

Original Research Article

PROGNOSTIC UTILITY OF THE ULCERATED LEG SEVERITY ASSESSMENT SCORE IN CHRONIC VENOUS LEG ULCER HEALING: A SINGLE-CENTRE OBSERVATIONAL FOLLOW-UP STUDY

Jeyaganesh. R¹, Nikhil Sholey. P², Aparajitha Sridharan³, Adithya. R⁴

¹Associate Professor, Department of General Surgery, Velammal Medical College Hospital and Research Institute, Anuppanadi, Madurai – 625009, Tamil Nadu, India.

²Assistant Professor, Department of General Surgery, Velammal Medical College Hospital and Research Institute, Anuppanadi, Madurai – 625009, Tamil Nadu, India.

³Senior Resident, Department of General Surgery, Velammal Medical College Hospital and Research Institute, Anuppanadi, Madurai – 625009, Tamil Nadu, India.

⁴Junior Resident, Department of General Surgery, Velammal Medical College Hospital and Research Institute, Anuppanadi, Madurai – 625009, Tamil Nadu, India.

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Corresponding Author:

Dr. Nikhil Sholey. P.

Assistant Professor, Department of General Surgery, Velammal Medical College Hospital and Research Institute, Anuppanadi, Madurai – 625009, Tamil Nadu, India.
Email: nikhil.sholey@gmail.com

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ABSTRACT

Background: Forecasting healing in chronic venous leg ulcers may support risk stratification and clinical decision-making. The Ulcerated Leg Severity Assessment (ULSA) score combines age, ulcer chronicity, and venous refill time. **Objective:** To examine the association of baseline ULSA categories with clinically assessed venous ulcer healing at 8, 12, and 24 weeks in a tertiary care hospital.

Materials and Methods: This single-centre observational follow-up study included 54 purposively sampled patients with lower-limb primary varicosities and venous ulcers at Sree Balaji Medical College and Hospital, Chennai (April 2021–June 2022). Baseline ULSA categories and healing outcomes at three follow-up points were extracted from the thesis. Categorical associations were re-examined using two-sided conditional exact tests applied to the reported aggregate counts.

Results: Healing was reported for 25/54 (46.3%), 34/54 (63.0%), and 36/54 (66.7%) participants at 8, 12, and 24 weeks, respectively. At 24 weeks, healing occurred in 14/15 (93.3%) with ULSA <20, 15/18 (83.3%) with ULSA 21–40, 7/13 (53.8%) with ULSA 41–60, and 0/8 (0.0%) with ULSA >60 (exact $P < 0.001$). Ulcer duration and ulcer size categories were also associated with 24-week healing in exploratory analyses. Age, sex, and anatomical site were not significantly associated with 24-week healing in aggregate-data exact tests.

Conclusion: Lower baseline ULSA categories were associated with a greater proportion of venous ulcers classified as healed by 24 weeks. The findings support further prospective evaluation, but do not establish discrimination, calibration, or independent prognostic value without individual-patient data and standardized healing definitions.

Keywords: VLUs, ULSA.

INTRODUCTION

Venous leg ulcers (VLUs) are a debilitating manifestation of chronic venous disease, causing persistent wounds, pain, reduced functional capacity, and substantial demands on patients and health services.^[1,2] Compression and appropriate local

wound care remain central treatment strategies, yet healing times differ markedly across patients.^[3] Prediction of the course of healing may help clinicians identify wounds that warrant closer surveillance or timely consideration of additional interventions.

Several studies have reported that ulcer chronicity, wound size, mobility, and venous disease characteristics are associated with delayed VLU healing.^[4,5] The Ulcerated Leg Severity Assessment (ULSA) score was developed to provide a simple healing-risk measure based on patient age, ulcer chronicity, and venous refill time. In the original development and validation cohorts, lower ULSA values were associated with superior healing at 24 weeks.^[6] Other prognostic instruments have since been proposed, but clinically usable stratification remains an important challenge.^[7,8]

Published cohorts may differ in patient mix, treatment pathways, and baseline disease severity, supporting local evaluation of the relationship between a prognostic score and observed healing. The present study assessed ULSA categories and healing over 24 weeks among patients with venous ulcers attending a tertiary care hospital in Chennai, India. The principal objective was to assess whether baseline ULSA score was associated with healing status at 8, 12, and 24 weeks.

MATERIALS AND METHODS

Study design, setting and participants

An observational clinical study with scheduled follow-up assessments was conducted at Sree Balaji Medical College and Hospital, Chennai, India, over the period April 2021 to June 2022. The source describes the method as cross-sectional but also describes prospective follow-up; the longitudinal assessments reported here are presented as an observational follow-up study. The setting included the departments of General Surgery, General Medicine, Obstetrics and Gynecology, and the emergency service. The study comprised 54 patients selected by purposive sampling.

Participants were eligible if they presented with primary lower-limb varicose veins and a venous ulcer, without restriction by age or sex. Exclusion criteria documented in the source included deep vein thrombosis, hypertension, diabetes mellitus, peripheral vascular disease, malignancy, ascites, vascular malformations, secondary varicosities, and recurrent varicose veins following surgery. The analysis is therefore applicable primarily to this selected study population and may not represent patients with common medical comorbidities.

Baseline assessment and ULSA score

After informed consent, baseline demographics and clinical characteristics were recorded using a semistructured questionnaire. Variables included age, sex, prolonged standing at work, ulcer laterality and anatomical location, venous system involvement, ulcer duration, ulcer size, and ULSA at presentation. The ULSA score is based on age in years and ulcer chronicity in months, with 50 points subtracted when venous refill time exceeds 20 seconds, as specified in the original ULSA publication. The thesis reports

baseline groups of <20, 21–40, 41–60, and >60; these category labels have been retained.

Outcome assessment

Clinical healing status was recorded at 8, 12, and 24 weeks. The source describes a surgeon's subjective judgment based on wound edge morphology, serous discharge, healthy granulation tissue, and contraction of wound size. Thus, the term "healed" in this manuscript reflects the source classification, which was not explicitly defined as complete epithelial closure.

Statistical Analysis

Counts and percentages were transcribed from the reported contingency tables, and percentages were recalculated from the displayed numerators and denominators where they disagreed with the printed values. Two-sided Fisher–Freeman–Halton exact tests (the multirow extension of Fisher's exact test) were computed from the published aggregate contingency counts to describe associations with healing at each time point. These analyses are exploratory, without adjustment for multiple comparisons. The source indicates that SPSS version 23 was used for its original statistical analysis, but patient-level data were unavailable for replication, multivariable analyses, or estimates of score discrimination/calibration. Statistical significance for exploratory associations was considered at $P < 0.05$.

Ethics

The thesis states that the institutional ethics committee approved the study, participants provided informed consent, confidentiality was explained, and participation was voluntary.

RESULTS

Baseline characteristics

The study included 54 participants, of whom 46 (85.2%) were men. The most common age group was 31–40 years (20/54, 37.0%), followed by 41–50 years (19/54, 35.2%). Forty-two participants (77.8%) reported work involving prolonged standing; 45 (83.3%) had unilateral ulcer involvement. The most commonly reported site was superomedial to the medial malleolus (40/54, 74.1%). Long saphenous vein plus perforator involvement was recorded in 24 (44.4%) participants, and isolated perforator involvement in 11 (20.4%). Complete baseline distributions are shown in Table 1.

Healing over time and baseline ULSA

Healing was documented in 25 participants at 8 weeks (46.3%), 34 at 12 weeks (63.0%), and 36 at 24 weeks (66.7%). At 24 weeks, the proportion healed decreased progressively with increasing baseline ULSA category: 14/15 (93.3%) for scores <20, 15/18 (83.3%) for 21–40, 7/13 (53.8%) for 41–60, and 0/8 (0.0%) for >60. Similar gradients were apparent at 8 and 12 weeks (Table 2; Figure 1). The aggregate-count conditional exact tests indicated associations at 8 weeks ($P = 0.012$), 12 weeks ($P < 0.001$), and 24 weeks ($P < 0.001$).

Other clinical associations

At 24 weeks, healing was reported in 23/24 (95.8%) participants whose ulcers had lasted <20 weeks, compared with 9/11 (81.8%) with 21–40-week ulcers, 3/12 (25.0%) with 41–60-week ulcers, and 1/7 (14.3%) with ulcers of >60 weeks (exact $P<0.001$). Healing was also less frequent in the larger ulcer-size categories: 25/29 (86.2%) in the 1–5 cm group, 6/14 (42.9%) in the 5–8 cm group, and 5/11 (45.5%) in the >8 cm group (exact $P=0.004$). The thesis expresses

ulcer size in centimetres without specifying whether this refers to a linear measurement or area.

The age, sex, and site groups did not demonstrate statistically significant 24-week associations when the published counts were reanalysed using conditional exact tests (age $P=0.590$; sex $P=1.000$; site $P=0.339$). These findings differ from some p -values printed in the original thesis. All 24-week subgroup comparisons are presented in Table 3 to preserve the observed patient counts and distinguish recalculated tests from the source's original analyses.

Table 1: Baseline demographic and ulcer characteristics (N=54)

Characteristic	Category	n (%)
Age (years)	31–40	20 (37.0)
	41–50	19 (35.2)
	51–60	9 (16.7)
	>60	6 (11.1)
Sex	Male	46 (85.2)
	Female	8 (14.8)
Prolonged standing at work	Yes	42 (77.8)
	No	12 (22.2)
Ulcer laterality	Unilateral	45 (83.3)
	Bilateral	9 (16.7)
Ulcer site	Superomedial to medial malleolus	40 (74.1)
	Medial and lateral aspect of leg	14 (25.9)
Ulcer duration (weeks)	<20	24 (44.4)
	21–40	11 (20.4)
	41–60	12 (22.2)
	>60	7 (13.0)
Ulcer size (cm; per source)	1–5	29 (53.7)
	5–8	14 (25.9)
	>8	11 (20.4)
Baseline ULSA score	<20	15 (27.8)
	21–40	18 (33.3)
	41–60	13 (24.1)
	>60	8 (14.8)

Values are patient counts (percentages based on N=54). Duration, size, and ULSA categories reproduce the thesis grouping; no assumption was made for unreported category boundaries.

Table 2: Baseline ULSA category and clinical healing at each follow-up

Baseline ULSA	Total n	8 weeks n/N (%)	12 weeks n/N (%)	24 weeks n/N (%)
<20	15	10/15 (66.7)	13/15 (86.7)	14/15 (93.3)
21–40	18	10/18 (55.6)	14/18 (77.8)	15/18 (83.3)
41–60	13	5/13 (38.5)	7/13 (53.8)	7/13 (53.8)
>60	8	0/8 (0.0)	0/8 (0.0)	0/8 (0.0)
Overall	54	25/54 (46.3)	34/54 (63.0)	36/54 (66.7)
Exact P value	—	0.012	<0.001	<0.001

Table 3: Associations of baseline factors with clinically classified healing at 24 weeks

Characteristic	Category	Healed n/N (%)	Exact P
Age (years)	31–40	15/20 (75.0)	0.590
	41–50	13/19 (68.4)	
	51–60	5/9 (55.6)	
	>60	3/6 (50.0)	
Sex	Male	31/46 (67.4)	1.000
	Female	5/8 (62.5)	
Ulcer size (cm)	1–5	25/29 (86.2)	0.004
	5–8	6/14 (42.9)	
	>8	5/11 (45.5)	
Duration (weeks)	<20	23/24 (95.8)	<0.001
	21–40	9/11 (81.8)	
	41–60	3/12 (25.0)	
	>60	1/7 (14.3)	
Ulcer site	Medial and lateral aspects	11/14 (78.6)	0.339
	Superomedial to medial malleolus	25/40 (62.5)	

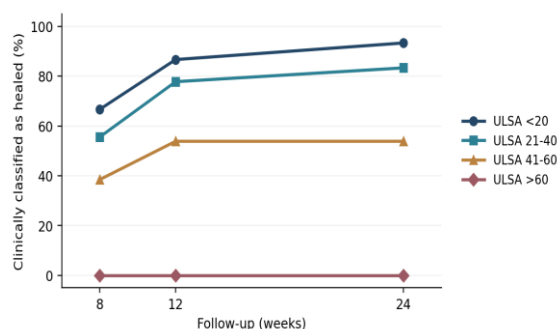


Figure 1: Healing proportions by baseline ULSA category over 24 weeks

Figure based on the thesis-reported number classified as healed at 8, 12, and 24 weeks.

DISCUSSION

This study demonstrated a clear inverse relationship between baseline ULSA category and venous leg ulcer healing, with substantially better 24-week healing among patients with lower scores, consistent with the original ULSA report.^[6] Shorter ulcer duration was strongly associated with healing, whereas ulcers persisting for 41 weeks or longer showed markedly poorer outcomes, supporting previous evidence that chronicity is an important adverse prognostic factor.^[5,9,10] Larger ulcer-size categories were also associated with reduced healing, in agreement with earlier studies linking greater wound size with delayed recovery.^[4,11] In contrast, age, sex, and ulcer site were not significantly associated with 24-week healing in the reanalysed aggregate data. Although ULSA may therefore be useful for clinical risk stratification, the present findings represent group-wise associations rather than formal validation of a prediction model.^[7,8] Treatment-related factors may also have influenced healing because compression therapy and venous reflux intervention are established components of care, while treatment consistency and adherence were not fully documented in the source data.^[3,12]

CONCLUSION

In this observational cohort of 54 patients with venous leg ulcers, lower baseline ULSA categories were associated with a higher proportion of clinically classified healing at 8, 12, and 24 weeks. Longer ulcer duration and larger size categories also showed poorer healing at 24 weeks. The results support further evaluation of ULSA as a practical risk-stratification aid, but larger studies with clearly defined healing endpoints, standardized treatment documentation, verified statistics, and formal prediction-model validation are needed before confident clinical implementation.

Declarations

Ethics approval and consent to participate: The study was approved by the Institutional Ethics Committee of Sree Balaji Medical College and Hospital, Chennai, India. Written informed consent was obtained from all participants prior to their inclusion in the study. Participation was voluntary, and participants were informed of their right to withdraw at any stage without affecting their medical care. Patient confidentiality and privacy were maintained throughout the study.

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Author contributions:

Dr. Nikhil Sholey P: Investigation, data collection, data analysis, interpretation of results, and preparation of the original manuscript.

Dr. Srinivasan: Study supervision, methodological guidance, critical review, and editing of the manuscript.

Data availability: The aggregated data supporting the findings of this study are presented within the manuscript. Individual patient-level data are not publicly available to protect patient confidentiality.

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