Author’s response to reviews

Title: A comparative study of irrigation versus no irrigation during burr hole craniostomy to treat chronic subdural hematoma

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Replies to Reviewers

First of all, we thank both reviewer and editor for their positive and constructive comments and suggestions.

Replies to Reviewer #1:

Mehmet Sabri GÜRBÜZ (Reviewer 1): * In your abstract (background); you start with mentioning BHD and in conclusion you start with irrigation. Conclusion should match to the aim of the study. Also, I am not sure whether BHD is the most widely used technique. As far as I know, BHD is the most popular one instead. In your no.23 reference; read Table 2. In that study (Weigel et al.) table 2 shows that there are 37 studies using irrigation and 10 studies not preferring it by the year of 2003.

Answer: Thank you for your constructive suggestions. It was a mistake due to inaccurate description. We have revised the abstract according to your advice (Page 1, line 5-10). Burr hole craniostomy is the most widely used technique to treat CSDH, while drainage and irrigation are operation details of this technique.

Moreover, you should organize your abstract as if you are asking a question in the aim (your postulation) and you are answering that question in the conclusion. I would prefer to say (briefly): 'BHDI is a widely used method for the evacuation of CSDH. However it is not clear whether the irrigation improves the prognosis or gives rise to additional complications instead.'
Was closed drainage system applied to the patients? It is not clear. You should mention this in 'surgical technique' section of methods. In BHDI, evacuation of the hematoma is done by irrigating. How is this done in BHD technique? Only opening the outer membrane of hematoma and inserting the drain? I would prefer to say: The drain was inserted to subdural space after spontaneous drainage of hematoma immediately after opening the dura. In BHDI, however, further irrigation with saline etc. was performed. You should describe it to make it easily understandable for the readers.

Answer: Thank you for your valuable advice. We added the description of closed drainage system (Page 5, line 10-11). We have revised the 'surgical technique' section according to your suggestion (Page 5, line 1-9).

Why did you include only the patients undergoing one hole BHD/BHDI? What did this selection add to your study? Please explain this.

Answer: Two hole craniostomy is convenient for irrigation, and it is mostly used in BHDI. The air can free flow in and flow out of the skull, so this method may reduce the comparability of some results, especially the volume of pneumocrania. We explained this question in the article (Page 3, line 15-17).

Subdural hematomas seen in the given figures are sub-acute subdural hematoma rather than chronic subdural hematoma. So, you’d better to replace them by the figures presenting chronic subdural hematoma. As you know CSDH has a lower density than the brain parenchyma.

Answer: Figure 1 C and D are sub-acute subdural hematoma, and we have replaced these two figures (revised Figure 1).

In the end; I think your title has a problem. You do not compare closed drainage system technique and irrigation technique. As understood from the text, both of your techniques include closed drainage systems. So, you only aim to determine whether irrigation works for the patient. That’s why you conclude that 'Irrigation had no improvement in the long-term curative effect on CSDH, but it increased the risk of short-term complications'

Answer: Thank you for your valuable advice. We have revised the title (Page 1, line 1-3).
You state that you believe that the irrigation procedure might increase the risk of bridge vein bleeding, in turn increasing the probability of postoperative rebleeding. I think you don't have enough to state such an assertive claim. It is better to say; irrigation might have increased the risk of rebleeding. Going beyond has no proof.

Answer: Thank you for your valuable advice. We have revised this paragraph (Page 9, line 20-21).

You state that both techniques are equivalent in long-term outcomes (recurrence, epilepsy, infection) in discussion but, when come to conclusion you say 'BHD is a safe and effective treatment in terms of long-term efficacy compared with BHDI' Great mistake!!!!!!

Answer: Thank you for your valuable advice. We have revised this paragraph (Page 11, line 9-13).

Dzung H Dinh (Reviewer 2): A good comparative study of BHD vs. BHDI. There a few clarifications needed

1. Were the burred holes done using standard craniotome of hand drill?

Answer: Thank you for your help for our paper. All burred holes were done using standard craniotome of hand drill, and we described it in the article (Page 5, line 1-2).

2. What was the size of the subdural drain? and what kind (red rubber catheter, pediatric feeding tube or ventricular drainage tube)?

Answer: We added the description in the paper (Page 5, line 3-4).

3. It appears that the patients in the BHDI group are older and probably have more age related cortical atrophy and larger subdural space. As such, they may be more prone to having pneumocephalus. The patient with pneumocephalus post BHD in Fig 1 A&B had more cortical atrophy as compared to the patient in Fig 1 C&D. It may be prudent to review age and subdural space volume as independent variables.
Answer: Thank you for your valuable advice. As you mentioned, patients in the BHDI group are older (65.5±7.8 versus 64.5±5.6 years). This study was a retrospective cohort, and the information was the actual presentation. Actually, the difference between age showed no statistical difference (p=0.40). The picture represented the individual case, and Fig 1 C&D revised according to Reviewer 1’s advice showed equivalent cortical atrophy with the patient in Fig 1 A&B (revised Figure 1).

Lennart Henning Stieglitz (Reviewer 3): The authors provide a retrospective study on the outcome of Burr-hole trepanation with irrigation compared with burr-hole trepanation alone in unilateral chronic subdural hematoma. A series of 151 patients from two centers is included, of which 63 received burr-hole trepanation alone and 88 a trepanation with irrigation. The authors found no significant difference in outcome and recurrence rate, but a higher rate of pneumocrania in the irrigation group. Thus, they conclude, that irrigation is not advisable.

The report is well written, but does not allow the conclusions drawn in my opinion.

Answer: Thank you for your valuable advice. We have revised the conclusions according to all reviewers’ suggestions (Page 2, line 3-6; Page 11, line 9-13).

Chronic subdural hematomas are a frequent entity. Recurrence rates are still high and may be serious for the patients. Therefore, the study question is highly relevant.

The authors describe the dilemma of inconclusive reports by other workgroups in the literature. To provide better data and solve this dilemma, only a study with higher evidence is appropriate. Another retrospective study is not sufficient to answer this question.

Answer: To our knowledge, there are less than 3 real RCT with sufficient sample size regarding this question. Our study is a retrospective cohort and has several limitations; therefore it can’t provide high level evidence to answer this question. We just present our experience and data for reference.

The allocation of the patients to both groups depends on the surgeon’s preference only. It is not said, if each surgeon stuck to his chosen procedure in all of his patients, or if he decided to use irrigation in cases with larger hematomas, fresher blood, more midline-shift pr for other reasons, marking those patients as more severe cases. Therefore, it might be the case, that the group receiving irrigation holds the more severe cases and a similar outcome might be in favour for this technique still.
Answer: Patients in this study selected from 4 medical groups in the two centers. All patients in two groups underwent BHDI and patients in another two groups received BHD. Therefore, the surgical method was unacted on severity of illness.

Statistical analyses are provided without giving statistical power.

Answer: This study was a retrospective cohort, and we didn’t estimate the optimal sample size before the study, and we just included all patients met the inclusion criteria. Admittedly, the statistical power of this study was not strong enough. We thought retrospective observational study had difficulty in getting strong statistical power, right?

Chronic subdural hematomas are among the most frequent entities in neurosurgery. It is unclear, why only 151 were retrospectively included over a period of 4 years by two centers. That makes less than 20 cases per year and center. Depending on the number of surgeons involved (data not provided by the authors), each surgeon might lack sufficient experience to provide appropriate data that allows a general comparison of both techniques.

Answer: As stated in the paper, there are kinds of surgical methods to treat CSDH (e.g., twist drill craniotomy, burr hole craniostomy, and craniectomy), however, optimal surgical procedures remain controversial. Thus all methods are adopted at the present time. The choices in most situations depend on the surgeon's preferences. We only chose patients from 4 professors in two centers who stuck to the two kinds of procedures.