INVITED COMMENTARY

Invited Commentary on: Contrast Enhanced Magnetic Resonance Angiography versus Intra-Arterial Digital Subtraction Angiography for Treatment Planning in Patients with Peripheral Arterial Disease: A Randomized Controlled Diagnostic Trial

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This prospective randomized controlled trial by Vahl et al. demonstrated that magnetic resonance angiography (MRA) is as effective as digital subtraction angiography (DSA) in pretherapeutic imaging of patients suffering from symptomatic peripheral arterial obstructive disease (PAOD). Effective pretherapeutic imaging (demonstration and categorization of in-flow and out-flow vessels according to TASC categories1) is a prerequisite for effective management of these patients. From a clinicians point of view there are different demands for pretherapeutic imaging of patients suffering from either claudication or critical limb ischemia (CLI).

65% of the 394 included limbs were symptomatic, 41% suffering from claudication, 21% from CLI, thus representing a mixed population. In order to define specific imaging requirements subgroups consisting only of claudicants or CLI patients would have made more relevant populations and would have allowed more specific conclusions. This study only demonstrated advantages of non-invasive imaging without answering the obvious question: which test to order for which patient.

In a real world scenario there are different modalities for non-invasive imaging. Currently duplex sonography and magnetic resonance angiography (MRA) are the most relevant with clear advantages for one modality still pending.2,3 Computed tomography angiography (CTA) has demonstrated, in some publications, advantages over MRA.4,5 Unlike CTA and duplex sonography, imaging quality in MRA and DSA studies is not hampered by severe calcifications often present in the old, diabetic or CTA patients with renal impairment.

Recently the obvious advantage of MRA – gadolinium use instead of iodinated contrast in patients with renal impairment - has been restricted by occurrence of nephrogenic systemic fibrosis (NSF). This has led to the prevention of gadolinium use in patients with renal impairment or patients on dialysis according to FDA recommendations.6 Additionally dosage has been restricted to single dose instead of double/or triple dosing of gadolinium routinely employed by moving table or hybrid MRA (a combination of stationary MRA for the crural region and moving bed MRA) as employed in this study. Unfortunately patients suffering from PAOD especially with CLI are often suffering from renal impairment and according to recent recommendations shouldn’t undergo MRA. Consequently prior to an MRA the renal function has to be determined for each patient. In this study patients with renal impairment were excluded but primarily only to allow inclusion for DSA.

Pretherapeutic imaging should also be cost-effective due to the current economic constraints of health systems. Cost-effective means a MRA approach has to be as effective (according to outcome measures relevant to the patients such as quality of life (QOL) and


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limb salvage) as a DSA approach at comparable total costs per patient (for evaluation and treatment). In this study there was no increased rate of complications or total costs for DSA despite that until now DSA has been considered more expensive (due to hospitalization) and more prone to increased complication rates than non-invasive cross-sectional imaging. Patients preference was the key advantage for MRA.

The studies results doesn’t make vascular medicine practice easier or more effective to perform, but points in the direction which way imaging studies should go: comparison of treatment plans and outcome measurement and total costs. This are the relevant parameters instead of just correlating stenosis and occlusions between various imaging modalities.

Limitations of this study are that morphologic parameters like grade of calcification are not ideally determined by either MRA or DSA. Grade of calcification and length of the lesion are of major impact on the therapeutic decision in many cases of PAOD in the pelvis and thigh as well as in the crural region. Additionally definite recommendations for pretherapeutic imaging have to be determined for either claudicants or patients suffering from CLI seperately.

References


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