

Peer Review File

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Reviewer A

INTRODUCTION:

*Lines 45-47: there are much more reasons for subsequent surgeries ... why did you cite "only" these ones? If you decide to cite them, please include all of them otherwise use a more general omnicomprehensive statement...

Response: Thank you for your suggestion. We have revised the manuscript, which can be seen in lines 73-76.

Changes: However, some patients who have undergone TEVAR may need to undergo open aortic surgery postoperatively, which can be caused by various reasons [2]. Among these, retrograde type A aortic dissection (RTAD) is the focus of discussion in this article.

*Overall, not a very appealing section that should organize including what's the amount of problem ... what is known (briefly) in literature ... WHAT IS MISSING (and this is missing in your paper ...) from the literature ... and therefore what's your paper aims to fill the eventual gap

Response: Thank you. We have revised this section; the details can be seen in lines 69-81.

Changes: The treatment of aortic diseases involves meticulous clinical decision-making, requiring a delicate balance between surgical risks and patient prognosis. With the continuous advancement of thoracic endovascular aortic repair (TEVAR), an increasing number of patients are opting for this treatment modality [1]. In the current clinical treatment process, there is not yet a unified diagnostic and treatment plan for this group of patients. This requires us to conduct more in-depth research. Investigating the safety of open aortic surgery after TEVAR provides valuable insights for clinical practice, assisting surgeons in better assessing patient outcomes and formulating personalized treatment plans, ultimately contributing to the improvement of patient prognosis.

MATERIALS and METHODS:

*Please, define what kind of study is yours (observational cohort retrospective study?)

Response: Thank you. This is an observational cohort retrospective study. The details can be seen in lines 102.

*Please, declare what kind of guidelines did you follow to draft your paper (21 cases = case series = CARE guidelines) and provide the correlated chart

Response: Strobe reporting guideline.

***numbers do not belong to this section, please shift all of them to the subsequent Results section!

Response: Thank you. We have moved the numbers to the results section. The details can be seen in lines 137-144.

Changes: The average age of the patients was 53 ± 11.4 years, and 20 individuals (95.2%) were male (demographic data presented in Table 1). The indications for the index TEVAR were 19 cases of type B aortic dissection (TBAD) and two cases of penetrating aortic ulcer. In five patients, TEVAR and chimney grafting implantation (CGI) were simultaneously performed, with one case involving the left carotid artery and five cases involving the left subclavian artery. The median interval between the initial TEVAR surgery and RTAD was 5.0 months (range: 0.25-96 months). Table 2 summarizes the relevant information of the TEVAR procedure.

*Please, provide the CONSORT algorithm to better describe from which whole aortic cohort this subgroup has been derived

Response: Thank you. This is an observational cohort retrospective study. The CONSORT algorithm is not applicable to this study.

*This study received approval from the Ethics Review Committee of XXX Hospital" What XXX does it mean? Please, blind your institution to avoid evaluation bias is good, but delete also this unuseful sentence in its current form.

Response: Thank you. "XXX" was processed for all contributors' information due to the journal's peer review requirements.

The surgery was conducted under general anesthesia, and all patients underwent median sternotomy". This means you did treat proximal aortic lesion after index TEVAR? These Authors MUST BETTER DESCRIBE the clinical scenarios in which they performed otherwise this reviewer should "imagine" everything!

Response: Apologies for the lack of clarity in our description. This procedure is very well established and is illustrated in previous reports. We have cited previous reports in the text. It is convenient for reviewers to extend their reading, if any are unfamiliar with the field. The details can be seen in lines 104.

Changes: The surgery was reported previously.

*Technical details are too too extensive; shorten them unless you are describing a radically different technique in comparison with what already known and described in literature

Response: Thank you. It has been shortened as suggested. The details can be seen in lines 121-134.

Changes: During the exploration of the arch, the proximal anchoring area of the TEVAR stent was appropriately trimmed (Fig. 1A). In some patients where the stent was positioned too close to the proximal end (Fig. 1B), a section of the covered stent was judiciously excised (Fig. 1C). The aortic arch was then trimmed to the proximal end of the left common carotid artery opening, and a frozen elephant trunk stent was implanted distally (Fig. 2A). The diameter of the elephant trunk stent was selected based on the diameter of the distal artery and the TEVAR stent. Four-branch artificial

blood vessels (TERUMO or MAQUET) were utilized to reconstruct the arch (Fig. 2B). After completion of the distal anastomosis between the four branch vessels and the autologous aorta, one branch vessel was selected for arterial perfusion to restore distal circulation. After the distal stumps of the left subclavian artery, left carotid artery, and innominate artery were anastomosed to branch vessels, the rewarming process was commenced. The extracorporeal circulation pipeline was gradually weaned, and the operation was concluded (Fig. 2C). Table 3 provides information related to the surgery.

***once again, NUMBERS belong to Results!!!! They should not included here!

Response: Thank you. We have moved the numbers to the results section. The details can be seen in lines 137-144.

Changes: The average age of the patients was 53 ± 11.4 years, and 20 individuals (95.2%) were male (demographic data presented in Table 1). The indications for the index TEVAR were 19 cases of type B aortic dissection (TBAD) and two cases of penetrating aortic ulcer. In five patients, TEVAR and chimney grafting implantation (CGI) were simultaneously performed, with one case involving the left carotid artery and five cases involving the left subclavian artery. The median interval between the initial TEVAR surgery and RTAD was 5.0 months (range: 0.25-96 months). Table 2 summarizes the relevant information of the TEVAR procedure.

*What about stats evaluation?

Response: Thank you. We have added “statistics” into the Methods section. Due to the limited number of cases undergoing aortic surgery after TEVAR at our center, we only conducted descriptive statistics, and the specific results can be found in the results section. The details can be seen in lines 98-102.

Changes: Continuous variables were described as mean \pm standard deviation (SD) or median (range), and categorical values as number (%). The Kaplan-Meier method was used to evaluate survival, and the "survival" package in R was used for plotting. Due to the limited number of cases in this study, descriptive statistics are mostly used rather than other statistical methods. This is an observational cohort retrospective study.

*What about definitions?

Response: Thank you. The details can be seen in lines 89-98.

Changes: RTAD refers to aortic dissection occurring at the proximal end of the TEVAR stent, as confirmed by CTA. Myocardial dysfunction refers to a condition indicated by transthoracic echocardiography showing a left ventricular ejection fraction of less than 50%. Dialysis is required when kidney function falls below a critical level, typically when the glomerular filtration rate (GFR) is less than 15 mL/min/1.73 m² or when serum creatinine levels are significantly elevated above normal values. Core temperature refers to rectal temperature.

RESULTS-DISCUSSION:

*To be re-rated after extensive revision of the M&M section

Response: Thank you. We are looking forward to your further suggestions, which are extremely helpful in improving the paper. The details can be seen in lines 82-134.

Changes: Methods

Patients

From September 2016 to August 2020, our center treated 21 patients who underwent repeat aortic surgery after TEVAR, with all cases confirmed through aortic computed tomography angiography (CTA). This study received approval from the Ethics Review Committee of Guangdong Provincial People's Hospital.

Definitions, Follow-Up, and Statistical Analysis

RTAD refers to aortic dissection occurring at the proximal end of the TEVAR stent, as confirmed by CTA. Myocardial dysfunction refers to a condition indicated by transthoracic echocardiography showing a left ventricular ejection fraction of less than 50%. Dialysis is required when kidney function falls below a critical level, typically when the glomerular filtration rate (GFR) is less than 15 mL/min/1.73 m² or when serum creatinine levels are significantly elevated above normal values. Core temperature refers to rectal temperature.

Patients are followed up annually by telephone, focusing on symptoms and their corresponding management.

Continuous variables were described as mean \pm standard deviation (SD) or median (range), and categorical values as number (%). The Kaplan-Meier method was used to evaluate survival, and the "survival" package in R was used for plotting. Due to the limited number of cases in this study, descriptive statistics are mostly used rather than other statistical methods. This is an observational cohort retrospective study.

Operative Technique

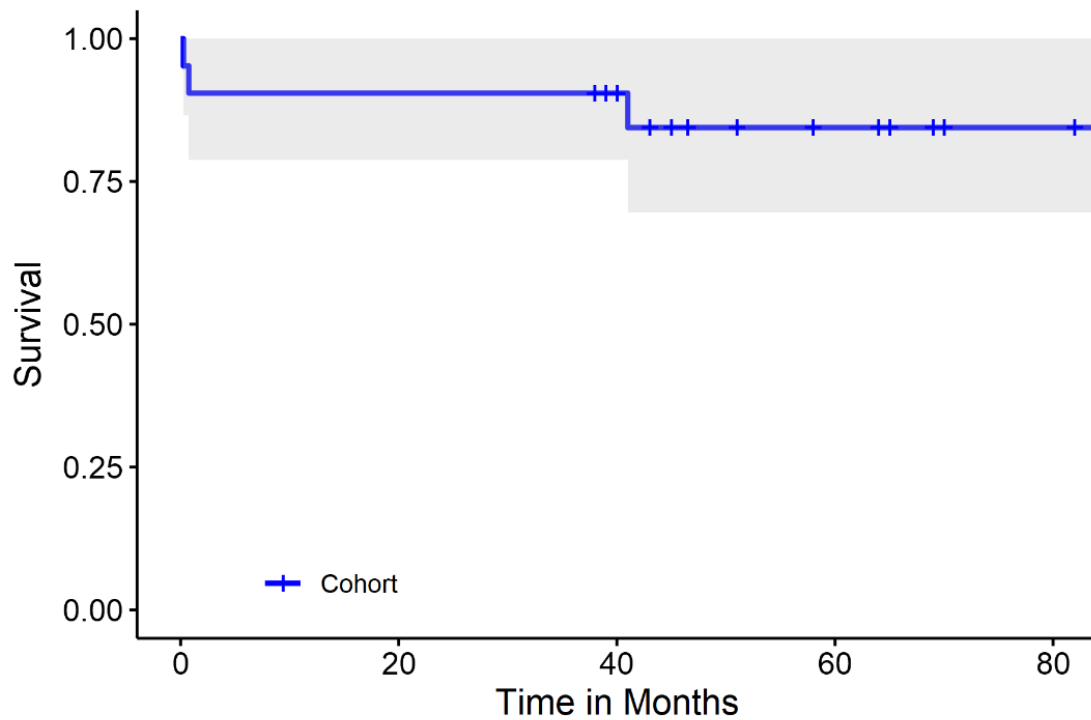
The surgery was reported previously [3]. Specially, during the exploration of the arch, the proximal anchoring area of the TEVAR stent was appropriately trimmed (Fig. 1A). In some patients where the stent was positioned too close to the proximal end (Fig. 1B), a section of the covered stent was judiciously excised (Fig. 1C). The aortic arch was then trimmed to the proximal end of the left common carotid artery opening, and a frozen elephant trunk stent was implanted distally (Fig. 2A). The diameter of the elephant trunk stent was selected based on the diameter of the distal artery and the TEVAR stent. Four-branch artificial blood vessels (TERUMO or MAQUET) were utilized to reconstruct the arch (Fig. 2B). After completion of the distal anastomosis between the four branch vessels and the autologous aorta, one branch vessel was selected for arterial perfusion to restore distal circulation. After the distal stumps of the left subclavian artery, left carotid artery, and innominate artery were anastomosed to branch vessels, the rewarming process was commenced. The extracorporeal circulation pipeline was gradually weaned, and the operation was concluded (Fig. 2C). Table 3 provides information related to the surgery.

FIGURE:

*KM curve for ONLY 21 patients is totally misleading from a methodological point of view!

Response: Thank you for your suggestions. We have annotated the KM (Kaplan-Meier) curve, and the results should be interpreted with caution. The details can be seen in lines 339.

Changes



Number at risk

Cohort	21	19	16	7	3
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Reviewer B

I have completed my review of the manuscript titled "The Safety and Prognostic Evaluation of Subsequent Aortic Surgery after TEVAR: A Retrospective Cohort Study." The study provides valuable insights into the safety and outcomes of aortic surgery post-TEVAR, highlighting a commendable 5-year survival rate of 85.7%. The focus on meticulous perioperative management is well-placed and underscores the importance of careful patient selection and follow-up.

However, I recommend addressing the following points for improvement and clarification:

1. Indications for Open Aortic Surgery: Previous literature indicates that proximal type I endoleak is the most common indication for open aortic surgery after TEVAR (1). However, in this report, RTAD emerges as the primary cause. It is crucial to explore the reasons behind this discrepancy. Is it due to alternative interventions like additional TEVAR, or is the prevalence of proximal type I endoleak inherently low? Understanding the factors contributing to this difference would enrich the discussion.

Response: Thank you. As a referral hospital, patients come to our hospital mainly

because of RTAD. This does not reflect the proportion of reasons for open surgery after TEVAR.

2. Consideration of Alternative Techniques: While the manuscript discusses TEVAR stent grafts, previous studies suggest that, apart from actively removing devices in cases of infection, stent graft preservation may be possible by utilizing fenestrated endovascular techniques and employing proximal branched grafts (1). Including a discussion on the technical aspects of this approach would be beneficial.

Response: Thank you. RTAD for redo-TEVAR is very risky because of the lack of sufficient anchorage area. Methods such as fenestration are also very at risk, as ascending aortas are often involved.

3. Clarity on Subsequent Surgery Indications: Clear criteria for secondary interventions

Response: Thank you. RTAD per se is considered the indication for open surgery. Other indications were not involved in the study.

4. Addition of Relevant References: Incorporating references to key studies, such as those by Roselli et al.(1), discussing open aortic surgery after TEVAR would strengthen the literature review.

1) Roselli EE, Abdel-Halim M, Johnston DR, et al. Open aortic repair after prior thoracic endovascular aortic repair. *Ann Thorac Surg.* 2014;97(3):750-756. doi:10.1016/j.athoracsur.2013.10.033

Response: Thanks for your suggestion, we will adopt your suggestion in the manuscript. The details can be seen in line 318-319.

In conclusion, the manuscript is a valuable contribution to the field, but it requires further refinement to fully realize its potential. Addressing the aforementioned concerns will strengthen the paper and better serve the journal's readership.

Reviewer C

Thanks for giving me the opportunity. The following is my comment.

- How many patients did receive TEVAR at authors' institution and how many patients did get TEVAR at OSH? In other words, how many TEVAR patients treated at authors institute did require open aortic repair? I would suggest Methods part is supposed to include "Among 21 patients, XX patients received TEVAR at OSH. During this period, our center performed N=XX TEVARs, of these XX patients underwent open repair" This needs to be mentioned in Methods rather than in Limitation part.

- Core temperature is bladder or upper body temperature? Needs to be clarified.

Response: Thank you. Core temperature refers to rectal temperature.

- Any debranch was performed at the time of TEVAR, for example left carotid to left

subclavian bypass?

Response: We performed open surgery for all the RTAD patients.

- Interestingly, 90.5% of patients were emergent setting (within 14 days). According to the definition of STS Database, this is not emergent. Authors might have to change the description.

Response: Thank you. Sorry for the misunderstanding. We have changed “Emergency operation” to “Acute phase”. The details can be seen in lines 145-146.

Changes : Among all admitted patients, 19 individuals (90.5%) received treatment during the acute phase (within 14 days).

- I cannot find indication of open aortic surgery in Table which is paramount in this kind of report. I guess RTAD is not the only indication. For example, if you see significant type 1a endoleak after Zone 2 TEVAR with aneurysmal dilatation, that is another important indication for open repair.

Response: Thank you for your suggestions. We have responded to Reviewer #1 for this point. As a referral hospital, patients come to our hospital mainly because of RTAD. This does not reflect the proportion of reasons for open surgery after TEVAR. All the patients in this cohort was operated on for AD.

- In addition, it would be interesting how many patients had bird beaking or type Ia endoleak prior to open aortic repair. This would be informative to avoid urgent type of operation if patients already had these kind of signs in follow-up CTA following TEVAR

Response: Thank you for your suggestions. Unfortunately, we do not have the information, as this is largely an open surgery based study.

- Do authors have to place FET inside TEVAR graft? Prior TEVAR graft works as ET in my experience as well as based on other reports.

Response: As you mentioned, prior TEVAR graft can work as ET. However, these 21 patients all had AD (Aortic Dissection), and we had to remove the proximal end of the TEVAR stent (“Crowns”) to create a suitable suturing area for anastomosing the distal end of the artificial blood vessel.

- Reconstruction of left SCA can be challenging in this condition. Did authors use any anti-anatomical bypass such as ascending to left axillary artery?

Response: Thank you. We did not encounter such problem in this study.

- Have authors ever experienced any problem of cross-clamping the aorta in case of Zone 0 or 1 TEVAR?

Response: An open anastomosis was performed under circulatory arrest. In other words, cross-clamping was not applicable in this study.

- Since most indications were dissections, it would be great to mention about distal

aorta during follow-up.

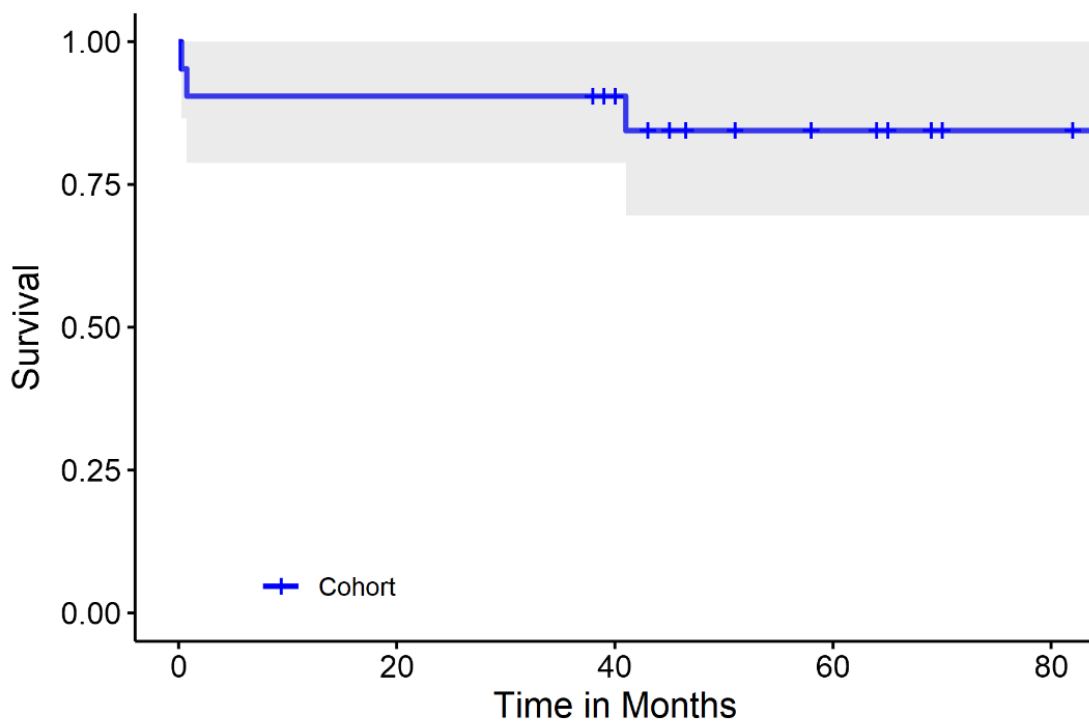
Response: Thank you for your suggestions. In most patients, there were no significant lesions in the distal aorta, or thrombi formed could be seen in the false lumen. Only one patient had aneurysmal dilation distally. For more details, please see lines 45-46.

Details is as follow: Preoperative comorbidities included hypertension in 15 individuals, abdominal aortic aneurysm in one patient, and coronary heart disease in two patients.

- Figure 2 needs the number of patients at risk.

Response: Thank you. I guess you mean the Kaplan-Meier curve in Figure 3. We have revised the KM curve. The details can be seen in lines 339.

Changes



Number at risk

Cohort	21	19	16	7	3
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Reviewer D

1. Lack of Specific Key Points: The summary lacks specific key points and main conclusions of the study, making it challenging to discern crucial findings or specific effects of the TEVAR followed by aortic surgery.

Response: This article mainly evaluates the safety and effectiveness of surgical intervention for patients with recurrent aortic dissection after TEVAR. It concludes that undergoing aortic surgery after TEVAR is safe and reliable.

2. Absence of Background and Purpose: The background and purpose sections are concise, with insufficient detail on the specific reasons for evaluating the safety and prognosis of aortic surgery following TEVAR. The fundamental motivation behind the study is not adequately conveyed.

Response: We have revised the relevant section. Thank you.

3. Insufficient Details on Proposed Treatment Approach: The methods section lacks detailed information on the proposed treatment approach or surgical details, leaving a gap in understanding the specific surgical complications and survival rate assessment methods.

Response: We have described the specific surgical method in the text. Thank you. For more details, please see lines 121-134.

Changes: During the exploration of the arch, the proximal anchoring area of the TEVAR stent was appropriately trimmed (Fig. 1A). In some patients where the stent was positioned too close to the proximal end (Fig. 1B), a section of the covered stent was judiciously excised (Fig. 1C). The aortic arch was then trimmed to the proximal end of the left common carotid artery opening, and a frozen elephant trunk stent was implanted distally (Fig. 2A). The diameter of the elephant trunk stent was selected based on the diameter of the distal artery and the TEVAR stent. Four-branch artificial blood vessels (TERUMO or MAQUET) were utilized to reconstruct the arch (Fig. 2B). After completion of the distal anastomosis between the four branch vessels and the autologous aorta, one branch vessel was selected for arterial perfusion to restore distal circulation. After the distal stumps of the left subclavian artery, left carotid artery, and innominate artery were anastomosed to branch vessels, the rewarming process was commenced. The extracorporeal circulation pipeline was gradually weaned, and the operation was concluded (Fig. 2C). Table 3 provides information related to the surgery.