



# Outpatient Surgical Management for Acquired Buried Penis

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<b>OBJECTIVE</b>	To demonstrate the safety and feasibility of outpatient surgical management for patients with acquired buried penis (ABP).
<b>METHODS</b>	We conducted an Institutional Review Board approved review of patients who underwent surgical repair of ABP at a single institution from September 2014 to August 2017. Patient characteristics, operative details, and 30- and 90-day complications were assessed.
<b>RESULTS</b>	Sixteen patients underwent surgical repair of ABP at the University of Kentucky during the study period. Mean age was 54 years (range 44-62). Median body mass index (BMI) was 47.7 (range 25.5-53.3). Patients largely underwent penile liberation, escutcheonectomy, and split thickness skin grafting. Concurrent scrotoplasty and urethroplasty were performed in select cases. The majority of patients 10/16 (62.5%) were discharged on the same day of surgery, while the remaining 6/16 (37.5%) were outpatient extended stay—and were discharged on postoperative day 1. The 30- and 90-day complications were 19% and 25% respectively, all were Clavien II. Split thickness skin graft take was 100%, and technical success was achieved in all patients. Patients with complications had higher BMIs, higher rates of diabetes, and higher rates of tobacco use, though only BMI reached statistical significance ( $P = .0150$ , $P = .5846$ , and $P = .0632$ ) respectively.
<b>CONCLUSION</b>	Multi component repair of adult ABP can be safely done on an outpatient basis without need for routine inpatient admission and complex algorithms. The most common complication is surgical site infection, which arose in the first 30 days postoperatively. Higher BMI was a significant risk factor for complications. UROLOGY 123: 247–251, 2019. © 2018 Elsevier Inc.

Adult acquired buried penis (ABP) is a complication of obesity, and occurs when surrounding tissues such as an abdominal pannus or suprapubic fat engulf the phallus. This creates challenges for appropriate hygiene, disrupts physiologic voiding, and sexual function. In severe cases, the penis will become trapped under a scarred and diseased cicatrix, which precludes normal extrusion of the penile shaft.<sup>1-3</sup> Many of these patients undergo repeated circumcisions, which exacerbates the deficiency of the penile shaft skin and can make the condition worse. Frequently, conditions like lichen sclerosus, balanoposthitis, urethral stricture, sexual dysfunction, and neoplastic changes coexist with ABP complicating the overall picture and treatment options. Management of ABP is multifaceted and can include weight loss, targeted liposuction, and in certain cases, surgical repair with escutcheonectomy/fat removal and skin grafting. Goals of surgical treatment include allowing the patient to have an accessible phallus for hygienic voiding and sexual function. Thus far, the management

described in the literature includes hospital admission for postoperative management and care.<sup>1,2,4</sup> We routinely perform surgical repair of ABP on an outpatient basis, and the objective of this study is to demonstrate the feasibility of outpatient surgical management for ABP.

## METHODS

An Institutional Review Board approved retrospective chart review was performed by our institution from 2014 to 2017. All patients were treated by a single reconstructive urologist and 1 of 2 plastic surgeons. This included patients undergoing penile liberation, split thickness skin grafting (STSG), with or without escutcheonectomy. Concurrent scrotoplasty and urethroplasty were performed in selected patients. Patient characteristics such as body mass index (BMI), comorbid conditions, and smoking status were obtained through review of the medical record. Skin graft success, as well as 30- and 90-day complications were assessed for each patient. Split thickness skin graft success was defined as the graft being viable and providing adequate penile skin coverage at the time of dressing take down at the initial follow-up visit. Surgical management for ABP has been well described in the literature.<sup>1-5</sup> In our approach, we follow similar principles including the following:

- 1) Release of cicatrix.
- 2) Penile degloving.
- 3) Escutcheonectomy/panniculectomy.

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- 4) Removal of diseased scrotal skin, scrotoplasty.
- 5) Skin closure with advancement flaps, tissue transfer, STSG on penile shaft.
- 6) Penile bolster dressing to secure graft.

In our management, we defined the escutcheon as the prepubic fat pad immediately surrounding and entrapping the phallus. If there was an abdominal pannus contributing to penile entrapment, panniculectomy was performed as well. Following similar principles, the penis is then degloved, and diseased scrotal skin or webbing is released. When possible, advancement flaps were used for wound coverage for panniculectomy and escutcheonectomy. Meshed STSG was used universally on the penile shaft. A bolster dressing was placed to secure the graft using a wound vacuum sponge and nylon sutures. A Foley catheter was left in place at the time of discharge. Typical donor site was the lateral thigh. A silver impregnated dressing (Mepilex AG Mölnlycke Health Care; Norcross, GA) was used at the donor site, and was secured with an all cotton elastic wrap. Patients were instructed to sponge bath only and leave their dressings in place until follow-up. They were discharged with a Foley catheter, scrotal support, donor site dressing, and the penile bolster dressing. They were not routinely sent home on antibiotics, and would follow-up 1 week after surgery for dressing take-down, and Foley catheter removal. Please see [Figure 1A-E](#) which depicts a patient undergoing penile liberation, escutcheonectomy, STSG, and representative follow-up. Comparisons were made by complication status. Categorical variables were compared using chi-square and Fisher's exact tests, as appropriate. Continuous variables were compared using *t* tests. Statistical analyses were done R programming language, version 3.5.1 (R Foundation for Statistical Computing, Vienna, Austria). Statistical significance was set at  $P < .05$ .

## RESULTS

Sixteen patients underwent penile liberation surgery at our institution from 2014 to 2017. Mean age of the 16 patients was 54 years (range 44-62). Median BMI was 47.7 (range 25.5-53.3) with 68.7% of patients being defined as morbidly obese with a BMI of  $>40$ . The majority of patients 10/16 (62.5%) were sent home on the day of surgery. The remaining 6/16 (37.5%) were outpatient extended stay—and were discharged on the morning of postoperative day 1. Mean blood loss 140 mL (range 20-600). Patient characteristics are noted in [Table 1](#). Nearly all patients had a buried penis directly related to obesity as 13/16 underwent escutcheonectomy at the time of penile liberation. Of the remaining patients; 2 had lichen sclerosus associated with obesity and lymphedema, another patient had scar contraction from a prior Fournier's debridement resulting in an entrapped penis. See procedures performed in [Figure 2](#). STSG was successful in 100% of the patients. Postoperative complications at 30 and 90 days were 19% and 25%, respectively. Complications were classified on the Clavien-Dindo scale as grade II. Three patients had surgical site infections within 30 days of surgery for which they received antibiotics. No patients needed to be readmitted during this timeframe. One patient was admitted to an outside hospital within 90 days following surgery for pneumonia. Of the patients who had surgical site infections, all (3/3) were either current smokers or diabetic—see [Table 1](#).

## DISCUSSION

ABP is often a result of obesity and is distinguished from childhood buried penis which is often self-limited and a result of inadequate attachment of penile skin to the base of the penis.<sup>3</sup> Obesity rates in the United States remain high affecting 1 out of every 3 adults, and 1 out of every 6 children.<sup>6</sup> With more pediatric populations entering adulthood obese, ABP will become a more common problem for the urologist to encounter. Repetitive or overzealous circumcisions can lead to further penile entrapment, therefore proper education and management is essential. One challenge is that the term buried penis alone does not characterize whether or not the penis is entrapped beneath a cicatrix, which makes comparison of research difficult, as the patient populations are quite heterogeneous. Mild cases of ABP may resolve with weight loss alone while others may be amendable to liposuction of the surrounding tissues which has been described in the plastic surgery literature.<sup>7</sup> In severe cases, a more extensive surgical approach may be required including removal of cicatrix and diseased skin, escutcheonectomy with tissue transfer and grafting. In this study, we performed multi-component, multi-disciplinary surgical repairs for patients with ABP in an outpatient setting.

The majority of the patients in this study (10/16) were discharged home on the day of surgery and 6/16 were outpatient extended stay and were discharged on postoperative day 1. Two patients were admitted overnight as they underwent simultaneous urethroplasty. The remaining 4 patients were kept overnight due to transport, social, or pain issues. The majority of our patients were morbidly obese and nearing super morbid obesity with a median BMI of 47.7. Complications at 30 and 90 days postoperatively were 19% and 25%, respectively. Obesity is a known risk factor for complications after surgery, specifically infectious complications which has been described in multiple surgical specialties.<sup>8-11</sup> Despite these challenges, only 3 patients experienced surgical site infections which required treatment within 30 days of surgery and all of our patients had successful STSG take. Additionally, only 1 patient experienced a complication beyond 30 days, which was an admission for pneumonia not thought to be directly related to his surgery.

Higher BMI, smoking status, and diabetes were common variables for patients who experienced complications. All patients that experienced complications were either smokers or diabetics; both of which have been shown to be risk factors for wound complications in colorectal surgery.<sup>8,11</sup> Smoking was not a statistically significant predictor of complications, but it was trending in that direction ( $P = .063$ ). Of the patients that had complications, we found that patients with a higher BMI experienced more frequent complications (BMI: 49.9 vs 42.5;  $P = .0150$ ) which makes intuitive sense given the nature of the surgery.

In the late 1990s, Donatucci and Ritter described management algorithms to treat patients with ABP.<sup>5</sup> Since



**Figure 1.** (A) Patient with an acquired buried penis secondary to obesity in which the phallus is entrapped under a cicatrix. (B) Penile degloving, (C) meshed split thickness skin graft used on the penile shaft, advancement flaps are pictured above the phallus. (D) Penile bolster dressing and Mepilex AG over donor site (E) representative follow up at 6 months, healed donor sites are pictured. (Color version available online.)

that time, multiple studies have used this algorithm as a stepping-stone to make further advances in surgical management; although large studies focusing on outcomes on these patients do not exist. The majority of information

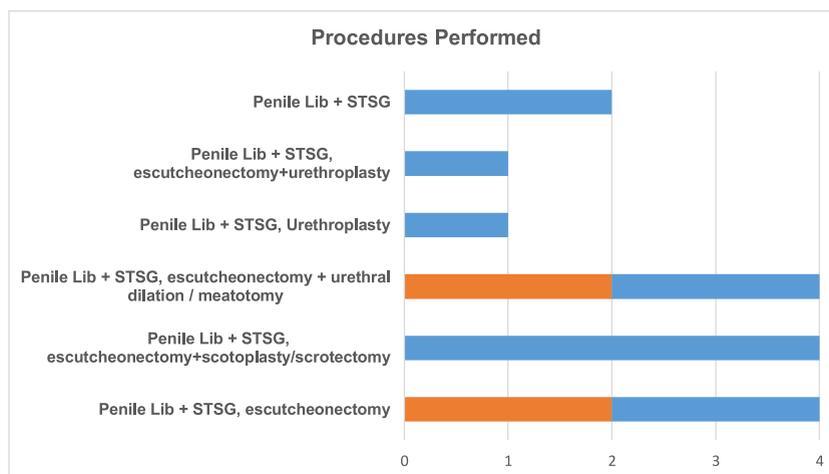
in the literature today comes from single institution experiences often in collaboration with the plastic surgery community. Some studies focus on the differences in operative techniques, while others focus on postoperative

**Table 1.** Patient demographics

	All Patients N = 16 (%)	No Complication N = 12 (75%)	Complication N = 4 (25%)	P Value
Age (y) Mean ± SD	54.4 ± 5.9	54.5 ± 6.3	54.25 ± 4.6	.940
BMI (Mean ± SD)	44.4 ± 7.7	42.5 ± 8.0	49.9 ± 2.0	.015
Blood loss (mL ± SD)	140 ± 170	161 ± 189	75 ± 45.9	.191
Diabetes	9 (56)	6 (50)	3 (75)	.584
Tobacco use	4 (25)	2 (17)	3 (75)	.063
Outpatient	10 (63)	7 (58)	3 (75)	1
Short stay	6 (37)	5 (42)	1 (25)	1
STSG take	16 (100)	12 (100)	4 (100)	1
Diabetic or tobacco use (current or prior)	11 (68.8)	7 (58.3)	4 (100.0)	.2445
Diabetic and tobacco use (current or prior)	3 (18.8)	1 (8.3)	2 (50.0)	.1357

care and patient selection with study sizes ranging from 1 to 42 patients.<sup>1,2,4,12</sup> The average BMI of patients undergoing surgery for ABP ranges from 43 to 49.<sup>2,4,12,13</sup> Surgical management, postoperative care, and patient populations are quite variable in the literature as well, but most follow similar principles set forth by Donatucci and Ritter. Patients are admitted following surgery with an average length of stay ranging from 2 to 7 days.<sup>1,2,4,12</sup> Many series report a period of bed rest postoperatively ranging from 3 to 5 days.<sup>1,2,4</sup> In contrast to this, there is literature to support early discharge for patients who suffered burns requiring STSG. Juang et al reported 100% skin graft success in over 200 patients who were discharged within 24 hours of grafting.<sup>14</sup> Additionally, Wells et al reported the cost effectiveness and safety of early discharge for patients with lower extremity burns treated with STSG.<sup>15</sup> They reported decreased hospital stays, with no reported complications which translated into over \$10,000 of savings per patient. While the above studies focus burn patients, they bring into question the utility of inpatient admission and bed rest following STSG. This study is the first to demonstrate the success of outpatient surgery for the management of ABP; reporting both skin graft success rates as well as 30- and 90-day complications.

There is an apparent cost savings advantage for patients undergoing outpatient procedures. However, this should never come at the expense of patient safety or outcomes. In this series, we show that surgical management of ABP can be simplified and safely performed in an outpatient setting with excellent results. As medicine continues to evolve toward more value based care, identifying safe alternatives to prolonged inpatient care will be important to help deliver quality care for our patients at a lower cost to an already burdened health care system. Despite our success, we recognize there are several weaknesses to this study. Like other studies on this topic, it is a single institution experience and sample size is small. As previously stated, there is much heterogeneity between patients with ABP, so our data may not be generalizable for all patients. We note that our patient population is remarkably unhealthy in terms of obesity, comorbidities, and surgical complexity; hence the need for multi-component repairs. The value of this study resides within the successful outcomes following a simplified postoperative algorithm in an outpatient setting. This study challenges the benefits of bed rest and extended inpatient stays for ABP repairs and provides evidence supporting the safety and success of outpatient STSG. Further studies will be needed to assess cost analysis and long-term outcomes.



**Figure 2.** Procedures performed: blue bars represent totals. Orange bars represent complications. (Color version available online.)

**Table 2.** Complications

	Occurrence (%)
<b>Individuals with any complication</b>	4/16 (25)
Total complication events	4 (100)
Complication within 30 d	3 (75)
Complication after 30 d	1 (25)
Clavien score II	4 (100)
<b>Patient characteristics</b>	
Diabetic	3 (75)
Current smokers	2 (50)
Prior smokers	1 (25)
Nonsmoker	1 (25)
<b>Complication events (30 d)</b>	
SSI	2 (50)
Fungal SSI	1 (25)
<b>complication events (30+ d)</b>	
Admission for pneumonia	1 (25)
<b>Procedure done</b>	
Penile Lib STSG, escutcheonectomy	2 (50)
Penile Lib STSG, escutcheonectomy, meatotomy	1 (25)
Penile Lib STSG, escutcheonectomy, urethral dilation	1 (25)
<b>Admission status</b>	
Outpatient	3 (75)
Observation (23 h admit)	1 (25)

## CONCLUSION

Multi-component repair of ABP can be safely done on an outpatient basis without need for routine inpatient admission and complex postoperative algorithms. The most common complication is surgical site infections, which arose in the first 9 days postoperatively. Higher BMI was a significant risk factor for complications (Table 2).

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