Author's response to reviews

Title: How do Stone Attenuation and Skin-to-Stone Distance in Computed Tomography influence the Performance of Shock Wave Lithotripsy in Ureteral Stone Disease?

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Author's response to reviews: see over
To the Editors of BMC Urology

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To the editor

We hereby would like to submit a revised version of our original article:

“How do Stone Attenuation and Skin-to-Stone Distance in Computed Tomography influence the Performance of Shock Wave Lithotripsy in Ureteral Stone Disease?”

We would like to thank the reviewers for making valuable contributions in improving the paper by their suggestions and corrections.

In what follows, we would like to give a point-by-point statement relating to the their comments and the resulting improvements that were made in the text and highlighted respectively.

With regard to the Additional Editorial Requests:

1. Name of Ethics Committee:

Ethic committee St. Gallen, Switzerland.

Study-Number EKSG 15/055
2. Authors' Contributions:

Contributions of the authors have been listed in the manuscript in a separate “Authors' Contributions” section after the „Competing Interests“ section.

With regard to Reviewer 1:

Abstract:

1. Definition of the success and failed groups should be the same as in the Manuscript. Definitions have been adapted.

2. Using the term success rate is confusing since your success rate corresponds to fragmentation rate and not stone free rate as usual. The definition of successful and failed SWL in our study has been adapted and the term “success rate” was removed. A clear definition of the terms “successful” and “not successful / failed” as used in our manuscript was provided in the “Materials & Methods” part.

3. Your conclusion should answer your purpose. You state that you wanted to assess stone attenuation and SSD in your purpose, but in your conclusion you add BMI as another parameter. Please rectify. BMI has been added to the “Purpose” as it is an important prognostic factor.

4. Success of SWL is stone free rates. Your study looked at the fragmentation rate. Conclude accordingly. The definition of success of SWL in our study has been adapted and relates to the fragmentation rate.
Introduction:
1. The AUA and EAU guidelines for the management of ureteral stones have been elaborated following the literature when flexible URS was not as common. In the light of new flexible scopes, these numbers have surely changed in the benefit of URS, even for proximal stones.

This is a legitimate objection. But also SWL machines underwent technical improvements. As recent data is lagging behind these developments, we think that we should refer to available data, which is underlying the latest guideline issues.

2. The objective of your study can't be “how additional information provided by NCCT might influence the choice of treatment in ureteral stone disease" since your study doesn’t compare treatment modalities. Please rectify.

Description of study objective was adapted accordingly.

Method:
1. When performing SWL for distal stone, did you place the SWL head in anterior? If so, did you adjust your calculation of the SSD for pelvic stones?

The measurements were performed analogous in prone position when targeting pelvic stones. This relevant information has been added in “Patients and Methods”.

2. When was the endpoint follow-up KUB and ultrasound performed?

The clinical outcome was defined as successful (visible stone fragmentation on KUB) or failed (absent fragmentation on KUB) at the day after the last SWL session. An appropriate description was added to the text.
3. If I understood correctly, you repeated SWL up to three times before concluding that the stone was not fragmenting? At what interval were the treatments repeated?

In cases of missing or inadequate disintegration in KUB, SWL was repeated once or twice at intervals of 1 day. This relevant information has been added to the “Patients and Methods” section.

4. Your primary clinical outcome is stone fragmentation. You state that “The clinical outcome was defined as successful (visible stone fragmentation on KUB) or failed (absent fragmentation leading to further treatment)” You should withdraw the “leading to further treatment” part of failed, since 25% of your success group also underwent additional interventions.

According to your valuable comment, the term “leading to further treatment” has been deleted from the definition of failed fragmentation.

5. Using the fragmentation rate instead of the classic stone free rate allows to concentrate on the impact of SWL on the stone, which excludes other factors that might interfere with the stone passage such as ureter diameter. However, it might by the same way include patients with incomplete fragmentation resulting in steinstrauß that were then classified as successful. An important bias may result from this decision.

- Other factors have been looked at in the past:
  - Degree of hydronephrosis
  - Presence of significant obstruction
  - Acute vs not acute

This is a legitimate objection. Because of the retrospective design those information were not available. On the other hand, like described in your comment, the stone free rate as endpoint is
susceptible for other factors interfering with stone passage and does also include patients with spontaneous stone passage without any disintegration. Thus, we added a corresponding comment to the description of the study limitations. Moreover, it is clearly described in the results part, that 25% of the patients with good disintegration in KUB needed further treatment.

Results:
1. So basically, your stone free rate after up to 3 sessions of SWL in your series was 37.5%. How do you explain such a low success in your study?

The response to SWL was 50% based on visible disintegration on KUB. Like described in the manuscript, there were several patients that needed further treatment despite of good disintegration. On the other hand, these are the (honestly reported) results of a tertiary care hospital performing about 500 SWL treatments per year with a last generation SWL machine following best clinical practice that is described for SWL in the literature. In our opinion, this might also prod to the limitations of SWL for ureteral stones.

Discussion:
1. You should comment on the decision to look at fragmentation rate instead of the stone free rate.

The comment regarding the use of fragmentation rate that was added to the limitations of the study also explains our decision to take the fragmentation rate.

2. You need to hypothesize why you believe your study failed to find an impact of MAV on fragmentation rate compared to other studies.

We think that this is due to the completely different methods of MAV measurement used in the studies performed so far. We tried to further work that out by inserting an according passage to the description of the problems of MAV measurement in the manuscript.
3. Performing a quick PubMed search, I was able to find at least 5 other studies that look at the same predictors in 2014-2015. Please update your literature review.

Literature has been updated like recommended.

4. How do you explain your low stone free rate in your series compared to others and could it explain partly your findings? Could your SWL machine or technic be in cause?

Please compare answer to comment 1. Of the “Results” part.

5. Ligne 267 You should remove “(10, 12)”

“(10, 12)” has been removed from line 267.

Conclusion:

1. Your conclusion does not reflect the findings of your study. It needs to be clarified in the light that your primary endpoint was stone fragmentation and not stone free rate for SWL.

Please compare answer to comment 1. Of the “Discussion” part.

Tables:

1. Table 1:

- The overall column is unnecessary.

The overall column has been removed.
2. Table 2:
- Add the more recent literature

More recent literature has been added.

**Figures:**

1. Figure 1
   - Unnecessary

Figure 1 has been removed.

**With regard to Reviewer 2:**

The article do not need any major review but might be helpful to create a sort of "successful rate diagram" using the skin to stone distance (SSD). That would be good to be used a predictive index of stone fragmentation. Of course SWL has a low successful rate compared to other endoscopic procedures so using the right diagram we might avoid useless SLW treatment to the patients.

We were also thinking about and working on such a diagram, but could not find a way to integrate the complex statistical correlations in a diagram without misleading simplifications.

As mentioned above, all changes were marked yellow in the text.

Once again, thank you very much for your efforts and valuable inputs.

Sincerely

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