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### Introduction:

The evaluation of peripheral vascular disease with MR Angiography (MRA) has represented for many years a challenge. Contrast enhanced (c.e.) MRA has shown excellent results in the assessment of several vascular districts; nevertheless, even if using c.e. MRA the length and diameter of the arteries of the lower limbs represent a limitation to the use of MRA in the evaluation of peripheral vascular disease. Recent technical advances such as moving beds and dedicated coils, have been developed with the aim of facilitating peripheral vascular studies. The purpose of our study is to demonstrate the possibility to perform a peripheral c.e. MRA in a short time even if a moving bed and a dedicated coil is not available.

### Materials and methods:

Sixty-four patients with symptoms of peripheral vascular disease were studied with c.e. MRA. All MR exams were performed with a 1.5 superconductive system (Siemens Vision Plus). In all patients two different acquisitions with a body coil were obtained using a T1 weighted spoiled gradient echo (TR=4.6 ms; TE=1.8 ms; FA=30°; TA=23 seconds; Nex=1; Matrix=195 x 512) with a 500 mm FOV. The first acquisition included the renal arteries, the infrarenal aorta, the ilio-femoral axes and the proximal superficial and deep femoral arteries. The second acquisition included the distal superficial and deep femoral arteries, the popliteal artery and vessels of the trifurcation. A test bolus sequence with 2 ml of Gd-DTPA followed by 10 ml of saline solution was used in all patients prior to the first sequence to determine the circulation time.

In all cases the contrast agent was administered with a power injector (Spectris, Medrad) through an 18G cannula in an antecubital vein. For each c.e. MRA acquisition a 20 ml dose of Gd-DTPA followed by 10 ml of saline solution was administered. The delay time for the second acquisition was determined empirically, based on that at the level of the aorta. For the second acquisition a pre-contrast sequence was also acquired in order to perform subtraction and eliminate signal from veins and surrounding tissues from the previous contrast injection. In all patients DSA was also performed within 1 week from MRA. MRA and DSA were independently evaluated, comparing the results at the level of: renal arteries, infrarenal aorta and ilio-femoral arteries, superficial and deep femoral, popliteal and trifurcation arteries.

### Results:

In all segments examined, no difference was found between MRA and DSA. Two acquisitions c.e. MRA allowed in all patients to obtain correct indications for therapy. In the second acquisition subtraction has proved necessary to eliminate superimposition of veins and stationary tissue, enhanced from the previous contrast agent administration.

Overall value of sensitivity and specificity for detection of stenoses greater than 50% were 93% and 92%. Overestimation of degree of stenosis was seen in 3 cases while underestimation in 4 cases. All stenoses erroneously diagnosed were located below the knee.

### Conclusion:

Peripheral vascular disease can be studied with c.e. MRA even if moving beds and/or dedicated coils are not available. Two acquisitions are sufficient if a large field of view is used to cover the entire peripheral vascular tree. The results obtained in the present study allow to consider c.e. MRA a reliable method for treatment planning.