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Reviewer A

The authors present a retrospective analysis of a single center experience regarding the self-made modification and implantation technique with the Frozenix J-graft hybrid prosthesis. They included a total of 44 patients. However, there are severe concerns regarding methodology and conclusion as well as incoherent presentation of this study:

Comment 1: Aim of the study and reason for modification of implantation technique is to prevent adverse events: spinal cord injury and kinking of the prosthesis. Proximalisation of the anastomosis to Ishimaru arch zone 2 is already well described and not at all innovative. Kinking seems to be a problem specific of the Frozenix prosthesis; the authors refer to a study that had shown kinking in 1 out of 60 patients; what do they want to prove with a group of 44 patients?

Reply 1: Thank you for your very useful comments. As you mentioned, Uchida et al. already reported that shortening the non-stent part to the greatest degree possible is important to prevent kinking of the Frozenix and ensure good outcomes of the Frozenix for aortic arch aneurysms. However, few studies to date have shown both the outcomes of total arch replacement with the Frozenix as well as total exclusion of the non-stent part of the Frozenix for aortic arch aneurysms. Therefore, we believe that our study is useful for readers who perform surgical operations for aortic arch aneurysms. Additionally, as you mentioned, it may be difficult to prove the rate of kinking of the Frozenix using our technique with only 44 patients. However, we believe that our study has clinical significance in that it showed real-world outcomes at a single center.

Changes in the text: We have revised the text in the Introduction section as follows: “In patients with an acute angulated or narrow aortic arch, kinking of the Frozenix J-graft may occur between the non-stent and stent parts after total arch replacement (TAR) with the FET technique (1,6). Based on the results of their multicenter study, Uchida et al. (1) recommended shortening the non-stent part to the greatest extent possible to prevent kinking of the Frozenix J-graft. Moreover, after deploying the Frozenix J-graft, the non-stent part is commonly distorted into folds and wrinkles, which makes anastomosing the vascular graft difficult. According to these findings, we considered total exclusion of the non-stent part to prevent kinking of the Frozenix J-graft and obtain good expansion of the proximal portion of the graft.” and “The number of reports showing the outcomes of the Frozenix J-graft is still relatively small, and all such studies have been multicenter in nature. Furthermore, although shortening of the non-stent part and use of the arch translocation anastomosis

technique may be well known, few reports have included both techniques. In this study, we assessed the results of TAR using the Frozenix J-graft with the TENSE technique for aortic arch disease at a single center."

Comment 2: It is not clear whether and why you excluded patients with aortic dissection? Later on dissection patients are described.

Reply 2: We appreciate your helpful comment. As you mentioned, we excluded patients with acute aortic dissection because this condition has a very different pathology and requires different surgical interventions compared with aortic arch aneurysms and chronic dissecting aortic aneurysms. Therefore, we analyzed the outcomes with a focus on aortic arch aneurysms, including dissecting aortic aneurysms.

Changes in the text: We have revised the text in the Study population section as follows: "Patients with acute aortic dissection were excluded from this study because compared with aneurysms, acute aortic dissection has a different pathology and requires different surgical strategies."

Comment 3: What is your selection criteria for conventional or minimally invasive approach?

Reply 3: Thank you for your question. We applied the minimally invasive approach in patients who underwent aortic arch aneurysmal repair alone if anatomically acceptable.

Changes in the text: We have added the following text to the Minimal incisional approach section: "We applied this technique in patients who underwent aortic arch aneurysmal repair alone if anatomically acceptable."

Comment 4: What is the rationale of a bicaval venous cannulation in aortic aneurysm?

Reply 4: Thank you for your question. We commonly use a two-stage cannula through the right appendage. We also use a bicaval venous cannula to the superior vena cava and inferior vena cava in patients undergoing intracardiac operations. Seven patients underwent bicaval venous cannulation because of mitral valve, tricuspid valve, and atrial septal operations.

Changes in the text: We have revised the text in the Surgical technique section as follows: "After systemic heparinization, we established cardiopulmonary bypass with an arterial cannula to the ascending aorta as well as a two-stage cannula through the right atrial appendage (most commonly) or a bicaval venous cannula to the superior and inferior vena cava (in patients who required intracardiac operations)." We have also added the following text to the Results section: "Seven patients underwent bicaval venous cannulation due to mitral valve, tricuspid valve, and atrial septal operations."

Comment 5. Regarding your TENSE technique: first, the „arch translocation

anastomosis technique“ is nothing else than a distal anastomosis in Ishimaru arch zone 2 which is already well known. Second, removing the Dacron part of your hybrid prosthesis so that it is no longer a hybrid and use of a second graft does not appear to be the therapy of choice but more a compromise solution in lack of a suitable hybrid prosthesis.

Reply 5: We appreciate your comments. As you mentioned, a distal anastomosis in zone 2 and shortening of the non-stent part of the Frozenix J-graft have already been described and are well known. However, the surgical operation including both technique is still little known. We believe that our study is meaningful because it provides real-world outcomes after surgical operations including both techniques at a single center. Additionally, in Japan, we cannot use the E-vita OPEN PLUS and Thoraflex Hybrid because they have not received insurance approval in Japan. Likewise, although a common stent graft, such as the cTAG, is also considered in the frozen elephant trunk technique, we cannot use this stent graft because it has not received insurance approval. However, we believe that the Frozenix J-graft has some advantages over the E-vita and Thoraflex. The Frozenix has an inner stent made of nitinol wire with a soft woven graft, which may reduce injury to the intima. This has already been described in the Discussion section. Therefore, the Frozenix is currently a useful open stent graft for aortic arch aneurysms in Japan.

Changes in the text: We have added the following text to the Introduction section: “because neither the E-vita OPEN PLUS hybrid prosthesis (JOTEC GmbH, Hechingen, Germany) nor the Thoraflex hybrid prosthesis (Vascutek, Terumo, Inchinnan, Scotland) has received insurance approval in Japan (1).” Moreover, we have revised the text in the Introduction section as follows: “In patients with an acute angulated or narrow aortic arch, kinking of the Frozenix J-graft may occur between the non-stent and stent parts after total arch replacement (TAR) with the FET technique (1,6). Based on the results of their multicenter study, Uchida et al. (1) recommended shortening the non-stent part to the greatest extent possible to prevent kinking of the Frozenix J-graft. Moreover, after deploying the Frozenix J-graft, the non-stent part is commonly distorted into folds and wrinkles, which makes anastomosing the vascular graft difficult. According to these findings, we considered total exclusion of the non-stent part to prevent kinking of the Frozenix J-graft and obtain good expansion of the proximal portion of the graft.” and “The number of reports showing the outcomes of the Frozenix J-graft is still relatively small, and all such studies have been multicenter in nature. Furthermore, although shortening of the non-stent part and use of the arch translocation anastomosis technique may be well known, few reports have included both techniques. In this study, we assessed the results of TAR using the Frozenix J-graft with the TENSE technique for aortic arch disease at a single center.”

Comment 6. What was the reason for aneurysm rupture in the patient that deceased after surgery? Was the aneurysm not excluded by the Frozenix?

Reply 6: Thank you for your questions. The patient with a ruptured aneurysm died of multiple organ failure caused by preoperative hemodynamic instability despite the fact that the aneurysm had been well excluded by the Frozenix. We have added these findings to the Results section.

Changes in the text: We have revised the text in the Postoperative results section as follows: “one patient with a ruptured aortic aneurysm died of multiple organ failure caused by preoperative hemodynamic instability on postoperative day 2, although the aneurysm had been well excluded by the Frozenix”

Comment 7: Overall stroke rate with 9.1% is quite high, Rankin scores are missing.

Reply 7: We appreciate your useful comment. As you mentioned, the rate of stroke may be relatively high, although we used a conventional antegrade cerebral perfusion technique and not a retrograde cerebral perfusion technique. However, previous reports showed a stroke rate of 5.0% to 13.4% after the frozen elephant trunk technique with antegrade cerebral perfusion for aortic arch aneurysms. That stroke rate is similar to our results. Moreover, we believe that a high rate of stroke is derived from inherent atherosclerotic changes of the arteries because all patients who developed postoperative cerebral infarction had previous cerebral infarction ($p = .010$). We have addressed this issue in the Discussion section. Additionally, we have added the modified Rankin scale score to the Results section.

Changes in the text: We have commented on conventional antegrade cerebral perfusion in the TENSE technique section. Moreover, we have revised the text in the Postoperative results section as follows: “No patients developed postoperative paraplegia or paraparesis, although four patients developed cerebral infarction (three patients intraoperatively [modified Rankin scale score of 1 in two patients and 4 in one patient (preoperative modified Rankin scale score of 3)] and one patient on postoperative day 7 [modified Rankin scale score of 4]). All patients who developed postoperative cerebral infarction had an old cerebral infarction preoperatively ($P = .010$).” Additionally, we have added the following text to the Discussion section: “Stroke is a major complication that also associated with a decrease in patients’ activities of daily living after thoracic aortic surgery. In the FET technique with antegrade cerebral perfusion for aortic arch aneurysms, a stroke rate of 5.0% to 13.4% has been reported (1-3,7). We also experienced four patients (9%) who developed a cerebral infarction postoperatively, which is similar to previous data. Furthermore, our results showed that a previous cerebral infarction was significantly associated with postoperative cerebral infarction. This finding may suggest the presence of inherent factors that contribute to the development of cerebral infarction postoperatively even when strict preventive measures are taken.”

Comment 8: You state you did not find significant relationship between shaggy aorta and stroke, but test method is missing.

Reply 8: Thank you for your helpful comment. We analyzed the relationship between

shaggy aorta and stroke by Fisher's exact test. We have added the method of analysis to the Statistical analysis section.

Changes in the text: We have added the following sentence to the Statistical analysis section: "Categorical variables were analyzed using Fisher's exact test."

Comment 9: You cannot generalize the behaviour of the Frozenix graft to frozen elephant trunk technique at all. In my opinion kinking and stiffness are problems specific for the Frozenix prosthesis.

Reply 9: Thank you for your useful comments. However, we do not believe that kinking of open stent grafts is a problem specific to the Frozenix because previous reports have described kinking of the E-vita OPEN PLUS. The Frozenix has some advantages over other open stent grafts, such as an inner stent that may reduce injury to the intima, although it is relatively stiffer.

Changes in the text: No change.

Comment 10: The manuscript is incoherently written and often argumentation is misleading, e.g. introduction 52-53: spinal cord injury is multifactorial.

Reply 10: Thank you for your helpful comment. As you mentioned, spinal cord injury is multifactorial and may be not suitable for discussion in the Introduction section. Therefore, we have deleted the sentence regarding spinal cord injury from the Introduction section. Moreover, we have revised the Introduction section for greater clarity and consistency.

Changes in the text: We have deleted the sentence regarding spinal cord injury from the Introduction section. We have revised the Introduction section for greater clarity.

Reviewer B

The author presented 44 cases of their modified technique for TAR FET with the Frozenix device. Their operative mortality was 4.5 % which is better than the predicted mortality by Japanese Score, however, their stroke rate is 9.1% which is slightly higher than usual.

The highlight of their paper is the "Novel" TENSE technique. I have a few questions for them.

Comment 1: Is this approach within the IFU of the Frozenix?

Reply 1: Thank you for your question. This approach is within the IFU of the Frozenix.

Changes in the text: No change.

Comment 2: From the diagram, it seems only the stent portion of the Frozenix graft was used, then what is the difference with implanting a commercially available TEVAR (Such as Valiant or Gore) to descending and perform conventional TAR?

Reply 2: We appreciate your useful comments. As you mentioned, a commercially available stent graft, such as Valiant or Gore, may be useful in the frozen elephant trunk technique. However, we cannot use commercially available stent grafts in the frozen elephant trunk technique because such stent grafts have no insurance approval in Japan. Additionally, the Frozenix has some advantages over other open stent grafts, such as an inner stent that may reduce injury to the intima. This has already been described in the Discussion section. We therefore believe that the Frozenix graft is useful for the frozen elephant trunk technique.

Changes in the text: No change.

Comment 3: Why would your approach results in a slightly higher stroke rate?

Reply 3: Thank you for your question. The stroke rate may be relatively high despite the fact that we used a general antegrade cerebral perfusion technique, not a retrograde cerebral perfusion technique. However, previous reports showed a stroke rate of 5.0% to 13.4% after the frozen elephant trunk technique with antegrade cerebral infarction for aortic arch aneurysms. That stroke rate is similar to our results. Moreover, we believe that a high stroke rate is derived from inherent atherosclerotic changes of the arteries because all patients who developed postoperative cerebral infarction had previous cerebral infarction ($p = .010$). We have added this information to the Results section. Moreover, we have added comments on cerebral infarction to the Discussion section.

Changes in the text: We have added the following text to the Results section: “All patients who developed postoperative cerebral infarction had an old cerebral infarction preoperatively ($P = .010$).” Additionally, we have added the following text to the Discussion section: “Stroke is a major complication that also associated with a decrease in patients’ activities of daily living after thoracic aortic surgery. In the FET technique with antegrade cerebral perfusion for aortic arch aneurysms, a stroke rate of 5.0% to 13.4% has been reported (1-3,7). We also experienced four patients (9%) who developed a cerebral infarction postoperatively, which is similar to previous data. Furthermore, our results showed that a previous cerebral infarction was significantly associated with postoperative cerebral infarction. This finding may suggest the presence of inherent factors that contribute to the development of cerebral infarction postoperatively even when strict preventive measures are taken.”

Comment 4: What is the advantage of using Hem-o-lock to close the LSCA?

Reply 4: Thank you for your question. We believe that we can appropriately close the LSCA using a Hem-o-lok without injury to the LSCA or leakage.

Changes in the text: No change.

Comment 5: Can you show us some pic of the kinking of the Frozenix that warrant you to change your operative strategy?

Reply 5: Thank you for your question. We had previously experienced a case of

kinking of the Frozenix, and we have added a figure showing the kinking.
Changes in the text: We have added Supplemental Figure 1.

Comment 6: What is the cause of aortic rupture in the case of mortality? supposing the stent should have excluded the aneurysm.
Reply 6: Thank you for your question. The patients with ruptured aneurysms died of multiple organ failure caused by preoperative hemodynamic instability, although the aneurysm had been well excluded by the Frozenix. We have added these findings to the Results section.
Changes in the text: We have revised the text in the Postoperative results section as follows: “one patient with a ruptured aortic aneurysm died of multiple organ failure caused by preoperative hemodynamic instability on postoperative day 2, although the aneurysm had been well excluded by the Frozenix”

Comment 7: Please ask a native English speaker to help with language editing
Reply 7: Thank you for your helpful comment. The manuscript has undergone revision and language editing by a native English speaker again.
Changes in the text: The manuscript has undergone English language editing.

Reviewer C

The manuscript with the title “Early outcomes of the Frozenix J-graft without non-stent part at single center” describe a patient cohort where the authors have used the Total Exclusion of the Non-Stent part of Frozenix using an Everting anastomosis (TENSE) technique to avoid some of the adverse events associated with the Frozenix J-graft.

The authors report good early outcomes (in-hospital mortality of 4.5 %) without spinal cord complications and kinking of the Frozenix J-graft.

Major concern:
Comment 1: The data presented in the manuscript are interesting, but of limited value for surgeons outside Japan since the Frozenix J-graft is not available outside Nippon.
Reply 1: We appreciate your comments. The Frozenix is currently available only in Japan. In the future, however, the Frozenix J-graft will available in European countries.
Changes in the text: No change.

Comment 2: In general, the data in the manuscript are well presented. The quality of the English language needs improvement throughout the manuscript. The authors are encouraged to get the manuscript revised by a native English-speaking doctor with knowledge of the field.

Reply 2: Thank you for your helpful comment. The manuscript has undergone revision and language editing by a native English speaker again.
Changes in the text: The manuscript has undergone English language editing.

Comment 3: The introduction frames the problems with the Frozenix J-graft and the possible solution with the TENSE technique well for the reader.
Why did the authors use the Frozenix J-graft instead of other FET prosthesis such as the Thoraflex hybrid prosthesis?
Reply 3: Thank you for your helpful comment. Although the E-vita OPEN PLUS and Thoraflex Hybrid are useful open stent grafts, we cannot use these open stent grafts because they have not received insurance approval and are not commercialized in Japan.
Changes in the text: We have added the following text to the Introduction section: "because neither the E-vita OPEN PLUS hybrid prosthesis (JOTEC GmbH, Hechingen, Germany) nor the Thoraflex hybrid prosthesis (Vascutek, Terumo, Inchinnan, Scotland) has received insurance approval in Japan (1)."

Comment 4: In general, when using K-M plots the plots should be truncated when less than 10% of the original cohort remains. Therefore, figure 2 should be changed accordingly.
Reply 4: Thank you for your helpful comment. We have truncated the plots when <10% of the original cohort remained. We have revised Figure 2 accordingly.
Changes in the text: We have revised Figure 2.

In the methods section:
Comment 5: In general use past tense when describing the methods, the current version of the manuscript is not consistent.
Reply 5: Thank you for your helpful comment. We have consistently used the past tense when describing the methods.
Changes in the text: We have revised the text to use the past tense when describing the methods.

Comment 6: Which cardioplegia regime was used?
Reply 6: Thank you for your question. We used antegrade and retrograde identical cold-blood cardioplegia after aortic cross-clamping, followed by intermittent selective administration into the orifices of the coronary arteries or retrograde administration.
Changes in the text: We have added the following text to the Methods section: "After performing aortic cross-clamping or moderate hypothermic circulatory arrest, antegrade and retrograde identical cold-blood cardioplegia were administered, followed by intermittent selective administration into the orifices of the coronary arteries or retrograde administration."

Comment 7: Page 4, line 89: Chronic dissection?
In general, the authors should use the term chronic dissection throughout the manuscript, since they did not include patients with acute aortic dissection.
Reply 7: We appreciate your helpful comment. However, we believe that the term "chronic dissecting aneurysm" may be better than "chronic dissection" because we treated chronic dissecting aneurysms of >55 mm in diameter.
Changes in the text: No change.

Comment 8: The original patient cohort was 44 patients, but on page 6, line 126, 44 (?) patients underwent computer tomography angiography before discharge. Is this correct? Should the number be 42?
Reply 8: Thank you for your helpful comment. We are apologize that 44 patients was the incorrect number. Instead, 42 patients underwent computed tomography angiography before discharge.
Changes in the text: We have changed the number of patients from 44 to 42 in the Follow-up section.

Comment 9: Furthermore, lost to follow-up and censoring are two different things. Revise and clarify.
This particular section of the manuscript needs to be rewritten and clarified.
Reply 9: We appreciate your helpful comments. Followed-up patients were censored at the point of the last known date that they visited the hospital or based on the patient referral documents from the other hospital. No patients were lost to follow-up. We have revised the sentence regarding censoring.
Changes in the text: We have revised the Follow-up section as follows: "Followed-up patients were censored at the point of the last known date that they had visited the hospital or based on the patient referral documents from the other hospital."

In the discussion section:
Comment 10: The partial upper sternotomy is interesting, but since only the three patients were treated with this approach it is more of an anecdote than data. The authors should rewrite this section and not draw general conclusion from such a small number of observations.
Reply 10: We appreciate your useful comment. As you mentioned, it may be difficult to draw a general conclusion because only three patients were treated. We have revised the discussion of the minimal incisional approach.
Changes in the text: We have revised the text in the Discussion section as follows: "A minimal incisional approach may be an acceptable alternative to reduce postoperative complications, and it also has cosmetic advantages (13,14). El-Sayed Ahmad et al. (14) suggested that TAR with the FET technique via partial upper sternotomy can be performed safely and repeatedly in patients with extended thoracic aortic aneurysms. We also performed TAR with the FET technique via partial upper sternotomy in three

patients. Translocated TAR with TENSE could be also applied using a minimal incisional approach because of easy distal anastomosis with minor bleeding from the anastomosis."

Conclusion:

Comment 11: [page 12, line 308]…, instead(?) of high Japan score.

Reply 11: Thank you for your helpful comment. We have "instead of" to "despite."

Changes in the text: We have changed "instead of" to "despite" in the Conclusion section.

Minor concern:

Comment 12: Have the authors used the Frozenix J-graft in the setting of acute type A dissection?

Reply 12: We appreciate your question. We have also applied the Frozenix J-graft to acute type A aortic dissection. However, patients with acute aortic dissection were excluded from this study because compared with aneurysms, acute aortic dissection has a different pathology and requires different surgical strategies.

Changes in the text: We have added the following text to the Study population section: "because compared with aneurysms, acute aortic dissection has a different pathology and requires different surgical strategies."

Comment 13: [page 6, line 138] P<.05 is the common form to use.

Reply 13: Thank you for your helpful comment. We have revised the P value as indicated.

Changes in the text: We have revised the expression of the P value throughout the manuscript.

Comment 14: The patients are retrospectively assessed from April 2017 to March 2021. How many patients did the authors do each year?

Reply 14: Thank you for your question. We experienced 4 patients in 2017, 10 patients in 2018, 15 patients in 2019, 14 patients in 2020, and 1 patient in 2021.

Changes in the text: We have added the following text to the Study population section: "(4 patients in 2017, 10 in 2018, 15 in 2019, 14 in 2020, and 1 in 2021)."

Comment 15: Table 2. Platelets, units 20 (20-20) Is this correct?

Reply 15: Thank you for your question. These data are correct.

Changes in the text: No change.

Comment 16: The authors are encouraged to use the term spinal cord complications instead of spinal cord injury

Reply 16: Thank you for your helpful comment. We have changed "spinal cord injury" to "spinal cord complications."

Changes in the text: We have changed "spinal cord injury" to "spinal cord complications" throughout the text.

Reviewer D

Morisaki et al. submitted a descriptive analysis of a case series of 44 patients who underwent a modified FET procedure called TENSE (Total Exclusion of the Non-Stent part of the Frozenix J-graft using an Everting anastomosis). The modified technique is characterized by a distal anastomosis in aortic arch zone 2 and separation of the non-stent and the stent-graft part of the prosthesis prior to the distal anastomosis. Using this modified technique, the authors aim to reduce complications like the kinking of the FET prosthesis, which they claim to be specific for the Frozenix J-graft.

The authors present good postoperative outcomes and figure 1 nicely illustrates the presented technique.

Nevertheless, some major issues need to be addressed:

Comment 1: It remains unclear how the Frozenix J-graft prosthesis leads to a kinking. Kinking is not common in the FET procedure using the Vascutek Thoraflex Hybrid Plexus prosthesis. Why did the authors not choose that prosthetic model? What is the difference between these different FET prostheses models that may explain a higher rate of kinking in the Frozenix prosthesis? Why is it necessary to separate the non-stent and the stent-graft part of the prosthesis to prevent kinking? Or is there another reason for this separation?

Reply 1: Thank you for useful comments. Currently in Japan, we cannot use the E-vita or Thoraflex because they have not received insurance approval in Japan. Additionally, in patients with an acute angulated or narrow aortic arch, kinking of the Frozenix J-graft may occur between the non-stent and stent parts after total arch replacement with the FET. In their multicenter study, Uchida et al. recommended shortening of the non-stent part to the greatest extent possible to prevent kinking of the Frozenix J-graft. Moreover, after deploying the Frozenix J-graft, the non-stent part is commonly distorted into folds and wrinkles, which makes anastomosing the vascular graft difficult. Based on these findings, we considered total exclusion of the non-stent part to prevent kinking of the Frozenix J-graft and obtain good expansion of the proximal portion of the graft. We have revised the Introduction section and had already described the above information in the Methods section.

Changes in the text: We have added the following text to the Introduction section: "because neither the E-vita OPEN PLUS hybrid prosthesis (JOTEC GmbH, Hechingen, Germany) nor the Thoraflex hybrid prosthesis (Vascutek, Terumo, Inchinnan, Scotland) has received insurance approval in Japan (1)." Additionally, we have revised the text in the Introduction section as follows: "In patients with an acute

angulated or narrow aortic arch, kinking of the Frozenix J-graft may occur between the non-stent and stent parts after total arch replacement (TAR) with the FET technique (1,6). Based on the results of their multicenter study, Uchida et al. (1) recommended shortening the non-stent part to the greatest extent possible to prevent kinking of the Frozenix J-graft. Moreover, after deploying the Frozenix J-graft, the non-stent part is commonly distorted into folds and wrinkles, which makes anastomosing the vascular graft difficult. According to these findings, we considered total exclusion of the non-stent part to prevent kinking of the Frozenix J-graft and obtain good expansion of the proximal portion of the graft.".

Comment 2: "Furthermore, after deploying the Frozenix J-graft, the non-stent part is commonly distorted into folds and wrinkles, which increases the difficulty of vascular graft anastomosis. " - This problem does not occur in the Vascutek Thoraflex Hybrid Plexus prosthesis. Why did the authors not decide to use the Vascutek or the E-Vita Open prosthesis?

Reply 2: We appreciate your helpful comment. Currently, we cannot use the E-vita OPEN PLUS and Thoraflex Hybrid because they have not received insurance approval in Japan. Likewise, although a common stent graft, such as the cTAG, is also considered in the frozen elephant trunk technique, we cannot use this stent graft because it has not received insurance approval. However, we believe that the Frozenix J-graft has some advantages over the E-vita and Thoraflex. The Frozenix has an inner stent made of nitinol wire with a soft woven graft, which may reduce injury to the intima. Therefore, the Frozenix is currently a useful open stent graft for aortic arch aneurysms in Japan.

Changes in the text: We have added the following text to the Introduction section: "because neither the E-vita OPEN PLUS hybrid prosthesis (JOTEC GmbH, Hechingen, Germany) nor the Thoraflex hybrid prosthesis (Vascutek, Terumo, Inchinnan, Scotland) has received insurance approval in Japan (1)."

Comment 3: "We included patients with distal aortic arch aneurysms that required thoracic endovascular repair with 2–3 debranching procedures (zone 0 or 1 landing), as well as those in whom it was difficult to use a median approach extending to the upper middle descending aorta to perform distal anastomosis." - This part of the text was not understandable. Could the authors please explain what they meant? Which kind of pathologies are meant here?

Reply 3: Thank you for your suggestions. As you mentioned, these sentences are unclear. We have therefore deleted these sentences.

Changes in the text: We have deleted the following sentence from the Study population section: "We included patients with distal aortic arch aneurysms that required thoracic endovascular repair with 2–3 debranching procedures (zone 0 or 1 landing), as well as those in whom it was difficult to use a median approach extending to the upper middle descending aorta to perform distal anastomosis."

Comment 4: At some parts of the text the English language is of poor quality and needs revision.

Reply 4: Thank you for your helpful comment. The manuscript has undergone revision and language editing by a native English speaker again.

Changes in the text: The manuscript has undergone English language editing.