

Modern Management of Adult-Acquired Buried Penis

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OBJECTIVES	To report our successful experience in managing acquired adult buried penis from nontraumatic origins. We describe a combination of modern techniques involving escutcheonectomy, scrotoplasty, split-thickness skin graft, and fibrin sealant application for genital reconstruction.
METHODS	From 2004 through 2007, 5 men with acquired adult buried penis underwent surgical repair at our medical center, by a single surgeon. A buried penis was a result of obesity in 4 of 5 patients, although other complicating factors, such as scrotal lymphedema, lichen sclerosis, and peripenile woody induration, were present in 3 of the 5 patients. All 5 patients required scrotoplasty and split-thickness skin grafts fastened with dilute fibrin glue to cover the penile skin defects. Excision of the excessive suprapubic fat pad (escutcheonectomy) was performed in the 4 obese patients.
RESULTS	All patients achieved excellent cosmetic results, with successful and lasting unburying achieved in all cases. The operative difficulty, intraoperative blood loss, and length of hospital stay varied. No wound complications developed at the skin donor sites, and a rate of 80% to 100% graft take was observed on the penis at 2 months postoperatively. Abdominal wound complications were noted in 2 patients and resolved with daily dressing changes.
CONCLUSIONS	Acquired adult buried penis is a correctable problem. The use of combined techniques, including surgical unburying, scrotoplasty, escutcheonectomy, and split-thickness skin grafts fixed with dilute fibrin glue, appears to be a useful approach to repair this unique condition. UROLOGY xx: xxx, xxxx. © 2008 Elsevier Inc.

A “buried penis” is most commonly observed in pediatric groups, but it is also seen in adults. In adults, the etiology is almost always acquired, with a major association between a buried penis and obesity. The condition can be worsened by injudicious circumcision, massive swelling of the scrotum due to lymphedema, lichen sclerosis et atrophicus (also known as balanitis xerotica obliterans), and scar contraction after circumcision.¹⁻⁴ A buried penis in adults can be troublesome. The patients universally have lower urinary tract symptoms, the worst of which is the discharge of urine from the buried urethral meatus, to drip over the scrotum and thigh. A complete loss of sexual activity and urinary tract infections have also been reported.⁵ In the present study, we focused on the acquired cases, and we excluded iatrogenic cases secondary to overexuberant skin removal during circumcision. This was because the treatments are different for these two distinct groups. We report our successful experience using a spectrum of techniques, combining escutcheonectomy, scrotoplasty, pe-

nile split-thickness skin grafting (STSG), and fibrin glue fixation of skin grafts for repair of the adult buried penis.

MATERIAL AND METHODS

Patients

A retrospective chart review was performed. From 2004 through 2007, the data from 5 consecutive patients who had undergone treatment for an adult buried penis were reviewed. All patients had been treated by a single surgeon. Patients with a buried penis from overexuberant circumcision were excluded, because they would not require escutcheonectomy or scrotoplasty (these patients are treated with penile degloving and STSG alone). Of the 5 patients included in the present study, 4 had a buried penis as a result of obesity, although for 2 it had resulted from a combination of obesity and other factors (severe lymphedema of the scrotum and lichen sclerosis et atrophicus causing severe penile glans-shaft adhesion). One nonobese patient had an unusual peripenile inflammatory condition that had resulted in mounded-up, thickened, peripenile tissue, resulting in a buried penis. Only 1 had previously undergone circumcision.

Operative Technique

The 4 patients with an obesity-related buried penis had a prominent and usually overhanging escutcheon and some degree of “scrotalization,” which formed a web in the ventral penoscrotal junction (Fig. 1A). We defined “escutcheon” as the

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Submitted: August 28, 2007, accepted (with revisions): January 31, 2008



A



B

Figure 1. (A) Typical acquired buried penis in obese man. He had prominent escutcheon and penoscrotal web that required surgical repair. (B) Excellent cosmesis seen immediately after escutcheonectomy, scrotoplasty, and penile reconstruction in same patient. Note, STSG was tacked down by suture and further fixed by adding fibrin sealant.

tissue immediately above the penis over which pubic hair is distributed and that, in our patients, created an overhanging “pannus-like” area of tissue distinct from the actual pannus (which is usually defined as overhanging abdominal wall tissue).

The penile incision began with a circumferential incision just 2 to 3 mm proximal to the coronal sulcus. The glans penis and shaft were fully exposed. We released the penoscrotal web and removed the aberrant scrotal tissues if they were bulky. The scrotoplasty was completed with a two-layer closure without

any drainage tube. The escutcheonectomy was then started with a transverse curved incision, forming a flap over the escutcheon and above the proximal penis. We trimmed the redundant escutcheon, and the flap was defatted to 0.25 in. thick. The lower tip of the flap was brought down and fixed to the superficial suspensory ligament of penis with multiple interrupted 2-0 Vicryl sutures. The escutcheonectomy wound was then closed, with all efforts made to minimize the potential space and avoided seroma formation. Closed-suction drains were placed under the escutcheonectomy flap whenever indicated.

The final step was to achieve skin coverage on the penis. The total surface area of the penile skin defect was measured, and the corresponding size of the donor site for STSG was planned. The left thigh was often chosen in our series. The STSG, with a thickness of 0.012 to 0.015 in., was harvested using an electric dermatome. The proximal end of the graft was tacked down with multiple fixation sutures to the skin first. Dilute fibrin sealant (freeze-dried Tisseel VH, Baxter, Deerfield, Ill), reconstituted according to the manufacturer’s instructions, was sprayed onto the penile surface to glue down the entire graft using the Tissomat fibrin glue spray device (Baxter) (Fig. 1B). (Dilute fibrin glue contains roughly 10% of the normal amount of calcium present in Tisseel and slows the hardening of the glue from seconds to minutes.)

The donor surface was covered with a transparent adhesive dressing (OpSite, Smith & Nephew, London, UK) with a tiny evacuated tube drain (TLS, Porex Surgical, Newman, Ga) to remove exudates and allow the dressing to stay on longer. The grafted penis was dressed with a 6-in. elastic antimicrobial gauze (Kerlix, Tyco/Kendell, Mansfield, Mass). Adequate local anesthesia with 0.5% bupivacaine (Marcaine) containing 1:200,000 epinephrine was used to minimize postoperative discomfort in the escutcheonectomy and scrotoplasty wounds. The dressing was removed and the graft “deblebbed” 24 hours postoperatively, if necessary.

The patient was observed in the hospital for 72 hours at bed rest with bathroom privileges and for another 24 hours at normal activity levels. Once the patient was performing his own dressing changes, usually by postoperative day 5, he was discharged home with a prescription for prophylactic oral antimicrobial agents such as amoxicillin/clavulanate for 14 days and instructions to shower daily and dress the penis lightly with soft, 4-in. gauze sponges (eg, Johnson & Johnson “Topper” dressing sponges, or other nonadherent absorbent pads). Typical “open weave” gauze sponges, designed to debride wounds when removed, were not recommended.

RESULTS

The mean age of the 5 patients was 39 years (range 31 to 47). In 4 of the 5 patients, the buried penis was directly related to morbid obesity, with a mean body weight of 167 kg (range 126 to 238; body mass index 43 to 71 kg/m²). In 1 patient, the condition was the consequence of long-term inflammatory changes in the scrotum and penis of unknown etiology. This patient had been a paraplegic for more than 30 years. Of the obese patients, only 1 had undergone childhood circumcision. The comorbidities identified in the 4 obese patients included diabetes in 2 (50%), hypertension in 2 (50%), hyperlipidemia in 2 (50%), and chronic joint pain in 2 (50%).



A



B

Figure 2. Extreme case of buried penis. **(A)** Patient's penis was buried in huge scrotum and covered by huge escutcheon. **(B)** Same patient after complete scrotal excision and one-stage reconstructions, as described.

All 5 patients were moderately to severely depressed, and 1 had suicidal ideation.

The blood loss during the procedures varied from 100 to 1500 mL. The mean hospital stay was 6.6 days (range 4 to 13). No perioperative complications developed, even in these high-risk patients.

Scrotoplasty was successful in 100% of patients without complications. The donor sites healed well, and no acute infection occurred. Two patients had superficial wound dehiscence in the escutcheonectomy/suprapubic wounds and were treated nonsurgically. In 1 case, we had initially tried to cover his unburied penis with native penile skin, but this maneuver failed owing to prolonged postoperative penile swelling that caused significant pain. He ultimately underwent a second operation with removal of the native penile skin and placement of a STSG, with excellent results. In all patients, 80% to 100% of the graft had taken at 2 months postoperatively. Healing was achieved by secondary intention in the areas of poor graft take. The cosmetic results, penile length, and grafted skin color were satisfactory in all patients. As expected, the area covered by the STSG had decreased sensation. Sexual function was possible in all patients after surgery.

COMMENT

A buried penis has been widely discussed in the field of pediatric urology,⁵ but staged reconstruction or flap techniques are seldom as necessary for reconstruction in children as they are in adults.^{6,7} The adult buried penis is scantily mentioned in general medical reports^{1,4} and has been even more rarely discussed in urologic studies.^{1,4,8,9} The adult buried penis can be categorized as iatrogenic, which is most often due to overexuberant circumcision,^{1,2,8} or acquired, which is most often due to obesity. In the present series, we described a comprehensive approach to severe, acquired, adult buried penis using unburying by creating a circumcising incision, followed by scrotoplasty, escutcheonectomy, defatting of the remaining suprapubic fat pad, and STSG coverage of the now-unburied penis with good results.

Although various individual repair techniques have been proposed by previous investigators, none have proposed the comprehensive technique we have described. Alter and Ehrlich⁹ reported on 7 adult cases and proposed a key technique involving tacking sutures from the subdermis of the ventral penoscrotal junction to the tunica albuginea. However, in our very severe cases (Fig. 2A), such superficial repairs would not have been effective. Others have described the use of either abdominoplasty and escutcheonectomy or suprapubic fat pad debulking using liposuction, but not both.⁴ Skin grafts have been successfully used to cover penile skin defect in sporadic cases.^{1,8}

Patient Preparation

In our series, we focused on the acquired nontraumatic cases because these were unique. These patients were frequently obese, and they often presented with such a severe buried penis that intercourse was impossible and urine voided messily out of a dimpled hole over their buried penis. Psychologically, they were often “at the end of their rope”; 100% were depressed by the disease, and one reported contemplating suicide.

Such obese patients are at high risk of perioperative complications. Obesity has been proved to have a negative effect on wound healing and increases the difficulty of perioperative management.^{10,11} Our patients obtained preoperative clearance from both their anesthesia team and their primary care physician. Maximization of cardiopulmonary function and optimization of concomitant metabolic syndrome were achieved. The patients were always informed of the high possibility of wound complications and about the sometimes deadly potential of pulmonary embolism. The risk of deep vein thrombosis was controlled with the use of sequential compression devices applied to the lower legs and early mobilization after an initial 24-hour period of relative bed rest. Preoperative weight loss would have been desirable, but we did not insist on this even in our most obese patients (body mass index 71 kg/m²).

STSG Versus Native Skin

Often urologists are not familiar with STSG techniques and might avoid its use. In adults, however, we have found STSG to be optimal for penile skin coverage. One attempt at preservation and coverage using the native penile skin failed and the patient ultimately required secondary STSG. We improved the success of our STSG technique with the use of diluted fibrin glue, sprayed in a thin layer just under the graft.¹² Fibrin glue has been proved to enhance graft take and decrease grafted skin contracture.^{13,14}

CONCLUSIONS

Management of the adult acquired penis is challenging; however, after unburying with a circumcising incision,

combined escutcheonectomy, defatting of the remaining suprapubic fat pad, scrotoplasty, and STSG coverage can achieve excellent results. Meticulous perioperative management of any comorbidities, gluing the STSG with dilute, sprayed fibrin sealant, and placement of transparent semipermeable nonadherent donor site dressings could improve results and decrease the incidence of complications. Limited suprapubic wound dehiscence can occur but responds well to local wound care. The improvement in cosmesis, sexual function, and urinary function can be profound after this surgery.

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