

Peer Review File

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Reviewer A:

This is an interesting report on a sizable cohort of surgically managed acute type A aortic dissection.

My main areas of criticism are:

1. This is a surgical series and we do not know the denominator. Therefore, this study is at high risk for selection bias. Do we know if more patients who are 70yrs or older were turned down for surgery compared to younger patients. Please discuss.

Reply 1: Thank you for your question, we re-check medical records, there were 1162 patients was diagnosed as aTAAD (including ascending aorta, arch, descending aorta) and 1082 received open surgery in Nanjing Drum Tower Hospital. Patients were divided as below (n=956, 87.5%) and above (n=136, 12.5%) 70 years of age. 80 patients didn't receive surgery, there were 31 (37.5%) patients above 70 years. Elderly patients have greater chance of underlying disease before the onset of aTAAD which might contribute to postoperative comorbidities¹⁰. Our baseline characteristics showed that patients above 70s have a higher percentage of diabetes, stroke history, CAD history and COPD history. Also, elderly patients got a higher incidence of tracheotomy, GI bleeding and bowel ischemia compare with younger patients. The frail status makes elderly patients more difficult to withstand surgical trauma, thus the value of aggressive surgical repair remains controversial. These may lead to more elderly patient's families refuse surgical treatment than young patient's families.

Changes in the text: we added some data and have modified our text as advised (see Page 6, line 5-8, 13-14; Page 12, line 1-2)

2. Please give the break up of Type I and type II DeBakey dissections. Older patients may have more Type IIs and hence may require less extensive surgery.

Reply 2: We agree that data about DeBakey classification would be useful to understand the surgery approach, but unfortunately, we use Stanford classification diagnosis aortic dissection in our center in the past, many patients' CT films are brought home and difficult to re-read to record, it is a limitation of this our data.

Changes in the text:

3. Do we have the data on the size of the arch and locations of the tears? Again, this kind of anatomic data affects the surgical strategy and its extent.

Reply 3.: We agree that the size of the arch and locations of the tears affects the surgical strategy, we add the data of the location of tears, and calculate the P value = 0.371, there was no statistical difference (see Table 3). We are sorry for that the data of the size of the arch didn't be recorded, it is a limitation of our data.

Changes in the text: (see Table 3)

4. There are multiple language issues that should be addressed before publication.

Table 1: ICU is Intensive (not intense) care unit.

Some language edits and fine tuning needed.

Reply 4: we have modified our text as advised (see table1, Abbreviations), thank you for your reminder.

Changes in the text: see table1, Abbreviations

Reviewer B:

I would like to congratulate Chen and colleagues with this work. It is interesting to read about operability of even older patients, and they raise a good question about treatment of Septuagenarians and Octogenarians.

However, I am not sure what the message of this study is.'

As I can read from the characteristics table, there are clinical differences between the conservative and aggressive group and between <70 and 70+ group.

I believe that these differences have major influence on outcome and on the type of procedure performed. I.e. One would perform a major arch operation in an octogenarian who comes in with cardiac tamponade, but keep it as "simple" and fast as possible. Hence, there is a selection bias.

Reply 1: We agree that this is a limitation of the study, It is indeed a bias, but the main purpose of this paper is to show whether there are differences in clinical manifestations, treatment options and outcomes among people over 70 years old. conservative surgery strategy is only a retrospective status quo to show that this choice may bring safer results, and the fracture-oriented treatment approach may be questionable for this special groups of patients

Changes in the text:

It would be more interesting to, for example, match the 2 cohort of patients and compare them if they had the same clinical presentation.

I would suggest to select the 70 and 80+ patients and compare that to the younger group, if you are to examine the influence of age.

Moreover, in table 3 there are more patients with cardiac tamponade in the conservative group (22.1%), compared to aggressive group (8%), while in the conservative group the % of hypotension is only 4.7%. Is this correct?

Reply 2: Thank you for pointing this out, In this paper, tamponade mainly stated that there was a large amount of pericardial effusion, some of which could be stabilized by medical treatment, this may cause less patients hypotension preoperation.

Changes in the text:

I don't think that this paper adds any new information than we already know, namely that in older patients with clinical impairment, one should not perform extended surgery, which is usually used to prevent future issues.

Reviewer C:

Improper Term use: use limited vs extensive surgery, instead of conservative vs aggressive surgical approach.

Reply 1: we have modified our text as advised

Changes in the text: these changes have been Yellow shading

Did you perform a propensity score matching for <70 and ≥ 70 for comparison?

Comorbidities were significantly more present in the ≥ 70 -year-old group!

For an analysis of age as an isolated risk factor you need two comparable groups with the same type of surgery (limited vs extensive) and with comparable comorbidities.

Reply 2: As suggested by the referee, we have try our best to do a PSM for patients <70 and ≥ 70 , there was little matched patients between two groups, and resulted in no statistically significant. Age as an isolated risk factor has been reported in many articles. The main purpose of this paper is to show whether there are differences in clinical manifestations, treatment options and outcomes among people over 70 years old. We would do a PSM for two groups when there are more old patients.

Changes in the text:

Age as a risk factor: did you calculate the risk for 70+80 together and did you do a separate risk analysis for octogenarians? ≥ 70 significantly more statistically significant comorbidities and a different gender distribution.

Reply 3: The population over the age of 80 was too small to be statistically significant only 18.

Changes in the text:

Comparison is therefore difficult without propensity score matching. Is age alone really that much of a risk factor considering the obvious comorbidity differences of the groups and the different gender distribution.

Reply 4: We agree that this, there was little matched patients between two groups, and resulted in no statistically significant. We will do a PSM for two groups when there are more old patients in our center.

Changes in the text:

Higher rate of postoperative tamponade but lesser morbidity and mortality? Tamponade constitutes one of the worst possible complications.

Reply 5: There should be no postoperative tamponade data in this article. Do you mean tamponade.

Changes in the text:

How do you explain lesser morbidity and mortality with limited surgery if extensive surgery would have been necessary like root sparing approach for root dissection?

Reply 6: The limited surgery mentioned here is mainly for the repair of the tear at the root or arch, if patients' pathology combined aortic root aneurysm or severe aortic insufficiency, we don't choose limited surgery.

Changes in the text:

Limited vs extensive surgery depends on pathology, these are not two different surgical approaches for the same pathology. Furthermore, there are mixed forms like root sparing with total arch replacement. You didn't mention those at all.

Reply 7: We agree that this, We don't have it here. The bow part can be selected as the subtotal arch replacement, the limited surgical approaches is mainly focus on root surgical strategy selection.

Changes in the text:

The preoperative condition is not mentioned for all groups, like catecholamine requirement, hemodynamic status, stroke and mechanical ventilation.

Reply 8: Thank you for pointing this out, Many drugs used by patients in transit in the past are not well documented, it is a limitation of our data.

Changes in the text:

“However, to what extent aortic dissection tears is somehow unpredictable, and involvement of the root can be deadly.” That statement is not part of the results, it should be part of the discussion section.

Reply 9: we have modified our text as advised

Changes in the text: this change has been Yellow shading

Table 1

Tracheotomy rate is significantly different with 3.6 % vs. 7.4% (p=0.035) but mechanical ventilation time was about the same with 56 vs. 51 (p=0.486)? Tracheotomy depends mostly on mechanical ventilation time! Besides, units were missing here. I presume you meant 56 vs 51 hours.

Reply 10: Thank you for pointing this out. we agree that this is an important consideration, We went back through the data, and find out that four patients with tracheotomy chose to be discharged for treatment, and there was no record of the time spent on ventilator after discharge, this shortened the mechanical ventilation in patients with tracheotomy in our center.

Changes in the text:

Table 3

Table legend is missing

Mortality comparison of the conservative vs aggressive group is not statistically significant (P=0.236)? That is contradictory to your initial statement in the abstract. There are no statistically significant differences between those two groups besides CRRT.

Reply 11: Thank you for pointing this out, the main purpose is to show whether there are differences in clinical presentation, treatment options and outcomes among people over 70 years of age. The conservative surgical strategy is only a retrospective status quo to show that this option may lead to a safe outcome. The possibility of a small sample size cannot be ruled out. Further research need to focus on the problem, it is a limitation of our article.

Changes in the text: