

Research Article

Outcomes of lymphovenular anastomosis in the treatment of lymphedema affecting the upper and lower extremities.

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Abstract

Background: Lymphedema of the extremities is a chronic disabling condition associated with impaired mobility, recurrent cellulitis, and reduced quality of life. Lymphovenular anastomosis (LVA) has emerged as a minimally invasive physiological surgical treatment; however, evidence regarding its outcomes in Sri Lanka remains limited. This study evaluated the functional outcomes, complications, and patient satisfaction following LVA.

Methods

A prospective cohort study was conducted among six patients who underwent LVA at the Plastic Surgery Unit, National Hospital of Sri Lanka, during 2024. Patients with upper or lower extremity lymphedema secondary to malignancy, congenital causes, filariasis, or radiotherapy were included. Patients younger than 18 years, those with Grade IV lymphedema, or those who had undergone other lymphedema procedures were excluded. Data regarding demographics, functional outcomes, complications, and patient satisfaction were collected using interviewer-administered questionnaires.

Results

Six patients were included (66.7% female; median age 29–39 years). In our study population, lower extremity lymphedema was more prevalent than upper extremity lymphedema (66.7% vs. 33.3%). Prior to surgery, all patients experienced limb heaviness, while most reported reduced range of motion and recurrent cellulitis despite conservative management. Following LVA, 66.7% reported reduced limb stiffness and 50% demonstrated improved mobility. Overall patient satisfaction was high, with only one patient (16.7%) requiring secondary liposuction. Postoperative wound infection occurred in two patients (33.3%) and was associated with lower satisfaction scores.

Conclusions

Lymphovenular anastomosis provides meaningful functional improvement and high patient satisfaction in selected patients with extremity lymphedema.

Despite the risk of postoperative wound infection, LVA represents an effective physiological surgical option and supports the incorporation of lymphatic reconstruction into comprehensive lymphedema management in Sri Lanka.

Keywords: Lymphedema; Lymphovenular anastomosis; Lymphatic reconstruction; Upper extremity; Lower extremity; Sri Lanka.

Introduction

Lymphedema of the upper and lower extremities presents a significant clinical challenge, profoundly impacting patient mobility, increasing susceptibility to infection, and diminishing overall quality of life.

While conservative management remains a staple, lymphovenular anastomosis (LVA) has emerged as a promising, minimally invasive surgical intervention. By creating direct connections between obstructed lymphatic vessels and adjacent venules, LVA facilitates physiological fluid drainage and reduces limb swelling. Despite refined surgical techniques, a critical need remains to evaluate LVA's real-world clinical outcomes to optimize patient selection and inform evidence-based treatment algorithms.

Existing literature underscores the procedure's potential efficacy across various patient populations. Regarding upper extremity outcomes, a systematic review of 14 studies (published through June 2020) reported volume or circumference improvements ranging from 0% to 100%, concluding that LVA is a safe and efficient treatment for decompressive-resistant upper extremity lymphedema, particularly in lower-stage disease (1).

Similarly, a 2019 study (n=26) in Goettingen, Germany, with an average 23-month follow-up, found that 50% of therapy-resistant patients reported subjective improvement, with early-stage upper extremity patients deriving the most benefit (2). In the context of lower extremity lymphedema (LEL), a systematic review encompassing 6,260 patients (through June 2021) demonstrated objective improvement rates between 23.3% and 100%, again noting the most substantial enhancements in early-stage LEL (3).

Beyond limb volume, a single-center prospective study of 100 upper and lower extremity cases followed over 24 months found that while limb circumference did not significantly improve, LVA yielded positive outcomes regarding the frequency of cellulitis episodes, reliance on compression garments, manual lymphatic drainage (MLD) sessions, and overall quality of life (5).

By systematically evaluating the functional outcomes, patient-reported experiences, and long-term efficacy of LVA, this study aims to bridge the gap between theoretical supramicrosurgery and practical application. Ultimately, elucidating predictors of treatment success will enhance patient care and advance the contemporary management paradigm for lymphedema

Methods

This prospective cohort study followed up 6 patients who had undergone lymphovenular anastomosis during the year 2024 at the plastic surgical unit, National hospital of Sri Lanka, Colombo. Patients diagnosed with upper and lower extremity lymphedema following excision of malignancies, congenital lymphedema, Filariasis, irradiation were included in the study. Patients who are under the age of 18 years, those who have undergone other surgical interventions for lymphedema beside LVA or with Grade 4 lymphedema were excluded from the study. Interviewer administered questionnaires were used to collect data on demography, treatment, outcome, complications and its effects to the patient. An information sheet was distributed among patients with explanation of the study and consent. Ethical approval was also obtained.

Results

Demographic Characteristic	Count (n)	Percentage (%)
Gender		
Female	4	66.7
Male	2	33.3
Age Category (years)		
29–39	3	50.0
40–50	1	16.7
51–61	1	16.7
62–72	1	16.7

Table 1: Demographic Characteristics of Patients Underwent Lymphovenular Anastomosis (N=6)

The condition most commonly affected the lower extremities (66.7%, n=4) compared to the upper extremities (33.3%, n=2).

Patients managed their condition with various conservative therapies: 83.3% utilized compression bandages, 83.3% relied on pharmacological therapies (predominantly prophylactic Penicillin), and 50% participated in physical or occupational therapy. Pre-operative complications were highly prevalent; all patients (100%) experienced limb heaviness, and the majority suffered from a reduced range of motion and frequent cellulitis episodes

Functional & Subjective Outcomes after LVA (N=6)

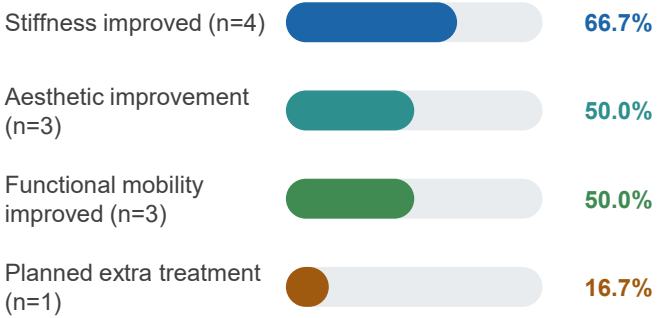


Figure 1.1 - Functional and Subjective Outcomes after LVA

Post-operative Complications after LVA (N=6)

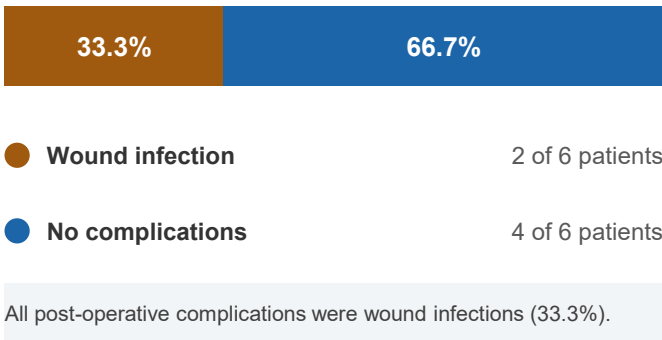


Figure 1.2 – Post Operative complications after LVA

Patient Satisfaction after LVA (N=6, mean 7.5/10)

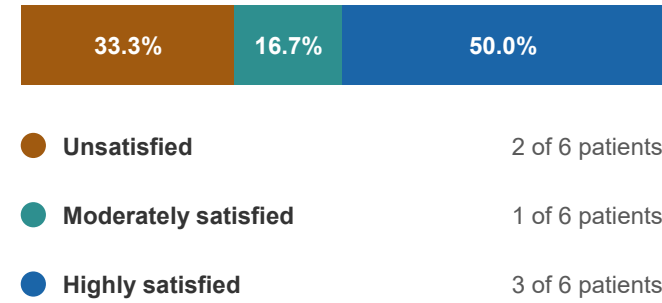


Figure 1.3 - Patient Satisfaction Post LVA

Discussion

This study demonstrates that Lymphovenous Anastomosis (LVA) is a functionally beneficial treatment for extremity lymphedema in Sri Lanka. Mirroring global literature, our cohort showed significant functional improvements despite 100% having previously relied on intensive conservative management: 66.7% experienced reduced limb stiffness and 50% gained improved mobility.

The procedure's positive impact on patient quality of life is validated by high peak satisfaction scores and a low need for secondary interventions (only 16.7% required liposuction). However, post-operative wound infections (33.3%) directly correlated with lower satisfaction, emphasizing the critical need for meticulous perioperative care and patient selection.

Conclusion

Lymphovenular anastomosis serves as a beneficial surgical intervention for patients with upper and lower extremity lymphedema. It improves functional mobility and significantly reduces limb stiffness for the majority of patients, while yielding positive aesthetic outcomes. While post-operative wound infections can impact overall patient satisfaction, the procedure strongly supports the integration of surgical lymphatic reconstruction into standard lymphedema care protocols in Sri Lanka.

Declarations

None

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Ethics approval and consent to participate

Ethical approval was also obtained. An information sheet was distributed among patients with explanation of the study and consent to participate.

Consent for publication

Informed written consent for publication and accompanying images was obtained from the patients prior to collecting information

Availability of data and material

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

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