PEER-REVIEW REPORT

Name of journal: Artificial Intelligence in Gastroenterology

Manuscript NO: 64107

Title: Clinical use of augmented reality, mixed reality, 3D-navigation and artificial intelligence in liver surgery

Reviewer's code: 02552429

Position: Peer Reviewer

Academic degree: FACS, MD, PhD

Professional title: Professor

Reviewer's Country/Territory: France

Author's Country/Territory: Germany

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Scientific quality	[ ] Grade A: Excellent [ ] Grade B: Very good [Y] Grade C: Good [ ] Grade D: Fair [ ] Grade E: Do not publish
Language quality	[Y] Grade A: Priority publishing [ ] Grade B: Minor language polishing [ ] Grade C: A great deal of language polishing [ ] Grade D: Rejection
Conclusion	[ ] Accept (High priority) [ ] Accept (General priority) [ ] Minor revision [Y] Major revision [ ] Rejection
Re-review	[Y] Yes [ ] No
Peer-reviewer statements	Peer-Review: [ ] Anonymous [Y] Onymous Conflicts-of-Interest: [ ] Yes [Y] No

SPECIFIC COMMENTS TO AUTHORS

We have reviewed the paper entitled "Clinical use of augmented reality, mixed reality, 3D-navigation and artificial intelligence in liver surgery". The paper reports on the surgical use of 3-dimensional images reconstructed from CT or MRI scans using augmented reality, mixed reality, and 3-D navigation. This report is extensive in this rich field. The report is well done but not very innovative. It is an extensive review of these three applications in open surgery, laparoscopic surgery and the specificity of augmented and mixed reality for 3-D navigation. The authors focus well on the problem of liver deformation during surgery for each application. There is however a lack of discussion concerning the problem of real-time acquisition of images during the surgical procedure and real-time reconstruction. In fact, the issue of the image registration caused by deformation may be solved by real-time acquisition and computer reconstruction. Many works are evaluating this specific aspect and should be discussed in this paper. The authors discuss the navigation based on intra-operative ultrasound, and determination of landmark definition. Nevertheless, there are other systems that can be used which include GPS localisation of reconstructed biliary ducts, arteries or veins.

The authors do not discuss the specificity of real-time fluorescence which is significant part of the development in this field. In the same way, the review should take into account the recent application of fluorescence imaging during robotic surgery. In fact, the principle of robotic surgery represents significant data acquisition that can be mixed with image reconstruction to give integrated images which is a key development of robotic companies.