Use of Panniculus Flap with Delayed Penile Reconstruction for Management of Buried Penis in a Patient with Massive Localized Lymphedema of the Scrotum: A Case Report

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Abstract

Buried penis is a rare debilitating phenomenon that has been associated with obesity, lymphedema, radical circumcision, and penoscrotal elephantiasis. Traditional management of this condition involves limited panniculectomy, excision of penile shaft skin, and skin grafting. Buried penis secondary to massive localized lymphedema of the scrotum is seldom described in the literature and further complicates the use of local reconstruction as local tissue is damaged and may be unfit for reconstructive purposes. The authors report the case of a morbidly obese patient with buried penis secondary to massive localized lymphedema of the scrotum reconstructed using a panniculus flap and delayed penile skin grafting. After undergoing scrotal reconstruction using a panniculus flap, the patient returned to the operating room five days later to undergo penile reconstruction with meshed split thickness skin grafting. Sequential compression wrapping between the first and second procedures allowed the swelling and edema to decrease significantly so that the penile bed would be more amenable to split thickness skin graft. In treating buried penis in the setting of massive scrotal lymphedema, the authors propose reconstructive staging and sequential compression dressings between procedures to maximize patient safety by limiting postoperative complications and minimize edema.

Keywords: Buried penis; Massive localized lymphedema; Scrotal reconstruction

Introduction

Acquired buried penis is a rare phenomenon that has been associated with obesity, lymphedema, radical circumcision, and penoscrotal elephantiasis. Those afflicted by the rare condition suffer from sexual dysfunction, psychological stress, difficulty ambulating, surgical infections, and chronic wound ulcerations. Surgically correcting a buried penis is a unique and difficult challenge that requires a multidisciplinary approach including plastic and urologic surgeons.

Buried penis secondary to massive localized lymphedema of the scrotum is seldom described in the literature and further complicates the use of local reconstruction as local tissue is damaged and may be unfit for reconstructive purposes [1]. Careful preoperative planning that addresses this multifactorial pathology is imperative to ensure appropriate treatment and recovery. We report the case of a morbidly obese patient with buried penis secondary to massive localized lymphedema of the scrotum reconstructed using a panniculus flap and delayed penile skin grafting. We emphasize the importance of staging operative procedures in morbidly obese patients to optimize patient safety by reducing intraoperative and postoperative complications.

Materials and Methods

A 44 year-old morbidly obese male (BMI 71) after 100lbs weight loss presented with massive lymphedema and ulcerations of his mons and scrotum that had significantly enlarged over the past three years. On exam his scrotum was significantly inflamed, making it difficult for him to ambulate (Figure 1 and 2). Due to the extent of his buried penis, the patient voided by allowing urine to dribble from the area between his pannus and scrotum for over 14 years. This made it difficult for him to have proper hygiene and impaired him from engaging socially. He agreed to undergo reconstructive surgery with the plastic surgery and urology team to treat this debilitating condition.

In the operative theater the patient underwent mons lipectomy and scrotal resection with local tissue rearrangement in collaboration with urology who performed a circumcision and cystoscopy.
Prior to scrotal resection, urology identified the penis and performed a dorsal slit procedure that extended 20 cm onto and through the scrotal skin until the glans was identified. The penile shaft was noted to be denuded and the scrotal skin had invaginated. The surrounding scrotal tissue was then dissected using sharp and blunt dissection, liberally using cautery, clips, suture ligatures, and the Ligasure device. The total excised scrotal tissue was measured and weighed 35 pounds. The phallus was then dissected free to mobilize the penile shaft and the suspensory ligament.

To reconstruct the scrotum the superior portion of the mons was taken down and tacked to the pubis and the base of the penis. Next two 10 x 20 cm flaps from the residual pannus were cleared of lymphedematous fluid, folded over and reapproximated to create a neoscrotum. This was then tacked up to the base of the penis laterally on each side to allow the penis to be up against the pubis. At this time we were approaching our five hour safety threshold for the procedure and deferred skin grafting. The patient's prolonged surgical course in the lithotomy increased his risk for rhabdomyolysis, neuropraxia and compartment syndrome [2-4]. By staging the reconstruction we were also able to avoid possible complications of seroma and infection secondary to swelling [5]. The patient was then transferred to the PACU in stable condition. The length of the procedure was just under five hours.

Results

On postoperative day 2 the patient endorsed ambulating and adequate pain control. After two additional days of observation, the patient was discharged home with the Foley in place. Five days later, the patient returned to the operative room for delayed penile reconstruction with split thickness skin graft. Intraoperatively, the patient’s scrotal edema was noted to be markedly decreased, the penile shaft was then skin grafted and subsequently dressed with bacitracin and Xeroform. After a bolster was placed and stapled in place to the body and glans of the penis, the donor site was dressed in the usual fashion and the patient was transferred to PACU in stable condition. The estimated blood loss was 10 ml and the procedure length was 1.5 hours. The patient’s postoperative course was uncomplicated and he was discharged the next day. The sequential scrotal wrapping controlled the edema and produced an appropriately sized scrotum (Figure 3 and 4). The patient can now wear pants and can walk several blocks which were impossible before the procedure.

Discussion

Though the management of buried penis has been extensively described in the literature Pestana et al. [5] are first to present a modified algorithm to the management of buried penis [6-10]. Their approach initially involves releasing the scar contracture of the shaft skin, resecting skin between the panniculus fold and pubic hair if there is abdominal fat pad impingement, and then releasing the suspensory ligament if more phallus exposure is required. Primary closure is then pursued if there is adequate shaft skin and tissue for coverage of the penis, but in most cases this is not possible due to the high likelihood that shaft skin removal is required as part of the initial release. In these cases, a split thickness skin graft is recommended for coverage with tissue flaps reserved as a secondary option [6,7,9]. While the algorithm proposed by Pestana et al. addresses buried penis management, it does not address operative management required...
in patients with buried penis in the setting of massive localized lymphedema of the scrotum.

Massive localized lymphedema (MLL), the condition of chronically impaired lymphatic drainage originally coined by Farshid and Weiss, appears to be increasing secondary to the rise in the incidence of morbid obesity in today’s society [11-16]. The chronic retention of fluid in the extravascular space expands connective tissue causing loss of elasticity and inflammation. This destructive process is exacerbated by the decreased inflammatory cell flow which predisposes the tissue to infection. For these reasons, afflicted tissue may be unfit for local reconstruction.

Conventional non-operative management of MLL consists of compression stockings, elevation, and bed rest has been deemed ineffective in treating scrotal MLL, especially when activities of daily living are impaired [13,17]. Surgical treatment options for MLL include physiologic and ablative reconstruction operations. Physiologic reconstruction involves building channels that expand the transport capacity of lymphatic fluid. This technically challenging option has yet to be established in the treatment of scrotal MLL. Ablative reconstruction involves removing affected excess scrotal skin and soft tissue either minimally or entirely. Minimal skin resection and soft tissue resection may allow for primary closure while more aggressive resection may necessitate resurfacing with skin grafting [9,18]. Although full thickness skin grafts (FTSG) have traditionally been used for penile reconstruction, successful use of split thickness skin graft (STSG) has been extensively described in the literature [7,8,19-21]. STSG is ideal due to high rates of success in contaminated fields, ease of harvest, and excellent cosmetic results [19]. Due to the high risk of contamination and difficult shape of the graft bed, we elected to use meshed STSG in our case.

At the conclusion of the first case, the patient’s reconstructed scrotum was wrapped with compression dressings in order to control the amount of lymphedema, wound breakdown, and swelling to the area. Daily sequential wrapping of the scrotum was performed until the patient was taken back to the OR. This decision was based on the standard conservative management of lymphedema to the scrotum, which consists of a penile compression bandage and tight scrotal support [22]. The extended period of time between reconstruction and STSG in addition to compression with Ace bandages allowed the penile tissue to be more favorable for STSG due to decreased swelling and lymphedema to the graft bed. This interval time period also allowed for early ambulation which helped minimize the patient’s risk for postoperative deep venous thrombosis (DVT). Our patient’s Caprini Score was calculated as 12 (Age >41, major surgery >3 hours, BMI >50, hx of DVT), which is considered high risk for the development of DVTs [23]. Due to his multiple risk factors, the classically described period of approximately 4 days of immobility and bed rest to ensure good penile graft take was not observed [19]. In our case, we did not encounter any problems with the graft despite early ambulation, leading us to conclude that as long as the graft is bolstered and dressed properly bed rest is not necessary for the graft to take successfully.

Staging the reconstruction not only helped limit edema and postoperative complications, it also maximized patient safety. Due to the patient’s distorted anatomy, scrotal dissection required meticulous technique as multiple large vessels that resembled spermatic cord were encountered. As reported in the urologic surgery literature, obese patients undergoing surgery lasting five hours or longer in the

lithotomy and exaggerated lithotomy position are at increased risk of risk of rhabdomyolysis, subsequent renal injury, compartment syndrome and neuropraxia. [2-4,24] Our patient’s morbid obesity and prolonged operative time put him at high risk for developing these complications. By staging the operative procedures, we were able to reduce his intraoperative and postoperative risks. Therefore, we encourage staging of these types of prolonged procedures especially in patients whose BMI is greater than 50.

Conclusion

Lymphedema of the penis can be debilitating. It causes lymph obstruction, uncomfortable swelling and inflammation, and impairment of daily activities. Buried penis secondary to massive scrotal lymphedema is a unique reconstructive challenge that should be addressed with staged procedures to limit edema, postoperative complications, and to maximize patient safety.

References

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