

Comparison of Outcomes between Side-to-End and End-to-End Lymphovenous Anastomoses for Early-Grade Extremity Lymphedema

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Background: Lymphovenous anastomosis is technically challenging and can be successfully performed with an advanced operating microscope, supermicrosurgical instruments, and indocyanine green lymphography. This study compared the outcomes between side-to-end and end-to-end lymphovenous anastomosis configurations for unilateral extremity lymphedema.

Methods: Between April of 2013 and June of 2017, lymphovenous anastomosis was indicated for 58 patients who preoperatively had patent lymphatic ducts by indocyanine green lymphography, including 20 patients with upper limb lymphedema and 38 patients with lower limb lymphedema. Either an end-to-end or a side-to-end lymphovenous anastomosis was used to anastomose the subdermal venule to the lymphatic duct. The circumferential difference and episodes of cellulitis were used as outcome measurements.

Results: Twenty-three patients underwent an end-to-end lymphovenous anastomosis and 35 patients underwent side-to-end lymphovenous anastomosis. All patients had an immediate patency evaluated by indocyanine green lymphography and patent blue assessments. All patients returned to their daily routine without the use of any compression garments. At an average follow-up of 16.5 months (range, 13.4 to 19.6 months), the improvement of circumferential difference (3.2 percent; range, 1.8 to 4.6 percent) in the side-to-end group was statistically greater than that in the end-to-end group (2.2 percent; range, 1 to 3.4 percent; $p = 0.04$). The overall episodes of cellulitis were significantly reduced from 1.7 times/year (range, 1.3 to 2.1 times/year) to 0.7 times/year (range, 0.3 to 1.1 times/year; $p < 0.001$), but no difference was observed between the two groups.

Conclusions: Both side-to-end and end-to-end lymphovenous anastomosis configurations were effective surgical approaches for improving early-grade extremity lymphedema. Side-to-end lymphovenous anastomosis has the advantages of having greater efficacy for lymph drainage, requiring only one anastomosis and eliminating the need to use compression garments. (*Plast. Reconstr. Surg.* 144: 486, 2019.)

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, III.

Extremity lymphedema is a progressive debilitating disorder that is characterized by proximal failure of the lymphatic transport system. Primary lymphedema results from abnormal lymphatic channels caused by obstruction, malformation, or hypoplasia. When primary lymphedema is present at birth or during infancy,

it is known as congenital lymphedema or Milroy disease. However, the presentation of symptoms

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