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A Surgical Treatment of Scrotal Lymphedema: A Report of Three Cases

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Abstract | **Case Report**

Penoscrotal elephantiasis, or scrotal lymphedema, is defined as an increase in scrotal volume that may become extremely pronounced. The resulting functional impairment and unsightly appearance may require extensive surgical treatment, although satisfactory functional outcomes can be achieved. We report three cases of penoscrotal elephantiasis successfully treated by wide excision of the affected tissues. The first patient, aged 70 years, had a seven-year history of scrotal and leg edema and was treated by en bloc scrotal resection, skin coverage, and penile skin grafting. The second patient, aged 21 years, had a history of surgically treated scrotal lymphangioma and presented with a progressive outgrowth of the left scrotum over two years, with cutaneous extension to the ipsilateral thigh, requiring tailored surgical management. The third patient, aged 65 years, had a 20-year history of a swollen, pachydermatous scrotum with partial burial of the penis. Ultrasound and lymphoscintigraphy confirmed massive bilateral lymphedema. In all three cases, surgery was chosen to restore anatomy, preserve genital function, and improve quality of life. Conservative lymphovenous treatments are no longer recommended; surgery remains the standard treatment except in cases of absolute contraindication.

Keywords: Elephantiasis; scrotum; lymphedema; surgery.

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INTRODUCTION

Scrotal elephantiasis (scrotal lymphedema) is an increase, sometimes considerable, in the size of the scrotum, resulting in an unsightly appearance and definite psychological distress.

It is a common condition in areas where filariasis is endemic. Outside this epidemiological context, the condition is rare, has various causes, and is often idiopathic.

The diagnosis is based on clinical findings, and treatment is surgical. We report three cases of idiopathic scrotal elephantiasis managed in the Department of Plastic Surgery at Mohammed VI University Hospital in Marrakech, together with a review of the literature.

Case 1

The patient, O.H., was a 70-year-old married farmer and father of four. His surgical history included surgery for a hepatic hydatid cyst in 1996, a supraumbilical hernia in 1997, and scrotal enlargement in 2009. He presented with scrotal lymphedema and lymphedema of both lower limbs, which had been progressing for seven years. He also reported urinary symptoms, including frequency and dysuria. Local examination revealed scrotal elephantiasis measuring 80 cm along its longest axis, with thickened skin and a buried, glove-finger-shaped penis, as well as lymphedema of both legs and feet (Figure 1).

The remainder of the clinical examination was unremarkable apart from an uncomplicated supraumbilical hernia. Pelvic MRI showed a large hydrocele with diffuse edematous infiltration and thickening of the scrotal membranes, without a detectable soft-tissue mass. Doppler ultrasound of both lower limbs was normal, as was echocardiography, with preserved cardiac function. The patient was scheduled for en bloc scrotal excision under spinal anesthesia, with release of both testes, which were covered directly with the remaining skin, and release of the penis, which was covered with a split-thickness skin graft. He also had anterior urethral stenosis, which was dilated, and an 18-Fr silicone urinary catheter was inserted (Figures 2 and 3). The surgical specimen weighed 8 kg. Histopathological examination showed acute and chronic inflammatory changes, with no evidence of malignancy or specific pathology (Figure 4).

Case 2

The patient, A.B., was a 21-year-old single man, unemployed, followed for a capillovenous malformation and previously operated on in 2022 for scrotal enlargement. He presented with a marked increase in scrotal volume that had been progressing for two years.

Clinical examination revealed an 11-cm-long scrotal mass, with a purplish-red plaque involving the left lateral trunk and the root of the left thigh, with translucent vesicles overlying the area (Figure 5).

Scrotal MRI showed cystic lesions of the left scrotum with marked thickening of the scrotal coverings extending to the ipsilateral thigh, suggestive of a lymphatic malformation associated with an ipsilateral varicocele. Renal, bladder, and prostate ultrasound showed no abnormalities.

Surgical excision of the scrotal mass, weighing 30 g (Figure 7), was performed. Histopathological examination of the specimen revealed nonspecific subacute and chronic dermatitis in the scrotal lesion and an epididymal cyst in the testicular lesion, with no evidence of malignancy.

Case 3

The patient, R.A., was a 65-year-old security guard who presented with marked chronic lymphedema of the penis and scrotum that had been progressing for 20 years and interfered with walking and sexual activity. He reported no history of filarial infection or perineal trauma.

Clinical examination revealed a scrotum measuring 20 cm in diameter (Figure 8), with thickened skin and a penis partially buried within the scrotal mass. Verrucous papules and nodules and a few isolated papillomatous lesions were also observed.

Scrotal ultrasound showed marked infiltration of the scrotal coverings with thickening of the tunica vaginalis, as well as a small bilateral hydrocele.

Lymphoscintigraphy showed complete obstruction of bilateral scrotal lymphatic drainage, consistent with obstruction of the lymphatic channels and therefore bilateral scrotal lymphedema.

Surgical excision of the scrotal mass, weighing 1 kg (Figure 9), was performed. Histopathological examination was consistent with scrotal lymphedema, with no histological evidence of malignancy.



Figure 1: Preoperative frontal view: the scrotal sac extends down to the knees because of its weight



Figure 2: Intraoperative view showing the Y-shaped surgical approach, providing adequate exposure for dissection of the penis and testes



Figure 3: Intraoperative view showing release of the penis and both testes



Figure 5: Postoperative photograph on day 9 showing normal scar healing, with the urinary catheter in place



Figure 6: Preoperative frontal view: the scrotal sac measures 11 cm along its longest axis.

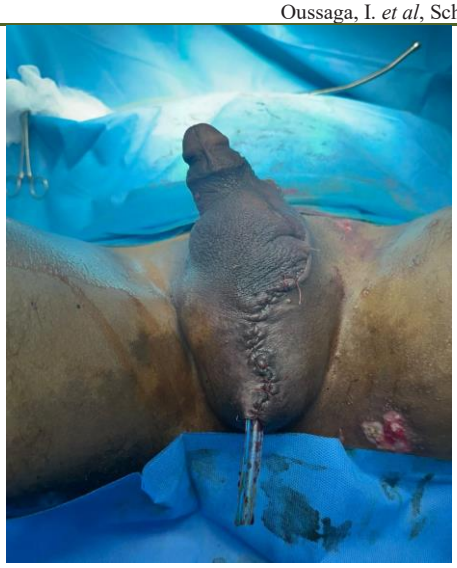


Figure 7: Intraoperative view after surgical excision



Figure 8: Preoperative view of the scrotal sac, measuring 20 cm in diameter



Figure 9: Intraoperative view after surgical excision

DISCUSSION

Penoscrotal elephantiasis may be defined as an abnormal accumulation of protein-rich fluid in the subcutaneous tissue due to a local alteration in oncotic or hydrostatic pressure. It is most often secondary to mechanical obstruction of the lymphatic channels, either due to inflammation and fibrosis or to adult filarial worms [1, 2]. The lower limbs may also be affected in some cases, as in two of our patients [3, 4].

Penoscrotal lymphedema is classically classified as:

- Primary or idiopathic: due to a congenital abnormality of the lymphatic vessels. It may become apparent at either an early or a later age.
- Secondary: it may result from a parasitic disease, namely lymphatic filariasis, which occurs in tropical and subtropical countries. It may also follow radiotherapy or pelvic cancer surgery, or occur as a sequela of surgery for urogenital schistosomiasis. These two types are mainly observed in men, while female genital involvement is less common [5, 6].

The diagnosis is clinical, based on marked scrotal enlargement with a twofold or threefold increase in wall thickness. The scrotal skin becomes thick, hard, and loses its elasticity [7, 8]. Lymphedema may extend to the penis, burying it in a glove-finger configuration, preventing sexual intercourse and sometimes causing urinary symptoms, as observed in the first patient [1].

The interval before the first consultation may be long [9], until the scrotum reaches a considerable size, sometimes weighing up to 8 kg, as in our first case.

Doppler ultrasound can rule out obstruction of the vascular axis in both lower limbs. In filariasis, it may show adult worms moving within the lymphatic vessels. Abdominal ultrasound and computed tomography, and even MRI, can help rule out a compressive cause (pelvic or abdominal tumor) [10]. Scrotal MRI provides tissue characterization that correlates well with histology and is particularly useful for defining the limits of surgical resection [11]. Treatment is surgical and is based on wide excision of the pathological scrotal wall to prevent recurrence.

Surgical excision is followed by scrotal reconstruction, for which several techniques have been described.

- Two posterolateral scrotal flaps, which are often preserved, can be used to reconstruct a neoscrotum. This technique, used by many authors, continues to provide good functional and cosmetic outcomes [12, 13, 1].
- Pedicled inguinal or suprapubic skin flaps [1, 14, 15].
- Two fasciocutaneous thigh flaps.
- Use of a split-thickness skin graft [1, 15]. This method may cause impaired spermatogenesis by altering local testicular temperature regulation [15].

For penile skin grafting, a split-thickness skin graft should be used and applied in a spiral fashion to prevent longitudinal or circumferential contracture of the penis [16, 13].

The results of this surgery are excellent, with good functional and cosmetic outcomes and a low recurrence rate.

CONCLUSION

Scrotal elephantiasis is a rare condition. Diagnosis is clinical, and radiological investigations help rule out a secondary cause.

Treatment is surgical, involving extensive resection of the affected areas and penoscrotal reconstruction.

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