

Peer Review File

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Reviewer A

This manuscript analyzed the impact on early outcome after endovascular repair with Castor single-branched stent graft by the length of the proximal landing zone 2 (PLZ 2). Various statistical analysis methods revealed that the PLZ 2 length was significantly associated with the occurrence of the bird-beak configuration and aortic-related adverse events. This is a meaningful work, but there are still some critical issues in this article as follows.

1. The length of PLZ 2 was analyzed in the article (Table 1), but the distance between the left common carotid artery and the left subclavian artery was used in grouping (Materials and Methods). Please describe the specific measurement range and the reason for using 10 mm as a grouping.

Reply: According to the guidelines, the PLZ2 is the distance from the distal end of the left common carotid artery to the distal end of the left subclavian artery. In this paper, we measured the distance from the distal end of the left common carotid artery to the proximal end of the left subclavian artery, because the length of this distance plays an important role in stent selection. The length of the front end of the support is usually optional, including 5mm, 10mm, 15mm, 20mm, 25mm. In our clinical work, the incidence of bird-beak configuration in the 5mm stent was significantly increased, considering that the distance between LCA-LSA and the shape of the aortic arch were related, so we measured this distance for analysis, and got a positive result. For the measurement of this distance, involving the description of various nouns in the text, we have been revised our paper.

2. In the inclusion criteria, the timing of surgery was in the acute and subacute stages. Whether this would affect the postoperative complications, and then affect the conclusion of this article, please analyze the results of acute and subacute surgery in the two groups.

Reply: We didn't describe the inclusion criteria clearly and have revised it according to reviewer's comments. We revised as: patients with acute aortic dissection were included. The results of statistical analysis were not statistically significant between acute and subacute group due to limited number of patients. In the future study, after we collected enough patients, we can separately analyze the postoperative effects of acute and subacute in subsequent relevant studies. Page 5 Line 11-20

3. The anterior end of the Castor branch stent is fixed in length. Whether the addition of the shortest distance between the distal end of the left common carotid artery and the proximal end of the left subclavian artery was considered in the exclusion criteria.

Reply 3: Thank you very much for your suggestion, we have added relevant content in the

exclusion criteria. Page 5 Line 11-20

4. What is the oversize option for the Castor bracket? Was there a difference between the two groups?

Reply 4: The stent graft diameter was generally oversized to the non-dissected aortic maximum dimension in the proximal landing zone by 5%-15% for patients. There was no difference between the two groups.

5. "Aortic-related adverse events included bird-beak configuration" was described in "Definition of Outcome and Complication". Whether it is reasonable that the data between "Aortic related adverse events n (%)" and "Aortic related adverse events n (%)" (Table 2). Please confirm.

Reply: Aortic-related adverse events included aneurysm formation or growth, aortic rupture, aortic branch vessel complications, stent migration, retrograde dissection, new distal dissection, Ia endoleak, and mortality. We have revised the methods section. Page 7 line 10-12. There are no errors in the data in Table2.

Reviewer B

This paper describes in detail the effect of aortic arch morphology on the treatment of type B aortic dissection with branch stents. The safety and efficacy of the early branch stent were demonstrated in conclusion. The effect of castor branch proximal landing zone on postoperative adverse events was determined by multivariate analysis. This article has some clinical significance and suggests risk factors of aortic-related adverse events when proximal landing zone is insufficient. But a few questions need to be asked:

1. Please introduce the device to know more about its advantages and disadvantages.

Reply: The Castor single branch stent graft was designed to exclude the entry tear and preserve the LSA using a branch section on it. It was a unibody branched graft consisting of a self-expandable nitinol stent and polyester vascular graft fabric without a proximal or distal bare stent. It consisted of a main stent graft and a side branch for the LSA. The delivery system consists of a 22 F outer sheath coated with a low friction, hydrophilic layer, and an inner soft polyester fabric sheath encapsulating the aortic graft trunk and the branch section, which are folded individually.

2. What are the considerations for choosing 10mm in the queue group?

Reply: In clinical practice, we found that the beak phenomenon was more common in cases with PLZ (LCA-LSA) less than 10mm. It is also hoped that through comparative analysis of existing data, it can be found and proved that when the proximal PLZ (LCA-LSA) of the stent is less than 10mm, adverse outcomes are more likely to occur.

3. All surgical procedures were enhanced by local anesthesia, and no tracheal intubation

was used? Whether ICU observation is required after surgery.

Reply : After TEVAR operations in our center, all patients were transferred to the general ward for ECG and oxygen monitoring. No additional stay in the ICU is required.

4.If you used branched endografts

a. what bridging stent graft did you use?

b. for both groups... did you balloon the endograft after deployment?

Reply: The Castor single branch stent graft (MicroPort Medical, Shanghai, China) was designed to exclude the entry tear and preserve the LSA using a branch section on it. It was a unibody branched graft consisting of a self-expandable nitinol stent and polyester vascular graft fabric. It is not a chimney/snorkel, a physician modified graft, an in-situ fenestration technique, or a standard TEVAR with LSA coverage. Thus, we didn't use bridging stent graft. Because of choosing oversize over 10%, we didn't balloon the endograft after deployment.

4. Is the oversize of the single-branch bracket the same as that of the traditional TEVAR?

Reply: In our stent selection, the conventional oversize is not more than 10%. When using castor in TEVAR, it is sometimes selected to be slightly larger in order to better reduce LSA endoleak.

6. In these cases, whether gender differences in the treatment of type B aortic dissection with branch stents lead to differences in outcomes, whether attention or statistics are concerned.

Reply: In many literature reports, gender has a different impact on the postoperative effect of TEVAR\EVAR, so different treatment standards are used in the formulation of treatment plans. In our article, due to data limitations, we cannot provide the effect of gender for the time being.

7.It is very confusing what treatment modalities you are comparing. I can see that one group of patients with branched device. Please clarify.

a. How many branches? proximal landing zone?

b. What bridging stent was used?

c. What was the length of the main stent graft and how was this length determined?

d. Where all patients treated with the same stent graft (same company)? and which one?

Reply: It is not a chimney/snorkel, a physician modified graft, an in-situ fenestration technique, or a standard TEVAR with LSA coverage. The Castor single branch stent graft (MicroPort Medical, Shanghai, China) was designed to exclude the entry tear and preserve the LSA using a branch section on it. It was a unibody branched graft consisting of a self-expandable nitinol stent and polyester vascular graft fabric. It consisted of a main stent graft and a side branch for the LSA, and in consequence, the delivery system was slightly

thick with an outer diameter of 22F. The branched stent graft is constructed of woven polyester fabric sewn to self-expanding Nitinol stents, without a proximal or distal bare stent. The delivery system consists of a 22 F outer sheath coated with a low friction, hydrophilic layer, and an inner soft polyester fabric sheath encapsulating the aortic graft trunk and the branch section, which are folded individually. The aortic graft trunk is folded with loops of thread and a nickel titanium wire.

8.The definition of aortic-related adverse events already included bird-beak configuration. Why is bird-beak configuration also a risk factor for aortic-related adverse events? Please confirm.

Reply: This is a typo in our methods section. In the Table, the bird-beak configuration was not counted as an adverse event, but as a presentation for statistical analysis, hoping to find that the bird-beak configuration had a certain impact on aortic related adverse events. This can also be confirmed in the final result.

9.The definition of secondary endpoints is not clear.Please clarify

Reply: Secondary endpoints were defined as all adverse events (including: mortality re-intervention new-onset stroke paraplegia renal complications aortic related adverse events.) Page 7 line 8-9

10.The ordinate of Figure 1 and Figure 2 is not appropriate, please confirm

Reply: We have revised the ordinate of Figure 1 and Figure 2.

Reviewer C

The manuscript reports an interesting experience on endovascular treatment of type B aortic dissection with a new single branched endograft.

Authors report unfavourable early outcomes in patients with short landing zone 2 with this promising new endograft.

The work is nicely written, original and early results are quite interesting.

The following reports are my remarks:

Title:

Page 1 line 1: "endovascular repair .. of type B dissection with...".

I suggest that indications of treatment should be emphasized in the title to better understand the clinical setting.

Reply: We have revised the title of the article according to reviewer's suggestion.

Abstract:

Page 1 line 12: "The study recorded ... technical success, mortality and...."

In my opinion would be interesting to report also immediate (30 days) results of the endovascular treatment of type B dissection with the Castor endograft. Literature is poor and immediate results seem positive in adequate anatomy. In all the text, authors limit their reports on 6 months results but more information on 30-day outcomes will be interesting for readers and would help to better understand later aortic adverse events.

Page 1 line 25: "it is more susceptible to the bird-beak configuration".

In my opinion conclusions should underlined the association of treatment with aortic adverse later events and not only with the bird –beak configuration.

Reply: Conclusions have underlined the association of treatment with aortic adverse later events. Page 2 Line7-10.

Introduction:

Page 2 line 49: "an intact proximal landing zone".

"Safe" or "healthy" should be used.

Reply: We have revised it, see the manuscript for details. Page 4 line 11

Materials and Methods:

Reply: We have revised Materials and Methods, see the manuscript for details.

Page 3 line 73: " acute (2-7 days) and subacute (8-30)".

Classification of the acute and subacute phase of acute dissection are never reported as described in the text (also in the reference work mentioned by authors). I suggested to change the text.

Reply: We have revised it, see the manuscript for details. Page 5 line 11-12

Page 3 line 83:.

Classification of aortic arch morphology is not reported in Materials and Methods but discuss later in the text. I suggested to add standard classification in M and M.

Reply: We have revised it. According to the vertical distance from the opening of the brachiocephalic trunk to the top of the aortic arch and the multiple of the diameter of the dominant common carotid artery, cassetly divided the aortic arch into 3 types. Less than 1 was Myla Type I aortic arch, 1-2 was Myla type II aortic arch, and greater than 2 was Myla type III aortic arch. Page 8 line 3-7

Page 4 line 91: "through the left brachial access".

Surgical access? Percutaneous? It should be interesting to add these informations.

Reply: We have revised it, see the manuscript for details. Page 6 line 11-12

Page 4 line 91: "obvious leakage".
What authors means? Please specify in the text.

Reply: We have revised it, see Page 6 line 17.

Page 4 line 98: "CTA versus DSA".
Why DSA? When DSA was selected instead of CTA?.

Reply: DSA is only used as a supplementary examination means for CTA. For some patients who encounter endoleak or need to intervene again, we re-measure various data in DSA for these patients.

Page 4 lines 102-3: "Technical success was defined...".
Type I and III endoleak was not considered as a criteria for technical success?.

Reply: We have revised it, see the manuscript for details. Page 7 line 4-6

Results

Page 6 line 155: "Table 2".
Type of endoleak should be specify in Table 2.

Reply: All the cases in the follow-up were type Ia endoleak, which we have described in detail in the table.

Page 6 line 157: "due to intolerance".
What authors means? Please specify in the text.

Reply: We have revised it, "because the patient can't cooperate" Page 10 line 7
Page 6 lines 158-63:.
See comment for page 1 line 12. In my opinion would be interesting to report also immediate (30 days) results of the endovascular treatment of type B dissection with the Castor endograft, above all endoleaks data.

Reply: We have revised it, see the manuscript for details. Page 10 Line 15-20; Page 1 Line 17-19

Conclusion:

Page 10 line 266:.
See comment for page 1 line 25. Conclusions should underlined the association of treatment with aortic adverse later events and not only with the bird-beak configuration.

Reply: We have revised it, see the manuscript for details. Page 15 line 17-19