



# Acquired buried penis: an observational study characterizing the variability in procedural codes reported during surgery

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**Background:** Adult acquired buried penis (ABP) is a heterogeneous condition and surgical treatment typically includes several steps. Additionally, there is no consensus on which current procedural terminology (CPT) codes to utilize for these steps. Our objective is to characterize the variability in CPT codes reported for ABP surgeries. We hypothesize that the heterogeneous disease process combined with a lack of consensus on appropriate CPT codes will result in marked variability in CPT codes reported during surgery for ABP.

**Methods:** Data was collected from American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) between 2007–2020. We included adults undergoing surgery for ABP. All CPT codes were grouped into different anatomic categories: penile procedures, scrotal procedures, pannus-related procedures, urethral procedures, tissue transfers, and skin grafts. Codes not fitting these categories were labeled “Other”.

**Results:** Our study included 146 patients. There were 413 total CPT codes reported with 82 unique codes in our cohort. The average number of codes per patient was 2.8, with a range from 1 to 9. There were many unique codes in each anatomic category: 18 different codes within penile procedures, 7 within pannus procedures, 8 within skin grafting, 4 within scrotal procedures, 7 within tissue transfers, and 19 within urethral. There was marked variability in individual code use with each code being reported anywhere from 1 to 58 times. Urologists were the primary surgeons in 69% (n=101).

**Conclusions:** We found marked variability in CPT codes reported during surgery for ABP. This suggests the need for our stakeholder organizations to support efforts that would allow consensus on which codes should be utilized for this increasingly recognized condition.

**Keywords:** Current procedural terminology (CPT); penile diseases; adipose tissue

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## Introduction

The current procedural terminology (CPT) system provides the most widely accepted nomenclature used to report medical procedures. The CPT system is used to process insurance claims, assess healthcare utilization, conduct research, and develop medical guidelines (1). In 1996, Health Insurance Portability and Accountability Act

(HIPAA) required the Department of Health and Human Services to set up standards for the electronic transaction of healthcare information—including code sets (2). As a result, the American Medical Association (AMA) did a comprehensive review and overhaul of the CPT system and in 2000, the CPT code set was designated as the national coding standard for physician services and procedures (3). Thus, the accuracy of CPT coding for surgical procedures

is essential to ensure healthcare data are effectively captured, claims are properly processed, and institutions are reimbursed appropriately. Lack of dedicated CPT codes for specific surgical procedures can lead to challenges for surgeons, institutions, and insurance companies.

Adult acquired buried penis (ABP) is a condition that was historically managed with redo circumcision or referrals for weight loss. Comprehensive surgical management has been offered with increasing frequency since the mid-2000s (4). This is a heterogeneous disease process, and patients present on a spectrum of severity. Surgical management to address the buried or trapped penis frequently requires excision of diseased penile skin and replacing this with a skin graft. Additionally, patients often require resection of excess adipose tissue over the mons pubis (i.e., escutcheonectomy) and lower abdomen (i.e., panniculectomy). Some patients require scrotal reconstruction, and 30–47% of patients have concomitant urethral strictures requiring treatment (5–7). Fortunately, studies suggest that comprehensive surgical treatment results in significant improvements in quality of life (8,9).

Comprehensive surgical management of ABP is in its relative infancy, thus dedicated CPT codes do not exist,

and surgeons and coders must use existing codes that best represent a surgeon's work. Given the heterogeneous disease process, lack of dedicated surgical codes, and lack of guidance from the American Urologic Association (AUA) on how best to code these procedures, we hypothesize that there would be marked variability in the surgical codes reported for patients undergoing surgery for ABP. In this study, we sought to describe the variability in CPT codes reported during surgical treatment of adult patients with ABP using a large national dataset. We present this article in accordance with the STROBE reporting checklist (available at <https://tau.amegroups.com/article/view/10.21037/tau-24-350/rc>).

## Methods

### Study design

Our study design is a retrospective observational study of adult patients undergoing surgery for the diagnosis of ABP between 2007–2020. We sought to evaluate the variability in CPT codes reported during surgery.

### Data sampling

We utilized data from the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) (accessible at <https://www.facs.org/quality-programs/data-and-registries/acs-nsqip/>) to gather patient information for our study (10). ACS-NSQIP is a risk-adjusted, nationally recognized program aimed at assessing and enhancing surgical care quality. It compiles patient data from 963 participating centers, including over 65 collaborative efforts both within the United States and internationally. Each participating center must receive comprehensive training and continuous support for Surgical Clinical Reviewers (SCRs) to ensure accurate data collection and analysis.

We selected patients for our cohort who underwent surgery for a diagnosis of ABP from the ACS-NSQIP database between 2007 and 2020. We used ICD 9 (752.65 hidden penis) and ICD 10 (Q55.64 hidden penis, N48.83 ABP) codes to identify patients. To avoid selection bias, we did not include patients with diagnoses such as phimosis, lichen sclerosis, or lymphedema because these diagnoses can exist in the absence of ABP. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

## Highlight box

### Key findings

- There is marked variability in the current procedural terminology (CPT) codes reported during surgery for adult acquired buried penis. While this could suggest that different operations are being performed for the same condition, it is more likely that this represents a lack of consensus on how we should be coding these surgeries.

### What is known and what is new?

- It is well-known that buried penis is a heterogeneous disease and successful surgical treatment frequently requires multiple surgical steps. Unfortunately, there are no dedicated CPT codes for this condition and there is no guidance on how best to code these cases.
- Our study characterizes the impressive breadth and variability in the CPT codes reported during surgery for acquired buried penis. This suggests a lack of understanding and/or agreement on which codes should be used during the standard steps of this operation.

### What is the implication, and what should change now?

- To address this issue, our stakeholder organizations could support a working group to engage with the American Urologic Association Coding and Reimbursement Committee to determine the best coding strategies for these cases and disseminate consensus amongst urologists who treat this condition.

**Table 1** Baseline characteristics and operative outcomes of patients with acquired buried penis who underwent surgery

Characteristic	Patients (N=146)
BMI (kg/m <sup>2</sup> )	41 [35–48]
Age (years)	54 [43–65]
Operative time (minutes)	163 [104–238]
Total hospital length of stay (days)	1 [0–5]
Same day discharge (<24 hours)	37 [25]
Later discharge (≥24 hours)	109 [75]
Wound dehiscence	5 [3]
Surgical site infection	23 [16]
Re-operation within 30 days	2 [1]
Any complication	33 [23]
Major complications	11 [8]

Continuous variables are reported as median [interquartile range] and categorical variables are reported as n [%]. BMI, body mass index.

### Descriptives

Primary and secondary CPT codes were collected for each patient. CPT codes were independently reviewed by a single reviewer (K.T.A.) and grouped based on different anatomic categories: penile procedures, scrotal procedures, pannus-related procedures, urethral procedures, skin grafts, and tissue transfers. CPT codes that did not fit into these categories but were relevant to ABP were grouped into an “Other” category. To further avoid selection bias, patients who had CPT codes for malignant indications and codes describing “debridement” were excluded due to concerns that these may represent oncologic resections or Fournier’s Gangrene (Tables S1,S2 display all included codes by anatomic category as well as all excluded codes).

### Statistical analysis

Patients missing any data for CPT codes were excluded. Demographic and surgical information was summarized. Details on total and unique CPT codes were reported. We tested for a change in codes over time by evaluating the frequency and types of codes reported during the first half of follow up [2007–2015] compared to the second half [2016–2020]. These time points were chosen because there was a notable increase in the number of cases performed after 2015 suggesting a national move toward

addressing this condition surgically. This timeline also corresponds with a rapid increase in the annual number of published articles dedicated to ABP on PubMed suggesting an increased recognition of this condition amongst the urologic community.

To assess for changes over time in the proportion of procedures performed by anatomic category we utilized a Chi-squared test. Chi-squared was used to determine if procedures differed between the surgical specialists performing the cases (urology *vs.* plastic surgery). We applied the Fischer’s exact test where expected cell counts were less than five. All statistical analyses were performed using SPSS v 28.0 with figures generated using GraphPad Prism v 10.2.

### Results

There were 160 patients who underwent surgery for ABP during our study period. After excluding patients who had a malignant or debridement CPT code we had a total of 146 patients for analysis. Patients had a median age of 54 years [interquartile range (IQR), 43–65 years] and a median body mass index (BMI) of 41 kg/m<sup>2</sup> (IQR, 35–48 kg/m<sup>2</sup>). The median length of hospital stay was 1 day (IQR, 0–5 days). A total of 23 (16%) patients experienced a surgical site infection, 5 (3%) had a wound dehiscence, and 2 (1%) had a re-operation. Overall complication rate was 23% (n=33), with an 8% (n=11) rate of major complication (Clavien grade ≥3) (Table 1).

A total of 413 CPT codes were reported for the 146 patients, with 82 unique CPT codes being identified. The total number of CPT codes per patient ranged from one to nine, with an average of 2.8 codes per patient. Half of patients had three or more CPT codes reported during surgery (Table 2).

Most patients (55%) had a penile procedure coded during surgery for ABP. This was followed by pannus-related procedures (performed in 46%). Skin grafts were used in 35% of patients, scrotoplasty and other scrotal procedures in 32%, tissue transfers in 27% and urethral procedures in 22% of patients (Figure 1).

There was impressive variability in code use within each anatomic category (Figure 2). Within the penile procedure category there were 18 unique codes reported. Each individual code was used anywhere between one and 26 times. The most common CPT codes were “penile straightening for chordee” (CPT 54300, reported 26 times) and “plastic repair of the penis to correct angulation” (CPT

54360, reported 21 times). In regard to common coding combinations, the penile CPT code 54300 (i.e., penile straightening for chordee) was most commonly paired with a local tissue transfer CPT code; specifically, codes 14302 (n=11) and 14301 (n=7). Conversely, the penile CPT code 54360 (i.e., plastic repair of penis to correct angulation) was most commonly paired with a complex scrotoplasty procedure (CPT code 55180, n=5) or a split-thickness skin graft procedure (CPT code 15100, n=5).

For pannus-related procedures there were a total of 7 unique codes reported and each code was used between one and 58 times. The most common codes utilized were “infraumbilical panniculectomy” (CPT 15830, reported 58 times) and “removal of excess subcutaneous tissue

other area” (CPT 15839, reported 7 times). With respect to common coding combinations, an infraumbilical panniculectomy (CPT 15830) was most frequently coded with a skin grafting procedure; specifically, split-thickness skin grafting (CPT 15120) in 17 patients and full-thickness skin grafting (CPT 15240) in 7 patients. Penile procedures were the next most common codes reported in combination with an infraumbilical panniculectomy. The CPT codes 54300 and 54360—representing “penile straightening for chordee” and “plastic repair of the penis to correct angulation”, respectively—were combined with infraumbilical panniculectomy in 6 patients each.

There were 8 unique codes in the skin grafting category and each code was used between one and 27 times. The most used skin grafts reported were “split-thickness” (CPT 15120, reported 27 times) and “full-thickness” grafts (CPT 15240, reported 14 times).

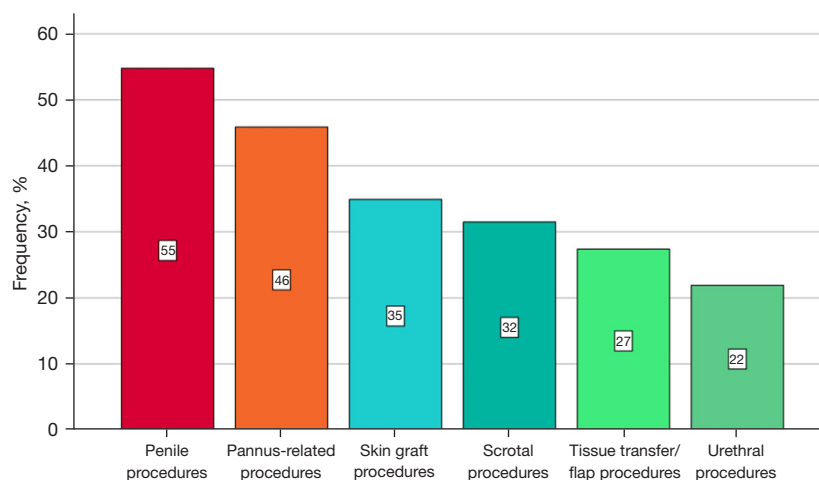
Scrotal procedures included 4 unique codes which were each reported between one and 27 times. The most common codes were “simple scrotoplasty” (CPT 55175, reported 27 times) and “complex scrotoplasty” (CPT 55180, reported 18 times). Lastly, there 22 unique codes within the urethral procedure category and each code was used between one and 10 times; most commonly used were “cystourethroscopy” (CPT 52000, reported 10 times), followed by “cystoscopy with urethral dilation” (CPT 52281, reported 5 times) (Table 3).

Of the patients that had only one code listed (N=29, 20%), 14 had an isolated penile procedure and 9 had an isolated pannus-related procedure. The majority of patients,

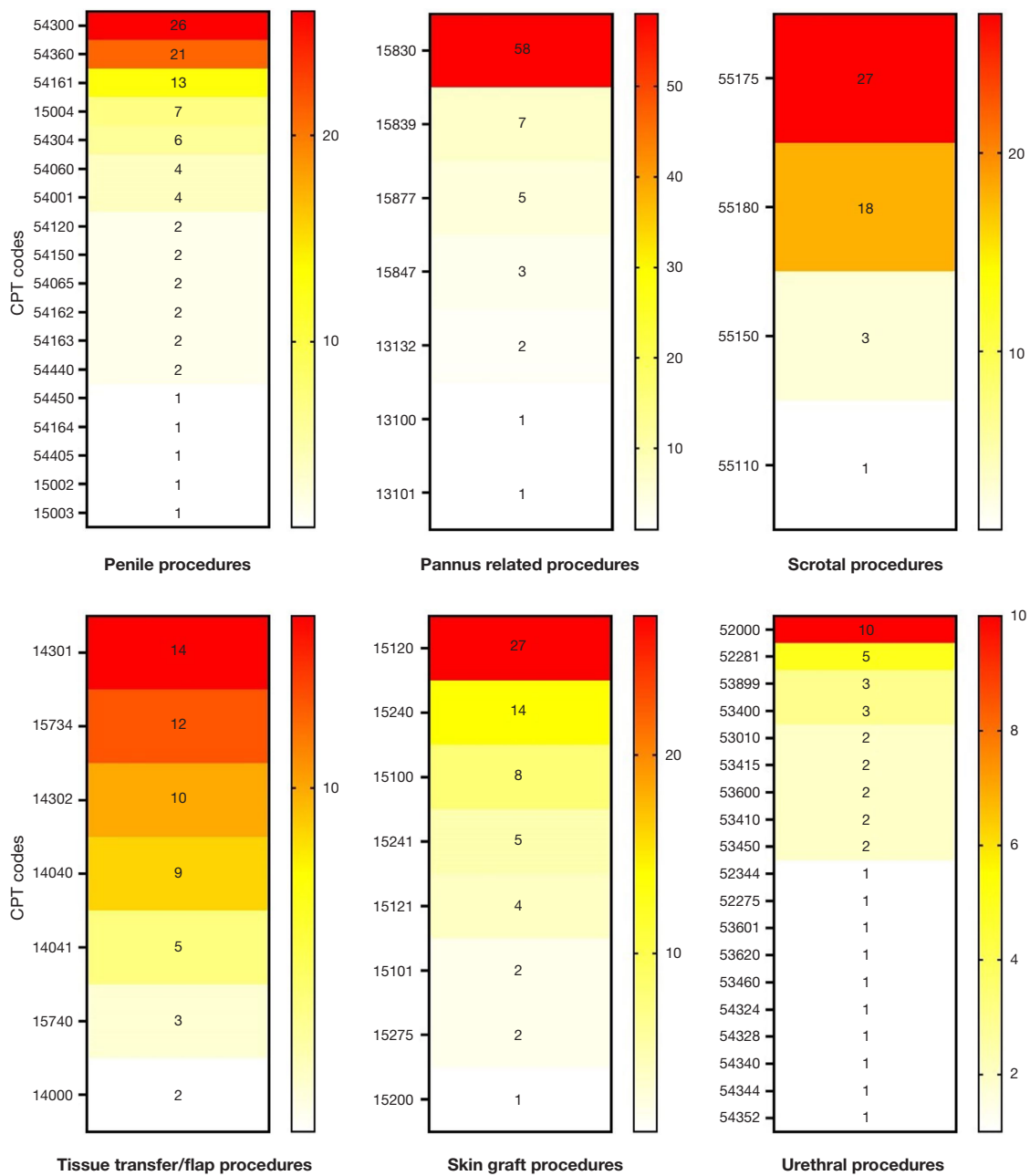
**Table 2** Total number of CPT codes utilized per patient surgery

Number of CPT codes per surgery	Number of patients [%]
1	29 [20]
2	44 [30]
3	27 [18]
4	20 [14]
5	10 [7]
6	9 [6]
7	3 [2]
8	3 [2]
9	1 [1]

CPT, current procedural terminology.



**Figure 1** Frequency of anatomic categories being addressed during surgery for acquired buried penis (N=146 patients).



**Figure 2** Heat map of CPT codes within each anatomic category (full description of CPT codes is in the [Table S1](#)). CPT, current procedural terminology.

however, had two or more CPT codes reported that spanned multiple different anatomic categories (i.e., penile procedure with a pannus-related procedure, etc.) ([Table S3](#)).

Of the 14 patients with an isolated penile procedure coded, none were circumcisions as solitary treatment. Further, there were 13 patients with a circumcision code however these were all reported with additional codes from

other anatomic categories.

When looking at different time periods, 25 cases (17%) were performed between 2007–2015 with the remaining 121 cases (83%) between 2016–2020. There were no significant changes in the distribution of CPT codes reported when categorized by anatomic region (P value >0.05 for all) when comparing the two time periods.

**Table 3** Top three CPT codes utilized according to anatomic category

Procedures	CPT code	Description	N [%]
Penile procedures (n=98 codes)	54300	Penile straightening for chordee	26 [27]
	54360	Plastic repair of penis for correct angulation	21 [21]
	54161	Circumcision	13 [13]
Pannus-related procedures (n=77 codes)	15830	Excision of skin and subcutaneous tissue from abdomen, infraumbilical panniculectomy	58 [75]
	15839	Excision of excess skin and subcutaneous tissue, other site	7 [9]
	15877	Suction assisted lipectomy of trunk	5 [6]
Scrotal procedures (n=49 codes)	55175	Simple scrotoplasty	27 [55]
	55180	Complicated scrotoplasty	18 [37]
	55150	Resection of scrotum	3 [6]
Skin graft procedures (n=63 codes)	15120	Split-thickness autograft ( $\leq 100$ cm <sup>2</sup> )	27 [43]
	15240	Full-thickness skin graft ( $\leq 20$ cm <sup>2</sup> )	14 [22]
	15100	Split-thickness autograft ( $\leq 100$ cm <sup>2</sup> )	8 [13]
Tissue tissue/flap procedures (n=55 codes)	14301	Replacement of lesions with healthy tissues from an adjacent site (30.1–60 cm <sup>2</sup> )	14 [25]
	15734	Muscle, myocutaneous, or fasciocutaneous flap	12 [22]
	14302	Replacement of lesions with healthy tissues from an adjacent site (additional 30 cm <sup>2</sup> )	10 [18]
Urethral procedures (n=41 codes)	52000	Cystourethroscopy	10 [24]
	52281	Cystourethroscopy with dilation or ureteral stricture or stenosis	5 [12]
	53899	Unlisted procedures in the urinary system	3 [7]

CPT, current procedural terminology.

Urologists were the primary surgeons in 69% (n=101) of cases, followed by plastic surgery (n=40) and general surgery (n=5). Urologists were more likely to perform penile procedures compared to plastic surgeons (60% *vs.* 38%,  $P=0.01$ ) but less likely to perform pannus-related procedures (39% *vs.* 63%,  $P=0.01$ ). There were no significant differences in all other procedures reported between different surgeon types ( $P$  value  $>0.05$  for all) (Table S4).

## Discussion

In this study, we found that surgical treatment for ABP based on CPT coding is highly variable. Additionally, there seems to be a trend toward comprehensive surgical management since most patients had multiple different codes listed during surgery and very few had only one code. It is unclear if the variability in coding is a result of this being a heterogeneous disease process or, perhaps more likely, lack of consensus on which codes should be used for

the common surgical steps employed in management.

Despite this becoming an increasingly recognized condition across the urologic community, there is no consensus on how best to code the critical steps of surgery from our stakeholder organizations [i.e., AUA, Genitourinary Reconstructive Surgery (GURS)]. Extensive search yielded limited guidance. The American Society of Plastic Surgery (ASPS) recommends that “panniculectomy” (CPT code 15830) be used for removal of excess skin and adipose tissue from the pubis to the umbilicus for the treatment of many conditions, including buried penis (11). This code was the most common pannus-related procedure reported in our study. Additionally, an online reference from the American Academy of Professional Coders (AAPC) suggests CPT code 54300 (i.e., penile surgery for chordee) should be used for correction of ABP. This code was the most frequently reported penile code in our cohort. Unfortunately, this code does not truly reflect this surgical step, and fails to address all the other steps



that are often necessary to adequately treat this condition (i.e., escutcheonectomy, lower abdominal panniculectomy, scrotoectomy, skin grafting).

A few other coding concerns were raised from the results of this study which could potentially be remedied with guidelines or consensus statements. First, tissue transfers/rearrangements were rarely reported (27% of patients). This is surprisingly low since most patients who have a mons or pannus resection with upward fixation of the penopubic angle would likely meet criteria for tissue transfer. Second, there is no defined criteria for when to report simple scrotoplasty versus complex scrotoplasty. This is left to the discretion of the surgeon and coders. Third, there were a few patients who had a circumcision code as well as a skin graft code; assuming the circumcision reflected the “resection of diseased penile skin” and a skin graft was used to cover the penile shaft defect, these codes together are confusing and are a poor depiction of surgery. Finally, there were 58 patients who had a CPT for skin grafting but only 9 patients who had a concomitant code for “preparation of the wound for grafting” (i.e., 15002, 15003, 15004). These codes may always be reported together.

One commonly cited challenge amongst urologists who treat this condition is obtaining insurance approval due to insurer concerns that this is cosmetic. There is no code for escutcheonectomy, however, this is a common surgical step that urologists perform. Therefore, as seen in our study, many surgeons may submit the code for “lower abdominal panniculectomy” (CPT 15830) because these are similar surgical procedures and the ASPS statement that this code is appropriate for this indication. In our experience, insurance companies frequently deny this code because panniculectomy is frequently considered cosmetic. We have found that code 15839 (“excision of excess skin and subcutaneous tissue from other area”) frequently gets approved. Notably though, this change represents a 41% reduction in relative value units (RVUs) for this step. We, however, have found this substitution a worthwhile concession because it helps avoid insurer denial of a surgery that imparts impressive improvements in urinary and sexual function, as well as quality of life (8,9,12,13).

Some of these challenges could help explain why plastic surgeons were more likely to code for “panniculectomy” procedures and urologists were more likely to code for “penile” procedures in our study. Plastic surgeons may be better at the documentation necessary for insurance approval of panniculectomy. Insurers may also be more apt to approve different codes for different specialties.

Lastly, given disease heterogeneity, different specialties may take on cases that appropriately align with their surgical skillset (i.e., plastic surgeons treating patients with buried penis due to large overhanging abdominal/suprapubic fat, and urologists treating patients with diseased penile skin trapping the penis).

The issue we face with buried penis is no different than any other new surgical technique or condition we treat as a urologic community. The field of urologic reconstruction provides many good examples of procedures that require new or revised CPT codes including: robotic ureteroenteric anastomotic stricture repair, robotic buccal graft ureteroplasty, endoscopic urethroplasty, robotic posterior urethroplasty, etc. And while urologic reconstruction provides good examples, the issue with non-dedicated CPT codes is relevant and important to all urologic subspecialties. Urologists have always prided themselves on being at the forefront of innovation. As the field continues to innovate and expands its reach, all urologists should be aware of the processes for revising or creating new CPT codes. The AUA Coding and Reimbursement Committee (CRC) exists in order to help us through this and other coding related processes. Urologists and subspecialty groups are encouraged to reach out to the AUA CRC to determine how best to code for new surgeries/techniques. If a current code is not adequate, the CRC can help guide development of a new CPT code which requires approval from the AMA (14). This can be a laborious process, however, as approval of a new CPT code can take up to 2 years (1).

To address the issue with buried penis surgical coding, GURS could create a working group to engage with the AUA CRC to determine the best way to code for these surgeries. Subsequently, a consensus statement could be generated and distributed to all urologists that treat this (and similar) condition(s).

There are several notable limitations to this study. First, we do not have operative reports available, so we do not know what was done during surgery and how this compares to the CPT codes reported. Second, the dataset does not have details on surgeon, institution, or geographic region so it is unclear how many surgeons are represented in the data. However, we believe the findings would be stronger even if fewer surgeons were represented because it suggests that perhaps even the same surgeon(s) is/are using multiple different CPT codes for the same surgical steps. Third, we only used ICD codes for buried penis and did not include other diagnoses such as phimosis, lichen sclerosus, or lymphedema so it is possible we missed patients in this data

set who underwent a surgery for ABP but were coded as having an alternative diagnosis. Additionally, we only have information on the primary surgeon, so it is unclear if a urologist enlisted the help of a plastic surgeon or vice versa. Additionally, we do not have granular details on patients, so we are unable to reliably compare patients undergoing the same surgical interventions. This also prevents us from classifying patients according to the comprehensive classification system recently reported (15). Lastly, this issue may not be relevant to providers who practice in universal, publically funded healthcare systems.

## Conclusions

There is impressive variability in the number and frequency of different CPT codes reported during surgery for ABP. This likely represents a lack of consensus on which codes should be used for each surgical step. Organizational efforts to address this issue could help provide a basis to advocate for patients to insurance companies, streamline prior authorization processes, optimize institutional reimbursement, and foster future population-based research studies.

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*Conflicts of Interest:* All authors have completed the ICMJE uniform disclosure form (available at <https://tau.amegroups.com/article/view/10.21037/tau-24-350/coif>). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related

to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

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