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IMAGING IN PERIPHERAL VASCULAR DISEASE

Atherosclerosis affects everyone to some degree as age advances. In some cases this leads to significant symptoms in the legs (claudication, rest pain/night pain, non-healing ulcers), often affecting mobility and quality of life.

The **diagnosis** of significant peripheral vascular disease can be made, or at least strongly suspected, on the basis of history and clinical examination. Objective confirmation is obtained simply and cheaply with **ABI** (ankle-brachial index) assessment. ABI is performed while lying supine, with measurement of BP in both arms (higher reading used) and each lower leg. The ratio of BP leg/arm is normally greater than 1. In significant peripheral vascular disease, ratios of 0.3 to 0.7 are often obtained.

Imaging is valuable not primarily for diagnosis, but for treatment planning – to assess the need for / feasibility of balloon angioplasty and stenting, or surgical grafting. For this purpose a comprehensive “road map” of arteries, including sites of narrowing and occlusion, and collateral circulation is required.

The primary imaging technique is **Magnetic Resonance Angiography (MRA)**

- a minimally invasive technique (IV injection of a very safe contrast agent)
- provides a comprehensive and accurate assessment of leg arteries from diaphragm to ankles

A limitation of MRA is that arterial stents and joint prostheses may cause artefacts. MRI is contraindicated in certain patients such as those with cardiac pacemakers. In these patients, CT angiography or digital subtraction angiography (DSA) can be used.

Ultrasound is a secondary technique for assessment of focal regions of concern, for example:

- areas not clearly seen on MRA due to metal stents/prostheses
- follow up of surgical grafts and balloon angioplasty sites for patency and exclusion of stenosis

Ultrasound cannot provide the comprehensive roadmap required for accurate treatment planning.

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Fig 1. Extensive atheromatous disease of the aorta and iliac arteries, without significant stenoses. The renal arteries appear normal.

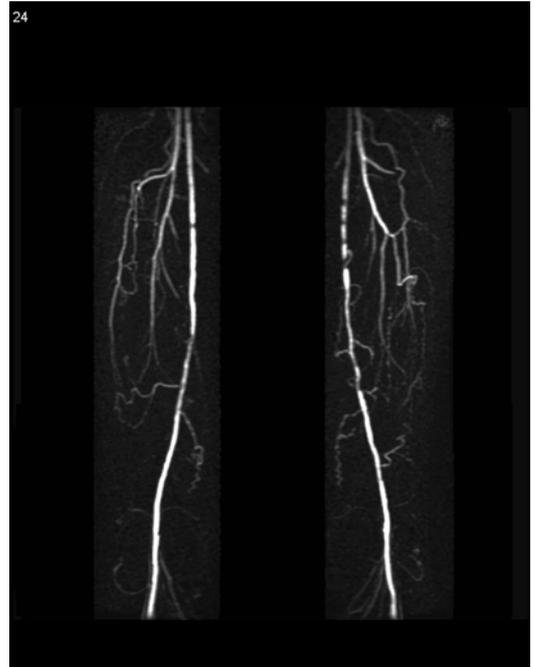


Fig 2. Several focal stenoses of the superficial femoral arteries.

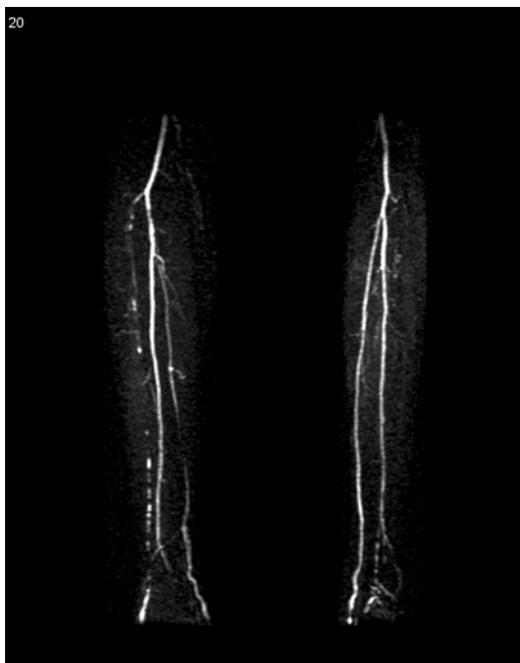


Fig 3. Complete occlusion of the anterior tibial artery on the left and multiple stenoses of this artery on the right. Adequate patency of the peroneal and posterior tibial arteries on both sides.



Fig 4. Spinal stenosis assessment is a bonus! A sagittal image of the abdomen is obtained as a routine part of the MRA study. This can reveal or exclude major spinal stenosis as a cause of the leg symptoms. This patient has significant spinal stenosis at L3-4.