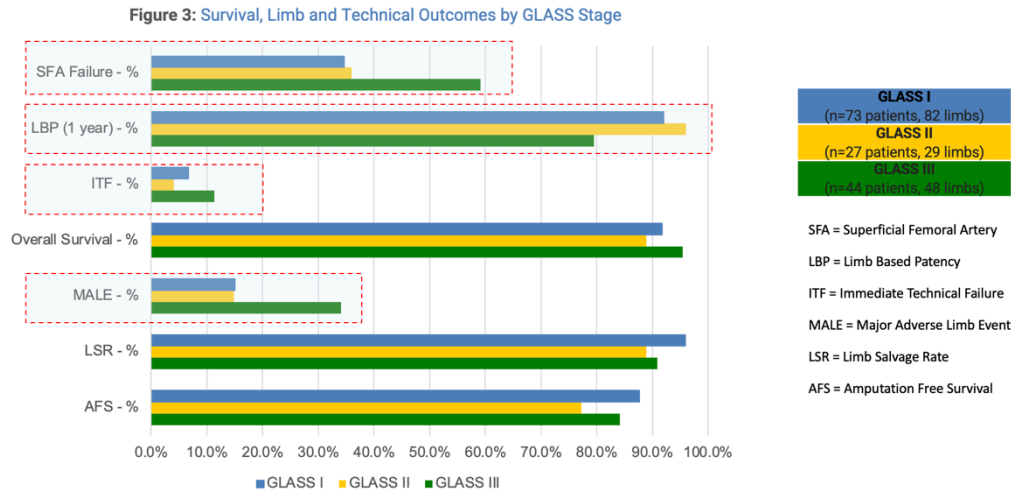


Author(s): Subash Subramanian, Gillian Shiau, MD, Samuel Pike, MD, Yaasin Abdulrehman, MD.
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Level of Training: Samuel Pike (MD,CM. FRCPC). Fellow. **Institutional Affiliation:** University of Alberta

Figure: Technical Outcome by GLASS Staging.



Background/Objective: The Global Limb Anatomic Staging System (GLASS) was recently developed to support evidence-based revascularization guidelines in Chronic Limb Threatening Ischemia (CLTI). The purpose of this study is to validate the use of the GLASS to predict technical success in revascularization based on grade. In addition, survival and limb events were also compared.

Methods: A retrospective review was performed of patients who underwent CT angiography and subsequent endovascular interventions targeting the superficial femoral, popliteal, and infrapopliteal arteries at a single center from 2017-2021. CT angiogram examinations were reviewed to assign a target arterial path with an estimated limb-based patency (LBP) and both femoropopliteal and infrapopliteal arterial segments were graded on a scale of 0 to 4. Segmental grades were combined into three overall GLASS stages. Endovascular outcomes analyzed included amputation-free survival (AFS), limb salvage rate (LSR), major adverse limb event (MALE), overall survival, immediate technical failure (ITF), LBP at 1 year, and superficial femoral artery (SFA) failure. Definitions of AFS, LSR, MALE, ITF, and LBP are described in the GLASS guidelines. SFA failure was defined as either an occlusion occurring within 1 year, stenosis greater than 50%, or artery re-treatment within a 21-month follow-up period. Data was obtained from the center’s VQI database. A Cox regression analysis was utilized.

Results and Discussion: 144 patients (159 limbs) with a median patient age of 68 (IQR 60-74) underwent endovascular interventions over the study period with a median follow-up of 20 months. The number of limbs classified into GLASS 1, 2 and 3 were 82, 29 and 48 respectively. Outcomes for GLASS Stage 3 lesions were worse for MALE, ITF, LBP and SFA Failure compared to Stages 1 and 2. Statistical differences existed when comparing GLASS 1/2 versus GLASS 3 lesions in MALE, LBP, and SFA failure. No significant differences were identified in AFS, LSR, overall survival or ITF.

Conclusion: When contrasting GLASS Stage 1 or 2 with Stage 3 lesions, there is an increased risk of MALE, failure of LBP at 1 year, SFA Failure and ITF. However, AFS, LSR, and overall survival were not associated with more advanced GLASS Stages. In combination with patient risk factors, GLASS Staging offers valuable decision-making support for CLTI revascularization strategies by stratifying technical outcomes.