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The Lived Experience of Patients with Adult Acquired Buried Penis

Gregory M. Amend, Jordan T. Holler, Michael J. Sadighian et al.

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**Study Need and Importance:** Adult acquired buried penis (AABP) is a syndrome of penile entrapment associated with obesity. Given the obesity epidemic, this is a disease of increasing importance. We describe the lived experience of adults with AABP through a thematic analysis in combination with quantitative survey instruments to examine the challenges that these patients face and the impacts of surgery.

**What We Found:** We enrolled 20 patients; 11 had undergone surgical treatment for AABP. The most common themes were problems with urinary and sexual function. Negative impacts on social life, relationships and mental health were also reported. Patients who underwent surgery demonstrated improvement in urinary and sexual function as well as psychosocial health (see Table). Access to reconstructive care was a significant issue for these patients, including insurance coverage, availability of services and knowledge gaps among the referring medical community. Specifically, patients struggled to find providers who were able to direct them to a reconstructive urologist, being told to lose weight as a solution to their complaints. Conversely, we found that weight loss did not improve the outcome of any patient.

**Limitations:** Outcomes were self-reported and therefore subject to confounding with comorbidities, which can alter the patient’s perception of his surgical result. Furthermore, we were unable to perform 2 separate interviews (preoperative and postoperative)

**Table.** Common issues in buried penis patients (preoperative vs postoperative)

Theme	Issues before Surgery? (20 pts)		Discussed Improvement after Surgery? (11 pts)	
	No.	%	No.	%
Urinary issues	19	95	9	82
Sexual function issues	19	95	8	73
Impacting social life	16	80	6	55
Hygiene issues	14	70	7	64
Poor mental health	11	55	6	55
Infections	9	45	2	18
Relationship issues	8	40	1	9
Cosmesis issues	6	30	0	0
Physical issues			0	
Mobility	6	30	2	18
Chronic pain	5	25	0	0
Livelihood	2	10	0	0

for any single patient. As a result, our quantitative data are unable to provide longitudinal insight into an individual’s experience before and after surgery.

**Interpretation for Patient Care:** When a successful repair is performed, this can significantly improve the hygienic, urinary and sexual function of the patient, as well as lead to improvements in mental and social health. While this condition is often associated with significant weight gain, it is an irreversible process that requires complex surgical reconstruction and does not improve with weight loss.

## The Lived Experience of Patients with Adult Acquired Buried Penis

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**Purpose:** We describe the lived experience of adults with acquired buried penis (AABP) through thematic analysis of patient interviews. We examine the challenges that patients face and the impacts of surgery.

**Materials and Methods:** This mixed-methods study utilized validated instruments and semi-structured interviews to capture pre- and postsurgical outcomes. Semi-structured interviews were conducted with open-ended questions to elicit the impact of AABP on a patient's quality of life in several domains including urinary function, sexual function, interpersonal relationships and mental health. Recruitment was completed once we achieved thematic saturation.

**Results:** Twenty patients participated in the study; 11 underwent surgical treatment for AABP. Semi-structured interviewee responses were coded into 12 different themes and 39 subthemes. The most common themes were problems with urinary (19/20, 95%) and sexual function (19/20, 95%). Most participants (16/20, 80%) reported negative impacts of AABP on social life. Interviewees struggled with relationships (8/20, 40%) and mental health (11/20, 55%), often avoiding romantic relationships and reporting fear of rejection with concomitant depression and/or anxiety. The majority (70%, 14/20) experienced difficulties accessing care. Among patients who underwent surgery, the majority discussed improvement in urinary and sexual function (82% [9/11] and 73% [8/11], respectively). Though weight gain was a precipitating factor, weight loss did not result in symptom improvement. Rather, in 4/20 (20%), weight loss made their condition worse.

**Conclusions:** Patients living with AABP experience profound negative impacts on quality of life including their urinary and sexual function, social life and mental health. Many patients face issues with access to care.

**Key Words:** urology, urologic surgical procedures, penile diseases, qualitative research, interview

ADULT acquired buried penis (AABP) is a syndrome of sexual and urinary dysfunction following the enclosure of a phallus underneath prepubic/scrotal skin and fat. The most common precipitating factor is increasing

obesity, which causes the escutcheon to grow over the corporal bodies, telescoping the mobile penile skin over the glans to bury the organ.<sup>1</sup> The encased penis results in a cycle of inflammation, skin breakdown and infection,

### Abbreviations and Acronyms

AABP = adult acquired buried penis

IIEF = International Index of Erectile Function

IMGI = Index of Male Genital Image

QOL = quality of life

UCSF = University of California San Francisco

USSIM = Urethral Stricture Symptom and Impact Measure

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**Editor's Note:** This article is the fifth of 5 published in this issue for which Category 1 CME credits can be earned. Instructions for obtaining credits are given with the questions on pages 487 and 488.

which leads to permanent penile skin fibrosis and fixed entrapment.<sup>2</sup>

Though the incidence of AABP has not been described, as of 2015–2016, 39.8% of adults and 18.5% of youth in the U.S. were obese, making this a disease of increasing importance.<sup>3</sup> Several surgical therapies have been described in the literature, with a focus on surgical outcomes such as penile length, perioperative complications and graft viability.<sup>4–9</sup> Despite the success of surgery, repairs are largely considered “cosmetic” by insurance companies and are often initially denied coverage, resulting in delays in care and further morbidity.

Recently, increased attention has been given towards patient-reported outcomes. These are principally single-institution studies of small cohorts focused on patient-reported quality of life (QOL) outcomes in Likert-style questionnaires, reporting excellent functional outcomes.<sup>10–13</sup> Whereas this existing literature provides quantitative data on QOL outcomes, we designed and performed the first qualitative study of men with AABP from a multi-center group of academic reconstructive urologists across the U.S. We hypothesized that men who have buried penis suffer extensive impacts and those who underwent surgical reconstruction would have superior urinary, sexual, hygienic and mental health.

## MATERIALS AND METHODS

### Study Population

Convenience sampling was used to survey patients who presented to urology clinics participating in TURNS (Trauma and Urologic Reconstructive Network of Surgeons), a multi-institutional group of specialty-trained urologists that focus on urological trauma and reconstructive care and research. The study was approved by the University of California San Francisco (UCSF) Institutional Review Board (protocol No. 20-32062) and consent was obtained from all participants. Nine patients were recruited from UCSF, 5 from Lahey Hospital and Medical Center, 2 from New York University, 2 from the University of Iowa and 2 from the University of California San Diego. A total of 22 patients were approached for participation, of which 1 from UCSF and 1 from the University of California San Diego declined.

### Survey

We developed a mixed-methods study protocol that utilized validated survey instruments and semi-structured interviews. We created a survey instrument based on expert opinion from TURNS members that asked targeted open-ended questions regarding the patient’s perception of his hygiene, urinary function, erectile function and sexual self-image (see supplementary Appendix, <https://www.jurology.com>). Patients discussed how living with AABP impacted their relationship with their partner, as well as their social, financial, mental and physical well-being. These semi-structured interviews were conducted with all patients

over a live virtual video and audio conference (Zoom Video Communications Inc., San Jose, California, <https://zoom.us>).

Prior to interview, participants completed surveys to assess urinary and erectile health, and self-image. We provided the Urethral Stricture Symptom and Impact Measure (USSIM),<sup>14</sup> the International Index of Erectile Function (IIEF)<sup>15</sup> and the Index of Male Genital Image (IMGI),<sup>16</sup> respectively.

The USSIM is an instrument developed to quantify the impacts of urethral stricture disease.<sup>17</sup> USSIM also targets comparison QOL metrics from the patient’s urinary health standpoint following their most recent surgery.<sup>14</sup> The IIEF is a multi-dimensional, validated patient-reported instrument for the evaluation of male sexual function.<sup>18</sup> The IMGI is a Likert-scaled questionnaire that measures a patient’s satisfaction with physical aspects of their genitalia.<sup>16</sup> Patient responses to these instruments were compared between those pending surgery and following operative repair. One postoperative patient completed the interview but declined to participate in the survey instruments.

### Data Analysis

Participants were interviewed for 15 to 30 minutes. Interviews used the survey instrument to elicit information regarding the impact of AABP in several domains including, but not limited to, urinary function, sexual function, impact on relationships and mental health. Interviews were conducted by the principal author (GMA), a fellowship-trained reconstructive urologist. The audio was transcribed electronically using Otter transcription software (Otter.ai, Inc., Mountain View, California, <https://otter.ai>) and inductively coded using thematic analysis<sup>19</sup> by secondary authors (JTH, MJS, NR). All codes were conceived by the research team; the coauthors did not employ any coding software to assist with thematic analysis. Patient recruitment was ongoing and concluded upon thematic saturation, defined by 3 consecutive interviews without a unique response. This study involved no direct interaction between the participants and the coders, and neither the interviewing nor the coding authors provided direct patient care.

A recursive analysis process was used.<sup>20</sup> Researchers read through the transcripts, keeping notes of observations and ideas to obtain a sense of overall content. These notes were revisited during the coding process to improve the acquisition and accuracy of all pertinent codes. Members of the research team convened at 3 intervals during coding: first prior to coding, where the team presented overall impressions to the text and to establish a common protocol for coding; second to follow line-by-line coding, where the team shared codes and discussed categorization into themes; and third, we assessed coder inter-rater reliability using a weighted Fleiss’ kappa coefficients.<sup>21</sup> All codes with a kappa value  $\leq 0.75$  were discussed among all authors until coding consensus was reached. Common sub-themes and themes were identified and categorized by domain type. Descriptive statistical analysis summarized survey responses and semi-structured interview themes.

**Table 1. Participant demographics and characteristics**

Mean±SD yrs age	58.8 ±13.9
Mean±SD kg/m <sup>2</sup> body mass index	41.1 ±9.4
No. self-identified race (%):	
White/Caucasian	17 (85)
Black/African American	1 (5)
Other	2 (10)
No. Hispanic/Latinx ethnicity (%)	3 (15)
No. relationship status (%):	
Married	12 (60)
Single	6 (30)
In a relationship	2 (10)
No. sexual orientation (%):	
Heterosexual	19 (95)
Homosexual	1 (5)
No. region (%):	
West	10 (50)
Northeast	7 (35)
Midwest	2 (10)
South	1 (5)
No. pts who underwent AABP surgical correction (%):	11 (55)
Ventral slit scrotal flap	5 (25)
Excision of penile skin with split-thickness skin graft	6 (30)
Escutcheonectomy	9 (45)
Mean±SD days total followup	497 ± 666

## RESULTS

### Study Demographics

The mean age of the participants was 58.8 years old (standard deviation [SD] 13.9) with mean body mass index of 41.1 kg/m<sup>2</sup> (SD 9.4; Table 1). The majority (60%, 12/20) were married and 85% (17/20) identified themselves as White. Of the 11 patients who had previously undergone surgical correction of AABP, 5 (45%) underwent local skin rearrangement via ventral slit scrotal flap<sup>22</sup> and 6 (55%) underwent a degloving and excision of penile skin with split-thickness skin graft.<sup>23</sup> Nine (82%) underwent concurrent escutcheonectomy. Interviews took place on average 497 days postoperative (range 29–2,204).

### Thematic Analysis

All 20 patients participated in semi-structured QOL interviews. Most patients (70%, 14/20) reported that weight gain was an important factor in the development of their buried penis. Forty percent (8/20) attributed a history of prior surgery, which was primarily prior circumcision, though 1 patient had cicatrix formation following Fournier's gangrene debridement. Twenty percent (4/20) reported that their condition was worse after weight loss. No patient noted improvement after weight loss (Table 2).

Common themes were demonstrated amongst the preoperative and postoperative AABP patients (Table 3). Most preoperative patients complained of significant urinary issues (95%, 19/20), sexual dysfunction (95%, 19/20), poor hygiene (70%, 14/20) and disruption of their social life (80%, 16/20). Additionally, preoperative patients also reported issues with poor mental health (55%, 11/20), skin or urinary tract infections (45%, 9/20), access to

**Table 2. Specific complaints among 20 buried penis patients**

Themes and Subthemes	No.	%
Urinary issues	19	95
Spray/stream	12	60
Hovers over toilet	8	40
Pain with urination	7	35
History of urethral stricture disease	3	15
Incontinence	3	15
Incomplete bladder emptying	3	15
Sits to urinate	2	10
Smelly urine	1	5
Trouble with catheter	1	5
Uses shower/tub to urinate	1	5
Sex issues	19	95
Unable to perform intercourse	12	60
Unable to get erection	9	45
Pain with sex or masturbation	7	35
Difficulty with sex or masturbation	4	20
Painful erection	4	20
Unable to maintain erection	3	15
Avoids sex	2	10
Unable to orgasm	2	10
Reduced genital sensation	1	5
Takes longer to orgasm	1	5
Pain with ejaculation	1	5
Intercourse not enjoyable	1	5
Mental health issues	11	55
Depression	10	50
Feels like less of a man	7	35
Anxiety	4	20
Decreased self-esteem	3	15
Stress	1	5
Impacts social life	16	80
Issues using public restrooms	12	60
Avoids travel	6	30
Hygiene issues	14	70
Hard/effort to clean	11	55
Skin tearing	7	35
Penile bleeding	6	30
Contributing factors	20	100
Worse after wt gain	14	70
Worse after multiple surgeries	8	40
Worse after wt loss	4	20
Improvement after wt loss	0	0

care (70%, 14/20), poor cosmesis (30%, 6/20), difficulties with mobility (30%, 6/20) and chronic pain (25%, 5/20).

**Table 3. Common issues in buried penis patients (preoperative vs postoperative)**

Theme	Issues before Surgery? (20 pts)		Discussed Improvement after Surgery? (11 pts)	
	No.	%	No.	%
Urinary issues	19	95	9	82
Sexual function issues	19	95	8	73
Impacting social life	16	80	6	55
Hygiene issues	14	70	7	64
Poor mental health	11	55	6	55
Infections	9	45	2	18
Relationship issues	8	40	1	9
Cosmesis issues	6	30	0	0
Physical issues			0	
Mobility	6	30	2	18
Chronic pain	5	25	0	0
Livelihood	2	10	0	0

**Table 4.** Coded themes/subthemes reported during patient interviews

	Relevant Quote Examples	
	Preop	Postop (as available)
	<i>Urinary</i>	
Pain with urination	"There's a lot of pain and the difficulty peeing... I describe it as peeing through broken glass and an open sore wound. I would have real pain and then a lot of blood sometimes."	
Spray/stream	"Most of it's going in the toilet, but all of it isn't. And it gets on me. Every once in a while, it's just blocked at the urethra the pee... It just squirts all over me and soaks me. It's unhygienic and it's humiliating. Absolutely humiliating. I have to do that all day."	"I mostly use a urinal... If I'm in public, I can pee. And I have a decent stream. I'm happy with it."
Hovers over toilet	"I can't see the penis. What I would do is just make sure that my old belly is over the toilet. So when I urinate, I try and get most of the urine into the toilet. I have no idea where the penis is, though. I have to just listen for the water. Urine hitting the water in the toilet. Then, I'm in a good spot."	"After surgery because the penis is now free, I can use a urinal. You know, much better than I did before."
Sits to urinate	"If I have to go to bathroom, I gotta sit down. I just can't stand up and go pee. Because it just kind of dribbles out and runs down my leg. There is no stream anymore because it's buried. That really bothers me."	"I needed the surgery to stand up and urinate. That's the biggest change."
Uses shower/tub to urinate	"This has made the use of public bathrooms extremely tough... When I'm at home, I gotta be honest, I pee in the bathtub and washed it down. It's the best way to keep it from splashing all over me. It's just the easiest way. And it's the cleanest way also."	
Incontinence	"The first six or seven hours of the day, I've got to use the restroom about every hour. I'm constantly going to the bathroom... If I don't go right away to the bathroom, then I'm afraid it's gonna dribble out on me. I can't hold it in as long as I used to."	
Incomplete bladder emptying	"And I never really know whether I empty my bladder all the way, it almost feels like there's a little residual left and comes out in the underwear."	
	<i>Sexual</i>	
Unable to perform intercourse	"I can't get the penis to come out. The skin is so abundant around the penis itself. That sexual issues are kind of non-existent."	"Now, well a total success... My wife and I are making up for lost time, which is fantastic. I believe 180 degrees. Fantastic."
Pain with sex or masturbation	"So I couldn't have intercourse or anything like that. It would be every time that area gets pushed back, it hurts. I couldn't do anything. I can't have sex like this. I haven't tried. But I know I can't. Even like masturbation is extremely difficult and can be painful. I have done it but it's not good."	
Painful erection	"When I do get an erection, it's underneath the fat pad and it pushes up against that scar tissue that's formed around the opening of the fat pad. That becomes very painful. Just the penis pushing against it. So I can still get an erection, but it's useless. If anything, it hurts."	
Intercourse not enjoyable	"I would I have an erection, but the skin would not retract. And as that would happen, it continued to be irritated where the skin would almost swell. It would get swollen trying to have intercourse or whatever to the point where it became uncomfortable to have intercourse."	"I do notice now, after the surgery, ejaculation is normal. And actually in my head, I think it's a little larger in volume than it was before."
	<i>Mental health</i>	
Depression	"The fact that I'm facing being like this for the rest of my life absolutely sucks. It's hopeless. And then if I can get reconstructive surgery, and in particular, paid for by my health insurance, then I can at least have a degree of optimism. But I don't want to go through the rest of my life like this... I have to kind of chase away the blues a lot. The feeling of helplessness and hopelessness. Yeah. It does affect me."	"I feel more social, I don't feel embarrassed anymore. It takes time to recover. But from a medical standpoint, I feel better. And personal standpoint, I don't have like a lot of psychological issues like I did before. I don't feel embarrassed, I don't feel depressed or upset or anything."
Feels like less of a man	"It is entirely depressing. I still don't have the simple act of just going to bed with my wife. It's something that I have to prepare for and be ready to accept that it's gonna be, could be disappointing or painful or something else... It's sad to say that there are some of my feelings of, I don't know, masculinity or whatever is attached to my ability to have sex. And when I can't, I don't feel like a full partner to my wife."	"I feel more of a man, I feel like normal. There's a big difference compared to before."
Stress	"Mentally, I'd like to be able to be at peace a little bit. Again, instead of having this in my mind on and off all day and having to push it back. Because I can't always push it back. No. I had broken down into tears. I don't want to do that anymore."	"I actually felt a little bit better because you don't have a deformity, right. So if you go into a gym, and after gym, you're taking a shower in a public... you don't want anybody seeing what's hanging there because it's kind of deformed. Now it's not deformed. So it's actually, I would probably feel better."

(continued)



Table 4. (continued)

	Preop	Relevant Quote Examples	Postop (as available)
Issues using public restrooms			
Avoids travel			
Affects social life			
Penile bleeding			
Hard/effort to clean			

#### Social life

"So wherever I go somewhere the first thing in my mind is where are the bathrooms? I want to be prepared. It's just not being able to live my life fully the way I look at it right now, and I'm not."

"I don't like going places where if I have to go to the bathroom, I'm going to be in a predicament where I have to sit down. I can't stand up and do it."

"Right now I don't feel I'm living a normal life. Like I say, when my son and daughter-in-law want me to go out on their pontoon boat. I don't go because once you're out there, if I have to go pee, I just can't pee off the side of the boat... It's just like a roadblock on everything."

#### Hygiene

"When the condition started, I was able with great difficulty to pull it out. But I had bleeding, a lot of bleeding. It was very sore. To me, it appeared that the head was very swelled. I thought it was like knotted. Tied, so to speak. Especially near the head area and wasn't a pleasant feeling."

"I have a handheld shower. What I do is I put it on the little finer stream so I kind of shoot it up in there. I can kind of stick my finger in if I work real hard to try to clean it. When I'm washing, I try to get soap stuck up in there and then kind of let the water run in there and kind of flush it out."

"Pre surgery, I had to be very careful going outside and time my shopping to know where the bathrooms were in the store as soon as I went in. If I was out for more than an hour, definitely I was straining. Hey, now it doesn't matter."

"From what I had before, to what I have today, it's certainly much, much better... I'm single, I'm in the dating world. And it certainly looks and feels a lot better when I'm with a woman."

"It's not bleeding like it was bleeding before. And it's not all the time. If I use a washcloth vigorously or heavy stimulation. Slight bit of blood. Slight."

"Actually feel that hygiene became a lot easier simply because I didn't have to dig my finger in and run around the shaft to try and wash everything out."

Table 2 reports the specific sub-themes amongst those with buried penis. The most common reported issues were depression (50%, 10/20), difficulty cleaning the penis (55%, 11/20), avoidance of public restrooms (60%, 12/20), spraying of the urinary stream (60%, 12/20) and inability to perform intercourse (60%, 12/20). In AABP patients, the severe interference with their QOL commonly led to effects on mental health, particularly feelings of depression and hopelessness.

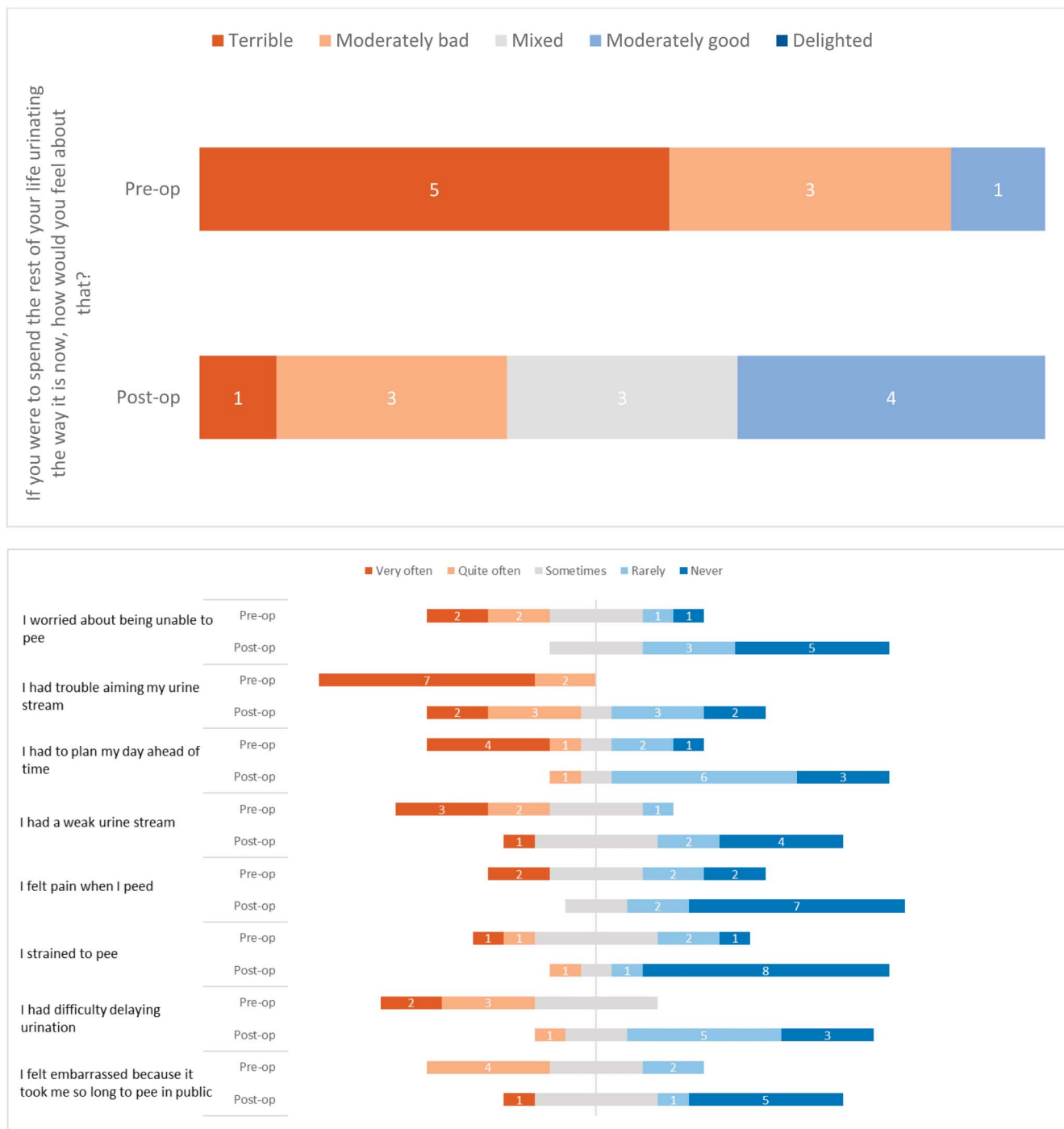
For the 11 patients who underwent surgery, significant improvement in urinary issues (82%, 9/11), sexual function (73%, 8/11), social life (55%, 6/11), hygiene (64%, 7/11) and mental health (55%, 6/11) were reported (Table 3). Table 4 demonstrates a complete compilation of direct quotes for common domains from patients expressing their experience living with AABP.

### Patient-Reported Outcome Measures

Survey responses correlated with the postoperative improvements demonstrated in the thematic analysis. More patients in the postoperative group (4/11 or 36%) felt delighted if they were to spend the rest of their life urinating "the way it is now" compared to only 1/9 patient (11%) in the preoperative group, and fewer patients reported feeling terrible (1/11 [9%] in the postoperative group vs 5/9 [56%] in the preoperative group; Fig. 1). Patients in the postoperative group provided more favorable responses to sexual (Fig. 2) and genital image (Fig. 3) questions. In preoperative patients, 2/9 (22%) reported having sexual desire more than half the time or almost always versus 7/11 (64%) postoperative patients. Additionally, 2/9 (22%) preoperative patients reported having increased satisfaction with their sexual relationships more than half the time or almost always versus 5/11 (45%) postoperative patients. Only 1/9 (11%) preoperative patient-reported almost always having erections sufficient for penetration sexual versus 5/11 (45%) postoperative patients stating more than half the time or almost always. On the contrary, 8/9 (89%) preoperative patients stated that almost never or never were their erections hard enough for penetration versus only 2/11 (18%) postoperative patients (Fig. 2). Similarly, responses to the IMGI supported a greater satisfaction with patients' cosmesis following surgery, as these patients reported higher satisfaction scores in texture, shape, and size of the erect and flaccid penis (Fig. 3).

### DISCUSSION

Unique to our study is a thematic analysis, which provides a more nuanced and intimate viewpoint of the patient's lived experience and QOL. Our analysis demonstrated that the most pertinent concerns were spraying of the urinary stream (12/20, 60%), hovering

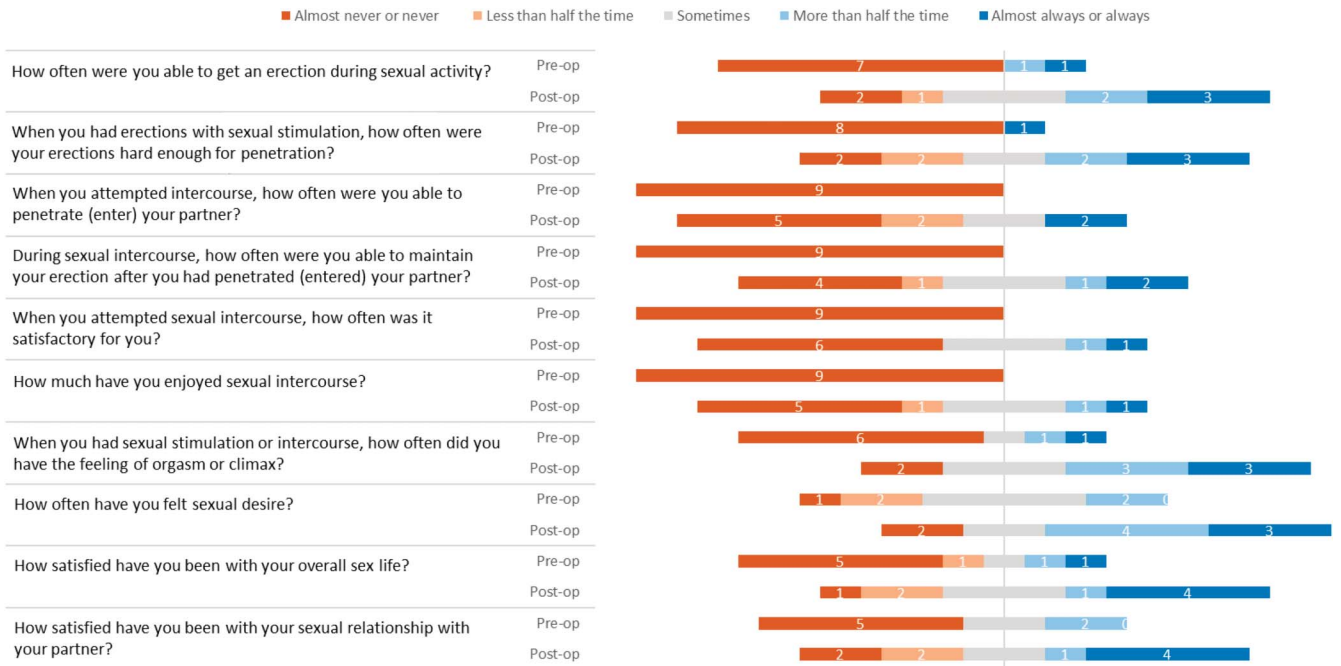


**Figure 1.** Preoperative (*pre-op*) to postoperative (*post-op*) impression of patient’s urinary function. Numbers contained within each bar represent the number of patients who selected that answer.

over the toilet (8/20, 40%), inability to perform intercourse (12/20, 60%), depression (10/20, 50%), avoidance of public restrooms (12/20, 60%) and difficulty cleaning the penis (11/20, 55%). By reporting the patients’ direct quotes in Table 4, we hope to give this community a voice that speaks louder than responses to standardized questionnaires.

Our findings agree with prior retrospective studies that have described successful functional and QOL outcomes following AABP repair. Using the “Changes in Sexual Functioning Questionnaire,” Hughes et al demonstrated in 9 patients that sexual pleasure, urination and genital hygiene improved significantly after 21 days following AABP repair.<sup>13</sup> In a similar study,

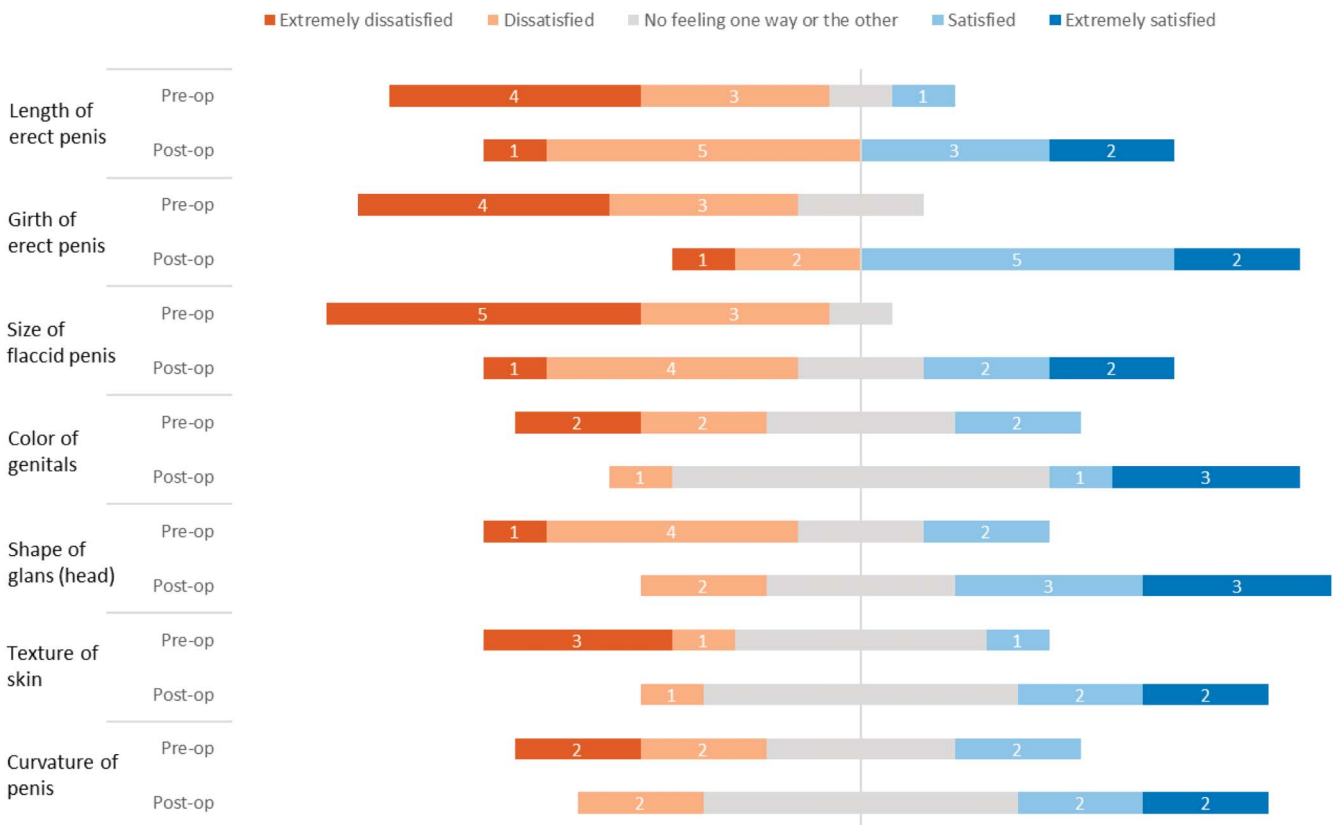




**Figure 2.** Preoperative (*pre-op*) to postoperative (*post-op*) impression of patient’s sexual function. Numbers contained within each bar represent the number of patients who selected that answer.

Theisen et al retrospectively identified 16 patients who underwent AABP surgery.<sup>10</sup> The “Expanded Prostate Cancer Index” questionnaire was completed with

Likert-scale responses at ≥3 months postoperatively and compared to a retrospective preoperative assessment of each patient. In their study, 14/16 (88%)



**Figure 3.** Preoperative (*pre-op*) to postoperative (*post-op*) impression of patient’s genital image. Numbers contained within each bar represent the number of patients who selected that answer.

patients reported significant improvement in overall sexual function and urinary function.

Rybak et al retrospectively identified 11 patients following AABP repair and showed that the IIEF scores improved an average of 7.7 out of 25 points. Importantly, this was the first study to link AABP to clinical depression, which was noted to be present in 7/11 patients preoperatively and 2/11 postoperatively.<sup>11</sup> Our findings again demonstrate that significant psychosocial issues exist amongst men with AABP, with several sharing feelings of depression, anxiety and decreased self-esteem. Importantly, 55% of men discussed improvement in this domain following surgery.

Patients' overall impression of their urinary and sexual function, as well as self-image, were captured pre- and postoperatively. More patients scored in the satisfied domains following surgery and more patients scored in the dissatisfied domains prior to repair. However, comorbid conditions are an important point of discussion. Rybak et al found that 91% of patients reported significant erectile dysfunction preoperatively.<sup>11</sup> In our study, 45% of men additionally reported the inability to achieve an erection and 15% reported concurrent urethral stricture disease, with 1 patient having a direct-vision internal urethrotomy that occurred concurrently at the time of AABP repair. These data in Figures 1–3 demonstrate that there appears to be a subpopulation of men following buried penis surgery who continue to have sexual, urinary and cosmetic complaints. It is unclear if these arise as a direct consequence of the surgery or if there are comorbidities not addressed by the repair. A unique finding was that 14/20 (70%) of patients discussed issues with access to care, including insurance coverage, availability of services and knowledge gaps among the referring medical community. Specifically, patients struggled to find providers who were able to direct them to a reconstructive urologist, being told to lose weight as a solution to their complaints. Conversely, we found that weight loss did not improve the outcome of any patient. Rather, 4/20 (20%) stated that weight loss made it worse. This demonstrates that additional skin laxity produces further burying from greater tissue redundancy. It does not serve to undo the chronic skin changes that have created permanent and fixed penile entrapment. Given this, patients should be immediately referred for reconstruction rather than proposing conservative lifestyle changes which have little benefit. It is our hope that when these findings are combined with demonstrated benefits in genital, urinary, mental and social wellness, reconstruction will no longer be viewed as “elective” or “cosmetic” by insurance companies.

There are several limitations to our study. Outcomes were self-reported and therefore subject to confounding with comorbidities, which can alter

the patient's perception of his surgical result. Furthermore, we were unable to perform 2 separate interviews (preoperative and postoperative) for any single patient. The interview data included the retrospective reflection of the 11 postoperative patients in addition to the present account of the 9 preoperative patients pending reconstruction. This may have skewed our results, as we would anticipate postoperative patients could reflect on their QOL prior to surgery with greater dissatisfaction than the 9 patients pending surgery. On the other hand, participants were asked to respond to the quantitative questions only at their present stage and did not have pre- and postoperative patient-reported outcome measures. As a result, our quantitative data are unable to provide longitudinal insight into an individual's experience before and after surgery. Additionally, as a result of convenience sampling we captured postoperative patients who underwent different methods of surgery and were in different stages of healing given the range of days following surgery, which was large (29 to 2,204 days). Subjects completing the survey months or years after surgery may introduce recall bias as their perception of the symptoms may have changed over time and their memory may not be as reliable as that of subjects who were recalling more recent surgeries. It is also possible that the relative satisfaction or dissatisfaction of the postoperative result changes over time. Due to the small size of our study population, our study is not sufficiently powered to further evaluate if themes are more prevalent amongst a specific demographic group or quantitative endpoint, such as time following surgery or by surgical technique. Further work would be needed to recruit a larger patient population to correlate specific quantitative questions with qualitative data. Lastly, because surgery was selected for those patients most likely to benefit from operative repair, we do not know if the benefits of surgery demonstrated in our results represent the benefits of surgery that apply to all patients with buried penis.

## CONCLUSIONS

We present the first thematic analysis which explores the functional and psychosocial domains amongst men with AABP. Our findings demonstrate significant improvement in these outcomes in men who undergo this repair. While this condition is often associated with significant weight gain, it is an irreversible process that requires complex surgical reconstruction and does not improve with weight loss. When a successful repair is performed, this can significantly improve the hygienic, urinary and sexual function of the patient, as well as lead to improvements in mental and social health.

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