Peer Review File

Article Information: http://dx.doi.org/10.21037/ales-20-106

Review comments

First off all we want to thank dr. C. Riediger for thoroughly reading the article and offering these helpful comments. It meant an upgrade to the article. Hopefully, the comments are adequately and to satisfaction implemented. If not, we invite the reviewers for further advice.

Major points:

- **Comment 1:** Authors discuss the application and value of IOUS in laparoscopic surgery. This sounds like authors are questioning the use of ultrasound in laparoscopic liver surgery.

It would be interesting to know whether laparoscopic liver surgery is performed without the use of intraoperative ultrasound in authors center. If yes, it would be interesting in how many cases and what kind of cases (minor/major anatomic/non-anatomic resections) and comparative analysis of laparoscopic liver surgery with and without intraoperative ultrasound should be performed. In addition, it would be interesting to know what other tool is used instead of ultrasound.

If not, authors should clarify that the intraoperative use of ultrasound is essential and a standard tool in laparoscopic liver surgery.

Reply 1: We certainly agree that LIOUS is a necessary adjunct in laparoscopic liver surgery, as stated in the Southampton Consensus Guidelines for Laparoscopic Liver Surgery. It is performed routinely in our centre. As performing ultrasound is a specific expertise of the radiologists, so is the handling of laparoscopic instruments in a three-dimensional operating field the expertise of the laparoscopic surgeon. We observed in practice the difficulty radiologists experienced in handling the laparoscopic ultrasound to satisfaction. We therefore trained our surgical staff in performing laparoscopic ultrasound of the liver. The aim of the study was to analyse the implementation and accuracy of LIOUS performed by ultrasound-trained and experienced laparoscopic surgeons instead of radiologists.

Changes in the text: the introduction was adjusted and a statement that the intraoperative use of ultrasound is essential and a standard tool in laparoscopic liver surgery was added. Changes were also made in the ‘suggestions for further research’ after discussing the feedback that was given.

- Comment 2: Authors describe a good accuracy of LIOUS. However, R0 and R1 resections rates are missing in this article.

Reply 2: thank you for this addition. R0 and R1 resection rates were calculated and added to the article. The total number of R0 and R1 resections were 66 and 18 respectively. 4 pathology reports were inconclusive. The percentage of R0/R1 resection was comparable with other studies.

Changes in the text: R0 and R1 resections rates were added to ‘results: patient and surgery characteristics’ .

- **Comment 3:** Authors should provide information about extent of liver resections included in this analysis: How many major/Minor resections resp. hemihepatectomies, segmentectomies, atypical resections were performed.

Reply 3: The suggested data were added to the article.

Changes in the text: frequency of hemihepatectomies and atypical/anatomic resections were added to 'results: patient and surgery characteristics'. The table was updated.

- **Comment 4:** Authors should clarify the standard preoperative diagnostic tool. Is it only ultrasound or also CT scan or MRI?

Reply 4: pre-operative imaging was obtained in all 107 surgeries, 101 CT scans and 59 MRI scans.

Changes in the text: this data was added to 'results: primary outcomes'.

-**Comment 5:** It is interesting to know that intraoperative plan was changed and some nodules preoperatively suspected as malignant were not removed. What was the preoperative diagnostic tool in this case? Were biopsies taken to proof benign disease before omitting resection?

Reply 5: for the malignant lesions that were not removed, a pre-operative CT was obtained in all three cases and an additional MRI in one case. These imaging techniques showed the malignant lesions (in segment 2, 3 and 7) although two CT scans were doubtful positive.
For the 8 cases with false positive lesions on pre-operative imaging, 7 CT scans were obtained and 6 MRI scans. 3 CT scans and 5 MRI scans suspected malignancy. These target lesions were not resected after LIOUS investigation and no malignant growth was observed at follow up imaging. No biopsies were obtained from these lesions, partly because some were not visible on ultrasound.

Changes in the text: information was added about this subject in 'results: primary outcome'.

- **Comment 6:** Authors should clarify the limitations and difficulties of laparoscopic ultrasound of the liver (significant error due to slightly different angulation of the ultrasound probe, etc.)

Reply 6: laparoscopic ultrasound has difficulties. The technique for LIOUS is more demanding and requires experience. The fixed entry during laparoscopy makes it harder to get a right angulation as was pointed out. A flexible laparoscopic ultrasound tip partly negates this problem however. Another limitation is the relatively high price of a laparoscopic ultrasound device.

Changes in the text: advantages and limitations of LIOUS were further elaborated in the introduction.

Minor points:

- **Comment 7:** Manuscript contains some grammatical mistakes and should be completely revised for language and grammar.

Reply 7: apologies for the grammatical mistakes. Hopefully, the next version will be improved.

Changes in the text: the text was revised for language and grammar.