We thank the reviewers for their helpful feedback and comments. Please find our responses below.

Reviewer 4:

1. “Qualitative assessment of pelvic-floor muscle activity, voided volume, Qmax and residual urine volume were also recorded.
Q. VV, Qmax, PVR are not qualitative results.”

Response: We thank the reviewer for the comment. The term ‘qualitative’ refers only to pelvic-floor muscle activity. We have revised this sentence to distinguish between qualitative and quantitative outcome variables.

1. “Out of 104 children who underwent UDS and non-invasive EMG uroflow, 34 (33%) refused or could not void on UDS and voided only with non-invasive EMG uroflow.
Q. This rate of no voiding was quite high. Please compare your results to the other centers.”

Response: As suggested by the reviewer, we compared the percentage of children who could not void on UDS in our study to results from other centers. The following sentences have been added to the Discussion section:

Similar studies that tested the effect of the catheter on pressure flow also found that a substantial proportion of children could not void in the urodynamic test. For example, in a study by Fugaru et al., 15% of children who underwent UDS could not void in the presence of the catheter, and therefore, pressure flow has not been determined.

1. “UDS showed more children with staccato (32% vs. 16%) and elongated (21% vs. 11%) voiding curves than seen on non-invasive EMG uroflow (p-value=0.2 and p<0.001, respectively).
Rate of staccato was statistically non-significant, while prolonged voiding time was significant. Please separate the two findings. Please provide the flow time difference. Defintion of prolonged voiding time should be provided.”

Response: We have corrected the sentence according to the reviewer’s comment and presented the percentages of children with the staccato and plateau curves separately.

Regarding the difference in flow time, the pressure flow test demonstrated a statistically significant difference in mean flow time (32.4 vs. 17.9 seconds in UDS and non-invasive uroflow, respectively, p-value 0.03).

In the Methods section, we clarified and improved the definition of the plateau curve and its meaning. This revision also corrected the term ‘elongated curve’ to ‘plateau,’ as pointed out by the reviewer in comment 6.

1. “While 39 (55%) children were able to normally relax their pelvic floor muscles during voiding on the non-invasive EMG-uroflow, only 21 (30%) children were able to do so on UDS (p-value=0.5).

Since p=0.5, there was no statistical difference, it is hard to make too much discussion on this issue.”

“We agree with the assumption that the urethral stimulation, pain, and anxiety caused by the urethral catheter interferes with children’s ability to relax the sphincter and pelvic floor muscles as is necessary for normal micturition.21 This is evident in our results as well, as 55% of children sufficiently relaxed pelvic floor muscles during noninvasive EMG uroflowmetry, while in the PF studies, 70% of children demonstrated increased pelvic floor muscle tension on EMG. Although not statistically significant, we suspect that this tendency implies difficulties to relax pelvic floor muscles with the catheter.

If p>0.05, it is difficult to make too much discussion. In addition, how did you define relax or un relax sphincter?”

Response: The reviewer has correctly pointed out, and we have also emphasized in the Discussion section, that there was no statistical difference in the pelvic floor muscle activity between the two tests, as measured by EMG. However, we discussed the non-significant trend because we found it intriguing.

As described in the Methods section, the assessment of pelvic floor muscle activity was qualitative and based on the evaluation of the EMG charts.

1. “Is staccato flow pattern correlated to non-relaxed EMG? The rate of staccato pattern was 32% in free uroflowmetry and non relaxed EMG in 45%.”

Response: Our results show that in the two uroflow tests, with and without the catheter, the percentage of children with a bell-shaped micturition curve was similar to that of children with good relaxation of pelvic floor muscles measured by EMG. In contrast, various abnormal micturition curves were observed in children who could not relax their pelvic floor muscles. A high proportion of the abnormal curves were staccato curves. These findings were not unexpected because a normal, bell-shaped micturition curve requires pelvic floor muscle relaxation.

1. “elongated curves. What is your definition? ICCS did not use this term. Do you mean plateau?”

Response: We accept the reviewer’s comment. We have changed the term ‘elongated’ to ‘plateau,’ and in the Methods section, we have clarified and improved the definition of the plateau curve and its meaning (as mentioned above).

1. “Table 1. Medical history + previous op=100% and symptoms =100%, So, please modify it to make the readers easy to read.”

Response: Table 1 has been revised according to the reviewer’s comment. Of the 104 children, 28 had no medical history, and 59 had no previous surgery. These data have been added for clarity and brought the total number of children to 100%. We also deleted duplicate symptoms in participants to bring the total to 100%.

Reviewer 5:

1. “What prepartory information was given to the children before their non-invasive uroflow regarding hydration before the actual test, as the invasive uroflow with the catheter was probably performed after the bladder was filled to its 'capacity' during cystometry? Therefore, was there a difference in the volume of voided urine during non-invasive vs invasive uroflowmetry, and if so, could this have affected the findings?”

Response: In response to this important comment, we have discussed the potential effect of the procedures on the voided volume as a study limitation.

Another limitation of the study is the difference in voided volume between the two tests because the amount of voided urine can potentially affect the flow rate. The median voided volume was 44 mL lower in the non-invasive uroflow test than in the pressure flow test, most likely because the bladder was filled to maximum capacity in the latter. To mitigate the potential effect of this confounding variable, we excluded non-invasive uroflow tests that have not fulfilled the ICCS test reliability criteria of over 50% expected bladder capacity.

1. “When did the boys with posterior urethral valves and those who had ureteral reimplant surgery have their surgery in relation to the time of their non-invasive and invasive uroflowmetry, as this may have affected the type of uroflow they exhibited at the time?”

Response: The timing of the uroflow tests, with or without a catheter, was at least six months after surgical intervention. The interval between the two tests was less than a month, with no change in treatment protocols during that time. These points have been further clarified in the Methods section. We believe that this protocol is a strength of the study, as detailed in the Discussion section.

1. “Several references are incomplete regarding authorship: references 8 & 14 have only initials for the 2nd author and are missing additional names of other authors. Please complete the authorship for these references and review other references to ensure accurate authorship citations.”

Response: We have reviewed all the references on the list and corrected the mistakes.

1. “In response to reviewer #1, comment 2, there is discordance between what the was written in the manuscript and what the authors answered in their response to the reviewer’s question. Can the authors correct this?”

Response: We rephrased the participants’ medical and surgical histories in the Results section. This information is now congruent with the response to Reviewer 1.

1. “Reviewer #2, comment 3, a synopsis of the authors response should be added to the manuscript as future readers might have the same concerns.”

Response: As suggested by the reviewer, the response has been added to the Discussion section.

1. “Reviewer #3, comments 3 & 4, the authors may want to add their responses to the end of the Discussion section, as ‘future directions’ for study.”

Response: As suggested by the reviewer, the main points have been added to the Discussion section.

1. “Reviewer #3, comment 5 is an important point that I think the authors’ response could (probably should) be added to their manuscript.”

Response: As suggested by the reviewer, the response has been added to the Discussion section.

1. In Table #1, why aren’t the categories for ‘Medical Background’, ‘Previous Operations’, and ‘Symptoms’, adding up to 100%? Please correct.

Response: Table 1 has been revised, as in our response to comment 7 by Reviewer 4 above.

(Of the 104 children, 28 had no medical history, and 59 had no previous surgery. These data have been added for clarity and brought the total number of children to 100%. We also deleted duplicate symptoms in participants to bring the total to 100%.)

1. In Table #3, under the column labeled “Children with Concordant Data”, what are the percentages after each number, reflective of? I assume it should be n = 70, but the authors need to more explicit of this in the legend.

Response: The percentages are calculated from the total of n=70. We have revised the information in the table column according to the reviewer’s comment.