Reviewer A

Comment 1: "The abstract needs to be rewritten, as the content in background is aim, not background. The indexed diameter needs a brief definition in Line 19. Besides, the authors obviously didn't present 40% of the objects remain stable."

Response 1: Thank you for your valuable comment. We have revised the abstract according to your advice.

Changes in the text: *"Background: Although there are studies on the growth of thoracic aorta in the general population, research based on serial computed tomography scan is rare. We investigated the influence of patient age and anthropometric variables on the size and growth rate of the thoracic aorta in the general hospital population."* Page 3 lines 28-31

"Results: ...Female subjects had a significantly larger indexed diameter (diameter / body surface area) than male subjects (P<0.001 at all five levels). ... In all thoracic aorta levels, the growth rate was the highest in subjects in their 40s, and the growth rate negatively correlated with the initial indexed diameter (P<0.001 at all five levels). In 40%-50% of the subjects, thoracic aorta size remained stable during the interval." Page 3 lines 41-46

Comment 2: "Line 74, even though authors mentioned Du Bois formula here, but it's much better to present the formula here to make it easier understood."

Response 2: We have added Du Bois formula in the manuscript.

Changes in the abstract: *"... and their characteristics are shown in Table 1. BSA was calculated using the Du Bois formula ($BSA = 0.007184 \times W^{0.425} \times H^{0.725}$)"* Page 6 lines 98-99

Comment 3: "Line 100, indexed diameter needs to be defined in the methods, even though it

Response 3: We have added the definition of indexed aorta diameter at the end of the section 'Aortic size measurement' in the Methods.

Changes in the text: *"The growth rate was calculated by dividing the difference of the diameters by the interval between the first and last CT examinations. Indexed aorta diameter was defined as aortic diameter divided by BSA." Page 7 lines 114-116*

Comment 4: "Line 180-182, have the authors compared the data between the patients with risk factors and those without risk factors?"
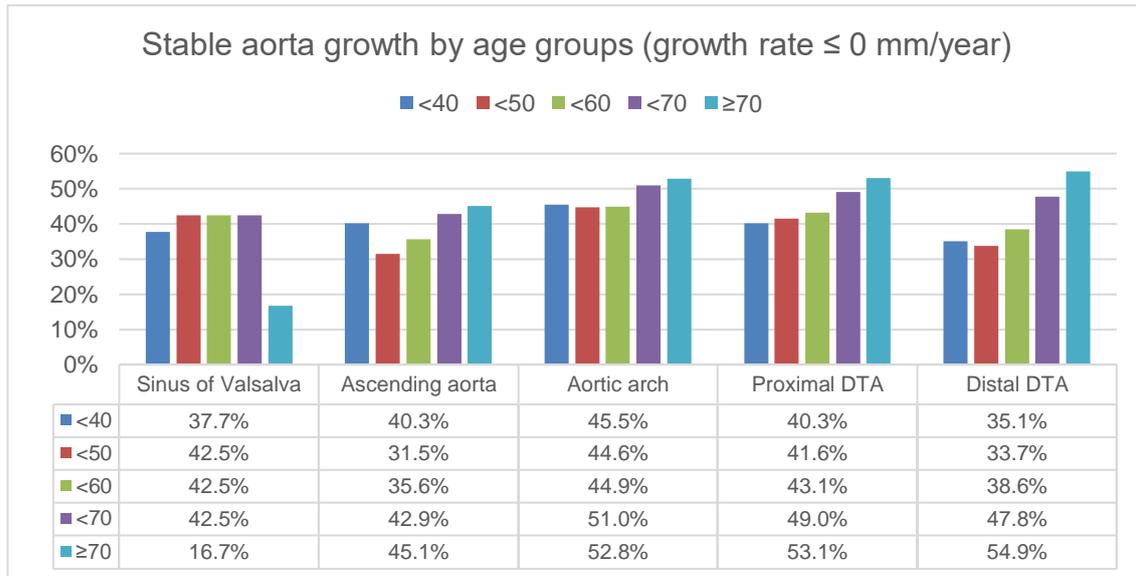
Response 4: Thank you for your valuable comment. Because we did not analyze the risk factors, we have changed the sentence to avoid misunderstanding.

Changes in the text (in Discussion):

"Our observation makes us infer that aging-related aortic dilatation slows down beyond middle age in the general hospital population." Page 12 lines 200-201

Comment 5: "Line 200, as authors mentioned that no change happened in the aortic diameters in 40% of the patients, so which age group do these patients belong to? Are there any possible reasons for the changes in the rest of patients?"

Response 5: Thanks for your intelligent question. We analyzed the proportion of subjects who showed stable aortic growth (growth rate ≤ 0 mm/year) by age groups. The results were consistent with our main study finding, and the growth rate was the highest in the younger group. Due to the limitation of table/figure numbers, we have included this graph as part of supplementary material (S3). The reason for higher proportion of stable aortic growth in the older age group might be owing to the relatively low growth potential in the older age group.

Stable aorta growth by age groups (growth rate ≤ 0 mm/year)

	Sinus of Valsalva	Ascending aorta	Aortic arch	Proximal DTA	Distal DTA
<40	37.7%	40.3%	45.5%	40.3%	35.1%
<50	42.5%	31.5%	44.6%	41.6%	33.7%
<60	42.5%	35.6%	44.9%	43.1%	38.6%
<70	42.5%	42.9%	51.0%	49.0%	47.8%
≥70	16.7%	45.1%	52.8%	53.1%	54.9%

Comment 6: "As the authors also noticed that the study population under 40 years was few, the conclusion in line 231 should be much carefully made."

Response 6: We agree with your point. We have inserted a word to be more careful in stating our findings.

Changes in the text (in Discussion):

"In conclusion, the thoracic aorta is generally dilated with aging and was larger in subjects with a larger body size." Page 14 lines 248-249

Comment 7: "Line 313, these figures are not labelled as A-E, and the abbreviations need to be noted."

Response 7: We apologize for our mistake. We have revised the figure legend as follows:

Changes in figure legends (Figure 1):

"Figure 1. An example of aortic diameter measurements at five levels. The five images were obtained from a single patient: SoV (Sinus of Valsalva), Asc (ascending aorta), Arch (aortic arch), pDTA (proximal descending thoracic aorta), and dDTA (distal descending thoracic aorta). Arrows indicate examples of measuring axes." Page 19

Comment 1: "Abstract: Short background on the growth rate with short aim of the study."

Response 1: Thank you for your valuable comment. We have revised the abstract according to your advice.

Changes in the abstract: *"Background: Although there are studies on the growth of thoracic aorta in the general population, research based on serial computed tomography scan is rare. We investigated the influence of patient age and anthropometric variables on the size and growth rate of the thoracic aorta in the general hospital population."* Page 3 lines 28-31
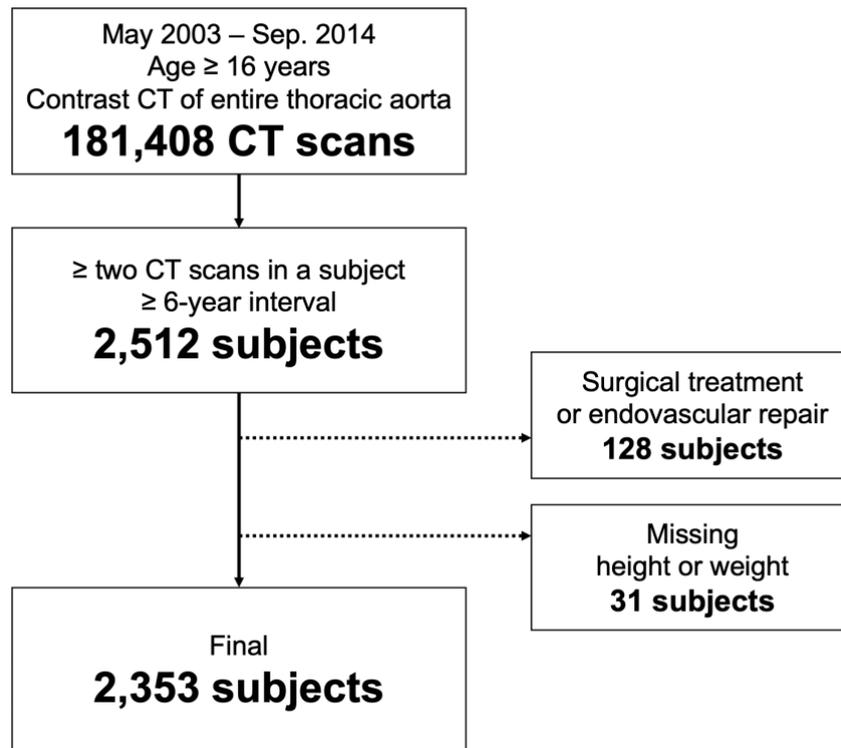
Comment 2: "Line 45: The sentence should be in the Method section."

Response 2: Thank you for the advice. We have deleted the sentence:
"The size of the thoracic aorta was measured, and the long-term growth rate was calculated based on these serial CTs, which were taken at sufficient intervals to enable these calculations."

Comment 3: "Line 72: A box graft showing the numbers might be beneficial to show the numbers here/included."

Response 3: We agree with your point. Due to the limitation in the number of figures/tables allowed, we will submit the flow diagram below as part of supplementary material (S1).

May 2003 – Sep. 2014
Age ≥ 16 years
Contrast CT of entire thoracic aorta
181,408 CT scans

≥ two CT scans in a subject
≥ 6-year interval
2,512 subjects

Surgical treatment
or endovascular repair
128 subjects

Missing
height or weight
31 subjects

Final
2,353 subjects

Comment 4: "Line 79: Outer diameter of the aorta?"

Response 4: You can find the answer in Line 87:

"The internal diameter excluding the thickness of the aortic wall, i.e. contrast-enhanced luminal diameter, was recorded for analysis." Page 7 line 112-114

Comment 1: "This manuscript details the morphologic changes of the thoracic aorta mainly in middle and later ages through evaluating interval changes in CT scans. The manuscript is well written, and the authors discuss the limitations of their study and of CT imaging (especially the fact that the CT scans are not-gated), as well as the lack of control of other confounding factors (such as comorbidities). They also do a nice job of fitting their findings within the context of the literature."

Reply 1: Thank you for your generous comment.

Comment 1: "It's not clear the ethnicity of the population."

Response 1: All the subjects in our study were Korean. We added a sentence in Methods.

Changes in the text (added in the *Study subjects*):

"Finally, 2,353 patients were enrolled in this study, and their CT images were reviewed. All the subjects were Korean." Page 6 lines 96-98

Comment 2: "Make clear that drugs (betablockers, ace-i, sartans) can affect the growth of aorta over time."

Response 2: Thank you for the comment. We have added a sentence in the discussion.

Changes in the text: *"Consequently, to our regret, we did not proceed to the labor-intensive, if not impossible, investigation of the factors that may affect aortic growth, such as familial history, hypertension, metabolic disorders, and chronic renal diseases. Moreover, potentially confounding medications such as beta blockers, angiotensin converting enzyme inhibitors, angiotensin receptor blockers were not checked."* Page 13 lines 226-230

Comment 3: "Can you report the average height/weight/BSA of the general population of your country?"

Response 3: We have obtained domestic data from KOSIS (Korean Statistical Information Service). We thought that these reference values are not essential in the manuscript considering space limitation. However, we are submitting the data as part of supplementary material (S2).

Age groups (years)	Body weight (kg)		Height (cm)	
	Men	Women	Men	Women
-19	71.9	59.1	173.4	160.8
20-29	74.8	56.9	173.8	161.4
30-39	77.3	58.2	174.1	161.2
40-49	74.9	58.6	172.2	159.3

50-59	71.2	58.3	169.4	156.7
60-69	68.3	58.0	166.9	154.2
70-79	65.5	56.5	164.9	151.5
80-	61.7	51.9	162.9	147.9

Changes in the text:

"For reference, mean body weight and height of general Korean population are presented in Supplementary Material S2."

Comment 4: "All CT were ECG Gated?"

Response 4: Most of the CTs were not ECG gated and we described this aspect as one of the study limitations:

"Additionally, most of the CT scans were not electrocardiographically gated. This might also lead to inconsistency in measuring the aortic diameter." Page 14 lines 239-241

Comment 5: "Diameter were calculated edge to edge or inner to inner?"

Response 5: The diameter was measured by inner-to-inner method. There is a sentence in the '*Aortic size measurement*' section of the Methods section:

"The internal diameter excluding the thickness of the aortic wall, i.e. contrast-enhanced luminal diameter, was recorded for analysis." Page 7 lines line 112-114

Comment 6: "I think it's important to highlight the difference between echo and CT."

Response 6: There is a sentence in the discussion explaining the technical drawbacks of aortic size measurement in echocardiography:

"Many previous studies used echocardiography as the examination tool, which has limitations such as inter-observer variation, inferior spatial resolution, and inaccuracy in examining the aortic arch and other segments beyond." Page 13 lines 213-215

Response 7: We measured the diameter of thoracic aorta in the axial images. The measurements were done with the tool included in the picture archiving and communication system (PACS). The PACS software provides a 2-D distance measure tool, which is commonly used in clinical practice.

Response 8: We measured the diameter of thoracic aorta in the axial images. It was one of our study limitations. You can find the sentence at the end of the discussion:

"Third, the CT equipment and imaging protocols in many patients were different between the two images analyzed because of the difference in the reasons for CT scanning and the acquisition of new scanners during the study period. The aorta size was measured on axial scans rather than on reconstructed images." Pages 13-14 lines 236-239

Response 9: We think your point is important, but majority of previous research did not show Z-score for the measurement of aortic size. We thought that the readers could easily understand the absolute value of aortic sizes because the sizes of aorta are more frequently reported in millimeters rather than as Z-score, in both CT and echocardiography.

Response 10: We have changed Figure 1 to represent orthogonal axis.

Response 11:

Thank you for the valuable comment. We agree that faster growth rate in the aortic root and ascending aorta is an interesting finding, but based on our data, we could only speculate the possible cause of this finding. We think that further research is necessary to address the issue.

Comment 12: "Some information about the presence of calcification should be useful."

Response 12: We agree with you. We think that heavier calcification might restrict growth of the aorta, but unfortunately, we could not collect reliable data about calcification based on CT scans obtained with various protocols.