Responses to Reviewers Comments

(The orders of the reviewers are listed as per the EiC's letter)

Reviewer #1: (02944288)

Scientific Quality: Grade C (Good)

Language Quality: Grade B (Minor language polishing)

Conclusion: Accept (General priority)

Specific Comments to Authors: Dear author/ Your manuscript needs some language corrections.

(*Detailed comments are also provided in a separated file, and listed as follow*)

(1) The overall structure of the manuscript is complete. It contains title, abstract, key words, core tip, introduction, the main body, conclusion and references.

(2) Scientific question proposed in the manuscript: how this progressive multidisciplinary technology plays its parts in assisting physicians, radiologists, and surgeons to carry out their tasks effectively and efficiently, and hence to improve post therapeutic outcomes of the patients diagnosed with liver diseases. This is presented in introduction, along with the background, rationale, major findings and potential significance. Collectively, this informs whether the manuscript would be interesting enough to warrant readers' attention.

(3) In this manuscript authors present analysis of 145 references about the application of computerized imaging in modern liver disease diagnosis and therapeutic intervention, including surgery.

(4) The source of the presented data is reliable by the information presented in the manuscript. The authors adequately understand and cite all of the important references in to support the overall explanation of their findings. The authors' appropriately use citations to support the information presented throughout the main body of the manuscript. The authors clarify the historic evolution of the relevant research, and they clearly present the academic significance of the main findings (including tables and figures).

(5) The authors provide adequate analysis and discussion on the basis of the current literature and also some key scientific and technological issues in the relevant fields. Results are appropriate and answered to the proposed scientific question, as the aim of the study.

(6) Conclusion answer scientific question.

(7) The manuscript references section contains important, relevant and timely references.

(8) The manuscript composed to answer proposed scientific question.

(9) The manuscript conforms to the academic rules and norms that include if applicable a human and animal rights statement, institutional review board statement, informed consent statement, clinical trial registration statement, institutional animal care and use committee statement, animal care and use statement, biostatistics statement, and conflict-of-interest statement

(10) The manuscript shows that: It has been demonstrated in the recent literature that, depending on data condition, prior knowledge, and amount of user interaction involved, various computer algorithms yielded reasonable diagnostic and simulation accuracy. Nonetheless, it is worth noting that

while they did particularly well for functional segment classification of a normal or slightly pathological livers, their performance on hepatic lesion characterization remained to be much further improved. Although ML and AI strategies have rapidly become the main players in liver imaging and so far, exhibited promising results, it remains challenging to acquire sufficient large and heterogenous datasets with labelled ground truth for training. This issue has been partly tackled in many less critical applications by using, for instance, big and crowdsourced data.

(11) The manuscript contributes to understanding of diagnosis and treatment of disease

(12) The title of the manuscript contains key words and is interesting enough to attract readers' attention.

(13) The topic of the manuscript falls within the scope of the World Journal of Gastro-Intestinal Surgery

(14) The language of the manuscript reaches the standard of publishing

3 Peer-reviewers' conclusions

(1) What are the new visions that the manuscript offers to readers?

It has been demonstrated in recent literature that, depending on data condition, prior knowledge, and amount of user interaction involved, various computer algorithms yielded reasonable diagnostic and simulation accuracy. Nonetheless, it is worth noting that while they did particularly well for functional segment classification of a normal or slightly pathological livers, their performance on hepatic lesion characterization remained to be much further improved. Although ML and AI strategies have rapidly become the main players in liver imaging and so far, exhibited promising results, it remains challenging to acquire sufficient large and heterogenous datasets with labelled ground truth for training. This issue has been partly tackled in many less critical applications by using, for instance, big and crowdsourced data.

(2) Are there any weaknesses or deficiencies in the manuscript?

Needs some language corrections.

(3) Can the experiences and lessons presented in the manuscript improve the readers' practice?

Yes.

(4) Does the content of the manuscript have value for publication? If not, rejection should be recommended.

Yes

(5) Is the manuscript concise, clear, comprehensive, and convincing?

Yes.

Response

We appreciate positive views and constructive comments provided by reviewer #1, on our manuscript.

Regarding language corrections, the revised manuscript was submitted to a Professional Language Editing service and is certified for proper English language, grammar, punctuation, spelling and style. The corresponding certificate has been issued.

Reviewer #2: (04015916)

Scientific Quality: Grade D (Fair)

Language Quality: Grade C (A great deal of language polishing)

Conclusion: Rejection

Specific Comments to Authors: Computer 3D imaging technology has been widely used in clinical practice at present, but its limited function has restricted its clinical development. Most of this article is summarized from the perspective of algorithm, and rarely involves the focus of clinical work, which is little help to clinical work, and it seems that it is not suitable for publication in surgical journals. It is suggested to switch to relevant professional magazines.

Response

We appreciate the constructive critiques provided by reviewer #2. The main scientific question of this paper is how this progressive multidisciplinary technology can assist healthcare personnels in modern clinical environment, and hence to improve post therapeutic outcomes of the patients diagnosed with liver diseases (**INTRODUCTION**). Background on clinical requirements (i.e., liver and its vascular anatomy, and its epidemiology and neoplastic pathology) (**LIVER SEGMENTATION**), present adoptions (i.e., resection, diagnostic imaging of tumor, functional, volumetry, and preoperative FLR assessments) (**DIAGNOSTIC IMAGING**), and currently emerging surgical simulation and therapeutic interventions (**PREOPERATIVE PLANNING AND SIMULATION and SURGICAL AND THERAPEUTIC INTERVENTION**) in practices are summarized. Centered by these anatomo-pathological cognitive needs, the algorithmic development, rationale, main findings and potential significances in related clinical procedures are also presented with contemporary and prospective insights.

Although this article aims at collaborative audiences in both clinical and technical professions, as a multidisciplinary team, its main emphasis is oriented toward clinical applications of computerized 3D imaging. Its standpoint is primarily bridging the gap between technological advancements and clinical end-uses, offering the readers a holistic perspective on the subject matter. Therefore, as already noted by the reviewer, an extensive yet strictly prominent list of algorithms and their characteristics, main results, and known issues, are mentioned and discussed. Particularly, clinical imaging and physiological data involved, expected accuracy, still required intervention, and shortcomings are highlighted.

That being said, since its targeted venue is the **World Journal of Gastrointestinal Surgery** (a *surgical journal*), technical terms, development, description, and implementation of these algorithms are kept minimal and brief, to ensure readability and comprehension by experts in broader fields (and not limit to computer scientists and radiology medical physicists). Nonetheless, the paper does not focus on any specific surgical procedure improvements nor does its content involve in the maneuver to attain ones.

In fact, as also pointed out by the reviewer, the limited functions of this technology that have so far impeded clinical development is of particular interest to this paper (i.e., ends of **3rd to 5th sections**). The important aspects in clinical management, e.g., multimodality assessments, tumor board evaluations, preoperative strategies, intraoperative access, and postoperative monitoring (e.g., graft regeneration and responses to cancer treatment, etc.) are elaborated and how advanced 3D imaging integrated in these processes could alleviate existing limitations is showcased. Moreover, appropriate policies on specialized software development and its clinical adoption are also outlined (**SOFTWARE AS A MEDICAL DEVICE**).

Moreover, to further strengthen its relevance to *WJGS*, another key example of surgical limitations is incorporated in the revised manuscript (subsection **Computerized Imaging for FLR**), as follows:

> *"One of the most widely utilized 3D software programs in preoperative liver surgery is Synapse Vincent™ (Fujifilm, Japan). It helps automate liver segmentation and their volumetric assessment. However, with recent surgical techniques, liver resection is no longer limited to only right hepatectomy. Several surgical plans have been devised or tailored for an individual, i.e., patient-specific strategies. Therefore, FLR should be resilient to variations in such planning."*

Regarding language polishing, the manuscript after revision was submitted to a Professional Language Editing service and is certified for proper English language, grammar, punctuation, spelling and style. The corresponding certificate has been issued.

Reviewer #3: (04627944)

Scientific Quality: Grade B (Very good)

Language Quality: Grade A (Priority publishing)

Conclusion: Accept (General priority)

Specific Comments to Authors: Dear Editors, I have had the opportunity to review the manuscript entitled "Recent advances in computerized imaging and its vital roles in diagnostics, pre-operative liver surgery and intervention: a review" submitted to the World Journal of Gastrointestinal Surgery. Upon careful review, it is evident that the authors have conducted a comprehensive study and provided a detailed review of the latest advances in computerized imaging, especially its significance in diagnostics and liver surgery. The manuscript is well-structured, the arguments are cogent, and the references are up-to-date and relevant. The figures and tables included further complement the text, providing visual clarity and aiding understanding. From both a technical and clinical standpoint, the authors have successfully showcased the relevance and advancements in this area of research. They have also managed to bridge the gap between technology and clinical applications, offering the readers a holistic perspective on the subject matter. Considering the quality and depth of the content presented, I recommend the acceptance of this manuscript for publication in the World Journal of Gastrointestinal Surgery without further modifications. It will be a valuable addition to the journal and will serve to inform and educate its readership on this vital topic. Thank you for the opportunity to review this work.

Response

We appreciate positive views and constructive comments provided by reviewer #3, on our manuscript.

Reviewer #4: (02510721)

Scientific Quality: Grade B (Very good)

Language Quality: Grade A (Priority publishing)

Conclusion: Accept (General priority)

Specific Comments to Authors: The Title and the Abstract report in a concise but complete manner the contents of the study. The introduction identifies the epidemiological data of the neoplastic pathology of the liver. In particular, it presents the anatomo-pathological cognitive needs that can be satisfied by the most up-to-date imaging methods. Data Pre-processing and Fully Automatic Segmentation: they are well developed and presented. Selected semi-automatic liver segmentation algorithms are certainly valid in the Semi-automatic Segmentation. In the construction of diagnostic images, the synthesis of various radiological imaging techniques is useful applied to the anatomy of the hepatic artery, portal vein, hepatic veins, bile ducts. The study then extends to the preoperative evaluation of liver tumors. Therefore, the possibility of preoperative planning and simulation opens up through the survey of Liver Volumetry and Future Liver Remnant, of Computerized Imaging for FLR of liver functions and of postoperative risk assessment. The evaluation of the role and therapeutic efficacy of surgical interventions for neoplastic liver diseases is developed below. The anatomical hepatic resection in the standard approach, in the minimally invasive approach, up to Computer Assisted Surgery, therefore emerges in the therapeutic scenario. This last possibility opens the introduction of software as a medical device (SaMD). The Conclusion is appropriate to the contents of the literature review study. References are complete and up to date. The Figures and Tables are clear and useful for understanding the study. In my opinion this study is very well conducted and elaborated.

(*Detailed comments are also provided in a separated file with identical content, so not included here*)

Response

We appreciate positive views and constructive comments provided by reviewer #4, on our manuscript.

Science editor:

The manuscript has been peer-reviewed, and it' s ready for the first decision.

Language Quality: Grade B (Minor language polishing)

Scientific Quality: Grade B (Very good)

Response

Regarding minor language polishing, the manuscript after revision was submitted to a Professional Language Editing service and is certified for proper English language, grammar, punctuation, spelling and style. The corresponding certificate has been issued.

Company editor-in-chief:

I have reviewed the Peer-Review Report, full text of the manuscript, and the relevant ethics documents, all of which have met the basic publishing requirements of the World Journal of Gastrointestinal Surgery, and the manuscript is conditionally accepted. I have sent the manuscript to the author(s) for its revision according to the Peer-Review Report, Editorial Office's comments and the Criteria for Manuscript Revision by Authors. Please provide the original figure documents. Please prepare and

arrange the figures using PowerPoint to ensure that all graphs or arrows or text portions can be reprocessed by the editor. In order to respect and protect the author's intellectual property rights and prevent others from misappropriating figures without the author's authorization or abusing figures without indicating the source, we will indicate the author's copyright for figures originally generated by the author, and if the author has used a figure published elsewhere or that is copyrighted, the author needs to be authorized by the previous publisher or the copyright holder and/or indicate the reference source and copyrights. Please check and confirm whether the figures are original (i.e., generated de novo by the author(s) for this paper). If the picture is 'original', the author needs to add the following copyright information to the bottom right-hand side of the picture in PowerPoint (PPT): Copyright ©The Author(s) 2023. Authors are required to provide standard three-line tables, that is, only the top line, bottom line, and column line are displayed, while other table lines are hidden. The contents of each cell in the table should conform to the editing specifications, and the lines of each row or column of the table should be aligned. Do not use carriage returns or spaces to replace lines or vertical lines and do not segment cell content. If an author of a submission is re-using a figure or figures published elsewhere, or that is copyrighted, the author must provide documentation that the previous publisher or copyright holder has given permission for the figure to be re-published; and correctly indicating the reference source and copyrights. For example, "Figure 1 Histopathological examination by hematoxylin-eosin staining (200 ×). A: Control group; B: Model group; C: Pioglitazone hydrochloride group; D: Chinese herbal medicine group. Citation: Yang JM, Sun Y, Wang M, Zhang XL, Zhang SJ, Gao YS, Chen L, Wu MY, Zhou L, Zhou YM, Wang Y, Zheng FJ, Li YH. Regulatory effect of a Chinese herbal medicine formula on non-alcoholic fatty liver disease. World J Gastroenterol 2019; 25(34): 5105-5119. Copyright ©The Author(s) 2019. Published by Baishideng Publishing Group Inc [6]". And please cite the reference source in the references list. If the author fails to properly cite the published or copyrighted picture(s) or table(s) as described above, he/she will be subject to withdrawal of the article from BPG publications and may even be held liable.

Response

We appreciate your valuable time handling our manuscript. Reviewers', the Science Editor's and your constructive comments on improving both its academic and presentation quality have been accepted, thoroughly considered and carefully addressed in the revised manuscript. Specifically, the copyright statement of the original picture has been provided and all the tables are converted to 3-line format. Any change made to reflect these improvements has been clearly highlighted. In addition, all related files have been included in the revision package and uploaded to the F6Publishing system.

We sincerely thank the Editor in Chief and the members of Editorial team for inviting and giving us the opportunity to publish our review article, entitled "Recent advances in computerized imaging and its vital roles in diagnostics, pre-operative liver surgery and intervention: a review" in the *World Journal of Gastrointestinal Surgery*.
