6
Surgical Management of Lymphedema

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Introduction

An ideal treatment for the lymphedematous limb should restore both function and cosmetic appearance. Unfortunately, it is impossible to achieve these goals using current treatment modalities.

Although manual lymph drainage-based complete decongestive therapy (CDT) effectively controls the progression of the disease in most cases and remains the primary management for chronic lymphedema, surgical therapy provides an adjunct to nonsurgical treatments (1–8).

Surgical treatments of lymphedema are usually categorized as excisional (ablative) or reconstructive (9–28). As with all forms of lymphedema treatment, surgical management necessitates a lifetime commitment to treatment. It too has limitations similar to those of conservative treatment, e.g., failure to improve the lymphedematous limb and the inability to prevent progression of the disease (29,30). Surgical treatment, whether ablative or reconstructive, has many advocates and is known to provide control of chronic lymphedema. Reconstructive surgery, in particular, has an attractive theoretical basis that in the future might provide an opportunity for cure. The use of reconstructive surgery, however, remains controversial and unavailable to most clinicians.

A dedicated and experienced microsurgical team for lymphovenous and lymphoymphatic anastomoses is a prerequisite for successful long-term results (15,17,19,21,23). Unfortunately, only a limited number of institutions have surgical teams that can meet these conditions.

As stated previously, CDT must accompany any type of surgical treatment, the combination of which may achieve complementary benefits not obtained by CDT alone (31,32).

Excisional/Ablative Surgery

Excisional procedures, often known as reduction or debulking operations, remove scarred and disfigured lymphedematous tissue from the limb. These procedures were condemned for many years because of general morbidity and significant complications; their application had been nonselective and used for any type of lymphedema. Some of these once-abandoned operations, however, have been reassessed and provide alternative palliative operations for chronic end-stage lymphedema. Large numbers of long-term results have yet to be assessed.

Early Debubling Operations

Excisional procedures have been described by Charles in 1912, Sistrunk in 1918, Homans in 1936, and Thompson in 1962 (9,10,12,13,33).

Charles recommended a radical operation for reducing the size of a massively swollen calf or foot (33). The entire skin and subcutaneous fat of the lower leg are removed circumferentially to the muscular fascia. Split-thickness skin grafts are applied over the denuded areas. The excision includes major veins and nerves of the saphenous system in addition to the lymphedematous tissues. The foot can be selectively treated in a similar manner.
Sistrunk described a noncircumferential debulking procedure. It removes a wedge of skin and subcutaneous fat to the muscular fascia (12). Skin grafting is not required as much as the adjacent flaps, created by the excision, are approximated and sutured.

Homans extended Sistrunk’s operation (10). He first excised a medial wedge of lymphedematous calf tissue then undermined the flaps to extend the area of tissue removal. Today, these 2 surgical approaches may be combined to reduce the circumference of the thigh.

Thompson’s operation is seldom performed today because it failed to provide relief of symptoms. Its thesis suggested that the lymphatics of transected skin (dermis), if buried beneath the deep muscular fascia, would form a bridge between the 2 lymph systems. The anticipated drainage from superficial to deep lymphatics failed to develop (12,13).

**Selection of Candidates for Excisional Surgery**

Failure to obtain satisfactory control of the lymphedematous process or to prevent disease progression during a year of vigorous nonsurgical treatment is a major criterion for selection for surgical treatment (29,32). Another important criterion, for any type of lymphatic surgery, is a serious commitment to a lifetime of maintenance. Because postoperative maintenance care with CDT relies heavily on a self-initiated, home-based maintenance program, it requires an initial hospital-based educational program for both patient and family (32).

A multidisciplinary team should evaluate all candidates for surgery. The final selection should be made by consensus after a vigorous and critical assessment is performed. Patients with lymphedema in clinical stage IV or those progressing to stage III with profound soft tissue changes, hardened fibrosclerotic tissues with distortion, disfigurement, and/or elephantiasis are ideal candidates for excisional surgery. Sepsis should have recurred more than 3 times during the year, even under adequate antibiotic protection (31,32).

Surgery should be considered only when the epifascial (superficial) lymphatic system has been irreversibly damaged. As with all debulking operations, the surgical goal is to reduce the amount of fibrosclerotic lymphedematous tissue, to reduce the incidence of sepsis, and to improve the effectiveness of CDT.

Lymphoscintigraphy should demonstrate a progressive deterioration of the lymphatic system’s residual function, e.g. increased dermal backflow, decreased lymph node uptake, decreased radiotracer clearance, and the disappearance of collaterals (34–36). Exclusion criteria include factors that interfere with conservative treatment and negate positive long-term results, such as poor compliance, lack of family support, age over 70 years, and infrequent infections.

**Excisional Surgery**

Our institution* uses a modified Auchincloss-Homans operation (9,10). It is usually performed on the lower limb and excises damaged skin and subcutaneous tissue to the muscular fascia. This procedure helps prevent tissue necrosis observed with procedures requiring more extensive undermining. Tissue edges are approximated and sutured immediately. As with many surgical procedures, morbidity consists of infection, hematoma, poor healing, skin loss, and recurrent swelling from lymphatic damage (11) (Figure 6-1).

Postoperatively, clinical evidence suggests increased lymph absorption through the deep subfascial lymphatic system, although lymphoscintigraphy has yet to confirm this clinical observation (29,32).

**Liposuction**

The swelling in a limb is often a combination of lymph fluid and edematous fat globules. It seems logical that removing at least 1 portion of the problem—the edematous fat—should improve the limb’s condition.

Liposuction is a surgical technique that inserts a tiny cannula into the subcutaneous tissues and aspirates the surrounding fat (27,28). The imagined ease of performing liposuction (actually ablation by aspiration) created an intense inter-

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