



Multistage Surgical Management of Severe Primary Lymphoedema Using Charles Procedure and Free Vascularised Lymph Node Transfer: Lymphatic Flow and Function Restoration Through Multidisciplinary Management

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INTRODUCTION

Primary lymphoedema is a rare inherited condition impacting the lymphatic system. It occurs due to genetic mutations that cause impaired lymphatic drainage, leading to fluid accumulation, fibrosis, and chronic swelling. We present the multistage surgical management of a 34-year-old woman with severe primary lymphoedema successfully treated with staged radical debulking and SCIP lymph node transfer. Her case required coordinated input from plastic and vascular surgery due to operative complexity.

AIM

This case highlights how combining modern microvascular approaches, such as vascularised lymph node transfer, with traditional radical debulking procedures can restore function and lymphatic drainage in end-stage refractory disease.

Pre-operative appearance



Severe primary lymphoedema of the right lower limb.

METHODS

In November 2024, A 34-year-old female presented with severe primary lymphoedema of the right leg, which had started since birth as swelling of the right big toe. This progressed gradually from 6 to 12 months old, which was managed conservatively with compression bandaging and a subsequent debulking procedure in 2018, complicated by post-operative PE. Following initial surgery, the lymphoedema became worse and spread to the entire leg, with recurrent infections.

After an MDT discussion between the vascular and plastic teams, a two-stage radical debulking and free lymph node transfer was performed for definitive management. CT Angiogram showed normal vascular anatomy with some venous pooling.

Stage 1: Charles procedure – tissue excision



Excised lymphoedematous tissue following first-stage radical debulking.

Stage 2: Radical debulking



Intraoperative appearance following completion of the second-stage radical debulking.

Split-thickness skin grafting



Intraoperative view showing the split-thickness skin graft secured with staples following second-stage debulking.

RESULTS

The first stage involved a Charles procedure of the right upper thigh with a split-thickness skin graft, removing 65 kg of tissue. Two months later, radical debulking of the below-the-knee area was performed, where approximately 25 kg of lymphoedematous tissue was excised. Following recovery from debulking procedures, a left vascularised superficial circumflex iliac artery perforator (SCIP) lymph node transfer to the right foot was performed. A left groin SCIP lymph node flap was harvested following pre-operative Doppler and reverse lymphatic mapping with patent blue dye and ICG to preserve draining nodes. An LN-only free SCIP flap was transferred to the dorsal foot. Microvascular arterial anastomosis was performed end-to-side (SCIP to DP), and venous anastomosis (SCIV to dorsal foot vein) was completed. Post-operatively, compression bandaging and early mobilisation were initiated, resulting in independent ambulation by discharge, significant volume reduction, good limb perfusion, and preserved motor and sensory function.

Post-operative outcome



Post-operative appearance demonstrating significant volume reduction and functional improvement.

CONCLUSIONS

In conclusion, this case demonstrates the successful management of severe primary lower limb lymphoedema through Free Vascularised Lymph Node Transfer, combined with staged radical debulking. This approach highlights the effectiveness of combining modern microvascular and traditional excisional surgical methods in managing end-stage cases to restore lymphatic function and address excess tissue, thereby improving patient outcomes and quality of life.