Chapter II: Diagnostic methods.

Abstract:
Non-invasive vascular studies can provide crucial information on the presence, location, and severity of critical limb ischaemia (CLI), as well as the initial assessment or treatment planning. Ankle-brachial index with Doppler ultrasound, despite limitations in diabetic and end-stage renal failure patients, is the first-line evaluation of CLI. In this group of patients, toe-brachial index measurement may better establish the diagnosis. Other non-invasive measurements, such as segmental limb pressure, continuous-wave Doppler analysis and pulse volume recording, are of limited accuracy. Transcutaneous oxygen pressure (TcPO(2)) measurement may be of value when rest pain and ulcerations of the foot are present. Duplex ultrasound is the most important non-invasive tool in CLI patients combining haemodynamic evaluation with imaging modality. Computed tomography angiography (CTA) and magnetic resonance angiography (MRA) are the next imaging studies in the algorithm for CLI. Both CTA and MRA have been proven effective in aiding the decision-making of clinicians and accurate planning of intervention. The data acquired with CTA and MRA can be manipulated in a multiplanar and 3D fashion and can offer exquisite detail. CTA results are generally equivalent to MRA, and both compare favourably with contrast angiography. The individual use of different imaging
modalities depends on local availability, experience, and costs. Contrast angiography represents the
gold standard, provides detailed information about arterial anatomy, and is recommended when
revascularisation is needed.

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