

Lymphedema Surgery

General Considerations

Lymphedema is a complex disease process with conservative and surgical treatment options. Lymphedema surgeries are no longer considered to be experimental or investigational and can be used to both treat primary and secondary lymphedema patients. Ample evidence exists in the medical literature that demonstrate lymphedema surgeries are safe and effective when performed by a trained and experienced lymphedema surgery team. Patients must be properly selected and integration of lymphedema therapy is critical to achieving successful outcomes.

Lymphedema surgeries enhance lymphatic drainage and have been shown to significantly improve patient outcomes. Postoperatively, individuals often experience a reduced incidence of cellulitis, diminished lymphedema symptoms, improved limb function, enhanced quality of life, and stronger patient-reported outcomes.

Lymphedema surgery must be performed by a trained and experienced lymphedema surgeon working as part of a multidisciplinary lymphedema treatment team. A certified lymphedema therapist (CLT) is an essential component of such a team. Any recommendation for lymphedema surgery should be made after a patient has been evaluated by the surgeon and team. As is the case with most types of surgery, different surgeons employ various types of surgery and surgical techniques depending on their training and experience. No single procedure is effective for all patients, and different surgical options should be considered. Treatment team clinicians should collaborate in the patient's initial evaluation and coordinate closely in the significant postoperative care regimen required to achieve successful outcomes.

Prior to consideration for surgery, patients should have a thorough lymphedema workup. The lymphedema diagnosis should be supported by at least one lymphedema imaging study, such as lymphoscintigraphy or indocyanine green (ICG) imaging.

In general, individuals with severe obesity may face increased challenges with lymphedema surgery and are often not ideal candidates. However, body mass index (BMI) should not serve as a strict eligibility criterion. Instead, it should be considered as one factor within a comprehensive assessment of the patient's overall health and condition. BMI alone should never be used to restrict access to surgical care.

Limb size should be documented as limb volume, measured in cubic centimeters (cc) or milliliters (ml), to ensure consistency and precision in clinical reporting. Such volumes may be determined with modalities such as circumferential measurements at 4 cm intervals, laser plethysmography, water displacement, or other reproducible perometry methods.^{1,2}

The efficacy and safety of lymphedema surgeries have been long established in existing medical literature and do not require further evidence from additional randomized controlled trials. The lack of randomized controlled trials regarding a particular type of lymphedema surgery in medical literature does not impact the established efficacy and safety for that surgery.

Conservative (Non-Surgical) Lymphedema Therapy

Conservative, non-surgical therapy should be pursued prior to lymphedema surgery as an essential component of a comprehensive treatment approach. Lymphedema therapy should be administered by a trained CLT, and include the use of properly fitted compression garments. In general, lymphedema surgery is expected to decrease lymphedema symptoms and the need for garment use, but may not eliminate the need for these modalities. All lymphedema surgery patients should have long term follow up by their surgeon and treatment team.

When employed as part of an overall treatment process by an experienced surgeon and team, lymphedema surgery may be a first line option in carefully selected cases. A patient should not be

required to undergo a standard or “one size fits all” course of lymphedema therapy or be required to “fail” a course of lymphedema therapy prior to surgery.

Physiologic Procedures

Physiologic lymphedema surgeries repair or increase the ability of the lymphatic system to drain lymphatic fluid. Various techniques are used, such as the transfer of lymphatic tissue and/or reconnection of lymphatic vessels. The procedures are technically complex and require surgeons to have specialized training and equipment. Lymph nodes and/or lymph vessels may be transferred along with the surrounding tissues from areas such as the groin, lateral torso, neck or abdomen to proximal recipient sites such as the groin, thigh, axilla, or distal locations, such as the ankle or wrist. The direct reconnection of lymphatic vessels to veins also may be performed, and usually involves supermicrosurgery, with connections of vessels with diameters of less than 1mm. Effective techniques that involve the direct connection of lymph nodes to veins have also been described.³

The type of physiologic surgery for each patient should be based on the patient’s clinical presentation and surgeon’s expertise. Physiologic surgeries can produce significant clinical improvements which include reduced risk of infection, reductions in the need for compression garments and lymphedema therapy, improved physiologic functions, and increased quality of life that are greater than can be achieved with lymphedema therapy alone.⁴⁻¹⁰

Lymph node transfer surgeries have a low risk of developing lymphedema at or around the flap donor site. However, the use of reverse lymphatic mapping reduces this possible risk and has been well described in the medical literature. Reverse lymphatic mapping is not experimental and has been used by surgeons for many years.¹¹

Physiologic procedures also are indicated in selected patients with early-stage lymphatic disease, in which damage to the lymphatic system may only be evident with imaging techniques and before symptoms occur.

Immediate/Early Lymphatic Reconstruction (ILR/ELR)

Procedures repairing damage to the lymphatic system during or soon following the surgery for

cancer treatment have been described and shown to be effective in medical literature.¹²⁻¹⁵ These procedures involve connecting lymphatic vessels to recipient veins to preserve lymphatic drainage in the affected areas. The surgical team should deliver a clear and individualized risk assessment regarding the potential development of lymphedema in the affected limb. This information should be shared with both the patient and their oncology provider to support informed decision-making around ILR/ELR procedures, whether performed during or after cancer surgery.

Surgical Reductive Techniques

Patients with advanced lymphedema may have permanent accumulation of pathologic lymphedema solids in their affected tissues. These solids cannot be removed with conservative methods or physiologic lymphedema surgery, and must be surgically removed. Reductive lymphedema surgery - also known as excisional surgery, which includes aspiration of solid tissue - has consistently demonstrated effectiveness in treating advanced lymphedema for over 25 years when performed by a skilled and experienced surgical team. Extensive preoperative, perioperative surgical and postoperative protocols are required for successful outcomes. Consistent and dramatic reductions in excess limb volume can be achieved with significant improvements in patient outcomes.

Reductive lymphedema surgery involving aspiration of solids are substantively different than cosmetic liposuction, or suction assisted lipectomy (SAL), and are significantly more technically complex and demanding. The aspiration procedures are intense, typically involve the removal of large volumes of solids, and require overnight stays. Close postoperative care with modalities such as bandaging and custom fitting flat knit compression garments are required for good outcomes. The severely compromised lymphatic drainage systems in advanced stage lymphedema patients do not allow for sufficient reduction of postoperative swelling using standard SAL protocols.¹⁶⁻²³

In summary, lymphedema surgery is a safe, effective, and evolving component of comprehensive care when performed by experienced teams and integrated with conservative therapy. As awareness grows and access expands, these procedures offer renewed hope for improved outcomes and quality of life for those living with lymphedema.

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