Peer Review File

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Reviewer A

Comment 1:
interesting question
well-designed
study
rather local issue and very north American focus. health care settings with more public funding would not relate to the insurance issues discussed

Reply 1: We thank the reviewer for their comments and appreciate the fact that this issue may not be highly relevant to individuals who practice in universal, publicly funded healthcare systems.

Changes in the text: We updated the limitations section of the paper to include that this topic/issue may not be relevant to providers in other countries. On page 11 lines 334-335 we state "Lastly, this issue may not be relevant to providers who practice in universal, publicly funded healthcare systems."

Reviewer B

Comment 2: This is a very interesting manuscript and one that is of particular interest. The authors use a large healthcare database to demonstrate that there is a significant heterogeneity in the way in which buried penis is billed for. It proposes that there is a need for a consensus statement to help urologists, who are responsible for the majority of cases, code for these complex surgeries. This is a problem not just for buried penis but also for complex urology cases. We historically as a field are not taught how to code and we under bill for the level of service provided despite increased risk and complexity. I congratulate the authors for bringing this to the forefront. The introduction, methods, results, and discussion are sound. Furthermore, they point out that they are limited by lack of operative report availability to verify the details of surgery against the codes used.

Reply 2: We are very grateful for the kind words from the reviewer and agree about the importance of this article for the urology audience.

Changes in the text: None required

Reviewer C

Comment 3: The authors offer a database analysis of what is increasingly being recognized as an issue amongst individuals who treat AABP – the variability in CPT coding. As the authors highlight, some of the challenges stem from the highly variable nature of the disease. In order to clarify the message, I offer some minor methodological changes (see below). Additionally, a potential strength of the discussion could be offering a framework for possible coding that could serve as a guide for the reader and coding bodies in the future.

Abstract
Background – While there is no singular guiding procedure code, there is guidance on codes many of the components of the surgery - removal of pannus, scrotoplasty, flaps, and grafting. I think more accurately there is no consensus on code(s) for similar procedures between practitioners.

Reply 3: We thank the reviewer for noticing this and will adjust the wording appropriately.

Changes in the text: We changed the abstract on page 2 line 34-37 to state "Additionally, there is no consensus on which current procedural terminology (CPT) codes to utilize for these steps."

Comment 4: Introduction – The American Society of Plastic Surgery has recommended that panniculectomy code 15830 be applied for buried penis. Initially approved in 2006 and reapproved in 2019 as coding for the skin removal of pannus including suprapubic pannus. Many practitioners avoid using this code due to a hard stop amongst insurers (as you discuss in discussion). There was also a period of time where the AUA recommended 54300 as the primary coded for repair of buried penis (as you cite in discussion with AAPC). I was also not able to find documentation support of that beyond but will forward if found. Including these minimal suggestions in the introduction would be helpful.

Reply 4: We appreciate the reviewer's comment. We would prefer not to introduce these topics in the discussion for the sake of keeping the argument streamlined (that there are no dedicated codes for this condition but that coders must use codes that currently exist

and there is no real consensus on which of these codes is best). However, we do agree that this information from the American Society of Plastic Surgery should also be included in the discussion alongside the recommendations from AAPC as the reviewer mentioned in order to be thorough.

Changes in the text: We included the information/guidance from the ASPS in the discussion section on page 9 lines 254-258. This now states "Extensive search yielded limited guidance. The American Society of Plastic Surgery 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 inductions, including buried penis. This code was the most common pannus-related procedure reported in our study."

Comment 5:
Methods
Rather than look at time, it may benefit the reader to examine frequency of code combinations which are clinically applicable. For example, for patients without skin graft codes (likely the milder AABP patient) what was the most frequent combination used? These combinations may be more instructive on the variability of coding compared to looking at isolated codes which will include the high variability of disease as well. May also benefit from removal of codes that are addressing alternative pathology (e.g., hydrocele excision)

Reply 5:
We thank the reviewer for their comment. Only one person had a code for bilateral hydrocele excision. We included this patient because we have treated several patients with buried penis that was primarily the result of bilateral hydroceles. This represents a relatively uncommon etiology, as is suggested in this cohort since only one patient had bilateral hydrocelectomy but since we do find this to be a primary etiology for buried penis in our patient population, we feel it is appropriate to leave this included.

Also, we agree it may be nice for the reader to see the code combinations that were most commonly reported together. We have added a supplementary table (included below as well) with the top 10 most frequently reported codes including code combinations (according to the broader anatomic categories). We also added more detail in text on which CPT codes were used more commonly together in the results.

Changes in the text:
On page 7, lines 194-200 we added the text:

“In regards 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). On the other hand, 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) and a split-thickness skin graft procedure (CPT code 15100, n=5).”

On page 7, lines 204-211 we added the text:
“With respect to common coding combinations, an infraumbilical panniculectomy (CPT 15830) was most commonly 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. The next most common codes combined with infraumbilical panniculectomy were penile procedures. The CPT codes 54300 and 54360 - representing “penile straightening for chordee” and “plastic repair of the penis to correct angulation”, respectively – were both used in 6 patients each along with an infraumbilical panniculectomy code.”

On page 8, lines 224-227 we added the text:
“The majority of patients, however, had two or more CPT codes reported that spanned multiple different anatomic categories (i.e., penile procedure with a pannus-related procedure, etc.)(**supplementary table 3**).”

Table added:
Supplementary table 3: Top 10 most frequent procedures done, whether involving a single anatomic category or more than one of the seven categories.

Type of procedure	Frequency of patients (% of total)
Penile procedure only	14 (10%)
Pannus-related + Skin Graft	11 (8%)
Penile procedure + Tissue Transfer	9 (6%)
Pannus-related procedure only	9 (6%)
Penile + Pannus-related procedures	8 (6%)
Penile + Scrotal procedures	4 (3%)
Penile procedure + Tissue Transfer + Skin Graft	4 (3%)
Penile + Urethral procedures	4 (3%)
Pannus-related + Scrotal procedures	4 (3%)
Tissue Transfer only	4 (3%)

Comment 6:
Results:
Paragraph line 178 – this breakdown of surgeons doing "pannus-related" vs "penile" is likely reflected of specialty guidance on coding. Worth discussion

Reply 6: Thank you for this insight and interest in hearing our thoughts on why this finding may have occurred. We have added to the discussion to go through possible explanations for this finding including differences in familiarity with documentation required for insurance approval, differences in frequency of insurance approvals for different surgical specialities, and differences in surgeon skillset that may cause them to take on different patients with buried penis (i.e., plastics taking on large pannus cases and urologists taking on more penile/scrotal cases).

Changes in the text: We have added the following to the discussion on page 10 lines 291-298: "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. Insurers may 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)."

Comment 7:
Discussion:
Line 220 – Agree. Despite clear language form ASPS (see above) that 15830 should be used for the panniculectomy component to address buried penis, many insurances have a hard stop denial on this code.

Reply 7: Thank you for the comment.

Changes in the text: None required.

Comment 8:
Line 251 – The biggest gap in coding here is the primary code of "unburying the penis". Do you use 15839 and take the RVU hit? Do you appeal the 15830 denials? Do you combine 15839 with 55180 (maybe only sometimes)? This is quite different from skin

grafting, preparation for grafting, flaps, etc which are all well codified with clear guidance.

Reply 8: Thank you for the comment. As is currently written in the discussion, we use code 15839 rather than 15830 because it almost always gets approval immediately and then patients who truly benefit from this surgery don't have to experience delays. We have trouble getting 15830 approved and many times face a delay in surgery so have moved to 15839. We code scrotoplasty (55180) only when we have to surgically augment the scrotum, not always. We have not changed our text based on this question because we do address this already in the discussion.

Changes in the text: None required

Comment 9:
Conclusion:
Again, my takeaway here that needs the attention of the coding body is the variability of the main code. The use (or not) of the other codes (e.g., preparation for grafting, flaps) may reflect providers ignorance of these codes/combination– that's not an issue that needs to be addressed by a coding body. I do agree that a "code list" could be helpful.

Reply 9: Thank you and we agree with the comment. Our conclusion states that we need organizational efforts (through not only the coding bodies but also our governing bodies such as AUA and GURS as advocates) to address this issue as a whole. Not only to ensure we are using the same main code but also to educate the providers who perform this surgery so they can appropriately code the steps they perform during surgery. It is not necessarily provider ignorance because there is not a great coding set for these cases and there is not guidance from our stakeholders. Therefore, we would like to leave our conclusion as it is because it reflects our thoughts on this issue.

Changes in the text: None required

Comment 10:
Supplementary table 1: You list 52000 as "other" here and then "urethral" in figure 2. Adjust

Reply 10: We thank the reviewer for pointing out this oversight. We will change the code for cystoscopy to a urethral procedure in our table.

Changes in the text: We changed 52000 in the supplementary material to urethral procedure rather than other.