



Ventral Slit Scrotal Flap: A New Outpatient Surgical Option for Reconstruction of Adult Buried Penis Syndrome

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INTRODUCTION We present a novel technique using ventral slit with scrotal skin flaps (VSSF) for the reconstruction of adult buried penis without skin grafting.

TECHNICAL CONSIDERATIONS An initial ventral slit is made in the phimotic ring, and the penis is exposed. To cover the defect in the ventral shaft skin, local flaps are created by making a ventral midline scrotal incision with horizontal relaxing incisions. The scrotal flaps are rotated to resurface the ventral shaft. Clinical data analyzed included preoperative diagnoses, length of stay, blood loss, and operative outcomes. Complications were also recorded. Fifteen consecutive patients with a penis trapped due to lichen sclerosus (LS) or phimosis underwent repair with VSSF. Each was treated in the outpatient setting with no perioperative complications. Mean age was 51 years (range, 26-75 years), and mean body mass index was 42.6 kg/m² (range, 29.8-53.9 kg/m²). The majority of patients (13 of 15, 87%) had a pathologic diagnosis of LS. Mean estimated blood loss was 57 cc (range, 25-200 cc), mean operative time was 83 minutes (range, 35-145 minutes), and all patients were discharged on the day of surgery. The majority of patients (11 of 15, 73.3%) remain satisfied with their results and have required no further intervention. Recurrences in 3 of 15 (20.0%) were due to LS, panniculus migration, and concealment by edematous groin tissue; 2 of these patients underwent subsequent successful skin grafting.

CONCLUSION VSSF is a versatile, safe, and effective reconstructive option in appropriately selected patients with buried penis, which enables reconstruction of penile shaft skin defects without requiring complex skin grafting. UROLOGY 85: 1501–1504, 2015. © 2015 Elsevier Inc.

Buried penis syndrome is an unusual and disabling condition in both children and adults that can be difficult to reconstruct. Corporal length is typically normal with poor external phallic exposure, but the lack of a standardized nomenclature to describe the condition has led to a variety of synonyms in the literature including the trapped, hidden, concealed, inconspicuous, and buried penis.^{1,2} Etiologies include trapping by cicatrix, burying by lymphedema or large suprapubic fat pad, or a combination of the two.¹ Various reconstructive techniques and treatment algorithms have been described, but there is no universally accepted standardized treatment because of the multifactorial nature of this syndrome.¹⁻³

We describe a new technique for managing trapped-type concealed penis in adults using ventral slit with scrotal skin flaps (VSSF) to resurface the penile shaft, and we present our initial experience, including postoperative outcomes.

MATERIALS AND METHODS

Patients

A retrospective review of an institutional review board–approved database was performed on all men undergoing reconstruction of adult buried penis from 2008 to 2014. All patients who underwent phalloplasty with VSSF and restoration of penopubic angle for correction of trapped penis were included in the analysis. We excluded patients who had suprapubic adiposity that contributed significantly to the buried penis syndrome. Demographic, clinical, operative, and outcomes data were analyzed. Postoperative assessment of patient satisfaction was assessed by chart review.

Technique

Surgery was performed under general anesthesia in the supine position, and all patients received perioperative antibiotics.

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Figure 1. A patient with trapped-type buried penis. An initial ventral slit allows exposure of the glans, and a retraction suture aids in exposure. Although there is ample penile shaft skin dorsally and laterally, a large ventral skin defect needs coverage. (Color version available online.)

A Foley catheter was used to identify the urethra. The initial surgical maneuver was glans exposure and penile traction. A vertical incision was made on the ventral aspect of the distal foreskin (ventral slit) until the glans could be visualized (Fig. 1). A 2-0 silk traction suture in the glans facilitated penile exposure. Pulling on this traction suture provided for the identification of the junction of the glans and the preputial skin and allowed for reduction of foreskin adhered to the lateral shaft.

Once the phimotic ring is reduced, attention is turned toward closure. The dorsal penile skin is mobilized to allow for closure dorsally. With the penis degloved, the penopubic angle is anchored with 2-0 braided, nonabsorbable sutures securing the tunica albuginea at the base of the penis to the underlying deep dermis of the dorsolateral skin. Although skin coverage is maintained dorsally, the resulting defect in the ventral skin extends from the glans to the penoscrotal junction (Fig. 1).

To cover this ventral skin defect, a vertical incision is carried through the midline of the scrotum. At the distal end of the scrotal incision, 2-cm horizontal relaxing incisions are made to create bilateral rotational anterior scrotal skin flaps (Fig. 2). The deep layers of dartos are then mobilized along with the skin as a transferring fascia to preserve cutaneous blood supply. This scrotal tissue is rotated up toward the distal end of the penis and approximated to the glans and the dorsolateral shaft skin. The penoscrotal angle is recreated with 2-0 braided, permanent sutures. The scrotum is closed by advancing the lateral scrotal tissue medially (Fig. 3); 4-0 braided absorbable sutures are used for deep layers and interrupted 4-0 chromic for skin closure. A compressive bandage is placed and the Foley catheter removed at the end of the case.

RESULTS

VSSF was performed on 15 men who underwent repair of adult concealed penis during the study period. Mean age was 51 years (range, 26-75 years), and all patients were obese (mean body mass index, 42.6 kg/m² [range, 29.8-53.9 kg/m²]). More than half (8 of 15, 53.3%) also had diabetes (Supplementary Table 1). In the majority of patients (11 of

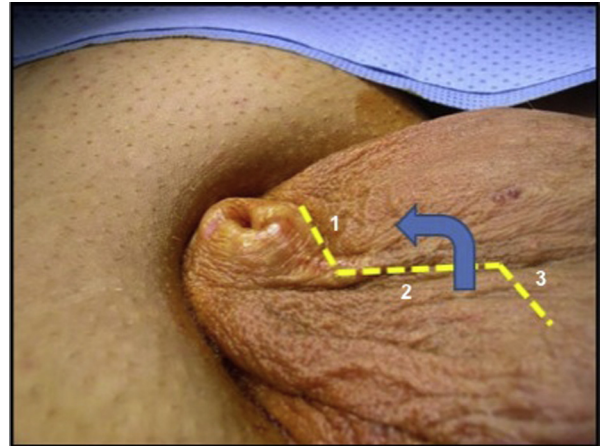


Figure 2. Concealed penis, trapped for 2 years by a cicatrix. (1) A ventral slit is made starting at the distal foreskin and continued toward the scrotum until the glans is accessible and the penis can be put on stretch. (2) The midline ventral incision is continued from midshaft to midscrotum. (3) A relaxing incision is made starting from midline and extending 2 cm to the right, creating the rotational flaps. (Color version available online.)



Figure 3. The right scrotal flap is used to reconstruct the ventral shaft of the penis. The scrotal flap is moved upward and rotated counterclockwise, covering the skin defect. The penile shaft is closed in 2 layers, and the scrotum is closed primarily for excellent cosmesis. (Color version available online.)

15, 73.3%), the penis had been buried for >1 year. Most (13 of 15, 87%) had biopsy-proven lichen sclerosus (LS), and 11 of 15 (73%) had phimosis. Seven of the 15 patients (46.7%) had at least 1 previous surgical intervention, and 2 (13.3%) had received treatment for prostate cancer before the onset of symptoms (Supplementary Table 2). Six of 15 patients (40.0%) presented with voiding difficulties, and 5 of 15 (33.3%) had concurrent urethral stricture disease. Only 3 of 15 men (20.0%) were noted to have erections sufficient for intercourse. No men had genital lymphedema or suprapubic adiposity that significantly contributed to the concealed penis.



Figure 4. Photograph of a patient 2 years after ventral slit with scrotal skin flaps repair. The phallus remains exposed, and he reports resolution of voiding difficulties and return of sexual function. (Color version available online.)

The mean operative time was 83 minutes (range, 35-145 minutes), and mean estimated blood loss was 57 cc (range, 25-200 cc), and no perioperative complications were encountered. In addition to phalloplasty, 3 patients concurrently had meatoplasty or meatotomy, 3 had a circumcision, 2 had penile prosthesis insertion, and 1 had a perineal urethrostomy. All patients were discharged on the day of surgery with 3 days of cephalexin.

With a mean follow-up of 12 months (range, 3-29 months), 11 of 15 patients (73.3%) expressed qualitative satisfaction as documented in postoperative follow-up visits and have required no further interventions (Fig. 4). Recurrence of buried penis occurred in 3 patients (20.0%). Two patients recurred at 1 year, and both underwent abdominoplasty with split-thickness skin grafting, with both reporting satisfactory results at 6 and 23 months. One patient recurred at 4 weeks and has not yet undergone further treatment.

COMMENT

A variety of procedures have been described to correct adult buried penis, such as primary closure, z-plasty, skin grafting, and lipectomy, but the use of scrotal skin has not been widely used as a reconstructive option.² Recently, the use of scrotal flaps in the reconstruction of large skin defects after wide local excision of extramammary Paget disease has been advocated,⁴ as well as the use of scrotal flaps in concealed penis cases due to lymphedema,¹ both with good outcomes. We have adopted a similar technique of using rotational scrotal flaps in adults for concealed penis due to trapping from LS and severe phimosis, with promising results.

Technical Considerations

The goals of surgery for adult buried penis syndrome are return of genitourinary function with the best cosmetic

result possible.^{1,2} Z-plasty reconfiguration, local skin flaps, and preputial unfurling have been described; however, these techniques have primarily been studied in the pediatric population.⁵⁻⁸ More recently, split-thickness skin grafts⁹ have become increasingly popular when primary closure or z-plasty does not provide sufficient skin coverage.² Our technique offers coverage of areas where penile shaft skin is lacking, while avoiding the morbidity of skin graft harvesting and hospitalization during the initial graft take.

Complex z-plasty rearrangement may be beneficial in small defects or correction of penoscrotal webbing.⁶ However, we prefer scrotal flaps to other complicated local tissue rearrangements^{2,3,10} as it is a simpler technique, which allows continuation of the ventral slit penile incision to be carried easily all the way down to the anterior scrotum. Scrotal skin is ideal for penile shaft coverage because it is pliable, stretches easily, and has no subcutaneous fat.¹¹ Additionally, because of the highly vascularized nature of the scrotum, scrotal flap necrosis is rare, and primary closure is possible after loss of up to 50% of scrotal skin.¹¹⁻¹³

Our Patients and Outcomes

Although all the patients in our series were obese, this technique was primarily used on patients who had concealed penis because of trapping from a cicatrix caused by LS or phimosis rather than by a redundant panniculus.¹ Patients who had buried or complex-type concealed penis were managed with skin grafting and abdominoplasty. This assessment was made by the surgeon based on physical examination findings at the initial consultation.

In the pediatric literature, one concern with using scrotal skin for penile reconstruction is poor cosmesis due to the hair-bearing nature of scrotal skin.⁸ In our series of postpubertal obese men, however, this has not been an issue postoperatively. Even though the rotational scrotal skin flap may transfer some hair-bearing and/or rugated skin to the proximal penile shaft, the functional outcomes significantly outweigh the minimal cosmetic detriment, and we have not had complaints relating to transferred hair or rugations.

Additional surgery, such as abdominoplasty or skin graft, may be necessary after VSSF. We use local flaps on patients we assess to have a concealed penis as a result of trapping; thus, additional procedures to address a prominent suprapubic fat pad such as lipectomy or abdominoplasty are not performed during the initial operation. Careful patient selection is imperative, as poorly selected patients may have an unsatisfactory surgical outcome, highlighting the need for a thorough physical examination before surgery.¹

The 3 recurrences noted in our series were likely due to the progressive scarring characteristic of LS, additional weight gain, or development of lymphedema, with possible improper patient selection. We do not routinely prescribe patients postoperative topical steroid

cream, and perhaps, given the high prevalence of LS, this could have prevented progression and recurrence. Buried penis syndrome exists as a spectrum, with obesity and abdominal or scrotal components playing variable roles. Our technique is best suited for less advanced cases with isolated penile pathology having salvageable penile skin.

Limitations

Our study represents a single, high-volume, institutional experience in treating these patients with complex penile deformities using a new technique. Although all the patients were obese, we believe our method is potentially applicable to any patient presenting with buried penis and may avoid unnecessary adjunctive procedures. The patients who underwent VSSF were highly selected, and in cases where suprapubic adiposity contributes to the etiology, we have found that a suprapubic lipectomy with or without skin grafting is often necessary, with combined urologic and plastic surgical reconstructive efforts. However, in our series of all patients with adult buried penis syndrome, we managed roughly 25% with a VSSF procedure alone.

CONCLUSION

Our initial experience with VSSF demonstrates that it is a safe, effective, and minimally invasive technique in the management of adult concealed penis. This technique is an excellent option for local flap coverage in appropriately selected patients as an alternative to multiple penile rotational flaps or complex skin grafting procedures.

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APPENDIX

SUPPLEMENTARY DATA

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.urology.2015.02.030>.