Author's response to reviews

Title: Hemodynamic behavior of stentless aortic valves in long term follow-up

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Author's response to reviews: see over
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Dear editorial Team, Dear Reviewers,

Thank you very much for consideration of the manuscript “Hemodynamic behavior of stentless aortic valves in long term follow-up” for publication in the Journal of Cardiothoracic Surgery and the excellent advices and recommendations to improve the manuscript. Hereafter I will give a point-by-point response to the concerns of the 2 reviewers and the implementation of changes in the manuscript.

Reviewer 1:
1. Only 54 of 64 identified patients were examined. Is it possible to raise this number?
The examined patients were operated in the 1990s after German reunification. In this time an extensive movement of population occurred. Therefore some patients moved away and were not willing to come to Berlin for an echocardiographic follow-up.

2. Why was the effective orifice area stated and not the indexed effective orifice area?
The effective orifice area was stated because the literature references, which were used for comparison in the manuscript, used it. The indexed effective orifice area can also be stated, but is not necessary in this context.

3. Were there any hemodynamic differences between the different bioprostheses?
No statistical relevant differences were found. Therefore no separate analysis or figures of the different types of prostheses has been done in this manuscript.

4. The stated survival includes the hospital mortality (seen in Figure 1). Hospital mortality and long-term survival are influenced differently. Therefore, I would recommend using the long term survival (without hospital mortality). Figure 1 and a sentence in the results section was adjusted according to your recommendation.

5. The examined patients at 15 and 16 years are very low. This should be mentioned in the text.
A sentence regarding this matter was inserted in the limitations section of the manuscript.

6. Patients included in the study are sometimes referred to as under 60 and sometimes #60 years. Please clarify.
Patients were aged 60 or younger. The manuscript was revised to clarify this.
Reviewer 2:

- **In this time 188 young patients were operate with a stentless aortic valve replacement. This data were published from the same group in the same journal. With this fact only from 28.7% of their patients we have a follow up.** The long term follow-up of the whole cohort (n=188) was already published previously with a completeness of follow-up of 90.4%. Due to death and reoperation the number of patients with the original implanted valve still in place decreased in the 7-16 years of follow up to 64. Due to personal reasons 10 patients gave only telephone interviews and were not willing to come to an echocardiographic examination. The resulting data from echocardiography of 54 patients represents the surviving patients with the originally implanted valve still in place. This data is in the manuscript analyzed and discussed with the already published data about the whole study population.

- **Data need to be given in more detail, including more detailed patient data and echocardiographic data.** Patient data was already published previously and is not substance of this manuscript. More detailed echocardiographic data would not change the significance of the drawn conclusions nor lead to different results. Pressure gradients, effective orifice area, left ventricular mass and left ventricular function should be sufficient for comparison to other valves or study populations, especially those mentioned in the manuscript.

- **There were some patients with an increase in left ventricular mass index. Have these patients a higher transvalvular gradient or a poor health?** 7 patients had an increased left ventricular mass. 6 of them showed an increase between 6 and 13%, mean pressure gradients were not elevated (3 - 14 mmHg). 3 patients were NYHA I (LVEF 60-70%), 2 patients were NYHA II (LVEF 60%) and 1 patients was NYHA class III (LVEF 25%). One patient in NYHA I showed a 35% increase of left ventricular mass, a mean pressure gradient of 14 mmHg and a LVEF of 60%. However, statistical outliers exist and the low number of these patients makes no conclusions possible. Therefore we decided not to further discuss this topic in the manuscript.

- **The authors described a left ventricular mass reduction from 21.8%. In which time was this reduction?** The reduction of 21.8% is an average of all examined patients 7-16 years after operation. Due to no further reduction of left ventricular mass in the examination interval (7-16 years) after operation one can assume a completed left ventricular remodeling before the examination interval. In the results section a clarification of this point is inserted.

- **The echocardiographic data in figure 1 shows only individual data and not the data from 54 patients.** Probably there is a mix-up of the figures. Figure 1 shows the survival of the study population in Kaplan-Meier analysis. Figure 4 shows the development of left ventricular mass: 1: in each patient (one line represents one patient) and 2: for the whole examined patients in the box plots before the implantation and at the time of examination.
• **Effective orifice area was described without the data from this individual stentless aortic valve replacement and without the numbers of this patients at the difference time interval.**
A breakdown in the different types of stentless valves is, due to the low number of respective patients, of no value and complicates the comprehensibility of the figure. Additionally, are all implanted prostheses first generation porcine stentless valves with only minor dissimilarities and no hemodynamic differences are expected.

• **In survival function and freedom from reoperation there are 188 patients in the analysis not 54 patients.**
Survival function and freedom from reoperation are given for the whole study population. The 54 examined patients are the representatives for the survivors with the implanted valves still in place at their particular time after implantation of the prosthetic valve. For the 54 examined patients the survival function and freedom from reoperation function would be 100%, respectively.

• **These results from the rate of mortality and reoperation in these young patients cohort must be explain from the authors.**
Mortality and morbidity was already published previously and are not primary substance of this manuscript.

Once again thank you very much for the very helpful recommendations. I hope all your concerns have been addressed.

Yours faithfully,

Torsten Christ