

## Peer Review File

Article Information: <https://dx.doi.org/10.21037/tau-23-406>

### Reviewer A

**Comment 1:** Running title is too long; authors should shorten it.

**Reply 1:** We are grateful for your suggestion, and the running title has been shortened.

**Changes in the text:** page 1 line 13-15: Running title: Hydronephrosis in Pediatric Horseshoe Kidneys

**Comment 2:** Abstract: Regarding the study's design, it'd be more appropriate to say retrospective cohort observational study.

**Reply 2:** Thanks for your valuable comment. We have rewritten relevant parts according to your suggestion.

**Changes in the text:**

Abstract section, page 3 line 11-12: 31 patients were included in this retrospective cohort observational study, and surgical success was achieved in 80.6% (25/31) of patients.

Methods section, page 7 line 3-4: Patients diagnosed with hydronephrosis in HSK and underwent pyeloplasty at our institution between August 2009 and June 2022 were retrospectively reviewed in this cohort observational study.

**Comment 3:** Highlight box: What should change now? Authors do not answer this question. I recommend rephrasing the answer to emphasize the LP recommendation as a less invasive option. Authors should also recommend the active and systematic search for possible crossing vessels during UPJO surgery on horseshoe kidneys, in order to avoid the morbidity themselves have had in 2 cases.

**Reply 3:** We gratefully appreciate for your meticulous and valuable comments. We deeply agree with you that LP and crossing vessels are the most crucial points and have changed above-mentioned sentences in the highlight box.

**Changes in the text:** Highlight box, page 5: It is crucial to search for crossing vessels actively and systematically when treating hydronephrosis in HSK patients.

**Comment 4:** Introduction: "This study may help improve the management of HSK-associated hydronephrosis and guide clinicians in selecting the appropriate surgical methods". These objectives are not achieved in this study. Authors should specify in the discussion how to improve

the management of these patients and how to select the most appropriate type of surgery or it would be better to eliminate these sentences.

**Reply 4:** We gratefully appreciate for your valuable comments. We agree with your opinion and have deleted these sentences.

**Changes in text:** Introduction section, page 6 line 14-15

**Comment 5:** Methods: I'd recommend ordering the indications, placing together the two that correspond to the diuretic renogram. SFU III could also be eliminated.

**Reply 5:** We gratefully appreciate for your careful and meticulous revisions and the valuable comments. We have read previous guidelines carefully and made changes in the Methods section.

**Changes in text:** Methods section: page 7 line 4-11: Surgical intervention was performed if either ultrasound showed progression of hydronephrosis, patients had clinical symptoms, renal function of the hydronephrotic kidney <40%, decrease in split renal function >10%, or severe upper urinary tract dilatation (Society of Fetal Urology grade IV)(13)(<http://uroweb.org/guidelines/compilations-of-all-guidelines/>).

**Comment 6:**“Preoperative data included patient age, weight, sex, symptom, laterality, and ultrasound parameters”. I'd recommend changing sex for gender.

**Reply 6:** Thank you for your rigorous suggestion. We have changed the phrases in the Methods section and in Table 1.

**Changes in text:** Methods section, page 7 line 16-17: Preoperative data included patient age, weight, gender, symptom, laterality, and ultrasound parameters.

Table 1

**Comment 7:** As the indications for surgery include, authors should include the diuretic renogram parameters of their series.

**Reply 7:** Thank you for pointing this out. In our study, the follow-up diuretic renogram was performed only in a few patients with reobstruction and severe symptoms. We worried that the sample size is too small to draw the solid conclusions. On the one hand, although diuretic renogram is the gold standard to assess the renal function, the use of diuretic renogram has traditionally required sedation in pediatric patients, which is inconvenience for the children and their parents. On the other hand, diuretic renogram is too expensive and time-consuming and is not available as a widely used tool in developing countries. Your advice is important, and we will include the follow-up data of renal scintigraphy in our future study.

**Changes in text:** None.

**Comment 8:** “Assessment methods for follow-up included clinical manifestations, ageultrasound, and urine routine”. age, ultrasound

**Reply 8:** We are very sorry for our negligence of proof-reading. We have made correction as “ultrasound”.

**Changes in text:** Methods section, page 8 line 2

**Comment 9:** Do you always perform urine test during follow up? Why?

**Reply 9:** Thanks for your valuable comment. We have added the relevant description in the manuscript.

**Changes in text:** Methods section, page 8 line 3-4 “We choose to examine urine routine when patients undergoing symptoms such as fever, lower urinary tract symptoms or pyuria that make us doubt the possibility of urinary tract infections (UTI).”

**Comment 10:** Do you ever perform postoperative renogram?

**Reply 10:** Thanks for your valuable comments. In our study, the follow-up diuretic renogram was performed only in a few patients with reobstruction and severe symptoms. We worried that the sample size is too small to draw the solid conclusions. On the one hand, although diuretic renogram is the gold standard to assess the renal function, the use of diuretic renogram has traditionally required sedation in pediatric patients, which is inconvenience for the children and their parents. On the other hand, diuretic renogram is too expensive and time-consuming and is not available as a widely used tool in developing countries. Your advice is important, and we will include the follow-up data of renal scintigraphy in our future study.

**Changes in text:** None.

**Comment 11:** How do you determine the existence or not of postoperative obstruction?

**Reply 11:** We gratefully appreciate for your careful and meticulous revisions. We added relevant description in the manuscript as “Reobstruction was defined as the need to redo dismemberment pyeloplasty if symptoms such as abdominal pain and vomiting were present, or if the Society of Fetal Urology grade was increased or the APD increased by more than 1 cm on ultrasound.”

**Changes in text:** Methods section, page 8 line 8-10

**Comment 12:** “All postoperative complications were classified according to the Clavien-Dindo classification, with postoperative UTI defined as Clavein-Dindo classification II and reobstruction defined as Clavein-Dindo classification IIIb (11)”. Clavien

**Reply 12:** We are very sorry for our incorrect writing. We have made correction according to your precise comments.

**Changes in text:** Methods section, page 8 line 12-14: All postoperative complications were classified according to the Clavien-Dindo classification, with postoperative UTI defined as Clavien-Dindo classification II and reobstruction defined as Clavien-Dindo classification IIIb (15).

**Comment 13:** For children younger than 1 year of age and of a weight less than 10 kg, we tend to performed OP. I would like to know how many patients of less than one year and less than 10 kg there are in each group (OP and LP). As these results are presented as median and IQR, this is not clear.

**Reply 13:** We gratefully appreciate for your careful and meticulous revisions. There were each one patient with above-mentioned characteristic in LP group and OP group. Considering of the rarity of HSK, the surgical strategy may not apply to the particular group of patients coincidentally. In addition to age and weight, the preference of the surgeon is also an important factor in the choice of surgical approach. We have added relevant content as “In addition to age and weight, the preference of the surgeon is also an important factor in the choice of surgical approach. Based on our institution's experience, the use of LP in low-body-weight, small-age children can lead to limited access to ureter and increased incidence of intraoperative complications and side injuries due to the small space for abdominal manipulation.”

**Changes in text:** Methods section, page 9 line 7-10

**Comment 14:** LP was performed using a transperitoneal methods with three ports (5 mm). The colon was mobilized to expose the renal pelvis up to the ureteropelvic junction (UPJ). Why don't you use 3 mm instruments (at least for smaller kids)? In any case have you made a transmesenteric approach? What tricks do they use when the UPJ is very medialized?

**Reply 14:** Thank you very much for pointing out our weaknesses in describing the details of the procedure. We rarely use 3mm instruments mainly because of the lack of complementary surgical instruments and the fact that 3mmports are less used and more expensive. In a slightly inclined position with the affected side elevated, transperitoneal method allows sufficient freeing of the bowel to fully expose the ureter, even when the UPJ is very medialized. We have added the above details to our manuscript.

**Changes in text:** Methods section, page 9 line 10-14: In a slightly inclined position with the affected side elevated, LP was performed using a transperitoneal methods with three ports (5 mm). The colon was mobilized to expose the renal pelvis up to the ureteropelvic junction (UPJ). When crossing vessels were detected, the UPJ and pelvis were delivered anterior to the crossing vessels and anastomosis was performed.

**Comment 15:** In patients with crossing vessels, the UPJ and pelvis were delivered anterior to the crossing vessels and anastomosis was performed. It was not that way in 2 cases.

**Reply 15:** Thanks for your valuable comment. We've rephrased the above-mentioned sentence to make it clearer.

**Changes in text:** Methods section, page 9 line 13-14: "When crossing vessels were detected, the UPJ and pelvis were delivered anterior to the crossing vessels and anastomosis was performed."

**Comment 16:** If within the LP group there are variations in the surgical technique, authors should perform an analysis by subgroups, as these differences can potentially alter the results.

**Reply 16:** We gratefully appreciate for your careful and meticulous revisions. In current study, all LP performed by same qualified surgeons who have performed more than 100 OP and LP surgeries and have more than 5 years of surgical experience of OP and LP surgery.

**Changes in text:** None.

**Comment 17:** What type of suture do you use?

**Reply 17:** Thank you for pointing out the lack of detail in above-mentioned sentence. We've added describe of procedure into the Methods section as: "was anastomosed with 5-0 absorbable monofilament running suture"

**Changes in text:** Methods section, page 9 line 16

**Comment 18:** What happened if you have difficulties placing the DJ stent? What were the other DJ sizes used and in what cases? This detail is very important, because if a 4.7Fr catheter does not progress through our anastomosis, it is more likely that we will not obtain an optimal result. For this reason, the authors should analyze this data and include it in their study.

**Reply 18:** Thanks for your valuable comment. In our study, all LP patient was placed 4.7F DJ stent except for one patients under 1 year old was placed 4F DJ stent. None of patients had difficulty placing the DJ stent. If a 4.7F DJ stent was difficult to place, we would change to a 4F DJ stent. If significant resistance at the ureterovesical junction appears, a nephrostomy tube plus external ureteral stent would be indwelled as an alternative drainage method. Besides 4.7F DJ stent and 4F DJ stent, there are also other choices of DJ stent including 3F and 6F, which would be used empirically.

**Changes in text:** Methods section, page 10 line 3-4: In our study, all LP patient has been placed 4.7F DJ stent except for one patients under 1 year old was placed 4F DJ stent. None of patients had difficulty placing the DJ stent.

**Comment 19:** For open pyeloplasty (OP), a 5 cm subcostal flank incision was made. That seems a huge incision, even for HSK. Please, explain why do you need such a big incision, especially in younger, thinner children. Have you considered performing all cases via LP regardless of the age and weight of the patient?

**Reply 19:** We gratefully appreciate for your comment. We have rewritten the Methods section as “For OP, an average size of 5 cm subcostal flank incision was made.” The selection of the incision is made based on a comprehensive assessment of factors including age, weight, and the surgeon's established practices. Performing all cases via LP regardless of the age and weight of the patient need further studies with larger sample sizes and prospective designs.

**Changes in text:** Methods section, page 10 line 5-6

**Comment 20:** OP followed the same steps as laparoscopic pyeloplasty, and a nephrostomy tube and external ureteral stent were indwelled as the routine drainage method. Both catheters? Why? The distal end of the external ureteral stent arrives to the bladder or not?

**Reply 20:** We would like to thank you for your valuable comment. For patients underwent OP, the nephrostomy tube serves to drain the urine, while the external stent serves to support the neo-UPJ. We believe that both of stents are necessary for postoperative recovery. The distal end of the external ureteral stent didn't arrive to the bladder. We have added the above details to your comment.

**Changes in text:** Methods section, page 10 line 6-9: OP followed the same steps as laparoscopic pyeloplasty, and a nephrostomy tube and external ureteral stent were placed. The nephrostomy tube serves to drain the urine, while the external stent serves to support the neo-UPJ. The distal end of the external ureteral stent didn't arrive to the bladder.

**Comment 21:** The nephrostomy tube was typically removed 10-14 days after the operation, according to the methylene blue study, while the DJ stent was removed under general anesthesia using a cystoscope 4-6 weeks after the operation. Do you leave the nephrostomy tube open for 10-14 days? What happens with external ureteral stent?

**Reply 21:** Thank you for pointing out the lack of detail in above-mentioned sentence. We have added related details as “External ureteral stent would be removed 6-7 days after surgery. The nephrostomy tube was clamped 24 hours before removal and the methylene blue test was performed at the time the nephrostomy tube was clamped. If the methylene blue urine was drained and there were no complications within 24 hours, the nephrostomy tube would be removed.”

**Changes in text:** Methods section, page 10 line 9-13

**Comment 22:** Methylene blue study has been losing usefulness over time. With it we only know if there is passage through the anastomosis or not, which we can know indirectly when we see a certain blood dye in the urine collected in the transurethral catheter. We also know this indirectly when our patient persists completely asymptomatic after clamping this catheter. If there is reasonable doubt about the patency of the anastomosis or other problems at that level, it may be better assessed by a nephrostogram.

**Reply 22:** We gratefully appreciate for your comment. As mentioned in Reply 21, the nephrostomy tube was clamped 24 hours before removal and the methylene blue test was performed at the time the nephrostomy tube was clamped. If the methylene blue urine was drained and there were no complications within 24 hours, the nephrostomy tube would be removed. Methylene blue study can assess the possibility of reobstruction easily and none radioactively at bedside. If the methylene blue urine was not drained within 24 hours, we would prolong the retention of the nephrostomy tube and perform nephrostogram 2 weeks after the methylene blue study. We would remove the nephrostomy tube after the imaging confirms ureteral patency. In the current study, all patients urinated blue urine within 24 hours and the nephrostomy tube was successfully removed.

**Changes in text:** None.

**Comment 23:** Follow-up time is insufficient for HSK patients. It is also noteworthy that having included patients since August 2009, the median follow-up time is 31.0 (10.5, 75.5). What happens to these patients in the long-term?

**Reply 23:** We deeply agree with you that comprehensive long-term follow-up is imperative. We retrospectively reviewed the clinical data of hydronephrosis patients with HSK through a wide time-span. Given the rarity of HSK and the fact that the current study covers a long period from August 2009 to June 2022, some of the cases had a relatively short follow-up period, but still exceeded six months. Longer follow-up times and larger sample sizes will be refined in future studies.

**Changes in text:** None.

**Comment 24:** Among them, 58.1% of patients (18/31) were symptomatic, with abdominal pain in 14, UTI in two, abdominal mass in one, paruria in one, and hematuria in one. Do you wanted to say pyuria?

**Reply 24:** We are very sorry for our incorrect writing. We have made correction according to your precise comments.

**Changes in text:** Methods section, page 12 line 6-8: Among them, 58.1% of patients (18/31) were symptomatic, with abdominal pain in 14, UTI in two, abdominal mass in one, pyuria in one, and hematuria in one.

**Comment 25:** In the OP group, one patient (6.3%) had a UTI with symptoms of abdominal pain and vomiting during ureteral stent placement, which improved after using antibiotics. In the LP group, three patients (20.0%) had UTI including two patients developed UTI after double-J stent removal and one patient had a UTI with symptoms of abdominal pain and vomiting during double-J stent placement, both improved after using antibiotics. This is not clear. I can imagine that authors mean while catheter was in place. They should reformulate the sentences in order to clarify what

happened. Do you think that your patients are more likely to have UTIs due to the long time do you leave the catheters?

**Reply 25:** Thank you for your precious comment. We rewrote the part of the description in Result section that wasn't clear enough as “A total of 4 patients presented with UTI. Among them, one patient in the OP group had UTI with symptoms of abdominal pain and vomiting with nephrostomy tube placed. One patient in the LP group had a UTI with symptoms of abdominal pain and vomiting with DJ stent placement. After DJ stents being removed, two patients in the LP group developed UTI. All patients' symptoms improved after antibiotic treatment.” We have also added content about the long time of leaving the catheters as “There was no significant difference in the incidence of UTI between the LP group, which left catheter in place longer, and the OP group, which left catheter in place for a shorter period of time. Our study did not find a correlation between the duration of indwelling catheterization and the occurrence of UTI, and prospective studies with larger samples are needed to further explore this question in the future”

**Changes in text:** Results section, page 12 line 1-5; Discussion section, page 16 line 1-4

**Comment 26:** Reobstruction occurred in one patient each in the OP and LP groups, and crossing vessels were found during the reoperation, which were not found in the primary operation. This morbidity is due to a human error. It is important to emphasize it so that it does not happen again in the future. As HSK has an aberrant anatomy, you ALWAYS have to actively look for a possible crossing vessel during surgery. I think this particular point is where we can draw the main lesson of this article.

**Reply 26:** We deeply agree with your valuable comments. We have emphasized the importance of searching for crossing vessels in highlight box and discussion section.

**Changes in text:** Highlight box, page 5: It is crucial to search for crossing vessels actively and systematically when treating hydronephrosis in HSK patients.

Discussion section, page 17 line 6-8: Reobstruction occurred in two patients because missing crossing vessels in the primary operation. This may be due to rotation of the renal pelvis, variations in vascular alignment and poor visual field exposure in HSK patients.

**Comment 27:** Figure 1. Shows postoperative changes in ultrasound, comparing OP and LP. It could be interesting to compare the other 2 groups that authors have analyzed: with and without crossing vessels.

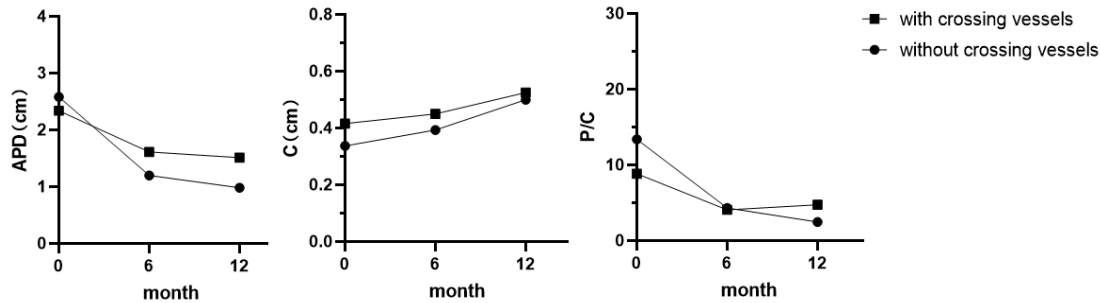
**Reply 27:** Thank you for your rigorous suggestion. As shown in Figure 2, we've compared postoperative ultrasound parameters between the other 2 groups as well. In the Result section, we added description of Figure 2.

**Changes in text:** Result section, page 14 line 6-8: The trend of changes in preoperative and postoperative ultrasound parameters were shown in Figure 2. APD and P/C ratio decreased



similarly between the two groups at 6 and 12 months postoperatively. The C thickness was similar to rise between the two groups at 6 months and 12 months postoperatively.

Figure 2



**Comment 28:** The success rate in crossing vessels was significantly lower than that in the no crossing vessels group (62.5% vs 100%,  $P=0.018$ ). In part, the success is so low due to the cases in which the crossing vessel were not detected.

**Reply 28:** We deeply agree with your valuable comments. We have emphasized the importance of searching for crossing vessels in highlight box and discussion section.

**Changes in text:** Highlight box, page 5: It is crucial to search for crossing vessels actively and systematically when treating hydronephrosis in HSK patients.

Discussion section, page 17 line 6-8: Reobstruction occurred in two patients because missing crossing vessels in the primary operation. This may be due to rotation of the renal pelvis, variations in vascular alignment and poor visual field exposure in HSK patients.

**Comment 29:** Discussion Line 2-11: This is more suitable in the introduction than the discussion.

**Reply 29:** Thank you for your thoughtful reading of our manuscript and for your valuable suggestions. We have moved part of the discussion to introduction to make the structure of the article more reasonable according to your valuable comments.

**Changes in text:** Introduction section, Discussion section

## Reviewer B

**Comment 1:** Should all the inclusion criteria be present for diagnosis? Please specify this aspect.

**Reply 1:** We gratefully appreciate for your careful and meticulous revisions and the valuable comments. We have read previous guidelines carefully and made changes in the Methods section.

**Changes in text:** Methods section, page 7 line 4-11

**Comment 2:** The authors should better report how the surgeons choose the intervention and how many surgeons are involved.

**Reply 2:** We gratefully appreciate for your careful and meticulous revisions. We have rewritten the Methods section as “All procedures were performed by four surgeons with the same qualifications and experience of pyeloplasty OP and LP surgery. For children younger than 1 year of age and of a weight less than 10 kg, we tend to performed OP. In addition to age and weight, the preference of the surgeon is also an important factor in the choice of surgical approach.”

**Changes in text:** Methods section, page 9 line 3-8

**Comment 3:** The authors declared: 'All procedures were performed by surgeons with the same qualifications and experience of pyeloplasty surgery. The choice of surgery modalities was largely determined by the experience and preference of the surgeon'. It looks like some surgeons could approach the surgery with a laparoscopic approach, meanwhile, others could not do it.

**Reply 3:** We gratefully appreciate for your careful and meticulous revisions. In current study, all surgeries performed by same qualified surgeons who have performed more than 100 OP and LP surgeries and have more than 5 years of surgical experience of OP and LP surgery. We have rewritten above-mentioned part according to your precise comments.

**Changes in text:** Methods section, page 9 line 3-8: All procedures were performed by four surgeons with same qualifications and experience of OP and LP surgery. The choice of surgery modalities was largely determined by the experience and preference of the surgeon. For children younger than 1 year of age and of a weight less than 10 kg, we tend to perform OP. In addition to age and weight, the preference of the surgeon is also an important factor in the choice of surgical approach.

**Comment 4:** 'Individual consent for this retrospective analysis was waived' Do the caregivers written consent?

**Reply 4:** Thanks for your precious comment. As mentioned in Method section (page 8 line 19-21): “This study was conducted in accordance with the Declaration of Helsinki (as revised in 2013) (16). This study obtained approval from our institutional ethical review board (No. [2023]-E-043-R). Individual consent for this retrospective analysis was waived.” The study was presented in accordance with the STROBE reporting checklist.

**Changes in text:** None.

**Comment 5:** Does nephrostomy tube place in every patient? Why?

**Reply 5:** Thank you for your rigorous comment. We have redescribed the relevant content in Methods section to make them clearer as “OP followed the same steps as laparoscopic pyeloplasty, and a nephrostomy tube and external ureteral stent were placed. The nephrostomy tube serves to drain the urine, while the external stent serves to support the neo-UPJ. The distal end of the external

ureteral stent didn't arrive to the bladder.”, “In our study, all LP patient has been placed 4.7F DJ stent except for one patients under 1 year old was placed 4F DJ stent. None of patients had difficulty placing the DJ stent.”

**Changes in text:** Methods section, page 9 line 6-9, page 10 line 3-4

**Comment 6:** No mention of guidelines is described in the text.

**Reply 6:** We gratefully appreciate for your valuable comments. We have read EAU guidelines carefully and made changes in the Methods section as “Surgical intervention was performed if either ultrasound showed progression of hydronephrosis, patients had clinical symptoms, renal function of the hydronephrotic kidney <40%, decrease in split renal function >10%, or severe upper urinary tract dilatation (Society of Fetal Urology grade IV)(13)( <http://uroweb.org/guidelines/compilations-of-all-guidelines/>).”

**Changes in text:** Methods section, page 7 line 4-11

**Comment 7:** Only a minimal mention of the robotic approach is made in the article. In such difficult cases as HSK it could play an important role. Please add some literature about that.

**Reply 7:** Thank for your precious comments. We have added literatures about robotic approach in discussion section as “In recent years, robotic technology has been developing rapidly and becoming more widely used in pyeloplasty (19). The advent of robotic technology has mitigated some of the technical challenges associated with laparoscopic surgery, providing surgeons with advanced EndoWrist instrumentation and three-dimensional visualization (20).”, “The main limitations of this study are the retrospective nature, the small sample size and lake of robotic approach. However, this limitation is due to the high rarity of this pathology in the pediatric population.” “Nonetheless, further studies with larger sample sizes and prospective designs are warranted to confirm our findings and evaluate the long-term outcomes of these procedures in HSK patients.”

**Changes in text:** Discussion section, page 15 line 11-14

19. Esposito C, Masieri L, Blanc T, et al. Robot-assisted laparoscopic pyeloplasty (RALP) in children with horseshoe kidneys: results of a multicentric study. *World J Urol* 2019;37:2257-63.

20. Boysen WR, Gundeti MS. Robot-assisted laparoscopic pyeloplasty in the pediatric population: a review of technique, outcomes, complications, and special considerations in infants. *Pediatr Surg Int* 2017;33:925-35.

**Comment 8:** I do not totally understand the importance of Table 3 because it maybe should be considered as a normal variable.

**Reply 8:** We politely disagree with your opinion. As described in result and discussion section, crossing vessels are main cause of reobstruction and the group with crossing vessels presents more

complications than the group without crossing vessels. We considered Table 3 is important to compare the characteristic between the groups of with and without crossing vessels.

**Changes in text:** None.

### **Reviewer C**

**Comment 1:** This is an interesting study; however, this study has been conducted previously and has been published previously and does not add to the current literature.

**Reply 1:** Thank for your precious comments. Our study is the largest single-center study compared both OP and LP procedures to date, with a long follow-up period. We have also cited some previous similar studies in the Introduction section as “However, pyeloplasty can be challenging in patients with HSK due to the abnormal structure of the kidney. While several small case series studies have reported the feasibility and effectiveness of pyeloplasty in children with HSK, limited research has compared different surgical procedures (5,7,12).”

**Changes in text:** Introduction section, page 6 line 6-9

5. Blanc T, Koulouris E, Botto N, et al. Laparoscopic pyeloplasty in children with horseshoe kidney. *J Urol* 2014;191:1097-103.

7. Nishi M, Iwamura M, Kurosaka S, et al. Laparoscopic Anderson-Hynes pyeloplasty without symphysiotomy for hydronephrosis with horseshoe kidney. *Asian J Endosc Surg* 2013;6:192-6

12. Elmaadawy MIA, Kim SW, Kang SK, et al. A retrospective analysis of ureteropelvic junction obstructions in patients with horseshoe kidney. *Transl Androl Urol* 2021;10:4173-80.

**Comment 2:** There is no mention of presenting symptoms for the patients

**Reply 2:** Thank for your precious comments. We have described presenting symptoms as “Among them, 58.1% of patients (18/31) were symptomatic, with abdominal pain in 14, UTI in two, abdominal mass in one, pyuria in one, and hematuria in one.” in the Results section, page 12 line 6-8.

**Changes in text:** None.

**Comment 3:** Different surgical approaches (besides open vs lap) are not discussed. What technique for pyeloplasty was utilized?

**Reply 3:** Thank for your precious comments. All patients underwent Anderson-Hynes pyeloplasty by open approach and laparoscopic approach. We have added literatures about robotic approach in the Discussion section as “In recent years, robotic technology has been developing rapidly and becoming more widely used in pyeloplasty (19). The advent of robotic technology has mitigated some of the technical challenges associated with laparoscopic surgery, providing surgeons with advanced EndoWrist instrumentation and three-dimensional visualization (20).”, “The main

limitations of this study are the retrospective nature, the small sample size and lack of robotic approach. However, this limitation is due to the high rarity of this pathology in the pediatric population.” “Nonetheless, further studies with larger sample sizes and prospective designs are warranted to confirm our findings and evaluate the long-term outcomes of these procedures in HSK patients.”

**Changes in text:** Discussion section, page 15 line 11-14, page 18 line 4-6, 11-13

19. Esposito C, Masieri L, Blanc T, et al. Robot-assisted laparoscopic pyeloplasty (RALP) in children with horseshoe kidneys: results of a multicentric study. *World J Urol* 2019;37:2257-63.

20. Boysen WR, Gundeti MS. Robot-assisted laparoscopic pyeloplasty in the pediatric population: a review of technique, outcomes, complications, and special considerations in infants. *Pediatr Surg Int* 2017;33:925-35.

**Comment 4:** What postoperative follow-up occurred for patients? Renal bladder ultrasound?

**Reply 4:** Thank for your rigorous comments. We have described content about follow-up in the Methods section (page 8 line 2-4, line15-16) as “Assessment methods for follow-up included clinical manifestations, ultrasound, and urine routine. We choose to examine urine routine when patients undergoing symptoms such as fever, lower urinary tract symptoms or pyuria that make us doubt the possibility of urinary tract infections (UTI).” “Ultrasound examination was performed 6 and 12 months after surgery and annually thereafter.”

**Changes in text:** None.

**Comment 5:** What do the authors define as a surgical success?

**Reply 5:** Thanks for your precious comments. We have defined complications in Methods section as (page 8 line 5-6) “Postoperative complications were defined as patients requiring further management, such as UTI, and reobstruction.”and have added definition of surgical success as (page 8 line 14-15)“Surgical success was defined as the absence of reoperation and UTIs associated with this surgery.”

**Changes in text:** Methods section, page 8 line 14-15

**Comment 6:** Why was robotic surgery not utilized?

**Reply 6:** Thank for your precious comments. Robotic surgery, mainly due to the long duration of the study and economic conditions, was not used in our institution. We have added relative content in the Discussion section as “In recent years, robotic technology has been developing rapidly and becoming more widely used in pyeloplasty (19). The advent of robotic technology has mitigated some of the technical challenges associated with laparoscopic surgery, providing surgeons with advanced EndoWrist instrumentation and three-dimensional visualization (20).”, “The main limitations of this study are the retrospective nature, the small sample size and lack of robotic

approach. However, this limitation is due to the high rarity of this pathology in the pediatric population.”

**Changes in text:** Discussion section, page 15 line 11-14

19. Esposito C, Masieri L, Blanc T, et al. Robot-assisted laparoscopic pyeloplasty (RALP) in children with horseshoe kidneys: results of a multicentric study. *World J Urol* 2019;37:2257-63.

20. Boysen WR, Gundeti MS. Robot-assisted laparoscopic pyeloplasty in the pediatric population: a review of technique, outcomes, complications, and special considerations in infants. *Pediatr Surg Int* 2017;33:925-35.

## **Reviewer D**

**Comment 1:** If you want to use the title "[...]Impact of different surgery methods", you should mention robotic-assisted laparoscopic pyeloplasty too (here some examples DOI: 10.1007/s00345-019-02632-x, DOI: 10.1007/s00464-015-4678-8). Otherwise, you should be more specific in your title (OP versus LP).

**Reply 1:** Thank you for pointing out the lack of rigour in the details of our title. We have changed our title according to your precious advice.

**Changes in text:** Title: Hydronephrosis in Pediatric Horseshoe Kidneys: A Comparative Analysis of Open and Laparoscopic Pyeloplasty and the Influence of Obstruction Causes

**Comment 2:** Furthermore, remember that CT angiogram can accurately delineate the vasculature and collecting system. OR MRU can also be utilized for simultaneous evaluation of renal function and anatomy. They may optimize success of surgery.

**Reply 2:** We deeply agree with you that CT angiogram and MRU can evaluate vasculature and collecting system accurately, as well as may optimize success of surgery. We have added relevant content in limitation section as your precious advice.

**Changes in text:** Discussion section, page 18 line 4-8: “The main limitations of this study are the retrospective nature, and the small sample size and lack of robotic approach. However, this limitation is due to the high rarity of this pathology in the pediatric population. In addition, due to the long time span of the study and economic conditions, only a few patients underwent CT angiogram and MRU which can evaluate vasculature and collecting system accurately.”

Discussion section, page 18 line 11-14: “Nonetheless, further studies with larger sample sizes and prospective designs are warranted to confirm our findings and evaluate the long-term outcomes of these procedures in HSK patients.”

## **Reviewer E**

Congratulations to author who can has a relatively good sample size of patients with double pathology, i.e. PUJO & horseshoe kidney.

**Reply:** Thank you for your kind letter and your careful work regarding our manuscript. We have revised the manuscript in accordance with your comments and point-by-point responded to the comments as below.

**Comment 1:** - In Table1 &2, the data is not well marked, i.e. meaning of the numbers within the bracket is not named. Pls state whether that is range or quartile, or sth else. Pls state whether mean or median is shown.

**Reply 1:** Thanks for your valuable comments. We have named the meaning of numbers within the bracket below in Methods section as (page 10 line 22 – page 11 line 5) “Normality test was performed before sample comparison (Shapiro-Wilk normality test or Pearson normality test). Continuous data following normal distribution showed as mean  $\pm$  standard deviation ( $\bar{x} \pm SD$ ) were analyzed by t-test. Continuous data not following normal distribution are presented as median and inter-quartile range (IQR), M (P25, P75), analyzed by Mann-Whitney U-test, while variables between groups were compared using Chi-square test or Fisher exact test.”

**Changes in text:** None.

**Comment 2:** - For the comparison of open vs lap pyeloplasty, author mentioned this is mainly based on surgeons' preference. When author tried to check then demographics and characteristics of the open and laparoscopic groups, there is obvious selection bias of operative approaches. Surgeons in this series tend to operation with open approach in patient with larger APD and worse P/C ratio, which means surgeons prefer to operation patients with open approach for those with severe PUJO. Despite the bias, I think it is reasonable to compare the 2 groups but take note of the bias present.

**Reply 2:** We are in agreement with your valuable comments. We acknowledge the existence of the above-mentioned biases, and the relevant content has been rewritten in the Methods section as “All procedures were performed by four surgeons with same qualifications and experience of OP and LP surgery. The choice of surgery modalities was largely determined by the experience and preference of the surgeon. For children younger than 1 year of age and of a weight less than 10 kg, we tend to perform OP. In addition to age and weight, the preference of the surgeon is also an important factor in the choice of surgical approach. Based on our institution's experience, the use of LP in low-body-weight, small-age children can lead to limited access to ureter and increased incidence of intraoperative complications and side injuries due to the small space for abdominal manipulation.”

**Changes in text:** Methods section, page 9 line 3-10

**Comment 3:** - In this series, author mentioned the obstruction rates is higher than other series, which all of the recurrence patients here has missed crossing vessel. Author should spend some effort why this was missed in the 1st operation, e.g. rotated renal pelvis in horse kidney and reminds other surgeons to look for crossing vessels in horseshoe kidney + PUJO.

- so, this paper better not stress on the difference between open vs lap pyeloplasty, but rather should spend some effort on the missed crossing vessels.

**Reply 3:** We deeply agree with your valuable comments. We have rewritten the highlight box and Discussion section to emphasize the importance of searching for crossing vessels. Furthermore, we have added Figure 2 to compare postoperative ultrasound parameters between the other 2 groups. In result section, we added description of Figure 2 as “APD and P/C ratio decreased similarly between the two groups at 6 and 12 months postoperatively. The C thickness was similar to rise between the two groups at 6 months and 12 months postoperatively.”

**Changes in text:** Highlight box: Both OP and LP are safe and effective in treating hydronephrosis in HSK patients, with LP being the less invasive option. It is crucial to search for crossing vessels actively and systematically when treating hydronephrosis in HSK patients.

Discussion section, Results section, Figure 2

**Comment 5:** - There are quite some areas with problems of sentence structure and grammar which makes understanding difficult, e.g. p6 line 20 (ageultrasound), p8 line 4 -5 (During the procedure, if the stenotic segment was resolved halfway through the anastomosis, a double-J (DJ) stent was first tried by the surgeons), p14 line 10 (common complications)

**Reply 5:** We are very sorry for our negligence of proof-reading. We have made correction respectively.

**Changes in text:** Page 7 line 2: Assessment methods for follow-up included clinical manifestations, ultrasound, and urine routine.

Page 9 line 21-22: During the procedure, the surgeons first tried a double-J (DJ) stent if the stenotic segment had resolved halfway through the anastomosis.

Page 16 line 14-16: For normal kidneys, the incidence of complications after pyeloplasty ranges from 0% to 29.3%, including urinary leakages, UTI, wound infections, ileus, restenosis, and hemorrhage (28).