A Selective Microsurgical Approach for Treating Bilateral Lower Extremity Lymphedema

Dalia Tobbia, MB, MD, FRCSI; Ming-Huei Cheng, MD, MBA, FACS

Disclosure: None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this manuscript.

INTRODUCTION: Lower extremity lymphedema is a debilitating condition, particularly when both extremities are involved. Clinical presentation is usually more severe and reported outcomes tend to be generally less favorable. More recently, microsurgical methods including lymphaticovenous anastomosis (LVA) and vascularized lymph node transfer (VLNT) have gained increasing popularity among plastic surgeons. Despite published studies detailing outcomes related to surgical success in treating lower extremity lymphedema,[1,2 3] limited studies have reported recommendations based on the pattern of lymphatic flow made possible due to recent advancement in lymphatic imaging technology with Indocyanine green (ICG) lymphography. [4,5] Frequently lower extremity lymphedema affects each leg to a variable degree. Therefore, each case of lymphedema should be treated by selecting the best surgical approach likely to give the most favorable long term outcome, taking into account the pattern of lymph flow rather than using the same approach to treat all lymphedema.

MATERIALS AND METHODS: This series includes four patients with chronic bilateral lower limb edema. Either LVA or VLNT was performed simultaneously for each of the affected limbs depending on lymphatic flow mapping in addition to lymphedema grading. Lymphatic imaging was performed using 0.3 to 0.6 mL indocyanine green (ICG) injection. A diffuse ICG pattern of lymphatic flow with stardust appearance and dermal backflow indicates severe obstruction that is unlikely to recover significantly from LVA and therefore a VLNT was required for optimal results. However a linear pattern on ICG indicates the presence of a functional lymphatic duct and performing a LVA is likely to produce a satisfactory reduction of extremity edema without the need for a more complicated intervention. Circumference measurements and ICG lymphography were evaluated pre-and post-op in all patients.

RESULTS: We successfully treated bilateral lower extremity lymphedema in these patients. There was a remarkable improvement of edema. Circumference reduction of the each extremity ranged between 40.5% to 50%. ICG appearance within the lymph node flap flap was seen in all cases of VLNT, and was also used to show flow through a functioning LVA.

CONCLUSION: This is a novel concept for dealing with extremity lymphedema. The selective application of a VLNT or LVA provides a steady reduction of limb circumference that is sustainable over time and is reflected by lymphatic clearance of ICG.

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