

Peer Review File

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Reviewer A

Comment 1: You present a comparison of open vs. laparoscopic treatment. I would transpose your paper title to make this clear.

Reply 1: Thank you for your constructive advice. The main purpose of this study is to summarize our experience with the Boari flap-psoas hitch and compare the indications, perioperative data and outcomes between open and laparoscopic procedures. As suggested by the reviewer, we have revised the title to be clearer.

Changes in the text: We have transposed the title to “Experience in the Management of Distal Ureteral Strictures with Boari Flap-Psoas Hitch and Comparison of Open and Laparoscopic Procedures”. (Title)

Comment 2: Please explain your decision making before treatment, between open and laparoscopic intervention. Did you have any criteria for selection?

Reply 2: Sorry for the unclear description. We did have criteria for the selection. Based on the etiology, comorbidities, medical history, and patient preference, we divided the patients in to open and laparoscopic group. Patients in the open group mainly had diseases other than ureteral strictures. Concerning patients in the laparoscopic group, the lesion was usually limited to the distal ureter.

Changes in the text: We have added the description of the criteria to the “Methods”. (Page 4 Line 111-115)

Comment 3: The first part of your discussion is a repetition of your introduction. Please select one part.

Reply 3: Thank you for your comment. We have rewritten the first part of the discussion.

Changes in the text: We simplified the first part of the discussion by outlining the consequences and treatment principles of ureteral stricture. Then introduce that different stricture lengths of distal ureter need different strategies. (Page 9 Line 339-345)

Reviewer B

Some suggestions to help the manuscript:

Comment 1: The manuscript needs to be re-written and directed towards a certain objective.

The title does not reflect the objective.

Reply 1: The main purpose of this study is to summarize our experience with the Boari flap-
psoas hitch and compare the indications, perioperative data and outcomes between open and
laparoscopic procedures. And this is the largest research group in China. According to the
objective, we transposed the title and re- wrote the manuscript to make the objective clearer.

Changes in the text:

Abstract: We have re-written the objective. (Page 1 Line2-4)

Results: We have added the result of comparison between open and laparoscopic group in
patients with the same surgical indication, which make the groups more similar and comparable.
(Page 7-8 Line 260-283)

Discussion: We have added our experience and points for attention for distal ureteral strictures

caused by different etiologies. (Page 10-11 Line 427-444).

We have also added our experience of alternative managements when the length of the bladder flap is found to be insufficient during the operation. (Page 11 Line 445-455)

We have discussed the comparison of the indications, perioperative data and outcomes between open and laparoscopic procedures. (Page 11-12 Line 443-516)

Comment 2: The objective needs to be clear as I could not understand what the author is trying to relay as a goal

Reply 2: Sorry for the unclear objective. The revised objective is mentioned in Reply 1.

Changes in the text: We have re-written the objective. (Page 1 Line 2-4). Based on the objective, the detailed revisions are listed in Reply 1.

Comment 3: The description of the operative technique is not clearly, or concisely written.

Reply 3: We have checked the surgical technique and simplified the description to a clear and concise way.

Changes in the text: We have deleted some redundant sentences such as Page 6 Line 194, Page 6 Line 197.

Comment 4: The illustrated figures need to mark the organs as some of them (e.g Fig 2 C) shows what I think is the liver and possible anastomosis to be close to the liver!!! Why would you need to be there for distal ureteric strictures?

Reply 4: Sorry for the unclear illustration of the figure which brought unnecessary puzzle.

Changes in the text: We have reselected intraoperative picture as Figure 2 and added the mark to the figure. (Figure 2)

Comment 5: What are the indications for laparoscopic Vs open surgery?

Reply 5: Sorry for the ignorance of the indications. We did have criteria for the selection. Based on the etiology, comorbidities, medical history, and patient preference, we divided the patients in to open and laparoscopic group. Patients in the open group mainly had diseases other than ureteral strictures. Concerning patients in the laparoscopic group, the lesion was usually limited to the distal ureter.

Changes in the text: We have added the description of the criteria to the “Methods”. (Page 4 Line 111-115)

From results:

Comment 6: I do not understand how open and laparoscopic surgery would have the same operative time, bleeding, and length of stay)? that defies any data that I have seen or even my own personal experience in both techniques.

Reply 6: We present the results from real data analysis at our institute. One possible reason is the bias due to small sample size and retrospective limitation. We made the comparison of the perioperative data between open and laparoscopic groups in the patients with same surgical indication. The operation time and length of stay still did not show significant difference. However, we found that laparoscopic surgery showed the advantages of being minimally invasive, with less estimated blood loss and fewer surgical complications.

Changes in the text: We added the results and discussion of the comparison between open and laparoscopic procedures in patient with same surgical indication. (Page 7-8 Line 260-283, Page 11-12 Line 464-516)

Comment 7: You mention that both groups had same complication rate yet the conclusion mentions that the laparoscopic is better. Based on what part of the results are you basing that on?

Reply 7: We reported that the complication rate was higher in the open group than that in the laparoscopic (7/19 vs 0/16, $p=0.009$). After changing the comparison objects, the complication rate still had significant difference (3/8 in the open group vs 0/12 in the laparoscopic group, $p=0.049$). In addition, for patients with the same indication, the laparoscopic group had little blood loss than that in the open group. Therefore, we think laparoscopic procedures showed the advantages of minimally invasive surgeries with little blood loss and fewer surgical complications

Changes in the text: We added the results and discussion of the comparison between open and laparoscopic procedures in patient with same surgical indication. (Page 7-8 Line 260-283, Page 11-12 Line 464-516)

Comment 8: Where are your pre-operative demographics for the patients? what is your median stricture length? That should be a basic table to be included in your study or added to another table that you supplied

Reply 8: We are sorry that we have mixed the baseline data in Table 2. We presented the baseline

data in the revised table 1

Changes in the text: We have added the baseline characteristic in the table 1.

Discussion:

Comment 9: After reading the manuscript multiple times, I could feel you are trying to describe your technique which is a well-established fact that both techniques exist. I think switching this paper to be for a longer follow up for both techniques might help it and to be an addition to the literature.

Reply 9: Thank you for your helpful advice. We are still continuing to follow up on these patients. Unlike ileal ureter replacement, long-term complications such as metabolic acidosis, electrolyte disturbance, abnormal renal function are one of the main concern. For Boari flap, common complications such as restenosis and urinary leak often occur in the early postoperative period. In this study, the median follow-up time was 11.9 months and the longest follow-up time was 53.3 months. We believe that such a duration of follow-up has some certain scientific value. In addition, we also summarized our experience managing distal ureteral strictures with Boari flap-psoas hitch.

Changes in the text: We have re-written the article for a clearer objective. The revision has been mentioned in detail in the replies above.

Comment 10: Having 35 patients can be a good addition to literature but it needs to be written in a concise goal directed fashion.

Reply 10: Thank you very much for the helpful comment. We clarified our goal and made a

revision around the theme

Changes in the text: We have re-written the article for a clearer objective. The revision has been mentioned in detail in the replies above.

Comment 11: You mention Boari-Flap psoas hitch with ileal ureter. do you mean you used ileum in your reconstruction? if so, where is the mentioned in your results in the script?

Reply 11: We reported the Boari-Flap psoas hitch with ileal ureter in our previous study. But we didn't use ileum in the present 35 patients. We mentioned such a combination technique to provide our experience of an alternative We are sorry that the way of discussion causes misunderstanding.

Changes in the text: We added the discussion about intraoperative failures and relevant alternatives, and moved the content of Boari-Flap psoas hitch with ileal ureter to that part. (Page 11 Line 445-455)

Comment 12: How come you need Boari flap/Psoas hitch for distal ureteric strictures? and even if the segment is long, why would ever need ileum? That is very contradictory to the whole manuscript and to the title.

Reply 12: Short lower ureteral strictures up to 4-5 cm can usually be managed by ureteroureterostomy or ureteroneocystostomy, but such techniques are unsuited because of tension on the anastomosis. We use Boari flap-psoas hitch to bridge long distal ureteral defects. At the same time, we prepare 2-3 surgical methods as alternatives, and an ileal ureter replacement is the last choice. We have previously reported our experience of the Boari flap-

psoas hitch combined with ileal ureter, which can shorten the length of the ileal graft so that the risk of postoperative complications is reduced, especially for patients with borderline creatinine levels and slightly poor renal function [Zhong W, Du Y, Yang K et al. *Ileal Ureter Replacement Combined With Boari Flap-Psoas Hitch to Treat Full-Length Ureteral Defects: Technique and Initial Experience. Urology 2017 ; 108: 201-6.*]. The surgical strategy depends on preoperative imaging evaluation and intraoperative condition. On the other hand, it also depends on the experience of the surgeon

Changes in the text: We discussed the condition when Boari flap-psoas hitch was required. (Page 9 Line 340-344 and Line 351-353). We also discussed the use of ileal ureter replacement as an alternative if the length of the bladder flap is found to be insufficient during the operation. (Page 11 Line 445-455).

Reviewer C

The strength of this manuscript is a detailed and clear description of technique of the Boari-flap and Psoas hitch and its feasibility in terms of intra-operative variables between open and laparoscopic approaches. The major takeaway is that the laparoscopic approach is as feasible and appears non-inferior compared to the open technique in a well-selected patient.

There are several limitations in the manuscript which should be clarified.

Comment 1: The authors note that laparoscopy was only considered for prior failed UVJ reimplant, megalourter, and iatrogenic injuries. A further explanation for these indications is warranted and perhaps a further description in general of patient selection towards open vs laparoscopic technique. Why was laparoscopy not considered for other etiologies of ureteral

injury/stricture?

Reply 1: Limited by the retrospective study, the laparoscopic group only consist of the patients in whom the lesion was limited to the lower ureter. the laparoscopic procedure for other etiologies was lacking. Based on the etiology, comorbidities, medical history, and patient preference, we divided the patients in to open and laparoscopic group.

Changes in the text: We have added the description of the criteria to the “Methods”. (Page 4 Line 111-115)

Comment 2: The authors need comment and explain their bias towards performing Lap. Reconstruction for simpler cases.

Reply 2: It is a limitation mainly caused by retrospective study. To equal the groups, we added the comparison using only the indications of the laparoscopic group in the open group to make the groups more similar.

Changes in the text: We added the results and discussion of the comparison between open and laparoscopic procedures in patient with same surgical indication. (Page 7-8 Line 260-278, Page 11-12 Line 464-516) We also pointed out that this limitation may be overcome with the development of surgical technique and instruments in the future. (Page 12 Line 509-511).

Comment 3: Additionally, postoperative outcomes need to be expanded upon. The manuscript notes that all patients followed up with interval ultrasound followed by CTU and that ureteral patency was confirmed in all 33 patients at followup. Was the patency confirmed by full

resolution of pre-operative hydronephrosis, functional imaging, or combination of both? More post-operative variables would be appropriate such as pre and post operative GFR, resolution of pain, need for interval procedures such as replacement of ureteral stent or nephrostomy tube.

Reply 4: In our study, surgical success was defined as both symptom relief and improved or stabilized hydronephrosis on ultrasound and CTU. None of the patients needed an interval procedure. However, the split renal function was unavailable because a part of patients did not undergo renogram at the time we retrospectively collected the data.

Changes in the text: We have added the detailed follow up data, including the symptoms, creatinine, hydronephrosis, need for interval procedures. (Page 8 Line 285-293)

Comment 4: I would also suggest the authors comment on the failures and how they were managed.

Reply 4: Thank you very much for your helpful comment. In this study, all patients' symptoms were relieved, and 30 patients showed improved hydronephrosis. Thus, none of the patients required further management. However, we did have our experience of failed reconstruction based on the large amount of patients in our center. The most important point is that different kinds of alternatives are required.

Changes in the text: We added our experience of failures and our alternatives to the discussion. (Page 11 Line 445-455)

Comment 5: Please comment if any of these were for radiation etiologies.

Reply 5: There was no radiation related ureter stricture in our study. However, we did treat a

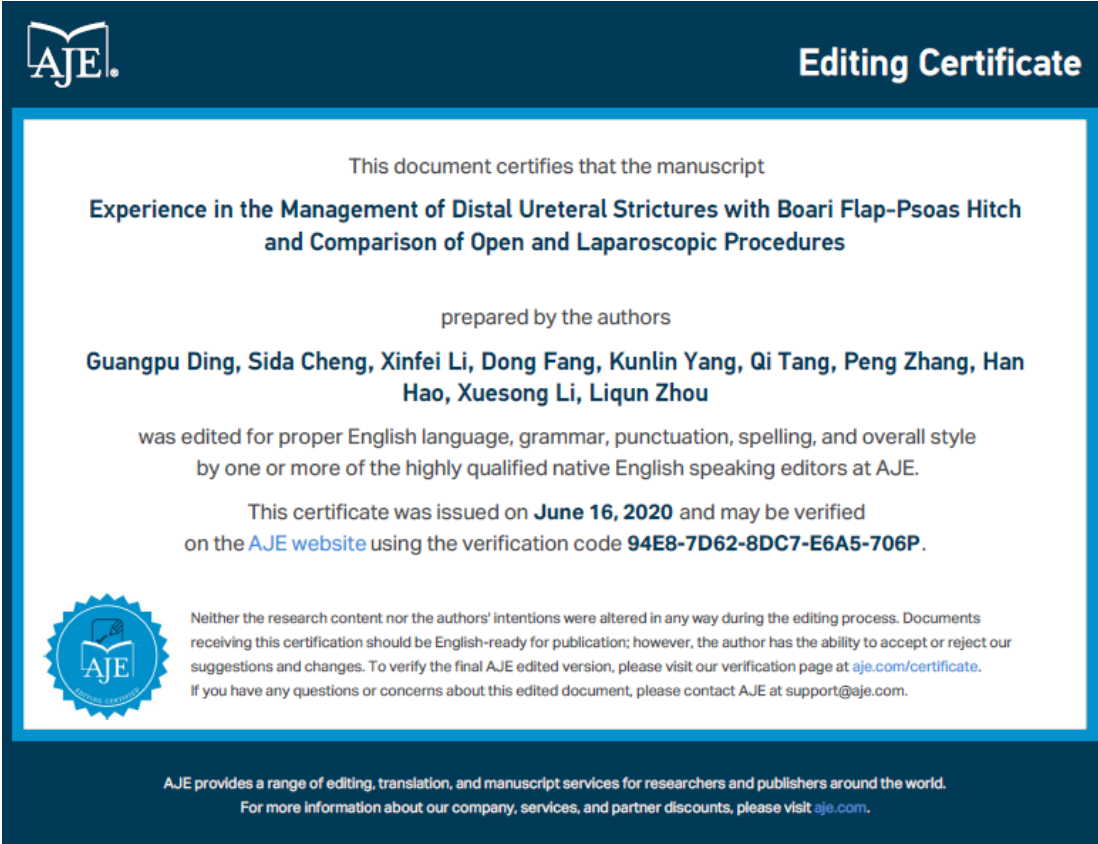
certain number of patients with ureteral injuries caused by radiotherapy. Because radiotherapy often causes bilateral long ureteral injuries, in our experience, we often use ileal ureter replacement or bilateral ileal ureter as the first choice.

Changes in the text: We added etiology analysis and different strategies for different etiology to the discussion. (Page 10 Line 427-444).

Comment 6: Finally, there could be mild improvement in the wording and translation to English for a smoother read.

Reply 6: Thank you for your opinion. We have sent the manuscript to AJE for language editing.

Here is the certification.



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Experience in the Management of Distal Ureteral Strictures with Boari Flap-Psoas Hitch and Comparison of Open and Laparoscopic Procedures

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Reviewer D

The authors are to be congratulated to a well written and easy-to-read paper that addresses an important and contemporary topic. The material is of minor size, and a shortcoming is of course its retrospective design. The paper is reasonably well discussed and the conclusions are distinct and detailed. However, in the Introduction a clear aim is lacking. I have a few suggestions for major revision and comments that could further improve the paper for acceptance.

Comment 1: This study has, in my view, a flawed methodology with selection bias between the two methods. I cannot see that this is a randomized or adjusted for cofounders? Therefore, I should suggest that you make this into a descriptive manuscript, a series study, without the statistical measurements, due to the uncertainty.

Reply 1: Sorry for the ignorance of the indications. We did have criteria for the selection. Based on the etiology, comorbidities, medical history, and patient preference, we divided the patients in to open and laparoscopic group. Patients in the open group mainly had diseases other than ureteral strictures. Concerning patients in the laparoscopic group, the lesion was usually limited to the distal ureter. However, limited by the retrospective study, the classification was not randomized. As suggested, we changed the main part of the study into a descriptive manuscript and deleted overall comparison of open and laparoscopic procedures.

Changes in the text: We have added the description of the criteria to the “Methods”. (Page 4 Line 111-115)

Comment 2: The two groups have a different indication for operation. To equal the groups, use only the indications of the laparoscopic group in the open group, which would make the groups

more similar. If the groups should be compared this is necessary. It is not possible to conclude that laparoscopic group has less complications than the open group, because of above reasons.

Some minor issues:

Reply 2: Thank you very much for the constructive comment. As suggested, we compared the perioperative data between open and laparoscopic procedures using only the indications of the laparoscopic group in the open group. We found that laparoscopic procedures showed the advantages of minimally invasive surgeries with little blood loss and fewer surgical complications

Changes in the text: We have added the result of comparison between open and laparoscopic group in patients with the same surgical indication, which make the groups more similar and comparable. (Page 7-8 Line 260-283)

Comment 3: First two rows 138 and 139 in Results, move to Patients.

Reply 3: Done

Changes in the text: Page 4 Line 110. Deletion at Page 7 Line 240.

Comment 4: Describe in methods how the decision was made to evaluate why the patient should have a laparoscopic or open surgery.

Reply 4: Based on the etiology, comorbidities, medical history, and patient preference, we divided the patients in to open and laparoscopic group. Patients in the open group mainly had diseases other than ureteral strictures. Concerning patients in the laparoscopic group, the lesion was usually limited to the distal ureter.

Changes in the text: We have added the description of the criteria to the “Methods”. (Page 4 Line 111-115)

Comment 5: In results; row 147, I suggest that you write: All the surgeries were completed without any complications or difficulties para operatively.

Reply 5: Thank you for your helpful comment. We have changed the expression.

Changes in the text: Page 7 Line 248.

Comment 6: In Results row 150-151 is already written in row 141-142, you do not need to repeat this.

Reply 6: Sorry for the repetition.

Changes in the text: We have deleted the repetition in Results row 150-151.

Comment 7: In summary, I find that the authors should be acknowledged for their effort to shed further light on this very important and contemporary topic. Though, I am surprised that ten authors are needed to write about 35 patients.

Reply 7: Every author makes an important contribution to the article, and the authors contribution is shown: GP.D. was in charge of project development, data management, and manuscript writing. SD.C. contributed to data management and manuscript writing. XF.L. was responsible for project development and manuscript editing. D.F was responsible for project development and manuscript editing. P.Z. contributed to data management and figure revising. H.H. was responsible for project development. XS.L. was responsible for performing surgeries,

project development, and manuscript editing. L.Q.Z. was in charge of project development and manuscript editing.