Single-Stage, Dual Gastroepiploic Lymph Node Flaps for the Surgical Treatment of Lymphedema

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BACKGROUND: Several donor sites have been described for lymph node flap (LNF) harvest from around the body. The gastroepiploic donor site has several advantages, including constant anatomy, large-caliber vasculature, and no reported associated iatrogenic lymphedema. The purpose of this case report was to review the technique of expanding the gastroepiploic donor site to two flaps (Figure 1), based on the right and left gastroepiploic artery and vein (RGEA/V and LGEA/V), for distal and proximal vascularized lymph node transfer for extremity lymphedema (Figure 2).

METHODS: Prospective data was collected on our first case of dual gastroepiploic lymph node flaps. Demographic data, indication, and perioperative details were recorded.

RESULTS: Our patient was a 65-year-old female with cervical cancer-related right lower limb ISL stage II lymphedema, with progressive limb enlargement and decreased mobility for three years. Comorbidities included obesity (BMI = 35.4kg/m^2) and poorly controlled hypertension. Preoperative circumferential measurements were 66.6cm thigh/ 44.3cm calf / 25.3cm ankle / 24.5cm foot, versus 56.5/39/1.6/22.4 contralaterally. Circumferential differentiation calculations were 17.9%/13.6%/17.1%/9.4%, with an average circumferential differentiation of 14%. Tonicity was not measureable at the thigh and leg, versus 87 / 86 contralaterally. Preoperative lymphoscintigraphy showed obstructive right lower limb lymphedema with dermal backflow distal to the thigh. Both gastroepiploic lymph node flaps survived, and no reexploration was required. Operative time was 575 minutes, harvest time was 140 minutes with open approach, and ischemia time was 120 minutes. All microanastomoses were performed in end-to-end fashion with 10-0 nylon. The anastomoses were the RGEA to the medial plantar artery, with corresponding veins, and the LGEA to the medial sural artery, with corresponding veins. Local flaps and small skin grafts were used for closure, to allow monitoring. Primary wound healing was achieved and there were no perioperative complications.

CONCLUSIONS: The single-stage, dual gastroepiploic lymph node flap is a safe and novel option for the surgical treatment of extremity lymphedema. Long-term follow-up and further studies are warranted to further evaluate the potential of this flap.

LEGENDS:
Figure 1. Schematic drawing of the dual gastroepiploic lymph node flap, based on the right and left gastroepiploic artery and vein (RGEA/V and LGEA/V). Adjacent omental vessels are shown.
Figure 2. Distal and proximal inset of the dual gastroepiploic lymph node flap in the lymphedematous extremity.