Peer Review File

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Reviewer A:
I want to thank the authors for writing such a well written through narrative review on a topic that is important. The authors present these data using their own personal experiences using excellent pictures and illustrations. It is clear that the authors are experts in this subjective matter. Having performed nearly 300 vaginoplasties/vulvoplasties myself, I wish I had thought of writing this. Well done!

Response:
Thank you for taking the time to review the paper and for the encouraging commentary.

Reviewer B:
The authors provide a nice overview and literature review. A few comments:
--What is the exact number of vaginoplasties the senior author/team has performed, as opposed to providing an estimate of "over 500"

Response:
Thank you for the supportive comments regarding this narrative review on vulvar aesthetics with clinical insights from our institution. As an institution we are currently at a combined 630 vaginoplasty/vulvoplasty cases. This does not include vulvar revision surgeries.

--What is the revision rate at your institution?
Response:
Our revision rate for all cause aesthetic and/or functional reasons is approximately 25%.

--What are the reasons for revisions at your institution?

Response:
Reasons for aesthetic revision are most commonly reduction of labia majora skin excess and revision labiaplasty to create more labia minora definition. Less common requests include anterior commissure reconstruction and labial fat grafting.

The most common functional revision request is revision urethroplasty for urethral webbing presenting with persistent urinary spraying or engorgement or the urethral bulb with arousal.

--For patients who do have atrophy of their labia, how do you correct this? Do you perform fat grafting; if so, what has your experience been with this?

Response:
We have recently begun to offer fat grafting for additional labia majora volume. However, we have found the degree of take of the fat to be sub-optimal. It is now our practice to perform labial fat grafting in combination with de-epithelialization of excess labial skin and rolling this internally to augment volume and provide a healthy vascularized bed for fat graft take. We have revised the manuscript to include mention of this preferred technique.

--Please describe differences in your approach to vulvoplasty, if any, if vaginoplasty is pursued as penile inversion vs. peritoneal pull through.

Response:
The main difference in our approach to vulvoplasty is that we often split the penile skin tube. Doing so allows for maximal skin use for the creation of labia minora and an easier closure at the inset of the perineal flap into the base of the urethra.

If patients pursue vaginoplasty after vulvoplasty they are offered either perineal approach or robotic peritoneal flap vaginoplasty depending on their medical history, goals and preferences. The manuscript has been edited to include these points.

--If additional skin is needed, what are your donor sites?

Response:
If a small to moderate amount of additional skin is needed then we take full thickness skin graft from the groin crease, bilateral if needed. The patient is marked in pre-op at the natural crease between the abdomen and thigh. If a very large volume of additional skin is needed for open perineal vaginoplasty in a patient with penoscrotal hypoplasia then we will take skin from the lower abdomen in an abdominoplasty pattern. The manuscript has been edited to add this additional nuance.

--There are in-depth discussions/recommendations about pre-op and intra-op maneuvers to maximize aesthetics. Can you please comment on post-op maneuvers that are implemented to ensure predictable results.

Response:
The main post-operative instruction to aid vulvar aesthetics is minimal walking (<2000 steps per day) until wounds are fully healed. Heavy activity levels or significant wound separation can lead to dehiscence of the penile skin tube and perineal flap which was compromise introitus and labial aesthetics. The manuscript has been edited to include this point.

Reviewer C:
Just a comment/suggestion; illustrations as in figure 2, 10, 11, 13 help a lot the reader to understand better the techniques described herein, especially residents and young specialists who do not have great experience with gender affirming surgery yet. Therefore if you could add such illustrations to the already used intraoperative figures, would be of essential academic and educational importance!

Response:
Thank you for this comment. We are glad that the medical illustrations are useful. Due to the significant cost and time associated with medical illustration, we picked the highest yield technical points to illustrate.

Given the high number (>20) figures in this paper, we are not able to provide medical illustrations for each figure. However, each figure has been constructed to best illustrate the key technical pearls and aesthetic points discussed throughout the paper.

It seems to me the authors worked very good on this very good review paper. Can only support its publication, especially if they add as mentioned before schematic illustrations to the already used intraoperative figures.

Response:
Thank you for taking the time to review this paper and for your support of its publication.

Reviewer D:
This article is worthwhile to be published but needs some major revision.
Major points:
1) this review really is too long way too much 'narrative ': the text should be reduced with about 20% and made much more concise and to the point. As an example: 88-89 is almost identical as 91-92

Response:
Thank you for taking the time to review this paper and for the helpful suggestions. We have made an effort to reduce the word count of the paper and be as concise as possible.

2)I have my serious doubts about the methodology of the literature review since at least one specific article I know of and which I considered as very worthwhile in my own practice and specifically deals with the aesthetics of vulvoplasty in AMAB patients is missing. So how much more good articles might be missing here?
Comparative Study, Plast Reconstr Surg. 2018 Nov;142(5):729e-733e. Creation of Clitoral Hood and Labia Minora in Penile Inversion Vaginoplasty in Circumcised and Uncircumcised Transwomen. Dries Opsomer et al

Response:
Thank you for providing this reference; we agree that this is an important paper that has been added and referenced in the paper. We were invited to provide a narrative review and description of our institution's approach to vulvar aesthetics.

We have selected manuscripts to highlight a variety of approached and techniques from the original search, which has also been updated with additional references.

Minor points:
- Line 60 and 85: shouldn't 'Despite this... 'not better be replaced by 'For this reason.....'
Response:
This correction has been made.

- line 156, also 250-252, 359 and 448 all mention the problem of a not well defined anterior commissure often due to excessive pull on the penile skin flap (absent in a simple vulvoplasty as mentioned by the authors in line 359). They don't stress enough that this can be avoided by making the skin flap a bit longer with more FTG and less pushing with the vaginal conformer. Then the penile skin kind of forms a 'dogear' at the anterior commissure with more skin at the clitoral hood and the start of the labia majora.

Response:
We have modified this section of the paper. Although it is important to avoid excessive tension on the penile skin (which can exacerbate the cleft in the anterior commissure) by adding skin graft where needed, even cases of minimal tension can still have a separation between the upper labia majora. This is especially prominent in patients with a wide penile base. Although minimizing tension and adding skin where needed helps, these maneuvers do not completely eliminate the limitation of the anterior commissure and possible need for revision in the future (if desired by the patient). We have added this reviewer's insights regarding excess downward tension on the penile skin flap (less pushing with the vaginal conformer) to the manuscript.

- I can somewhat agree with the preservation of fat and muscle tissue to provide enough volume for the labia majora (and avoid a 'gaping 'entrance of the vagina) but sometimes preserving too much tissue can give a 'young-man's-scrotal 'appearance to the labia majora (which might be a bit the case in fig20?)

Response:
We appreciate this important point. There is a difference between fat preservation vs. skin preservation. We believe all adipose tissue should be preserved for maximal labial volume.

Regarding skin however, it is our preference to air on the side of leaving just slightly more skin than needed. Excess tension often leads to worse wound breakdown and can predispose patients to difficulty with dilation. We prefer tension free closure and as much primary wound healing as possible. If patients develop some "scrotal" appearance of labia in the post-operative period from mild skin excess, we can treat this easily with a revision for skin excision. We have updated the manuscript to make this point and distinction.

- line 199: it's a detail but personally I like the ve less visible lateral scars very much next to or even at the lateral groin crease

Response:
Thank you for the comment. We agree that there is no consensus in the field regarding all technical/aesthetic points, including differences in preference of lateral scar placement. We have clarified that the manuscript reflects our center's surgical approaches and preferences.

- line 202: i agree not to extend the incision too much superiorly but would recommend to do so when really necessary to correct a dogear there

Response:
We agree with this concern. The manuscript has been edited to make this important clarifying point. The incision must be extended as superiorly as needed in order to correct any dog ear.

- line 227-229: I do not understand the 'hollowing out 'of the 'siuperior 'half of the labia majora or the 'flat appearance of the supero-lateral labia'. I would rather think there is always too much volume supero-antarior and never enough postero-inferior as shown in fig 5 and 7. Therefore I fully agree with the redistribution of the labial volume by suturing the fat more posteriorly.

Response:
The inferior labia majora are absolutely the more common issue in regards to hollowing and loss of volume. The pubic fat tends to be more dense and preserve volume long term. However, if this fat is violated or lifted off with the scrotal skin graft, there can be labial hollowing both of the inferior and the superior labia majora. In our experience fat preservation is important across the entire vulva.

- as I learned from the above mentioned article, in case of circumcision, also some of the distal penile skin proximal of the scar can be used for the reconstruction of clitoral hood and labia minora

Response:

There are cases where we will take additional skin proximal to the circumcision line (if the circumcision line is quite distal and we need more skin volume for labia minora construction). The manuscript has been edited to make this important clarification.
- the correct fixation of the clitoris (specifically to position it at the right depth) still seems to be somewhat of a problem for the authors; it might be useful to mention that not including the tunica in the pedicle dissection gives the advantage of leaving somewhat longer or shorter stumps of the corpora cavernosa: then fixation of the clitoris at the exact anatomic place as the authors say also allows for adjusting the depth

Response:
Thank you for this comment. There are benefits and drawbacks to leaving tunica with the pedicle. As it is our preference and a common practice at many centers to keep the tunica with the pedicle (in order to avoid injury to the neurovascular bundle), we have accepted these trade-offs and have described our technique for clitoral positioning in this context. We acknowledge there are certainly other ways to choose clitoral position, especially in the context of tunical excision.

-line 406: I was somewhat surprised tat the authors do not at all describe how to perform an adequate resection of the bulbus

Response:
A robust discussion on the importance of adequate resection of the bulb/debulkiing the corpus spongiosum is in the below section on the introitus.

- line 436: personal preference: the small perineal flap can be made a bit longer (but not with a wider base)

Response:
Thank you. The dimensions of the perineal flap vary quite widely between surgeons in the literature. We tend to make the flap longer in patients with higher BMI/longer and deeper perineums. This point regarding adjusting perineal flap dimensions has been added to the manuscript.

-line 448: the authors do not provide any details on the 2nd stage correction of the anterior labial commissure: I think it is important to mention that visible scars there should be avoided as much as possible

Response:
Thank you for this point. The primary purpose of this paper was to highlight our preferred techniques to optimize aesthetics at the time of the primary surgery. However, we felt it was important to state the role of revision surgery in regards to achieving individual patient aesthetic goals. We have added additional references

that further describe anterior commissuroplasty and other revision techniques but felt an in depth discussion was beyond the scope of this article.

Reviewer E:
I read your paper with great interest and it is evident that authors have a great experience in GRS. However,in the present form this manuscript is not suitable for publication, unless restructured.

Response:
Thank you for taking the time to review this manuscript. Overall the comments from the reviewers were abundantly positive in regards to the format and content. For this reason, we have went with the majority opinion and left the manuscript in the pre-existing structure.

While I do agree with majority of recommendations proposed throughout the manuscript, the present paper does not offer any novel aspects or additional information,it merely describes more or less standardized technique published multiple times before, such as for instance by the Preecha group from Bangkok.

Response:
Although we deeply appreciate the work by these groups, there are numerous additional technical points unique to our institutional experience with this procedure.

There is not yet a resource in the literature that includes technical discussion, in addition to a narrative review of the literature supported by a large number of medical illustrations and figures. We respect the opinion of the reviewer but found the comments of the other reviewers to be overwhelmingly in support of publication of this work.

The authors take reference to over 500 cases performed in their centre, however they fail to provide any statistical analysis of their patients and outcomes. To correlate their personal experience and compare it to the review of literature would add to this manuscript the substatntial value it is lacking in its present form. If authors are not willing to perform this retrsopective analysis of their results, more organized and systemic review would be needed with more concrete comparison between various techniques proposed in cited references.

Response:
This manuscript and invitation was limited to a narrative review with clinical insights, rather than an original research article describing outcomes from our center. We appreciate the importance of describing surgical outcomes in a separate manuscript, however, and this will be an area of future work. We believe that this manuscript is of value as it describes vulvar aesthetics from a detailed technical perspective, with

medical illustrations and a large volume of clinical photographs and notable references from the literature.

Minor revisions would include: trim down the text - there is a lot of repetition

Response: We have edited the manuscript and made an effort to be more concise where possible.

Page 2 Line 60: `Despite` doesnt make sense in this context as you are reconfirming the previous statement

Response: This sentence has been edited.

Page 3 Line 85: idem

Response: This sentence has been edited.

Page 4 Line 94: irrelevant as these patients not included in the present work

Response:
This section references anatomic “norms” and perceptions of an “ideal” vulva as illustrated by various art works and references. Although cisgender patients were not included in this work, many transfeminine patients use natal vulva as a “standard” and often compare surgical results to natal vulvar appearances. We find this pre-op education on vulvar diversity crucially important to achieve patient satisfaction so have left this segment of the manuscript in place.

Page 8, Line 188: while preserving max amount of subdermal tissue is mostly the case, it doesnt always apply to every patient and should be induvusually assessed

Response:
This line has been adjusted to reflect the need for individualized decision making in this regard.

Page 8, Line 195: not a valid argument, as even delayed skin excision allows the team to prepare the skin graft in time and does not prolong the surgical time.Also, describe other advantages between direct and delayed skin excision.

Response:
Whether or not delayed skin excision will prolong OR time will very much depend on the institution and work flow. At our center the scrub techs thin and tubularize and suture the graft. A process that can take them 45-60 minutes. We are often in need of the skin graft 90-100 minutes after surgical start time. If delaying skin excision until the point of vulvar closure, in our hands this will add significant delay based on how

we structure our workflow. This may be different using other surgical work flows. A discussion of pros and cons of delayed skin excision has been added to the paper and a reference that thoroughly discusses differences between delayed and immediate skin excision has been included.

Page 10: by pexating excessively the skin to the inferior point- take reference to related complications, such as open wounds or skin necrosis

Response:
We have revised the paper to ensure it is clear that excessive tension on closure, especially at the introitus can lead to increased skin necrosis and wound breakdown

Page 11: ref 24 doesntseem to correspond, please double check

Response:
We have checked and edited the reference as appropriate. Thank you for pointing out this error.

Page 12: describe the quality of skin between circumcised and not-circumcised patients and potential consequences on surgical technique.

Response:
Generally the inner preputial skin of uncircumcised patients tends to be thinner and more pink in color with a softer more friable texture compared to the distal penile shaft skin of circumcised patients. In our opinion the inner preputial skin of uncircumcised patients is the best tissue match for the inner/medial surface of the labia minora so we use it whenever available. Our second choice is distal penile shaft skin if the patient is circumcised. This skin tends to be darker in color and thicker which may translate into a slightly darker/thicker appearance to the labia minora. The manuscript has been updated in this regard.

Page 12: concerning the urethral flap, describe other disadvantages related to it, e.g. prompt to bleeding, sometimes uncomfortable sensation during the intercourse etc.

Response:
A thorough discussion on every functional trade off of vaginoplasty techniques is beyond the scope of this aesthetic focused discussion. As stated, we prefer to use the urethral flap as it is the most appropriate tissue match to reconstruct the urethral plate.

We have added a sentence discussing these concerns regarding use of a urethral flap and alternatives that have been proposed in the literature.

Page 17: mention and discuss the advantages of trimming of urethral thickness in order to avoid excessive swelling and reduce risk of heamatoma

Response:
We routinely debulk the superior and lateral aspects of the urethral flap in order to decrease swelling and excessive prominence of the urethral flap. The paper has been revised to make this statement clear.

Page 19; lines 432-441: the argument remains unclear, please rewrite
Response:
This segment has been revised to be more clear in our approach to skin management in cases of penoscrotal hypoplasia. We have also added a reference to a video paper that discusses this approach.

Page 20: Lines 455-6: mention and discuss secondary comissure plasty, as proposed by various authors

Response:
We have added a line to mention secondary commissuroplasty and added a reference. As the focus here is on aesthetics of primary vulvoplasty, a thorough discussion of every possible secondary revision technique is beyond the scope of this paper. However, we agree acknowledging and referencing secondary commissuroplasty is appropriate here and have also included additional references to recent review articles on aesthetic revisions.

Overall, the recommendations and proposed practice is not correlated in any way to minimalizing the intra- and post-op complications. It woud offer a reader additional value understanding which surgical steps contribute to avoiding risks and reduce the complication rate.

Response:
This request is beyond the scope of this narrative review. We appreciate the reviewer's comment that a correlation between intraoperative technique and post-operative complications would be helpful. Through future randomized studies, these questions can be better answered; however we have provided our technical insights which have evolved with out clinical practice.

Reviewer F:
Very good review of one of the most important aspects after gender affirming vulvo and vaginoplasty. However, numerous figures are based on personal experience and could be reduced in this Review. We recommend to authors to collect these fanatactic material and write separate manuscript based on personal experience.

Response:

Thank you for the suggestion. We felt the best balance for this paper was a narrative review of the literature in addition to discussion of institutional practices regarding vulvar aesthetics. For those less familiar with gender-affirming vulvoplasty, the figures are needed to best follow and learn from the text. Given the overall positive feedback from the reviewers regarding the figures, we have elected to keep them in the manuscript.

Good review of outcomes after Gender affiring vaginoplasty. The question is interest for publishing in Andrology&Urology Journal. Authors included numerous figures that make this manuscrip more like as Original article instead Review.

Response:
This was an invited article for submission to the journal. Given the invitation, the number of reviews and the increasing number of these cases performed annually, we think this paper is of great interest to the readership of the journal.

Reviewer G:
This is a useful article that systematically summarises the techniques of vaginoplasty and refers to methods of patient care.

Response:
Thank you for taking the time to review this paper and for your comments and suggestions.

1. Although the article discusses the aesthetics of vaginoplasty and vulvoplasty, a more detailed description of the technique of vulvoplasty alone would be appreciated. In other words, whether the design of the labia minora differs between zero-depth vaginoplasty and vaginoplasty because the vagina is not formed.

Response:
Thank you for this comment. We have addressed this question in response to Reviewer B.

2. There is no mention of skin vaginoplasty other than penile inversion; did you exclude it?

Response:
In this paper we discuss our approach to vulvar construction that applies to all cases of vulvoplasty, penile inversion vaginoplasty with or without additional skin grafts as well as robotic peritoneal flap vaginoplasty.

3. Are there any reports of morphological evaluation or satisfaction surveys by patients in your institution or other centres? If so, please mention them in the DISCUSSION.

Response:
We have not included patient reported outcomes as part of this narrative review and technical discussion. This represents a future direction of this work.

We consider this paper to be worthy of acceptance.

Response:
Thank you for the support of publication of this manuscript.

Reviewer H:
The authors present a well-written description of their surgical technique. The manuscript is clear and addresses a range of issues. The figures are helpful and nicely illustrate the concept. Well-written-a helpful article for surgeons interested in the field

Response:
Thank you for taking the time to review this manuscript and for your support of its publication.