

## A single-stage reconstruction on giant scrotal lymphedema: a case report



David Ralph Lienhardt Ringoringo<sup>1</sup>, Ramlan Nasution<sup>2\*</sup>,  
Kharisma Prasetya Adhyatma<sup>2</sup>

### ABSTRACT

**Introduction:** Scrotal lymphedema is a rare condition characterized by the swelling of the scrotal skin due to deterioration in lymphatic drainage. Although not life-threatening, chronic lymphedema is disabling with significant physical and psychological morbidity and complications, including impaired hygiene, urinary incontinence and immobility. This report aimed to describe the diagnosis and treatment of giant scrotal lymphedema.

**Case Presentation:** A 23-year-old man presented with a gradually enlarging scrotum. Physical examination of the genitalia shows that the patient's penis was difficult to identify, and testes were completely impalpable due to the thickness of the scrotal skin. There were neither inguinal lymph node enlargement nor other skin lesions on the scrotum. The scrotum was homogenous, with a measured dimension of 35 cm x 28 cm x 20 cm anterior to posterior. Laboratory evaluation, including complete blood count, complete metabolic panel, human immunodeficiency virus, sedimentation rate, and antibodies to strongyloides, schistosomes, and filaria, were within normal limits. The penis and testes were normal-sized and clearly demarcated from computed tomography scan, buried within the hardened scrotal soft tissues, with no signs of testicular tumor or any pelvic lymph node enlargement.

**Conclusion:** Scrotal lymphedema is a rare condition characterized by the swelling of the scrotal skin due to deterioration in lymphatic drainage.

**Keywords:** advancement flap, lymphatic, rotational flap, scrotal lymphedema.

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<sup>1</sup>Department of Urology, Faculty of Medicine Universitas Indonesia / Haji Adam Malik General Hospital, Medan, Indonesia;

<sup>2</sup>Department of Surgery, Urology Division, Faculty of Medicine Universitas Sumatera Utara / Haji Adam Malik General Hospital, Medan, Indonesia;

\*Corresponding author:

Ramlan Nasution;  
Department of Surgery, Urology Division,  
Faculty of Medicine Universitas Sumatera  
Utara / Haji Adam Malik General  
Hospital, Medan, Indonesia;  
[ramlan\\_doc@yahoo.com](mailto:ramlan_doc@yahoo.com)

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### INTRODUCTION

Scrotal lymphedema is a rare condition characterized by the swelling of the scrotal skin due to deterioration in lymphatic drainage.<sup>1</sup> There are two types of lymphedema, primary and secondary lymphedema. Primary lymphedema is caused by a disturbance in the lymphatic vessel's development due to genetic mutation or idiopathic. At the same time, secondary lymphedema occurs by external factors, which leads to the damage of the lymphatic vessels. Secondary lymphedema can be caused by lymphatic filariasis and onchocerciasis helminthic diseases.<sup>2,3</sup> Those are capable of causing permanent disabilities or even death to the host. Furthermore, filariasis and onchocerciasis could cause lymphedema, hydrocoele, elephantiasis, skin disease and blindness.<sup>2,3</sup> Primary lymphedema is uncommon; it affects 1.2 per 100,000 persons less than 20 years of age. Secondary lymphedema affects the majority (90%) of patients, principally

the lower extremities of adults, owing to infection or treatment for malignancy.<sup>4</sup> Although not life-threatening, chronic lymphedema is disabling with significant physical and psychological morbidity and complications, including impaired hygiene, urinary incontinence and immobility.

Although medical therapy, such as the use of filaricides, causes the filarial worms to be eliminated quickly, the lymphoedematous alterations they cause are generally resistant to medical treatment. Other medical treatments, such as diuretics and scrotal elevation, have been proven ineffective and are no longer recommended. Surgery, therefore, is the only way to achieve an optimum reduction in tissue size, which can be difficult at times, and this can sometimes be challenging.<sup>5</sup>

Reporting of giant scrotal lymphedema in industrialized countries is limited to a small number of case reports, mainly

attributed to surgery, irradiation, or malignancy. The aim of this paper is to report the case of a patient with giant scrotal lymphedema, as well as the surgical therapy and early outcomes.

### CASE PRESENTATION

A 23-year-old man presented with a gradually enlarging scrotum. The patient had not been experiencing significant disability and had been physically active until one year prior when the lymphedema began to worsen (Figure 1). The patient denied any fever, malaise, or other symptoms of viral infection before the scrotal enlargement. The patient worked as an office worker with good hygiene. Physical examination of the genitalia shows that the patient's penis was difficult to identify, and testes were completely impalpable due to the thickness of the scrotal skin. There were neither inguinal lymph node enlargement nor other skin lesions on the scrotum. Physical

examination of other systems revealed otherwise normal findings. The scrotum was homogenous, with a measured dimension of 35 cm x 28 cm x 20 cm anterior to posterior.

Laboratory evaluation, including complete blood count, complete metabolic panel, human immunodeficiency virus, sedimentation rate, and antibodies to

strongyloides, schistosomes, and filaria, were within normal limits. The penis and testes were normal-sized and clearly demarcated from computed tomography scan, buried within the hardened scrotal soft tissues (HU: 4-40), with no signs of testicular tumor or any pelvic lymph node enlargement (Figure 2).

The patient was scheduled for elective surgery. Glans penis and penile shaft were identified. We incised the skin until the dartos fascia and degloved the penis. A urethral catheter was inserted, we incised the scrotum, identified the tunica vaginalis of each testis, and preserved both spermatic cords after all the hardened scrotal soft tissue was excised (Figure 3). Some remaining elastic scrotal skin was left. The perineal skin was then mobilized, and the scrotum was reconstructed using an advancement flap. The final procedure was a reconstruction of the penile skin, utilizing the remaining elastic scrotal and perineal skin which the subcutaneous fat layer was already removed, using a rotational flap (Figure 4).

In our patient, no postoperative complications occurred. Seven days post-operation, the wound was dry with no pus, wound dehiscence, or flap necrosis. The minimal hematoma was observed and tension-free (Figure 5). Histopathology examination found enlarged lymphatic cells without any trace of microfilariasis (Figure 6).

At 14 days post-operation, the scrotum shows epithelization with no pus, wound dehiscence, or necrotic area. The minimal hematoma was also observed and tension-free. The patient reported no discomfort, and sufficient function and aesthetics were achieved (Figure 7).

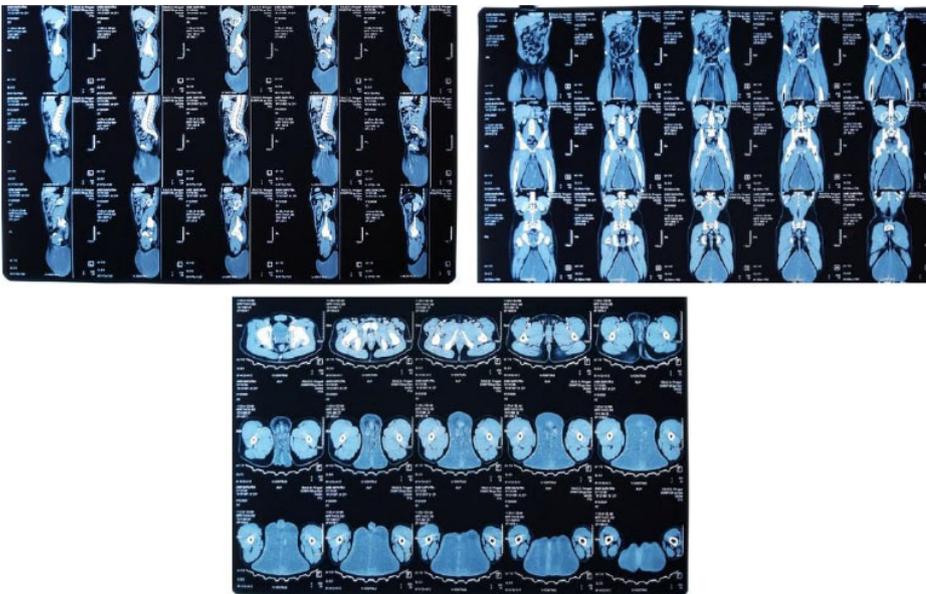
**DISCUSSION**

Lymphedema is defined as an abnormal accumulation of protein-rich fluid in soft tissues due to a derangement of the lymphatic drainage.<sup>6,7</sup> There is an imbalance between the production and the absorption of the lymph. In chronic conditions, this is shown with fat storage and thickening of fibrous tissue. The obstruction to the lymphatic flow causes ductal dilation, along with hypertrophy and hyperplasia of the connective tissue, interstitial edema, and chronic inflammation.<sup>6,7</sup>

Lymphedema is classified as primary (idiopathic) or secondary forms according to its etiology. Primary lymphedema is caused by an intrinsic defect of the lymphatic vessels, while secondary lymphedema may occur after surgery, radiation, tumors, and infections.<sup>6</sup>



**Figure 1.** Preoperative clinical scrotal appearance.



**Figure 2.** Computed tomography scan results.



**Figure 3.** Excised tissue.

Lymphedema of the male genitalia presents a complicated management problem. Little information regarding treatment is available in the literature, and medical treatment has usually proved ineffective. A common approach involves the excision of involved tissue (scrotoplasty).<sup>8</sup>

There are various surgical methods available for scrotal lymphedema. Daniel et al. reported performing rotation flap scrotoplasty followed by subsequent orchidopexy six months after the first surgery.<sup>8</sup> Another report by Filho et al. used perineal scrotal skin flaps to prepare the scrotal sac.<sup>9</sup>

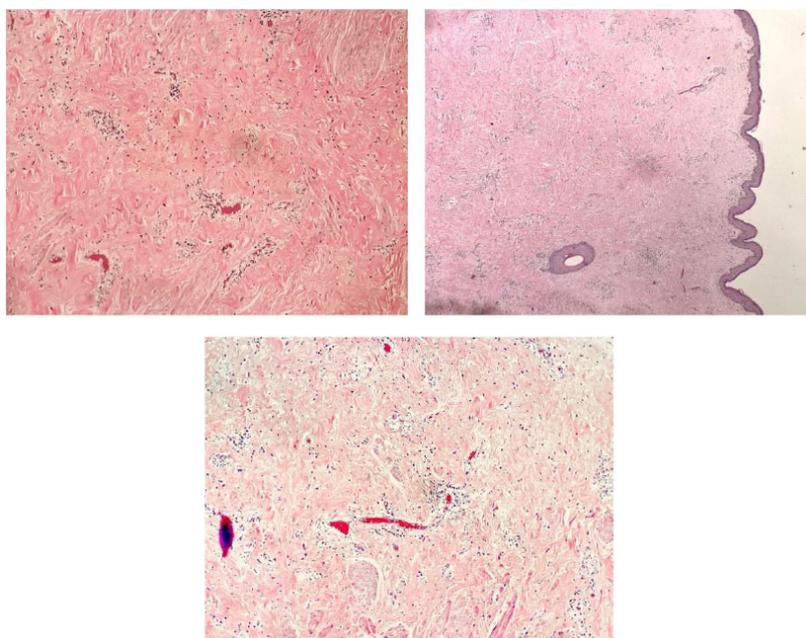
Despite the different surgical approaches accessible in the literature, there is no definitive rule as to which is superior to the other. This surgery is relatively straightforward and results in a pleasing cosmetic outcome.<sup>10,11</sup> The limitation of this study is that the etiology of giant lymphedema remains unknown, whether caused by radiation, malignancy or congenital.



**Figure 4.** Postoperative Result



**Figure 5.** Scrotum appearance 7 days after the operation.



**Figure 6.** Histopathology examination.

## CONCLUSION

Scrotal lymphedema is a rare condition characterized by the swelling of the scrotal skin due to deterioration in lymphatic drainage. Our patient is a 23-year-old man who presented with a gradually enlarging scrotum with no history of infection. We performed a single-stage reconstruction of the scrotum and penis using advancement and rotational flap techniques. The patient reported no discomfort and was pleased with the result. The surgeon's expertise, as well as personal preferences, plays a role in deciding which methods to execute.

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## CONFLICT OF INTEREST

None declared.

## ETHICAL CONSIDERATION

Written informed consent was obtained from the patients and a copy of which had been sent to be reviewed by the editorial team.

## AUTHORS CONTRIBUTION

All of the authors contributed to the study from the conceptual framework, data gathering, and data analysis until interpreted the study results on publication.

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**Figure 7.** Scrotum appearance 14 days after the operation.

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