Duplex ultrasound scanning (DUS), a non-invasive and low-cost imaging modality, has been extensively used to investigate peripheral arterial disease (PAD). Numerous studies have compared DUS with digital subtraction angiography (DSA) in the past, and most of them found good correlation, particularly in the supragenicular segments. Interestingly, interobserver variation in DUS and DSA interpretation is equally frequent.

In this issue, Eiberg and colleagues present a prospective study, which assessed the reliability and applicability of DUS compared with DSA, in patients with PAD. Not surprisingly, technical success rate and agreement of these two methods were significantly better in the supragenicular than in the infragenicular arteries. DUS was the best technique for imaging of the distal crural arteries (technical success rate 97% vs. 92% for DSA) and DSA the best technique for imaging of the proximal crural arteries (technical success rate 95% vs. 91% for DUS). Another original finding was that agreement was not influenced by PAD stage, but technical success rate for angiography was worse in claudicants. Based on their findings, which showed that DUS compared favourably with DSA in both tibial vessels, particularly in the distal part (but not in the peroneal artery), the authors concluded that DUS is a useful non-invasive alternative to DSA. Pedal runoff was equally assessed by the two methods.

Although useful, these findings should be viewed with some caution. In many patients, DSA was carried out with the bolus chase technique through a retrograde femoral access, without being selective or performed in more than one plane, leading to suboptimal imaging. The authors acknowledge some of these facts that could be responsible for the inferior technical success rate obtained with DSA in patients with intermittent claudication, compared with those with critical ischaemia. This could explain previous findings that DUS can improve the results of DSA by detecting tibial arteries not visualised. Relevant to this study, PAD stage has been shown not to influence interobserver agreement of DUS, the presence or absence of superficial femoral artery (SFA) occlusion not to influence interobserver agreement of DSA for infragenicular arteries and obstruction level not to significantly influence the accuracy of DUS in either above-knee or below-knee vessels.

The implications of the findings reported by Eiberg’s group are that, in some patients studied with DSA, an additional test (such as DUS of magnetic resonance angiography (MRA)) should be performed to maximise the information obtained to facilitate the proper planning of bypass grafting or endoluminal therapy, as previously suggested by the authors’ group and others. Similar recommendations have been made for the pedal arteries. In addition, the good results obtained with...
DUS support its use as a single diagnostic modality, especially in patients with renal insufficiency or contrast allergy, provided that there is adequate local familiarity with its use, a prerequisite necessary to reproduce the excellent outcomes previously reported.12,13

Finally, further research, such as three-dimensional (3-D)-reconstructed lower limb vessel imaging with an ultrasound robotic system, might prove useful in providing a single image of the arterial tree,14 much more useful than the contemporary DUS images.

References


