

A clinical study of the reductive surgery an effective option for the treatment of advanced lower limb lymphedema

Original
Article

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ABSTRACT

Introduction: An advanced form of lymphedema is called elephantiasis. It is a clinically difficult impairment that lowers one's quality of life. There are very few good surgical treatments, and medical care and other conservative therapies are rarely helpful. We evaluated the clinical effectiveness of reduction surgery in this study using a Charles technique modification.

Patients and Methods: We present two cases of lower extremity advanced lymphedema that were treated by removing the affected tissues with deep fascial excision up to the muscles and meshed split-thickness graft resurfacing from the excised tissue was done immediately. Followed by decongestive lymphatic therapy, which includes skin care, hygiene, mobilization, and compressive pressure garments.

Results: Primary healing was an eventful process, and the surgical therapy was well accepted. The leg's mobility and function both significantly improved, yielding extremely pleasing cosmetic outcomes.

Conclusion: Reduction of advanced lymphedema is necessary to lessen the severe handicap and enhance the uncomfortable circumstances of these individuals. Reduction surgery can significantly enhance the quality of life and lower the condition's morbidity when combined with proper post-operative care.

Key Words: Compression, elephantiasis, garment, lymphedema, reductive surgery

Received: 9 January 2024, **Accepted:** 4 February 2024, **Publish:** 7 July 2024

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ISSN: 1110-1121, July 2024, Vol. 43, No. 3: 644-649, © The Egyptian Journal of Surgery

INTRODUCTION

Elephantiasis is a deformative lymphedema end-stage characterized by significant soft tissue alterations. There are signs of papillomatosis, cutaneous acanthosis, hyperpigmentation, tissue fibrosis, and fat deposition^[1,2]. A chronic, progressive illness, lymphedema affects almost 200 million individuals globally^[3,4]. Since early lymphedema is sometimes not reported until it becomes critical and requires attention, the incidence is difficult to estimate. Although lymphedema can affect any area of the body, it most frequently affects the upper and lower limbs, and genitalia^[5]. There are two types of lymphedema: primary and secondary. Secondary lymphedema develops as a result of trauma, surgery, cancer, radiation, filariasis (a significant cause globally), and other complicated genetic diseases that cause the lymphatic system to not grow normally, resulting in primary lymphedema^[6]. Although lymphedema may be diagnosed clinically, in the early stages one can rule out other disorders that may complicate the clinical presentation using imaging (x-rays, ultrasounds, computed tomography scans, and MRI) or blood smears or tests for microscopic worms for filariasis^[7]. Magnetic resonance imaging may be used in conjunction with

lymphoscintigraphy, also known as indocyanine green lymphangiography, to confirm lymphedema or schedule surgery^[8]. After a diagnosis, the severity of lymphedema can be categorized. The Campisi scale and the International Society of Lymphology (ISL) scale are the two primary staging techniques (Fig. 1)^[9].

The majority of non-surgical or conservative lymphedema therapy options are physical and include skin care, exercise, elevation, and the use of elastic stockings or other pressure garments^[10-12].

It has been suggested that lymphedema surgery can reduce the size of the limbs, enhance function and quality of life (QoL), and produce acceptable cosmetic outcomes^[13]. Excisional surgeries and lymphatic reconstruction are the two primary subtypes of lymphedema procedures. Proposed physiological methods for patients with early-stage lymphedema^[14]. Techniques for reducing and debulking are suggested for advanced lymphedema (elephantiasis). Surgical techniques that integrate a physiological process with surgery have been studied recently. The most often used physiological procedures include flap/tissue transfer, vascularized lymph node transfer (VLNT),

lymphatic-lymphatic by-pass, lymphovenous by pass, and lymphaticovenous anastomosis (LVA)^[15-17].

Liposuction and excisional (Stage 111) surgeries of lymphadenomatous tissue, encompassing the skin and soft tissue, are among the reductive or ablative techniques^[18-20].

Tissue flaps (Sistrunk, Homans & Thompson procedures, for example) or skin grafts (Charles technique, for example) are used to cover the ensuing flaws. In order to sustain the advantages of surgery, wearing compression garments after surgery can be necessary for life^[21].

		ISL Staging and Description		Campisi Staging and Description	Proposed Surgical Treatment
Subclinical	0	No swelling, changes found only on imaging.			None CDT
Mild	I	Accumulation of fluid with high protein content, which subsides with limb elevation. Usually lasts ≤ 24 h.	Ia	No overt swelling despite impaired lymph drainage	CDT LVA or VLNT
			Ib	Reversible swelling with limb elevation	
Moderate	IIa	Rarely resolves with limb elevation alone.	II	Mild persistence of swelling with elevation	LVA or VLNT SAPL
	IIb	Loss of pitting owing to progression of dermal fibrosis. Sometimes called spontaneously irreversible lymphedema.	III	Persistent swelling with recurrent lymphangitis	
Severe	III	Lymphostatic elephantiasis. No pitting; develop trophic skin changes (fat deposits, acanthosis, and warty overgrowths).	IV	Fibrotic changes with columnlike limb	SAPL Surgical excision
			V	Elephantiasis with limb deformation including widespread lymphostatic warts	

Abbreviations: CDT, complex decongestive therapy; ISL, International Society of Lymphology; LVA, lymphaticovenous anastomosis; SAPL, suction-assisted protein lipectomy; VLNT, vascularized lymph node transfer.

Fig. 1: ISL and Campisi staging systems for comparison with proposed treatment.

PATIENTS AND METHODS:

We present 2 cases of advanced Lymphedema complicated by elephantiasis.

Patient 1

A 30-year-old Al-Hodeida resident complained of a left lower leg edema that had been bothering her for the last 18 years. She was severely disabled due to constant discomfort in her leg. She went to the physiotherapy clinic and our patient base's house, where traditional manual massage of elastic stocks is done, for medical advice. We examined the woman and discovered that she had a typical

disfiguring hypertrophy of the left lower limb, which was especially noticeable in the leg. Her lymphedema was classified as stage IV (Campisi staging) and stage III by international society of lymphology (ISL).

Patient 2

A 33-year-old male patient arrived with a history of right lower limb edema and heaviness, as well as poor Health Related Quality Of Life (HRQOL) and an inability to walk or carry out everyday tasks without help. Examining the right lower limb, we discovered advanced lymphedema (elephantiasis) with limited function, poor limb cleanliness, and signs of recurrent cellulitis or lymphangitis episodes.

The two patients are self-referred. They were admitted 2 days before surgery during which clinical assessment is done and the required investigations are done also. The affected limbs were elevated and skin hygiene optimized. Peri-operative antibiotics are given.

Operative technique

Charles technique is direct excision of lymphedematous tissue down to the level of fascia followed by full thickness skin graft (FTSG) taken from the excised tissue. The modification entailed a more extensive surgery which include initially harvesting split thickness skin graft (STSG) from the entire circumference of affected leg followed by excision of the fibrosclerotic lymphedematous tissue with deep fascial excision up to the muscles and ending with covering of the denuded limb by meshed split thickness skin graft, followed immediate effective postoperative compression garments.

Following exsanguination of the affected limb, a rubber tourniquet is placed at the proximal thigh. Initially, the STSG harvested from the entire circumference of affected leg, which is then manually meshed. Sharp and blunt dissection is used to remove fibrosclerotic lymphedematous tissue, followed by deep fascial excision up to the muscles.

Within two hours of tourniquet ischemia time, all significant bleeding should be eliminated and controlled. Once the limb denuded has been, compression bandaging, gauze soaked in hydrogen peroxide, and deflated tourniquets are administered. Hemostasis is secured and split-thickness skin graft applied circumferentially. A bulky compression dressing is completed at this point. The limb was raised following surgery, and dressings were started on the third day. Compression stockings are begun after two weeks. After 4 weeks, long-term limb garment compression and physiotherapy are also started. Patients take oral antibiotics after being released from the hospital until full recovery is accomplished. Patients are followed every 3 months for the first year and every 6 months for the second year.

RESULTS:

Following surgery, there was a noticeable decrease in lower limb edema and a considerable drop in leg circumference. (Figures 1a–c and 2a–c) provide photos of the lymphedematous limb before and after surgery, which clearly illustrate the results. The sensation of weight loss was significantly reduced. The two patients expressed satisfaction with the functional result and increased limb size. Within the first three months following the procedure, they were able to resume their regular daily activities by adhering to physiotherapy and the compression of the limb garment. In the second patient, careful management was implemented despite minor partial loss and no infections.

No significant sequelae were seen and no recurrence during the first two years. The two patients experienced greatly pleasing cosmetic outcomes along with an improved QoL.



Fig. 2: a: 39 Years old woman with advanced left lower limb lymphedema, b: Post excision of lymphedematous tissues with circumferential onlay of STSG, c: Appearance three months post operation with good aesthetic result.

DISCUSSION

People with chronic lymphedema have a severe decline in their QoL as a result of this degenerative illness. The morbidity^[22], is increased by ambulation difficulties, recurring infections, and recurrent skin ulcers. Moreover, there is little question that changed body image and broader psychological effects are substantial. Various classifications of surgical interventions have been suggested to address lymphedema: 1. Excisional procedures (such as liposuction, amputation, and reductive surgery). 2. Rebuilding of the lymphatic system. 3. Tissue transfer techniques (such as transplanting lymph nodes, among others). Although early stages of elephantiasis can be treated with tissue transfer and lymphatic repair, other strategies for reductive surgery have been established. In our situations, fascial aponeurosis up to the muscles was used to remove all lymph adenomatous tissue. The concept behind this method was the de novo development of blood vessels and lymphatics from the sprouting of intramuscular blood vessels and lymphatics^[23]. Our criteria for the modified Charles operation, or reductive surgery, are stage 111, low Health Related Quality Of Life (HRQOL), persistent pain, and trouble walking or doing everyday tasks. In our situations, we discovered that the look of their limb was upsetting, especially when clothes was unable to sufficiently conceal it. The potential difficulties of the Charles procedure are a common source of criticism. However, there were hardly any difficulties in these two cases. Prior reviews^[24] of the Charles technique recommended against the use of STSG. Moreover, full thickness skin graft (FTSG) or thicker cover offered better and longer-lasting protection. In our instances, a high graft take % was achieved by the success of STSG. They approved of the aesthetic outcomes. In our circumstances, the advice was to use compression clothing to minimize hypertrophic scar development, avoid abrasions, and preserve the skin transplant with moisturizing lotion. Recurrence is common after excisional surgery when some subcutaneous fat is left behind. Van der Walt *et al.* have previously reported on the use of negative pressure treatment (NPT) or vacuum assisted circulation (VAC) therapy to improve skin graft take in the Charles operation. 35 Nevertheless, Yemeni health insurance does not cover the high cost of NPT. Because of the less than ideal outcomes, the Charles method was not advised for lymphedema in several prior papers^[25] some, on the other hand, think the surgery is necessary for severe lymphedema that is resistant to conservative treatment. We don't think the Charles operation, sometimes known as reductive surgery, should be ignored. For individuals with late-stage lower limb lymphedema, this therapy can significantly improve QoL, provide long-term symptom relief, and give considerable benefits.

CONCLUSION

Elephantiasis patients who have end-stage chronic lymphedema and find it more difficult to provide effective conservative or physiotherapy measures, particularly in severely disfigured extremities, may benefit from surgical management in the form of excision of all lymphedematous tissue with deep fascial excision up to muscles, followed by immediate postoperative compression bandage support, elevation of the limb, and later on compression garment. If there are any postoperative problems, they are often controllable. Patients can have highly satisfactory cosmetic outcomes and a higher QoL (Fig. 3).



Fig. 3: a: 33 years old male patient with severe right lower limb lymphedema, b: One month later with good graft take, c: Appearance six months later with acceptable aesthetic result.

CONFLICT OF INTEREST

There are no conflicts of interest.

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