

**Peer review file**

**Article information:** <https://dx.doi.org/10.21037/jtd-21-674>

**Reviewer A**

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Comment 1: Rewrite background, the aim of the study is inappropriate.

Reply 1: Thanks for your comment. We have rewritten the Background section.

Changes in the text: see Page 2, line 37-40.

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Comment 2: L40 « predictors for post-operative ... » is method

Reply 2: Thanks for your comment. We have moved that sentence to the Methods section.

Changes in the text: see Page 3, line 50-51.

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Comment 3: L46: it is not “re dissection, recanalization “replace by major adverse events were defined as aortic dissection, aortic rupture ...

Reply 3: Thanks for your comment. We have rewritten the sentence.

Changes in the text: see Page 3, line 49-50.

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Comment 4: In your results, I did not find any correlation between HTR and primary entry tear site “In pure acute type A intramural hematomas, the tear site can be inferred as hematoma thickness ratio and based on such assessment, emergency surgery or conservative treatment and timely surgery can be chosen accordingly.

please rewrite your conclusions

Reply 4: Thanks for your comment. As a result of comparing the aortic measurement by grouping according to the presence or absence of intimal tears, there was a significant difference in the HT index, which reflects the location of the tear site. However, the findings of this study cannot be deemed novel, that can determine the treatment method; therefore, the Conclusion section has been revised.

Changes in the text: see Page 3, line 59-63.

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Comment 5: What did you mean by “pure” type A intramural hematoma? please clarify.

Reply 5: Thanks for your comment. "Pure" ATAIMH was defined as ATAIMH in the entire region which did not penetrate aortic ulcer (PAU) and aortic dissection (including focal lesions), which can be considered as an intimal tear site on initial CT scans. Eventually, patients with pure ATAIMH did not have preoperative CT findings suggestive of intimal defects.

Changes in the text: see Page 5, line 95-98.

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Comment 6: L82 “reviewing the major ...” The sentence should be moved in method section

Reply 6: Thank you for your comment. We removed the sentence.

Changes in the text: \*\*\*\*\*

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Comment 7: L99 how did you make the difference between thrombosed FL and IMH if there is no intimal tear? maybe you should replace thrombosed FL by aortic dissection

Reply 7: Thanks for your comment. We replaced “thrombosed FL” with “aortic dissection.”

Changes in the text: see Page 6, line 111-112.

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Comment 8: Number of patients and flowchart are results.

Reply 8: Thanks for your comment. We moved those sentences to the Result section.  
Changes in the text: see Page 8, line 170-172.

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Comment 9: L113

Did you measure the maximal aortic diameter in the descending aorta? Or only the aortic diameter at the level of the pulmonary bifurcation? it would be important because the maximum aortic diameter is often the more predictive criteria.

Reply 9: Thank you for your comment. At the time of study design, the maximal diameter and maximal hematoma thickness of the descending aorta were measured as in the ascending aorta. Since the maximal diameter was measured at the PAB level in most patients, it was indicated that it was measured at the PAB level. Therefore, the existing value was corrected to maximal diameter, and measurements at the inferior vena cava-Rt. atrium junction level (IVC) and celiac axis (CA) level were added below it.

Changes in the text: see Page 6, line 121-126.

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Comment 10: Please rewrite and clarify the subsection “endpoint” with the primary composite endpoint major adverse events and secondary endpoint (risk factors for MAE?)  
Sentence L101 should be move here

Reply 10: Thank you for your comment. We rewrote "endpoint" according to your comment. Sentence L101 has been moved here.

Changes in the text: see Page 6, line 128 – Page 7, 135

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Comment 11: it is not “re dissection, recanalization “replace by major adverse events were defined as aortic dissection, PAU, aortic rupture, aortic death ... please defined aortic reintervention as a part of MAE.

Reply 11: Thank you for your comment. We have rewritten the definition of MAAE.

Changes in the text: see Page 6, line 130 – Page 7, line 131.

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Comment 12: “Indication of reinterventions”: L125 this section is a result

Reply 12: Thank you for your comment. L125 sentence move to Results section.

Changes in the text: see Page 11, line 229-230.

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Comment 13: Please add a section on operative technique for Type A IMH repair.

Reply 13: Thank you for your comment. We added the operative technique for ATAIMH.

Changes in the text: see Page 7, line 136-148.

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Comment 14: L162: remove “however” and “in contrast”

Reply 14: Thank you for your comment. We remove “however” and “in contrast.”

Changes in the text: \*\*\*\*\*

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Comment 15: Did you test clinical data and operative data (initial repair) for risk factors of MAE? it is important.

Reply 15: Thank you for your comment. We test clinical data and operative data for risk factors of MAAE. However, there were no significant variables.

Changes in the text: see Table 2. And Page 10, line 210-211.

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Comment 16: L180 What is “the false lumen procedure? I don’t understand

Reply 16: Thank you for your comment. False lumen procedure is defined as an endovascular procedure with closure of the communicating channels between the true lumen and false lumen or obliteration of the false lumen itself both entry and re-entry tears using various materials (arterial vascular plugs, coils, stents, and glues). We have added the definition and reference. Changes in the text: see Page 11, line 232-235.

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Comment 17: Short term results for reinterventions? mortality?

Reply 17: Thank you for your comment. Fortunately, short term results for reintervention were favorable. There were no reintervention after procedure and no mortality.

Changes in the text: see Page 11, line 235-237.

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Comment 18: L191 is it aMax <47.42 mm?

Reply 18: Thank you for your comment. L191 aMax <47.42 mm was right. However, there was an error in the previous data, and as the MAAE group has now become 9; the statistical results were partially changed.

Changes in the text: \*\*\*\*\*

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Comment 19: L218 “Therefore, when we define IMH as

“IMH may originate from small intimal tears rather than a rupture of the vasa vasorum,” we believe that it is because the primary tears have not been appropriately treated.” I don’t understand what you mean.

Reply 19: Thank you for your comment. We removed the sentences and we have rewritten the Conclusions section to clarify.

Changes in the text: \*\*\*\*\*

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Comment 20: please clarify the discussion with more focus on the aim of the study:

1. rate of MAE in your study compared with literature
2. risk of MAE with more details and discussion on demographical risk factors
3. importance of initial surgery and type of repair

Reply 20: Thank you for your comment. 1. We compared rate of MAAE in our study with literature. 2. Clinical and operative data were tested for risk of MAAE. 3. In unstable or complicated ATAIMH, there was no doubt to surgical repair is gold standard. We agreed with that. In this study, type of repair was not independent predictor of MAAE.

Changes in the text: 1. See Page 12, line 264 – Page 13, line 273.

2 &3. See Table 2. And see Page 10, line 210-211.

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Comment 21: in your study all patients underwent surgery, you cannot conclude on surgical indications “The absolute value of hematoma thickness or ascending aorta diameter was an important factor in the existing surgical indications of ATAIMH; however, we believe that the conclusion of this study is much more reasonable.”

“Based on such assessment, emergency surgery or conservative treatment and timely surgery can be chosen accordingly.”

In your results I did not find any correlation between HTR and primary entry tear site “In pure ATAIMH, HTR is a good clue to inferring the primary intimal tear site;”

please rewrite your conclusions

Reply 21: Thanks for your comment. As a result of comparing the aortic measurement by grouping according to the presence or absence of intimal tears, there was a significant difference in the HT index, which reflects the location of the tear site. However, the results of this study cannot be a novel finding that can determine the treatment method; thus, the

conclusion has been revised.

Changes in the text: see Table3 and Page 11, line 222-227 and Page 14, line 310 – Page 15, line 318.

## **Reviewer B**

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Comment 1: The study group which in fact includes 47 patients were mentioned as patients with pure Acute Type A intramural hematoma is relatively small (p.4- 100). However intraoperatively, by 16 (16/47) patients were found an intimal Tear (p.6- 166)

Reply 1: Thank you for your comment. I agree with you. We tried to include only pure ATAIMH in this study. So that the sample size was too small. In the study design, pure ATAIMH was selected in preoperative CT. Further, we wanted to find the risk factor for MAAE based on CT findings. Therefore, inevitably, intimal tears were found in 16 patients during surgery. However, it appears to support the claim that IMH originates from minimal intimal tears.

Changes in the text: see table3 and see Page 11, line 222-227.

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Comment 2: Why the aortic measurements, in the descending Aorta, were obtained at the level of pulmonary Level and not at the maximal Diameter? (p.4- 116-117)

Reply 2: Thank you for your comment. At the time of study design, the maximal diameter and maximal hematoma thickness of the descending aorta were measured as in the ascending aorta. Since the maximal diameter was measured at the PAB level in most patients, it was indicated that it was measured at the PAB level. Therefore, the existing value was corrected to maximal diameter, and measurements at the inferior vena cava-Rt. atrium junction level (IVC) and celiac axis (CA) level were added below it.

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Changes in the text: see Page 6, line 121-126.

Comment 3: What the authors mean by recanalization? And which is the difference between recanalization and re-dissection? (p. 4- S.120)

Reply 3: Thank you for your comment. We replaced this by “major adverse events were defined as aortic dissection, PAU, aortic rupture, aortic reintervention and aortic death.”

Changes in the text: see Page 6, line 130 – Page 7, line 131.

Comment 4: The indications for Re-intervention were not described (p. 6- 178-181)

Reply 4: Thank you for your comment. The indication for re-intervention was included method section.

Changes in the text: see Page 7, line 131-133.

Comment 5: What the authors mean by false lumen procedure? (p. 6. 180-181)

Reply 5: Thank you for your comment. False lumen procedure is defined as an endovascular procedure with closure of the communicating channels between the true lumen and false lumen or obliteration of the false lumen itself both entry and re-entry tears using various materials (arterial vascular plugs, coils, stents, and glues). We added definition and reference.

Changes in the text: see Page 232 – 235.

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Comment 6: I Think that the sentences (p.6 181-183) need editing.

Reply 6: Thank you for your comment. We revised the sentences for clarity.

Changes in the text: see Page 11, line 235-237.

Comment 7: The presented data doesn't allow such a conclusion.

Reply 7: Thank you for your comment. We revised conclusion section.

Changes in the text: see Page 14, line 310 – Page 15, line 318.

### **Reviewer C**

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Comment 1: Very well written manuscript on the management of acute type A IMH. The authors' conclusion that hematoma ratio between ascending and descending aorta can give a clue as to whether the occult tear originated in the ascending aorta (type A) and hence requires emergent surgery, or in the descending aorta (type B with retrograde extension) and may be managed medically if not complicated.

Reply 1: Thank you for your comment.

Changes in the text: \*\*\*\*\*

## Reviewer D

Comment 1: the background implies a prospective trial. The authors are examining outcomes from replacement of the proximal aorta to determine the influence of various aortic hematoma indexes on late aortic events and survival. I would recommend coming up with a term to describe dHTR/aHTR -- I suggest the hematoma thickness index.

Reply 1: Thank you for your comment. We revised the Background section and changed dHTR/aHTR to HT index.

Changes in the text: see Page 2, line 37-40. And see Page 3, line 47-49.

Comment 2: Line 77: should read "Debakey Type I and II aortic dissection" or "Stanford Type A dissections". I would recommend naming the classification system and keeping it consistent throughout the manuscript.

Reply 2: Thank you for your comment. We revised the naming of the classification system and kept it consistent throughout the manuscript.

Changes in the text: see Page 4, line 82-83.

Comment 3: Please also include that coverage, rather than resection, of the primary tear is the goal of endovascular therapy for Stanford Type B dissections.

Reply 3: Thank you for your comment. We included that coverage, rather than resection, of the primary tear is the goal of endovascular therapy for Stanford Type B dissections.

Changes in the text: see Page 4, line 84-85.

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Comment 3: Line 80-85: this portion is very confusing. Please succinctly define "pure Type A intramural hematoma"

Reply 3: Thanks for your comment. Pure ATAIMH was defined as ATAIMH in the entire region without penetrating aortic ulcer (PAU) and aortic dissection (even focal lesion also included), which can be considered as an intimal tear site on initial CT was named pure ATAIMH. Eventually, patients with pure ATAIMH did not have preoperative CT findings suggestive of intimal defects.

Changes in the text: see Page 5, line 95-97.

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Comment 4: Line 102-104: this portion adds very little to the manuscript. Consider removing.

Reply 4: Thank you for your comment. We removed the sentences.

Changes in the text: \*\*\*\*\*

Comment 5: Why did you measure site of maximal diameter in the ascending, and measure only at a single landmark for descending? The data would be much more compelling if the authors were to measure the site of maximal diameter in the DTA as well. Were measurements made in axial plane only, or after centerlining?

Reply 5: Thank you for your comment. At the time of study design, the maximal diameter and maximal hematoma thickness of the descending aorta were measured as in the ascending aorta. Since the maximal diameter was measured at the PAB level in most patients, it was indicated that it was measured at the PAB level. Therefore, the existing value was corrected to maximal

diameter, and measurements at the inferior vena cava-Rt. atrium junction level (IVC) and celiac axis (CA) level were added below it. The measurements made in the axial plane after central lining.

Changes in the text: see Page 6, line 121-126.

Comment 6: Please also define recanalization, which I assume means progression to classic dissection

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Reply 6: Thank you for your comment. We replaced it with “major adverse events were defined as aortic dissection, PAU, aortic rupture, aortic reintervention and aortic death.”

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Changes in the text: see Page 6, line 130 – Page 7, line 131.

Comment 7: Indications for reintervention and the tabulation of these patients belongs in the results section

Reply 7: Thank you for your comment. Indications for reintervention have been moved to method (endpoint) section, and the tabulation of these patients have been changed to pie graph. Changes in the text: see Page 7, line 131-133. And see Page 11, line 229.

Comment 8: While the description of non-normal distribution is needed, the q-q tables are not necessary and should be removed for the sake of clarity.

Reply 8: Thank you for your comment. We removed the q-q tables and subsection named normality assessment.

Changes in the text: \*\*\*\*\*

Comment 9: In Figure 4, the significant digits for cutoff values are not applicable in the real world. I would recommend reporting cutoffs to the mm, as no radiologist can measure to the hundredth of a mm.

Reply 9: Thank you for your comment. I totally agree with you. The values to be measured for length in CT scan is reported to one decimal place, and ratio and index are reported to two decimal places.

Changes in the text: see Table 1, 3. And see Figure 3.

Comment 10: Table 2 would be best presented as pie graphs.

Reply 10: Thank you for your comment. Table 2 has been presented as a pie graph.

Changes in the text: see Page 11, line 229.

Comment 11: The discussion of the surgical mortalities should be condensed and moved to the results section

Reply 11: Thank you for your comment. The discussion of the surgical mortalities have been condensed and moved to the Results section.

Changes in the text: see Page 10, line 201-206.

Comment 12: The discussion does not mention the role for TEVAR in conservative management of presumed retrograde ATAIMH, and this should at least be mentioned.

Reply 12: Thank you for your comment. We added the role of TEVAR.

Changes in the text: see Page 14, line 296-310.

Comment 13: The authors should more clearly delineate the concluding hypothesis that aneurysmal ascending degeneration and elevated hematoma thickness ratio point to an ascending aortic primary tear.

Reply 13: Thank you for your comment. We revised the Conclusion section to clarify.  
Changes in the text: see Page 14, line 310 – Page 15, line 318.

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