Author’s response to reviews

Title: Feasibility Evaluation of Micro-Optical Coherence Tomography (μOCT) for Rapid Brain Tumor Type and Grade Discriminations: μOCT Images Versus Pathology

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Author’s response to reviews:

Summary of Revision

Response to the Editor’s Comments

Comments:

Your manuscript "Feasibility of Micro-Optical Coherence Tomography for Rapid Brain Tumor Type and Grade Discriminations: a Randomized Controller Trail" (BMIM-D-19-00270R1) has been assessed by our reviewers. Based on these reports, and my own assessment as Editor, I am pleased to inform you that it is potentially acceptable for publication in BMC Medical Imaging, once you have carried out some essential revisions suggested by our reviewers.
We request that a point-by-point response letter accompanies your revised manuscript. This letter must provide a detailed response to each reviewer/editorial point raised, describing what amendments have been made to the manuscript text and where these can be found (e.g. Methods section, line 12, page 5). If you disagree with any comments raised, please provide a detailed rebuttal to help explain and justify your decision.

Please also ensure that your revised manuscript conforms to the journal style, which can be found at the Submission Guidelines on the journal homepage.

Response: We sincerely thank the Editor for giving us the invaluable opportunity to revise our manuscript for further improvement. We have very carefully considered each of the Referees’ comments and made the necessary revisions accordingly. A point-to-point summary of the revisions that have been made is presented as requested. All the revisions suggested by the Referees have also been marked with underlines in the revised manuscript. The style of the revised manuscript has also been adjusted to conform to the journal requirements. We earnestly hope that the Referees could be satisfied with our revisions.

Response and Revisions Based on Comments of Reviewer 1

General Comments:

Ingrid Różyło-Kalinowska (Reviewer 1): The paper is overall well-organised, novel and interesting.

Response and revision: We are extremely honored to receive the above positive comments from Prof. Ingrid Różyło-Kalinowska, which strongly encourages us to carry on this topic and make further improvements. We also sincerely thank Prof. Ingrid Różyło-Kalinowska for reviewing our manuscript carefully and pointing out the weakness of our manuscript. In the revised manuscript, we have very carefully considered each of the comments, and made the necessary revisions accordingly. All revisions made to the previous manuscript are highlighted with underlines in the update version.

Detailed comments:

1. The major concern is the Conclusions section, which is too long and too general. It could constitute the last paragraph of the Discussion while concise Conclusions derived from the study should be elaborated.
Response and revision: We deeply appreciate the invaluable suggestion offered by Prof. Ingrid Różyło-Kalinowska for improving the quality of our manuscript. We totally agree that the conclusions of this study should have been made more concise and accurate.

In the revised manuscript, we merged the conclusion part in the original manuscript into the 2nd paragraph of “Discussions” Section. The 2nd paragraph of “Discussions” is updated as below,

“……

In this proof-of-concept study, we explored the potential of µOCT as an intraoperative diagnostic imaging tool for meningioma and glioma types and glioma grade discriminations, for the first time to the best of our knowledge. Both cross-section and 3D imaging results show that the lab-built µOCT, which achieves a spatial resolution of ~2.0 µm, could provide detailed microstructures of meningioma and glioma clearly. Imaging results of those tumor specimens demonstrated that µOCT is capable of providing real-time rapid, label-free and 3D imaging of the CNS tumors with cellular/sub-cellular morphology information, which are comparable to those in their corresponding pathological images and could help neurosurgeons to identify both CNS tumors types and glioma grades. The noninvasiveness, high-resolution and simplicity properties make µOCT a promising candidate as an intraoperative diagnostic tool for CNS tumor diagnosis in clinical practice, while the neurosurgeons could adopt appropriate treatment strategies for the patients. Furthermore, as compared with the routine diagnostic imaging tools, the µOCT imaging-based diagnosis is not only much more cost-effective, but also much more time efficient and accurate. Typically, the routine pathological based diagnosis takes 1-3 days to experience the tedious processes, e.g., tissue excision, specimen resections, staining, and imaging, which may also introduce missed diagnosis and/or misdiagnosis. While with µOCT, the detection could be carried out instantly after tissue resection, and the diagnosis could be finished in very short time, and thereby, the neurosurgeons could make appropriate surgery decisions quickly and accurately. In addition, the µOCT system is much simpler. It has been reported that OCT, and thereby µOCT, could be miniaturized and integrated onto a handheld surgical pick tips [34, 35]. Specifically, with the high-resolution miniature OCT detection probes integrated surgical pick tips, neurosurgeons could visualize the “real-time” tissue-instrument interactions directly [36, 37], and thus, they could be able to excise the tumors completely. In such a way, the neoplasms can be treated properly, while over-resection, or missed resection, or both could be avoided. We believe that this study would lay a solid foundation for the future applications of µOCT in neurosurgery in clinical practice.

……”

Meanwhile, we updated the “Conclusion” Section as below according to Prof. Ingrid Różyło-Kalinowska’s comments,

“……
Conclusion

In conclusion, this study presented high-resolution µOCT imaging of glioma and meningioma ex vivo, and the comparisons to their corresponding pathological images. Results convincingly demonstrated that µOCT is capable of discriminating both CNS tumor types and glioma grades, which thus illustrates the feasibility of µOCT as an intraoperative diagnostic imaging tool to help neurosurgeons perform precise surgery in tumor treatment process.

References


2、There are some minor typing errors.

Response and revision: We sincerely thank Prof. Ingrid Różylo-Kalinowska for reviewing our manuscript carefully and offering us the opportunity to improve the quality of our work. We double checked the whole manuscript, especially those grammar, spelling and typing error, and made the necessary changes accordingly.

As for the English expressions, we have ordered the professional editing services from a company named American Journal Experts, which is a company providing academic English editing services. All the revisions made to the original manuscript are highlighted with underlines in the update version. We earnestly hope that the updated English expression could meet the standard of a publication in BMC Medical Imaging.
Response and Revisions Based on Comments of Reviewer 2

Major Comments: Kaan Orhan (Reviewer 2): manuscript reported a study regarding a topic about to explore the potential of Micro-optical coherence tomography (µOCT) as an intraoperative diagnostic imaging tool for identifying and discriminating glioma and meningioma thus may help neurosurgeons to perform precise surgery which can be interesting to some readers of this journal. However, this reviewer has some concerns about the study. There some issues that should be clarified and discussed by the authors.

Response: We sincerely thank Prof. Kaan Orhan for reviewing our manuscript so carefully, and also giving us the precious comments for improving the quality of our manuscript. We have very carefully considered each of the comments and made necessary changes accordingly. All the revisions made to the original manuscript are highlighted with underlines in the update version. We earnestly hope that the updated manuscript could meet the standard of a publication in BMC Medical Imaging.

Detailed comments:

1、Article Title: The title is inappropriate. However, titles should also emphasize the method of the study. The study is about evaluating QCT as well as comparison of pathology. Thus, I suggest authors indicate this in the title.

Response: We deeply appreciate the invaluable comments and revision suggestion offered by Prof. Kaan Orhan. We do realize that the title could not cover the whole content of this study appropriately thanks to Prof. Kaan Orhan’s comments.

To appropriately indicate the contents this study, we revised the manuscript as follows in the updated version,

“Feasibility Evaluation of Micro-Optical Coherence Tomography (µOCT) for Rapid Brain Tumor Type and Grade Discriminations based on µOCT Image and Pathology Comparisons: a Randomized Controlled Trial”

2、Abstract: Abstract is appropriate. However, there can be several suggestions for the "Methods" section". Please do not use abbreviations in the abstract section and follow the instructions for authors.

Response and revision: We are honored to receive the above positive comments from Prof. Kaan Orhan on the abstract. We followed the BMC Medical Imaging journal instructions for authors and included the full names for all abbreviations at the place for their first time use both in the abstract and in the main text.

Specifically, Lines 12-17 of “Methods” part in “Abstract” Section has been updated as follows,
Methods: Fresh glioma and meningioma samples were resected from patients, and then slices of such samples were excised and imaged instantly ex vivo with a lab-built µOCT, which achieves a spatial resolution of ~2.0 micrometer (μm). The acquired optical coherence tomography (OCT) images were pathologically evaluated and compared to their corresponding histology for both tumor type and tumor grade discriminations in different cases.

……

3. Introduction: Review of the Literature: The review of the literature is adequate and updated. However, several studies are available about dose optimization should also be inserted, the authors may wish to add those in this section.

Response and revisions: We deeply thank Prof. Kaan Orhan for pointing out our oversight on the latest studies on the related areas, especially the dose optimization issue with routine clinical tools for brain tumor treatment in clinical practice.

In Lines 11-13 of 3rd paragraph of “Background” Section, we inserted a few studies to emphasize the influences of dose optimization for routine clinical imaging tools to be utilized for CNS tumor diagnosis and treatment in clinical practice. The revisions are follows,

“……

……. The radiation dose optimization problem with CT or MRI is another issue that hindering their applications as an intraoperative diagnostic imaging tool for CNS tumors surgical treatment [19-21]. ……

……”

References:


4. Statement of Objectives: The objectives are clear.
Response: We sincerely thank Prof. Kaan Orhan for his positive comments.

5. Material and Methods: The methods are clear and detailed.
Response: We sincerely thank Prof. Kaan Orhan for his positive comments.

Response: We sincerely thank Prof. Kaan Orhan for his positive comments.

7. Results: The results are clear. The tables are also appropriate.
Response: We sincerely thank Prof. Kaan Orhan for his positive comments.

8. Discussion: The inferred results are well described.
Response: We sincerely thank Prof. Kaan Orhan for his positive comments.

9. Conclusions: This reviewer agrees with the conclusion drawn in the study.
Response: We sincerely thank Prof. Kaan Orhan for his positive comments.

Response: We sincerely thank Prof. Kaan Orhan for his positive comments. After carefully checking the manuscript again, we found that the notation “vesiclesthe vesicles (VV)” was defined by mistake, and therefore, we updated it within the whole manuscript and the figure captions with “vesicles (V)” in the updated version.
11. References: The references are generally good, there are some minor errors which can be corrected.

Response and revision: We deeply thank Prof. Kaan Orhan for reviewing our manuscript carefully and pointing out the places that have to be improved in our manuscript. We double checked all the references in the manuscripts and updated both the minor errors and the reference formats according to the requirements of BMC Medical Imaging one by one. All the references now conform to the Journal requirements.

12. Grammar and Style: Recommend the manuscript be reviewed for spelling, punctuation and grammar. There are few mistakes in the reference list which should be corrected. is in need of further refinement.

Response and revision: We deeply thank Prof. Kaan Orhan for reviewing our manuscript carefully and pointing out the issues with the reference in our manuscript. We have double checked the whole reference list and made the necessary changes accordingly. All the references now conform to the Journal requirements.

As for the English expressions, we have ordered the professional editing services from a company named American Journal Experts, which is a company providing academic English editing services. All the revisions made to the original manuscript are highlighted with underlines in the update version. We earnestly hope that the updated English expression could meet the standard of a publication in BMC Medical Imaging.