Can infra-inguinal vascular reconstruction be based on duplex ultrasonography alone?

A. M. Alabadaarachchi[1], K. M. A. B. Ilangasekara[2], P. H. R. S. Mendis[2], M. R. N. Cassim[2]

[1]*Royal Prince Alfred Hospital, Sydney, Australia*

[2]*Department of Surgery, Faculty of Medicine, University of Colombo, Sri Lanka*

Duplex Ultrasound (DUS) is a non-invasive imaging modality used in the assessment of Peripheral Arterial Disease (PAD). It serves as the primary imaging tool for infra-inguinal PAD in Sri Lanka. This study compares the DUS findings with the gold standard, Arteriography (DSA). This descriptive cross-sectional study included 145 post-angioplasty patients who had both DUS and DSA. Infra-inguinal PAD was assessed using Global Limb Anatomic Staging System (GLASS) grading, with separate scores for the Femoropopliteal and Infrapopliteal segments. Of 145 patients, 59.3% were male, with a mean age of 66.72 years (31-90). Risk factors included diabetes (97.2%), hypertension (80.7%), IHD (49%), dyslipidaemia (68.4%), smoking (22.1%), CKD (38.6%), and CVA (6.9%). DSA findings showed 40% had extensive disease in both segments, 44.1% had Infrapopliteal, and 15.9% had Femoropopliteal disease. For the Femoropopliteal segment, sensitivity, specificity, positive predictive value, and negative predictive value were 84.21%, 62.32%, 71.11%, and 78.18%, respectively; for the Infrapopliteal segment, these were 90.00%, 34.29%, 81.15%, and 52.17%. Cohen's kappa test indicated moderate agreement (k=0.44) for the Femoropopliteal segment and fair agreement (k=0.30) for the Infrapopliteal segment. In this cohort, 84.1% had DSA-confirmed Infrapopliteal disease- significantly higher than in developed countries. While existing data show good agreement between DUS and DSA for this segment, our findings indicate only fair agreement, with DUS tending to overestimate disease severity. Given these findings, selective use of alternative imaging such as CTA or implementation of quality assurance programmes for DUS operators should be considered before definitive reconstructions.

Keywords: *DUS*, *DSA*, *PAD*, *GLASS*, *Sensitivity*