

## Peer review file

Article information: <http://dx.doi.org/10.21037/jtd-20-1335>

### Reviewer A

Comment 1: How were postoperative hiatal hernia diagnosed? Was this with CT or endoscopy, and what was the criteria for diagnosis?

Reply 1: All patients with minimally invasive esophagectomy at our institute underwent chest Xp and CT as standard surveillance every three to six months. Moreover, the patients with any symptoms indicating postoperative hiatal hernia (HH) were also checked with CT. When digestive organ, except for graft conduit, herniating into thoracic cavity was detected with chest Xp and/or CT examinations, we diagnosed it as postoperative HH and performed laparoscopic repair surgery for all patients, regardless of symptoms.

Changes in the text: We have added a section “Repair Surgery” in “Methods”, and have described the definition of postoperative HH at our institute. (Page8/Line130-136)

Comment 2: Page 7, Line 141 – notes a patient had a laparoscopic hiatal hernia repair only 3 days after their oesophagectomy. Can the authors provide more details on this case?

Reply 2: We agree with your suggestion, because this patient developed postoperative HH so early after esophagectomy compared with other patients developing postoperative HH. However, we could not detect any differences between the patient and others in all aspects. We also consider that further analysis of this point the reviewer suggested is so important. However, the number of patients with postoperative HH in our series is too small to investigate and analyze the difference of these groups. Therefore, in current report, we have not described the patient in detail.

Comment 3: How were hiatal hernias repaired? Was biosynthetic or synthetic mesh-reinforcement considered?

Reply 3: We have added a section “Repair Surgery” in “Methods” and have described the procedure of repair surgery (Page8/Line130-136). We have never used any mesh to reinforce the diaphragm, because we could simply close the hernia orifice with horizontal mattress suture with non-absorbable sutures in all cases. We also consider that mesh would be necessary if the hernia orifice is too large to close with simple suture.

Comment 4: Has this evidence now changed your institutional practice? Would you consider/ or further study the role of prophylactic hiatal reinforcement (pexy/ suture/

mesh) in NAC oesophagectomy patients?

Reply 4: We consider that colopexy on diaphragm is one of recommended method to prevent postoperative HH as described in “Discussion”, and now initiatively add the procedure for the patients with NAC.

Changes in the text: According to your suggestion, we added the sentence “*and we initiatively add the procedure for the patients with NAC*” in “Discussion” (Page16/Line304-305).

**Comment 5: Minor grammatical/ spelling issues:**

Page 4, Line 80 – Avoid starting a sentence with an acronym (MIE)

Page 5, Line 91-92 – Consider rephrasing as: ‘All patients with HH, regardless of symptoms, underwent laparoscopic repair at our hospital’.

Page 6, Line 115 – Does ‘conventional celiotomy’ refer to conventional laparotomy? The later term is used more frequently in the literature.

Page 8, Line 157-158 – Clarify, ‘not to a significant degree ( $p=0.05$ )’. Was this from the univariate or multi-variate analysis?

Page 8, Line 169 – missing p-value.

Page 9, Line 172 – clarify the bracketed text, ‘data not shown’

Page 9, Line 182 – ‘1 patient’, should be written in text

Page 9, Line 183-185 – Also present the percentages and p-value.

Page 11, Line 227 – ‘2’, should be written in text

Page 12, Line 240 – ‘potentially leading to HH recurrence’

Page 13, Line 269 – Spelling error ‘cStage’

Reply 5:

In accordance with the reviewer’s comment, we have added the full term. (Page6/Line90-91)

In accordance with the reviewer’s comment, we have rephrased as “*All patients with HH, regardless of symptoms, underwent laparoscopic repair at our hospital*” (Page6/Line101-102)

In accordance with the reviewer’s comment, we have changed “celiotomy” to “*laparotomy*”. (Page125/Line125)

The p-value was calculated by univariate analysis. And we have deleted the sentence “*Variables with  $p < 0.10$  in the univariate analysis were subsequently included in a multivariate logistic regression model.*” from the section “*Statistical analyses*” in “Methods”

In accordance with the reviewer’s comment, we have added p-value in the

text.(Page10/Line185)

In accordance with the reviewer's comment, we have added accurate data to Table 2 and p-value to our text. (Page11/Line188). At the same time, we have added “¶; *Ce: cervical esophagus, Ut: upper thoracic esophagus, Mt: middle thoracic esophagus, Lt: lower thoracic esophagus, Ae: abdominal esophagus*” to footnote of Table 2

As requested, we have added “and 1 patient underwent laparotomy” to our text. (Page11/Line199-200)

In accordance with the reviewer's comment, we have added percentages and p-value to our text. Moreover, we had mis-calculated the percentages. We are so sorry, but we have changed the sentence as following. (Page11/Line200-202)

“The ratio of laparoscopic surgery was **slightly lower** in the HH group (91.0%) than in the non-HH group (93.1%), although laparoscopic surgery was not statistically related to postoperative HH development ( $p=0,78$ ).”

As requested, we have added “(Table 1)” to our text (Page14/Line244)

In accordance with the reviewer's comment, we have added “*recurrence*” to our text.(Page145/Line256)

In accordance with the reviewer's comment, we have corrected the spelling error.(Page15/Line283)

## **Reviewer B**

Comment 1: I think that the incidence of HH is too high. Can you provide the reasons for detail? To highlight the study, we need to clarify the definition of HH. Preoperative HH is well-defined but the definition of HH after surgery is some obscure. Most patients after MIE have HH with various degrees and most of them need not repair. The incidence of repair for postoperative HH is quite low and in fact, I have not repaired HH after MIE. Therefore, I think that postoperative HH is not highlighted.

Reply 1: We appreciate the reviewer's comment on this point. As the reviewer's comment, there was not the obvious definition of postoperative hiatal hernia (HH). In our institute, when digestive organ, except for graft conduit, is detected in thoracic cavity with chest XP and/or CT, we diagnose it as postoperative HH and perform repair surgery. To make this point clearer, we have added the following to the “Methods”. :

*When digestive organ, except for graft conduit, herniating into thoracic cavity was detected with chest Xp and/or CT examinations, we diagnosed it as postoperative HH and performed laparoscopic repair surgery for all patients, regardless of symptoms.*

(Page8/Line130-133). As described in “Discussion”, postoperative HH occurred in 0.8-7.9% of patients after conventional esophagectomy and 4.5-26% after minimally

invasive esophagectomy. Therefore, we do not consider that incidence (9.7%) of postoperative HH after minimally invasive esophagectomy at our hospital is so high.

Comment 2: As we know, increased pressure gap between thorax and abdomen plays a key role in HH. Preoperative risk factors include heavy lifting or bending over, frequent or hard coughing, hard sneezing, violent vomiting, and straining during defecation (i.e., the Valsalva maneuver). However, postoperative risk factors should include the perioperative therapies and surgery as well as preoperative ones. I basically agree with authors' thought. However, because HH occurs via hiatus, the analyses focused on esophageal hiatus, such as size, shape, postoperative change and its reasons, etc, should be performed. NAC induces hard and fragile tissues, preoperative adhesion and more dissections during operation, delayed healing which are considered to be associated with HH. In addition, they should study whether NAC can enlarge hiatus after surgery or not.

Reply 2: We agree that additional information on the effect of NAC for size of postoperative HH, as the reviewer suggested, would be valuable. Regrettably, however, we are unable to statistically investigate the point, because the number of the patients with postoperative HH is too small and most of them (10/11) underwent NAC. We want to make it future research task.

Comment 3: Because the surgery is so invasive and induce cachexia, I agree that BMI after surgery is not associated with HH.

Reply 3: We also agree with the reviewer's comments.

Comment 4: Could you provide preventive manners?

Reply 4: Taking this result, now we add colopexy on diaphragm for the patients with NAC at the time of esophagectomy. We have added the following to "Discussion". *"and now we initiatively add the procedure for the patients with NAC"*. (Page16/Line304-305)