Author response letter to reviewer's comments

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Manuscript title: **Fluorescence cholangiography enhances surgical residents' biliary delineation skill for laparoscopic cholecystectomies**

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Dear Editor,

Thank you very much for your and the reviewer's thoughtful evaluation and positive review about our manuscript entitled "Fluorescence cholangiography enhances surgical residents' biliary delineation skill for laparoscopic cholecystectomies".

In the revision of our manuscript, comments and issues raised by the reviewers have been carefully considered and appropriate changes (highlighted in yellow) have been made. Please find a point-by-point response to the reviewers' comments (below).

We appreciated the time and efforts by the editor and reviewers in reviewing this manuscript. We hope that the revised manuscript will now be suitable for publication in your journal.

Sincerely yours,

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Response to comments from reviewer,

Reviewer # 1 (05233845)

1. This paper discussed the efficacy of fluorescence cholangiograpy (FC) to surgens-in-training for laparoscopic cholecystectomy (LC), and the author advocated that FC enhanced identification of biliary structures: cystic duct (CD), common bile duct (CBD), common hepatic duct (CHD), and cystic artery (CA). Identification of these structures firmly is essential especially in the cases with thick connective tissue or sever cholecystitis. On the other hand, as mentioned in the manuscript, the number of "paired-structure" was relatively small. Distribution of the characteristics of “video-recorded patients” (e.g. obese patients, biliary pancreatitis, etc.) as well as description of biliary paired structure (CA/CBD/CHD/CA) should be shown,

   Response: Thank you for your valuable time to reviewing our manuscript. We have added the representative images of the video-recorded patients of the following situation including (a) gallbladder polyp in an obese patient; (b) history of biliary pancreatitis; (c) symptomatic gallstone; (d) acute cholecystitis; and (e) gallbladder polyp in a non-obese patient as shown in Figure 1. For the paired structure, the example of description of biliary paired structure were shown in Figure 4.

2. Discussion about rationale that enhanced identification of the biliary structure in particular patients (in which “paired-structure” were pointed) could make a contribution to SRs’ training.

   Response: Thank you for your suggestion. The major limitation of FC is that the delineation of the deeply located bile ducts might fail because near-infrared light can penetrate tissues only to a depth of about 5 mm. Therefore, in patients with thick connective tissue or severe cholecystitis, FC may fail to elucidate the extrahepatic bile ducts. However, we proposed that analyzing paired structures would increase the accuracy of the analysis. We defined paired structures as those structures that could be identified in both with- and without-FC phases, in the same patient, for each dissection phase (before or after dissection phase); for example, the CD in Patient 1, seen in with-FC and

without-FC phases, before dissection. We have discussed more about the rationale of the pair-structure analysis in the discussion part (highlighted text).

Reviewer #2 (00069988)

1. This study should be submitted to surgical journals because it is completely a surgical topic.

   Response: Thank you for your valuable time in reviewing our manuscript. Thank you for the suggestion.