirmed the diagnosis of CAD demonstrating the mucinous cyst in the adventitia of the popliteal artery.

Although rare, CAD of the popliteal artery should be included in the differential diagnosis in young patients with intermittent claudication.

Final Diagnosis

Cystic adventitial disease of the popliteal artery.

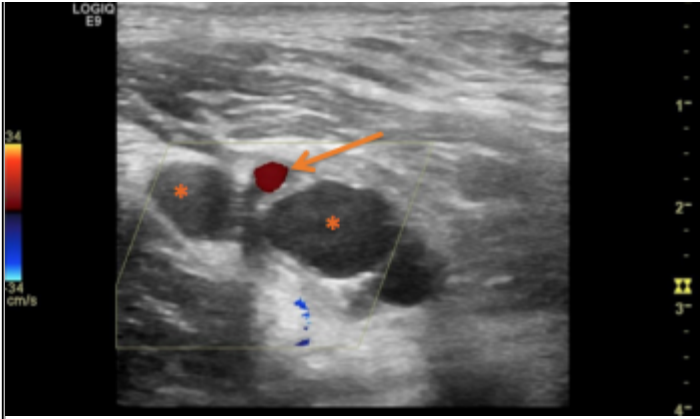
Differential Diagnosis List

Popliteal artery aneurysm , Baker's cyst, Peripheral arterial occlusive disease, Popliteal entrapment syndrome

Figures

Figure 1 Color Doppler US

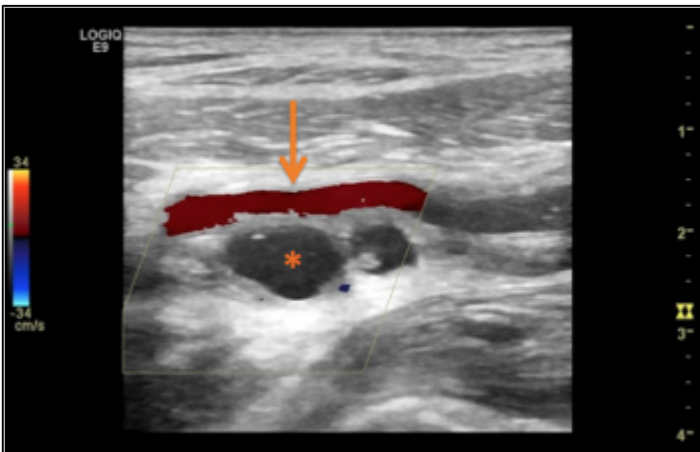




Axial ultrasound image shows a multilocular hypoechoic structure with retro-acoustic enhancement (asterisk) surrounding the popliteal artery (arrow). There is absence of flow on color Doppler examination within the lesion.

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Area of Interest: Vascular;
 Imaging Technique: Ultrasound-Colour Doppler;
 Procedure: Diagnostic procedure;
 Special Focus: Cysts;

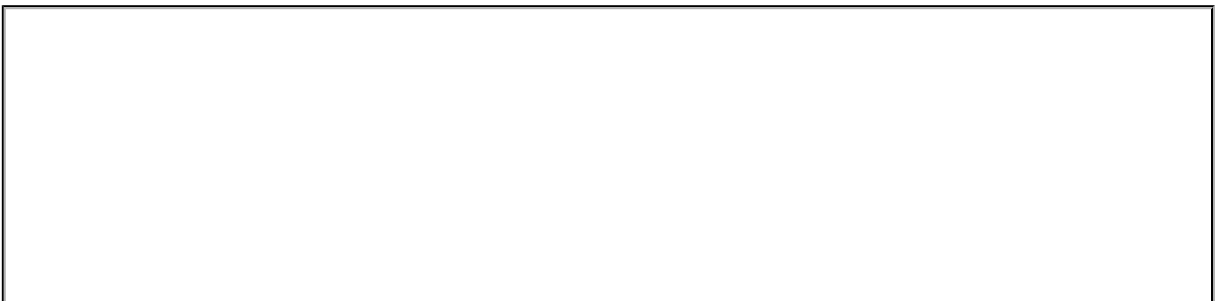


Sagittal ultrasound image shows the same multilocular hypoechoic structure with retro-acoustic enhancement (asterisk) surrounding the popliteal artery (arrow). There is absence of flow on color Doppler examination within the lesion.

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Figure 2 CT angiography



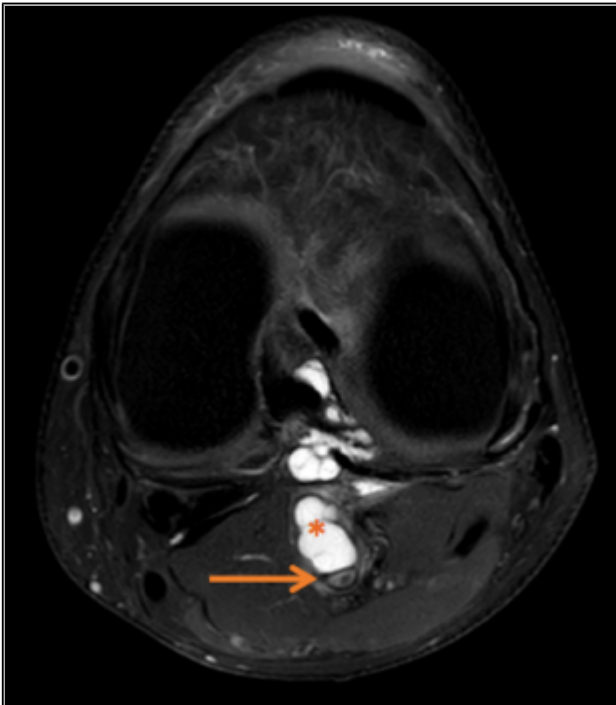


CT angiography (MIP reconstruction) shows an occlusion of the popliteal artery (arrow). There are no signs of atherosclerotic degeneration.

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Imaging Technique: CT-Angiography;
Procedure: Diagnostic procedure;
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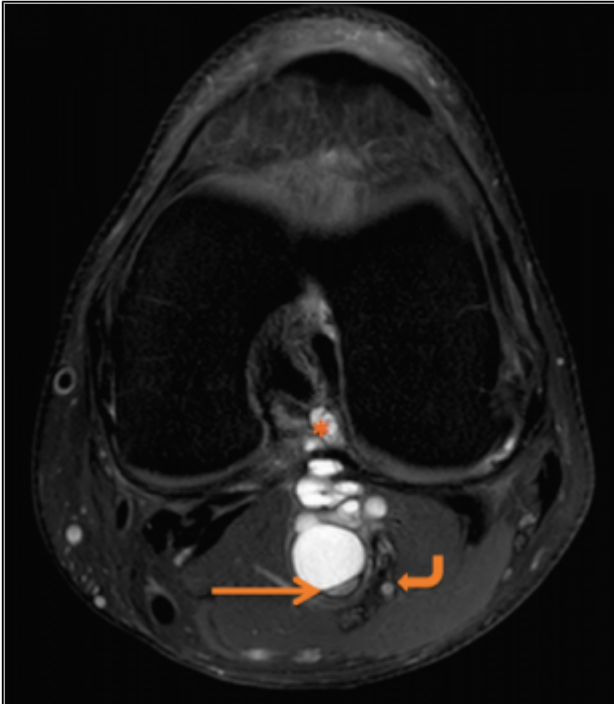
Figure 3 MRI



MRI without intravenous contrast (axial STIR image) shows extensive multilocular cystic mass (asterisk) originating from the wall of the popliteal artery (arrow).

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Imaging Technique: MR;
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STIR image shows significant mass effect on the neurovascular bundle (curved arrow), containing the tibial nerve, with narrowing of the popliteal lumen (arrow). Note the connection of the cystic lesion to the joint space (asterisk).

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Area of Interest: Vascular;
Imaging Technique: MR;
Procedure: Diagnostic procedure;
Special Focus: Cysts;



MRI without intravenous contrast (sagittal PD image) shows extensive multilocular cystic mass (asterisk) originating from the wall of the popliteal artery (arrow).

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Area of Interest: Vascular;
Imaging Technique: MR;
Procedure: Diagnostic procedure;
Special Focus: Cysts;

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Citation

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