Author's response to reviews

Title: Effectiveness of CO2-insufflated Endoscopic Submucosal Dissection with the duodenal balloon occlusion method for early esophageal or gastric cancer

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Author's response to reviews:

To: Professor Dr. Mark Andrew Cardinez and Dr Reginald V. Lord
Editor-in-Chief: The Journal of BMC Gastroenterology
March 29, 2012

Dear Professor Dr. Mark Andrew Cardinez and Dr Reginald V. Lord:

MS: 9118427096207785

Thank you very much for your letter regarding our manuscript entitled “Effectiveness of CO2-insufflated Endoscopic Submucosal Dissection with the duodenal balloon occlusion method for early esophageal or gastric cancer”. We are grateful for the feedback from the review. We have revised our manuscript accordingly.

Our response to the referee comments is provided on the following pages.

We look forward to hearing from you soon.

Sincerely,

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Responses to Reviewers' Comments
Reviewer: Dr. Reginald V. Lord

COMPULSORY REVISIONS

1. The chief limitation of this study is the lack of accuracy of CT for measuring intestinal volume. More information should be provided regarding exactly how these measurements were made by the radiology technicians. Were any of the authors involved in making these measurements?

Response
We agree to your comment. We should have mentioned about the Methodology and the accuracy of intestinal volume calculated using 3DCT.

So, we added and rewrote the sentences in revised manuscript (Page 7, line 9 –) after the duodenal balloon method section.

Our revised sentences in the text are follows:

3DCT (intestinal gas volume)
Reconstructions of 3DCT and measurements of intestinal gas volume were performed and calculated by radiology technician Dr. Masaomi Ohkubo. 3DCTs were reconstructed from raw CT images by volume rendering (VR) technique. The cut off level of VR was set at -400HU. The voltage was 120kV and the electric current was 200mA. Raw Slice thickening was 1mm and reconstruction was 0.8mm, and using these parameters, the accuracy of calculated intestinal volumes was 99.5%.

2. End tidal CO2 was lower in the balloon arm but pH levels were similar. Why was measurement of end-tidal CO2 concluded at 2 hours even if the procedure took longer than this to perform?

Response
As you pointed out, PETCO2 was lower in the balloon group but pH levels were similar. That’s because we conducted blood gas analyses after 3DCT which took 15 minutes to conduct. Thus, this studies’ pH levels were examined about 15 minutes later after the ESD was finished. As carbon dioxide is absorbed faster in the body than air and also that it is rapidly excreted through respiration, there may be no significant differences among pH levels. According to former reports, we decided to terminate measurements at 120 min. That's because under the stable CO2 insufflation, #PtcCO2 reached a certain level and not changed so much. The sentence “Arterial blood gas pH was measured in both groups just before and after ESD.” (Page 6, line 14 -19) is not adequate description. So, we revised and rewrote the sentences.

Our revised sentences in the text are follows:
3DCT was performed the day before ESD and just after the ESD to measure intestinal gas volume. CO2 concentrations were measured every 10 minutes by a
capnometer (end-tidal CO2; PETCO2) every 10 min until the end of ESD (from 0 to 120 min; however, if ESD was finished earlier, measurement was terminated; if ESD lasted longer, measurement was terminated at 120 min. that's because under the stable CO2 insufflation, #PETCO2 doesn’t change so much ). Arterial blood gas pH was measured in both groups just before ESD, and after ESD subsequently to 3DCT (about 15 minutes later after ESD finished).

Reviewer: Dr. Yutaka Saito
1) The References were incorrect.
Ref. No. 11 is paper about CO2 insufflation for colorectal ESD not for routine CS. The other paper about CO2 use for colorectal ESD is as below;

Response 1)
As you pointed out, some references and sentences were cited incorrectly and used by mistake. We revised and rewrote all these sentences and references wholly.

2) Introduction
The authors described that “little investigation has been performed on how CO2 gas used in ESD for the treatment of early esophageal or gastric cancer affects the human body.” In the Introduction section but this description is incorrect. The usefulness and safety of CO2 use in upper GI ESD were already reported. Please refer to papers as follows;

3) Discussion
The same issue in the introduction
The authors described as “The advantage of CO2-insufflated ESD for early
colorectal cancer has been previously reported [5]. However, no study has scientifically examined the influences of CO2 insufflation on the human body during ESD of the upper gastrointestinal (GI) tract. “
This is not correct. Please refer to appropriate papers.
According to the previous papers, upper GI ESD using CO2 can be conducted safely so please discuss the comparison with these previously reported papers.

Response to 2) 3)
Thank you so much for letting me know some important papers with regard to safety of carbon dioxide insufflation for upper gastrointestinal tract. We referred to all these papers and re-discussed. (Page 4, line 23- 24) (Page 11, line 6- 8). So, we revised and rewrote the Background, Introduction and Discussion sections.
Our revised sentences in the text are follows:
The advantage of CO2-insufflated ESD for early colorectal cancer has been previously reported [10]. Complication associated with CO2 insufflation such as CO2 narcosis and gas embolism wasn’t seen [11]. Several studies has been reported about the influences of CO2 insufflation on the human body during ESD of the upper gastrointestinal (GI) tract, and it is well known that carbon dioxide is absorbed faster in the body than air and also that it is rapidly excreted through respiration without any complications [12]. And it is also reported that insufflation of CO2 than air during esophageal ESD significantly reduced postprocedural mediastinal emphysema [13].