Peer Review File

Article information: https://dx.doi.org/10.21037/ tau-22-858

Review Comments
Reviewer A:

Comment 1:
I would recommend at small table/figure summarizing the “Contemporary Developments” section in particular with pictures of the various described devices.

REPLY 1: Thank you, this was a suggestion by a number of reviewers. We have added Table 1 to summarize the contemporary developments.

Comment 2:
Can you quote/cite the consensus conference goals.

REPLY2: Thank you for this note, it has also been mentioned by other reviewers. We have added a list of the “ideal AUS” features from the consensus conference.

Comment 3:
You introduce the concept of regenerative medicine here for first time. Would remove or introduce sooner.

REPLY 3: We thank the reviewer for identification of this oversight. We have added an introduction of this concept to the introduction of our article.

Comment 4:
Line 91 – can quote guidelines or cite review to support

REPLY4: Consensus panel citation added.

Comment 5:
Line 137 – Rephrase as “Improving mechanical longevity…”

REPLY 5: Thank you for this note, we have made this revision.

Comment 6:
Line 140 – cite

REPLY 6: We appreciate this suggestion and have added a citation for each of the Montreal devices

Comment 7:
Could you comment on some developments that were tried and not successful (if known/discovered)

REPLY 7: We appreciate this comment. Many of the developments we have discussed fall under this category.

Comment 8:
This is a nice addition to the paper but needs to be laid out a bit more in the introduction as it seems separate from the discussion on device optimization.

REPLY 8: Thank you for this comment, we believe this section is quite valuable to the discussion of the future of male SUI therapies even though it is not, strictly speaking, a device. We have added a line to the introduction so that the topic seems more integrated with the remainder of the paper.

Reviewer B:
Comment 1:
The authors describe many of the current iterations of AUS improvements being pioneered by current start-ups and established companies. Some of the companies or approaches seem to be defunct and it is unclear if all are viable or not. It would be nice to understand or have explicitly stated how each design addresses the consensus statements about an ideal AUS put forward in 2015.

REPLY 1: We very much appreciate the suggestion. We believe a clearer explanation of the features of an “ideal AUS” addresses this oversight best and have added this list to the manuscript.

Comment 2:
I think the authors need to acknowledge that they are the PI institution for the AUSCO study that is meant to establish baseline QoL data with current AMS 800 prior to FDA approval for an electronic AUS to be produced by Boston Scientific.

REPLY 2: This has been added to the title page as well as the appropriate COI disclosure form.

Comment 3:
The narrative review does not read well with multiple areas where adjectives could be eliminated, such as exception, fascinating, etc.

REPLY 3: We appreciate the reviewers concerns and have changed some of the language of the article to be more succinct. That being said, other reviewers have had positive comments on readability, so these changes were made judiciously.

Reviewer C:
Comment 1:
In lines 83-90, the authors discuss the AS721 as the first contemporary artificial urinary sphincter device, stating that this technology is the basis of the current AUS design. Further elaboration on the design and mechanism of this device will provide a basis of

the technology to the reader as well as provide a reference for understanding the current research being conducted. Discussion of the current design of the AMS 800 would also further enhance the understanding of the improvements discussed later in the paper to the reader. A simple figure of the mechanism of this device, if possible, may provide further understanding for the readership.

REPLY 1: This is an excellent note. We have added a small description of the AS721 to lines 9-11. We have also added more on the mechanism of the AMS800 to lines 16-21.

While several contemporary innovations in AUS technology have improved both device efficacy and complication rates, the basic technology in use in Boston Scientific's AMS800 can be traced back to the fundamental hydraulic tenets of the AS721. Even the components of the AMS800 differ only in the replacement of the AS721's deflation pump with the AMS800's pressure-regulating balloon (PRB). When the scrotal pump of the AMS800, which lies in series between the cuff and the PRB, is cycled, it pumps fluid into the PRB against its native pressure gradient, thereby drawing fluid out of the urethral cuff. The PRB then passively empties fluid back into the urethral cuff via the scrotal pump as it returns to its resting pressure."

Comment 2:
In line 137, the authors state that "focus on mechanical longevity" was another aspect of the "ideal" AUS. Though this is certainly a genuine consideration, this is not one of the aspects provided by the AUS Consensus Group. The AUS Consensus Group provided the following characteristics for the "ideal" AUS: (a) easily manipulated and inactivated, (b) modify cuff pressure after implantation, (c) be able to adapt occlusive cuff pressure in a real-time manner, (d) have a simple and robust design, (e) be safely implanted via a minimally invasive procedure, and (f) be as cost effective as possible.

REPLY 2: Thank you for this clarification. We have both revised that sentence and also listed the AUS Consensus Group's ideal AUS characteristics to aid in further clarity.

Comment 3:
In lines 122-135, the authors discuss the importance of dynamic cuff pressures and quotes the article by Elliot et al., who discusses the risk of urethral atrophy and use of nocturnal deactivation of the device. Although this article did not find a statistical significance in the rate of decreased urethral atrophy with nocturnal deactivation of the AUS device, we believe that details from this quoted article should be mentioned in the theoretical statement made by the authors (e.g., in their discussion about the importance of dynamic cuff pressures). It would be valuable to the paper to include any other literature (if available) that specifically supports the authors' following statement: "Although this data is early and inconclusive, the concept of selective deactivation and adaptive cuff pressures may increase device survival without a decrease in efficacy."

REPLY 3: We appreciate this suggestion. We have changed lines 88-90 to address this.

Comment 4:

The authors did mention limitations for each future device. They should also include potential side effects that the patient can experience from each of these electronic devices, such as safety of applying electronic voltage to the skin and increased risk of complications that exist with the contemporary AUS, if any of these innovative AUS devices malfunction.

REPLY 4: This is an excellent point and one we have addressed in lines 163-166.

Comment 5:
The section entitled, “Regenerative Technology,” discusses stem cell therapy. This section seems out of place, considering the previous discussions solely consisting of the electronic AUS devices that are currently being developed. This section would be more appropriate in the “Future Considerations” section of the manuscript.

REPLY 5: Thank you for this note. We have moved this section in the text.

Comment 6:
The addition of an adjoining table with each new device mentioned and specific parameters commented on would be beneficial to the readership. Perhaps provide further elaboration on the future AUS devices commented upon by Marziale et al. (Reference 19).

REPLY 6: Thank you, this was a suggestion by a number of reviewers. We have added Table 1 to summarize the contemporary developments.

Reviewer D:
Comment 1:
Authors provide a well written narrative review on the limited studies that exist on eAUS technologies. I have no concerns with the methodology or content. My only recommendation is to include a Table of the devices and details such as their last update, ongoing clinical trial, image or device perhaps, etc. This will help readers who are less familiar with the products to easily become familiar with the scene.

REPLY 1: Thank you, this was a suggestion by a number of reviewers. We have added Table 1 to summarize the contemporary developments.