

## SURGICAL TREATMENT OF SCROTAL LYMPHEDEMA: MODIFIED SURGICAL TECHNIQUE

A. Atta, M. Saber El Basiouny, S. Mostafa Abass

Plastic Surgery Department, Faculty of Medicine, Cairo University, Cairo, Egypt

### ABSTRACT

*Lymphedema is a chronic disease in which lymph accumulates under the subcutaneous tissue. The condition may be due to either congenital or acquired lymphatic system abnormalities. Genital lymphedema (scrotal lymphedema) has a high psychological and functional impact, and many surgical techniques have been tried in an attempt to improve function and cosmetic appearance. The aim of this study is to present our experience in treatment of a series of patients with scrotal lymphedema. Twenty patients suffering from moderate to severe scrotal lymphedema underwent treatment by using three flaps technique (2 inguinoscrotal flap and one perineoscrotal flap). The technique showed improvement in cosmetic, sexual, and voiding function with low incidence of recurrence up to 23 months of followup.*

**Keywords:** scrotal lymphedema, lymphedema, scrotal reconstruction, elephantiasis, surgery

Scrotal lymphedema is caused by either acquired obstruction or congenital aplasia/hypoplasia of lymphatic vessels. It leads to progressive increase in size of the scrotum and penis. Thickening of scrotal skin and ulceration may occur in severe cases (1). In scrotal lymphedema (elephantiasis), the superficial chain of inguinoscrotal nodes which drain the scrotal and penile skin is affected while the deep chain draining the

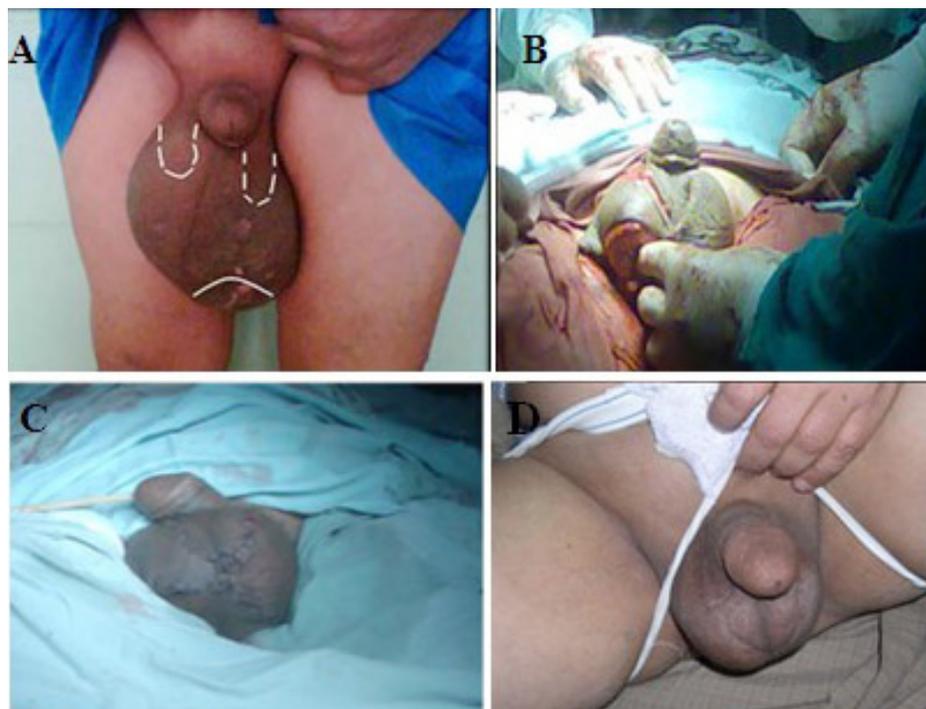
testes and penile body to the inguinal and abdominal lymph nodes is preserved (2).

Many surgical techniques have been tried to treat scrotal lymphedema aiming at restoring sexual and voiding function, treatment of the underlying pathology, and giving acceptable cosmetic appearance. Treatment modalities have varied from simple total excision and skin grafting to the most complicated technique such as lymphangioplasty with in-between techniques using local fasciocutaneous flaps. These modalities have largely demonstrated poor results with low patient satisfaction (3).

### PATIENTS AND METHODS

This study reviewed 20 patients suffering from moderate to severe scrotal lymphedema. All patients were subjected to full history including age (ranged from 25-50 years old), occupation, residence, previous operations, previous history of malignancy, and history suggesting any systemic disease (heart, kidney disease, etc.). The onset, course, duration of the disease and whether its course was complicated with fever or cellulitis was also assessed. Special concern was taken to evaluate the extent of disease impact on the patient's daily activities including his sexual life.

Full general, abdominal and pelvic examination in addition to detailed local examination was done to detect size, severity of condition, and skin quality. All patients



*Fig. 1. A: Depiction of the pre-operative flap design. B: Intra-operative picture of the resected scrotum. C & D: Postoperative early and later photos.*



*Fig. 2: Intraoperative photos demonstrating the large mass of tissue removal and immediate post-operative picture.*



*Fig. 3: Pre- and postoperative photos with removed tissue.*

were subjected to fully informed verbal and written consent regarding the operation and postoperative complications.

#### *Operative Technique*

Spinal or general anesthesia was taken according to each patient condition after which the patient was placed in supine position. The design of the three flaps was done in the form of 2 inguinoscrotal flaps and one perineoscrotal flap. Foley catheter was inserted as an intraoperative guide for the urethra followed by scrubbing the patient. Intravenous antibiotic was given at the time of induction.

The three flap incisions were done first then identifying the 2 testes and the urethra followed by elevation of flaps (two anterolateral and one posterior). The anterolateral flaps extended below and parallel to the inguinal ligament and the external inguinal ring with its length double to the neck of the

scrotum. The posterior flap extended to the perineum and its length double the width of perineum with 2 cm thickness. The flap (base: length) ratio measured one:two and its thickness approximately a few centimeters. All tissue in between the flaps was then removed. The flaps were closed by simple interrupted sutures and a rubber drain was inserted (*Fig. 1,2*). Occlusive light dressing was applied to all patients who were supported using a scrotal elevator.

Patients stayed at the hospital for 3 days postoperatively taking intravenous antibiotics. The rubber drain and the catheter were removed by the third postoperative day. Patients were followed postoperatively over a period of 23 months.

#### *RESULTS*

Results were evaluated using both objective and subjective tools, including comparison of pre- and postoperative



Fig. 4. Pre and post-operative photos of a patient with more advanced skin condition.

photographs, weighing excised tissue, improvement of clinical symptoms, patient satisfaction, and assessment of recurrence (Fig. 3,4).

No problems were found regarding anesthesia or dissection of the flaps. The spermatic cord, urethra, and testes were safely identified. No blood transfusion was needed in any of the cases. Clinical results showed excellent improvement regarding size, sexual and voiding functions, and cosmetic appearance even in cases of recurrence. There was a 20% recurrence rate within the followup period (23 months), which did not exceed upper third of the thigh. 80% of cases showed wound infection that was controlled on conservative management. 80% had excellent satisfaction and 20% showed moderate satisfaction (Table 1). No cases showed urethral injury during dissection, and no painful erections were reported.

## DISCUSSION

Scrotal lymphedema is not a common condition despite lymphedema affecting most parts of the body. It leads to marked discomfort for the patients as it results in both functional and cosmetic morbidities. The condition is associated with chronic irritation, pain, and repeated infections, which results in a progressive course of the disease (2).

Lymphedema is classified into stages: Stage 0, latent or subclinical; Stage 1, early accumulation of fluid subsides with elevation; Stage 2, swelling with pitting edema as fibrosis develops, and elevation alone rarely reduces tissue swelling; and Stage 3, lymph static elephantiasis with trophic changes developing. Stage 3 can be subclassified into mild, moderate, and severe in relation to upper, middle, and lower thirds of the thigh. Surgical treatment is generally indicated in

**TABLE 1**  
**Series Results of the Procedure**  
**Describing Number and Percentage of**  
**the Patients Reporting Satisfaction,**  
**Recurrence, and Infection**

	<b>Number of patients</b>	<b>%</b>
Recurrence	4	20%
Patient satisfaction		
Excellent	16	80%
Moderate	4	20%
Infection	16	80%

moderate and severe cases (4) with conservative treatment such as elevation and diuretics only in mild cases (5).

One of the surgical modalities is excision and application of split thickness graft on the penile shaft using a zigzag suture on the ventral aspect of the shaft to avoid contracture. However, this results in low patient satisfaction as it results in both functional and cosmetic morbidities by altering sensation with contracture if it occurs (6).

Grafting after total excision has proved not to be the best modality used in treatment of scrotal lymphedema. In an attempt to avoid its complications, flaps were used in treatment of scrotal lymphedema either as lateral fasciocutaneous thigh flaps or posterior perineal flaps. However, lateral fasciocutaneous flaps affect testicular thermoregulation and may cause infertility in addition to the need for second stage operation for separation. This approach cannot be used if the condition is not isolated to the scrotum (7). Techniques using an advancing posterior perineal flap give a bad cosmetic appearance by making a suture line to simulate median raphe and in addition using skin without preserving length to base ratio, which may result in skin necrosis (8).

Restoring lymphatic continuity by microvascular anastomosis remains the ideal procedure used in treatment of scrotal lymphedema. However, it requires proper

patient selection with absence of fibrosis and a low level of lymphatic obstruction. The demanding surgical technique has a high incidence of failure, and recurrence reduces the procedure's value (9).

Despite the aforementioned technique not being novel, it could be considered as promising compared to those described in the literature (6-10). It avoids graft-induced contracture and its cosmetic morbidities. It also avoids testicular thermoregulation abnormalities, which frequently are encountered with other flaps such as thigh flaps. None of our cases developed flap necrosis likely due to adherence to a safe ratio (length: base = 2:1), which ensures flap viability and allows for proper testicular accommodation without affecting cosmetic appearance. Infection, although incidence was similar to that described in literature, was our main problem. However, the complicated cases with infection showed a good response to conservative treatment. We tried to avoid one of the major difficulties found in management of scrotal lymphedema, i.e., tailoring surgery depending on the situation of every individual patient. This technique can provide a safe modality of treatment with good cosmetic, functional, and standardized technique in addition to low incidence of recurrence. Using bioadjuvant therapy such as growth factors especially VEGF (vascular endothelial growth factor) with surgery may also improve surgical technique outcomes (2).

#### *CONCLUSION*

Treatment of scrotal lymphedema using 3 flaps is a valuable technique which provides excellent cosmetic, sexual, and voiding function with low incidence of recurrence.

#### *CONFLICT OF INTEREST AND DISCLOSURE*

All authors declare that no competing financial interests exist.

## REFERENCES

1. Pastor, C, MS Granick: Scrotal lymphedema Eplasty 11 (2011), ic15.
2. Halperin, TJ, SS Slavin, AF Olumi, et al: Surgical management of scrotal lymphedema using local flaps. Plast. Reconstr. Surg. 59 (2007), 67-72.
3. Apesos, J, G Anigian: Reconstruction of penile and scrotal lymphedema. Ann. Plastic Surg, 27 (1991), 570-573.
4. International Society of Lymphology: The Diagnosis and Treatment of Peripheral Lymphedema Consensus Document. Lymphology 49 (2016), 170-184.
5. Yormuk, E, K Sevin, M Emiroglu, et al: A new surgical approach in genital lymphedema. Plast. Reconstr. Surg. 86 (1990), 1194-1197.
6. Modolin, M, A Ibrahim Mitre, JC Faes da Silva, et al: Surgical treatment of lymphedema of the penis and scrotum. Plastic Surgery/ Urology Faculty of Medicine, University, 2006
7. Kumar, P, GP Navaneethan: Resection of scrotal lymphedema. Plast. Reconstr. Surg. 116 (2005), 24e-27e.
8. Vaught, SK, AS Litvak, JW McRoberts: The surgical management of scrotal and penile lymphedema. J. Urol. 113 (1975), 204-206.
9. Sauer, PF, AJ Bueschen, LO Vasconnez: Lymphedema of the penis and scrotum. Clin. Plast. Surg. 15 (1998), 69-78.

**Shaimaa Mostafa, MD**  
**Cairo University Hospitals**  
**Al-Saray St., El-Maniel**  
**11451 Cairo, Egypt**  
**Tel: 01006179377**  
**Email: shaimaagad18@yahoo.com**