Reviewer #1:

Scientific Quality: Grade B (Very good)

Language Quality: Grade B (Minor language polishing)

Conclusion: Accept (General priority)

Specific Comments to Authors: Review of the manuscript: „Four-year experience with more than 1000 cases of total (totally) laparoscopic liver resection in a single center (centre)" All Author List: Xiang Lan, Haili Zhang, Hua Zhang, Yufu Peng, Fei Liu, Bo Li and Yonggang Wei Manuscript Type: Retrospective Study The title reflects the main subject of the manuscript, but it needs to be changed as I show up on this page. Or my proposal is: „Our learning curve in totally laparoscopic liver resection based on more than 1000 cases". In the disclosure chapter, you missed one space: ….or financial ties todisclose. The abstract is well structured and summarize the work described in the manuscript, and keywords reflect the focus of the manuscript. The manuscript adequately describe the background, present status and significance of the study. The manuscript generally describes methods in adequate detail, but I will have some proposals:

1. In the chapter, patient characteristics show Barcelona Clinic Liver Cancer (BCLC) as a diagram.

Answer: This is only the inclusion criteria, not the specific description of BCLC staging. There are descriptions of other standards, so we think text description is more appropriate and saves more space than table.

2. In the chapter, surgical technique describe the liver resection technique, instruments which were used, durations of inflow occlusion methods (the longest one, did you make intermittent, after how much time ….?), and correct missing space in Figure 1.

Answer: Because this method has been described in our previous study and we already cited this article here (Reference 12). But we still accept this proposal and revised it. The Figure 1 has been revised.

3. In the chapter, diagnosis of cirrhosis describe preoperatively used radiological methods (like elastography, MSCT volumetry if you used them).

Answer: In our center, the diagnosis of liver cirrhosis is mainly based on the histological examination of hepatic tissues. Preoperative imaging should only serve as an auxiliary reference and should not be used to grade patients with cirrhosis.

   Results: 1. The sentence:…." Among them, 2 patients received pure laparoscopic common bile duct exploration; 5 patients received laparoscopic splenectomy and portal azygous vein dissection; 2 patients received laparoscopic splenectomy; 1 patient received laparoscopic pancreatoduodenectomy, and 1 patient received laparoscopic Roux-en-Y anastomosis." needs to be removed, it is not our point of interest in this manuscript (keep the focus).

Answer: We will accept this proposal and revised it.

   2. In the demographic data table 1, it looks to me, many hemangiomas indicate resection (explain later in the chapter).

Answer: In our center, we operate on hemangioma patients in the following situations: 1. Symptomatic hemangioma (right upper quadrant pain); 2. The size of

the tumor is increasing; 3. The patient has a heavy psychological burden and anxiety symptoms, which affect daily life and strongly request surgical treatment; 4. The tumor is located in special segments (e.g. the caudate lobe or the porta hepatis), and it is very difficult to operate when it becomes larger in the future; 5. The diagnosis is unclear and the possibility of malignant tumor cannot be completely ruled out.

3. Figure 2. – exclude a group of RFA as you mentioned before in the manuscript, it can not fit in this figure which shows the distribution of types of liver resections. Answer: It's our description error. Actually, these 39 RFA patients underwent simultaneous biopsy of cirrhosis liver tissue. So we classify them as hepatectomy patients. Here, we will accept this proposal and removed the data of these 39 cases and redid the statistical analysis
.

4. Table 2. – explain the increase of the conversion rate in the 2016/2017 year late in the text. The contribution of this study is a big database of this very challenging operation technique, the retrospective of the learning curve in this, and it will be good material for future meta-analyses of this topic.
Answer: We have added related comments to explain the conversion rate in the discussion part.

Discussion: The manuscript interprets the findings adequately and appropriately, highlighting the key points concisely, clearly and logically. The findings and their applicability/relevance to the literature are stated in a clear and definite manner. The discussion is accurate but it needs to underline significance to the clinical practice of this study. This sentence is more fore results chapter: „In our center (centre) in addition to observing these common complications, we found that 4 patients that underwent right anterior lobectomy suffered from right posterior branch injury. One of these 4 patients suffered from liver failure and ultimately died." Figures, diagrams and tables are sufficient and of good quality. Biostatistics is well done, but it needs to be changed by the excluded cases (RFA group).
Answer: We have revised it.

References: citation was adequately done in this manuscript, with the latest, important and authoritative references, and without self-cite, omit, incorrectly cite and/or over-cite references. Please use the same font in this chapter.
Answer: We have revised it.

The quality of manuscript organization and presentation is good. The style, language and grammar need to go under native speaker check. The author prepares the manuscript according to the appropriate research methods and reporting. The manuscript meets the requirements of ethics by the local ethics committee.

Reviewer #2:
Scientific Quality: Grade B (Very good)
Language Quality: Grade B (Minor language polishing)
Conclusion: Accept (General priority)
Specific Comments to Authors: This is a very interesting paper showing the authors significant experience. Could the authors comment on the laparoscopic vs robotic

experience?

Answer: As we can see from the Figure 2, there were only two robot-assisted (actually these 2 cases underwent robotic combined with laparoscopic surgery) liver resection cases in our data. So our team has no more experience in robotic surgery. It would be in inappropriate to comment in this area for us. As I known, the robot provides much more flexible steering, which allows us to do laparoscopic sutures very quickly. But in mainland China, robotic surgery is not yet covered by medical insurance. That means patients have to pay more.

Reviewer #3:
Scientific Quality: Grade C (Good)
Language Quality: Grade B (Minor language polishing)
Conclusion: Major revision
Specific Comments to Authors: This is an interesting manuscript describing the authors' great experience. However, this is just description of their experience in its current form. I recommend that the authors should more focus on thier learning curve and changing the outcomes and the factors impacted on that during four years. For example, learing curves analysed from bleeding, hospital stay, conversion and morbidity semms also be interested. Changes of types of morbidity, reasons of conversion and surgical indication should be also interested.

Answer: The most important measurement index of learning curve for one kind of surgical method is operation time and blood loss. Considering that the focus of this study is to introduce and summarize our experience, rather than the learning curve, we only included the operation time into the analysis of the learning curve. If we add length of stay, complications, hospitalization costs, etc., into the learning curve analysis, the focus of this study completely changes. We'll explore the learning curve in more detail in another study.

Additionally, we have added related discussions in the "Discussion" part about the conversion and morbidity. These are the things we should learn and summarize.

Minor points

1. Table 3. There should be the definition of central and marginal tumor locations. Also, capsular invasion is unclear, whether it means liver or tumor.

Answer: We have added the definition of central tumor and capsular invasion in the "Method" part. We include the "Diagnosis of cirrhosis" and "HCC differentiation" into one part called "Histopathology".

2. Line 4 and 15 in Discussion. J Hepatobiliary Pancreat Sci. 2015 May;22(5):342-52. doi: 10.1002/jhbp.215. from 2nd international consensus conference of lap liver resection should be cited. Also line 20 ref [24]. J Hepatobiliary Pancreat Sci. 2014 Oct;21(10):745-53. doi: 10.1002/jhbp.166. should be cited as the first difficulty scoring system. Line 19 ref [22, 23], there is another early report Biomed Res Int. 2015;2015:960752. doi: 10.1155/2015/960752. Line 21-23. There should be some references.

Answer: We have revised and added related ref.

Reviewer #4:

Scientific Quality: Grade C (Good)

Language Quality: Grade B (Minor language polishing)

Conclusion: Major revision

Specific Comments to Authors: Xiang Lan et al present a large single center experience of 1137 patients undergoing laparoscopic liver surgery during a 4 year period. Hepatocellular carcinoma was the most common disease (43.10%). The conversion rate was 1.76%, and the complication rate (grade II-V) was 8.88%. The learning curve was grouped into two phases for local resection, three phases for anatomical segmentectomy, and three phases for hemi-hepatectomy. The research topic is important and the paper present the experience on LLR from a very-high volume center.

The inclusion criteria is unclear for me. Methods section: Patients with hemangioma, BCLC-HCC 0~B stage, and A3 stage with normal liver function after conservative treatment and patients in A4 or B stage with a tumor located in the same hemi-liver were included. However, in table 1 the authors show that LLR have been performed for several other indications: metastases, hepatolithiasis, parasitic disease, living-donor, trauma etc. Please clarify. In my opinion the methods section focus too much on HCC (cirrhosis, histology differentiation).

Answer: This misunderstanding is because of our ambiguous expression. That's our fault. In this present study, we include every patient who has undergone LLR because of liver disease including metastases, hepatolithiasis, parasitic disease, living-donor, trauma etc. In our "Method" section, we just list the inclusion criteria of HCC and hemangioma because we think these two diseased must be specifically mentioned.

In order to eliminate these misunderstandings, we have added detailed inclusion criteria in this part.

This is a paper on the whole spectrum of liver disease eligible for LLR. In the methods section patients receiving only radiofrequency ablation during laparoscopic surgery were excluded, but in figure 2 the authors present 39 cases. Please clarify.

Answer: It's our description error. Actually, these 39 RFA patients underwent simultaneous biopsy of cirrhosis liver tissue. So we classify them as hepatectomy patients. Here, we will accept this proposal and removed the data of these 39 cases and redid the statistical analysis

The methods section should include a paragraph that for analysis of the learning curve LLR were divided into three subgroups: local resection, anatomical segmentectomy, and hemi-hepatectomy, and shortly argue why.

Answer: The reason why we analyze the learning curve for these three types of LLR is that we think they represent three stages during the process during we learn LLR. We always are allowed to perform local resection at the beginning of learning LLR and then is the hemi-hepatectomy. Finally, anatomical segmentectomy is allowed to perform after we've mastered the technique of liver resection.

I do not prefer to use the expression "laparoscopic liver-related surgery", either you do a laparoscopic liver resection (LLR) or not. Please give details on the other

procedures that were not resections: explorations only? abscess drainage (liver abscess)? hemostasis (trauma)?

Answer: We have revised this expression. Because these of 39 RFA patients underwent simultaneous biopsy of cirrhosis liver tissue, so we expressed as "laparoscopic liver-related surgery". Patients suffered from abscess who needed to be drainage would be performed Ultrasound-guided percutaneous drainage of liver abscess rather than laparoscopic drainage. All patients (including who suffered from abscess and trauma) included in this study underwent laparoscopic liver resection.

Figure 3 could be omitted. Do the authors find that these graphs add any value to the paper?

Answer: One of the most controversial areas of LLR is hepatic inflow occlusion. Some scholars believe that LLR takes longer operation time than laparotomy and the occlusion time is correspondingly longer, so it may have a greater impact on postoperative liver function. We only show the postoperative recovery of liver function in patients with LLR.

If the reviewer insists on omitting the Figure 3 and related description, we could accept this proposal.

The learning curve data is the most important and interesting part of the study. The authors present their experience in LLR, and the whole learning curve from their first cases. How many surgeons performed the procedures?

Answer: Professor Yonggang Wei performed the first case of LLR in West China Hospital. And He has performed the most cases for these 1098 patients under the help of Professor Bo Li. As the technique has matured and gained popularity, there are now about three to five professors performing LLR.

The authors present data on the different subgroups of resections in Figure 4. However, the type of procedures (local resection, anatomical segmentectomy, hemi-hepatectomy) should be included in Table 2. As the experience increase the surgeons often perform more complex procedures.

Answer: We have added related contents in Table 2.

Were more hemihepatectomies performed during the last part of the study?

Answer: Yes. We have performed 43 right hemi-hepatectomies for HCC patients (Total 87 cases).