**Peer Review File**

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**Reviewer A**

Comment 1: There is a fundamental problem with the evaluation method. The evaluation of PR is crucial in this paper; however, the number of cases in which MRI was performed is small. In many patients, only qualitative echocardiography was evaluated, and the criteria for the echocardiography evaluation are not presented in the paper.
Reply 1: Cardiac MRI was performed only over 8 years old in our center, so the sample size was small. We have modified our text as advised(line112-114) added references 2.

**Reviewer B**

1. General comments
The authors conducted a retrospective study to evaluate the durability and effectiveness of the single-valved bovine pericardium patch (BalMonocTM) for reconstructing the right ventricular outlet tract (RVOTR). The study included RVOTRs performed between November 2010 and August 2020 for 88 patients. Among them, 83 patients were followed up for long-term survival rates, reintervention-free rate, and pulmonary stenosis/regurgitation. The authors concluded that RVOTR with BalMonocTM resulted in satisfactory outcomes in preserving right ventricle function.
I agree with the authors that further investigation is needed to explore the durability and growth potential of pulmonary valve diameter after RVOTR with a single-valved patch, and that the single-valved patch is a useful material for preventing pulmonary regurgitation. This report provides novelty in terms of the material itself. However, I have several concerns about this report.

2. Specific comments
Major:
Firstly, the product information about BalMonocTM is limited. Many surgeons have concerns about using bovine material due to potential calcification. Although the authors mention the anti-calcification treatment for this product, postoperative calcification has not been investigated. Therefore, the lack of product information and evaluation of the postoperative material's status undermines the product's credibility. Secondly, I recommend toning down the statement that "Both REV and the modified Barbero-Marcial procedure can bring growth potential and reduce the reoperation rate." Although growth of the pulmonary valve diameter

was confirmed during the follow-up period, most of the patients consisted of simple RVOTR patients. The growth of the pulmonary valve diameter should be examined based on the type of surgeries.

Reply first: The product information about BalMonocTM is introduced in line243-249. Almost none of the children underwent re-operation, and the calcification of the single valve could not be evaluated visually. Echocardiography indicated that the valve was still active, which indirectly reflected the absence or light calcification of the valve.

Reply second: Both REV and the modified Barbero-Marcial procedure changed the complicated RVOTR into simple RVOTR. It does have growth potential.

Minor:

1. The baseline characteristics of the patients, including preoperative evaluation, should be summarized in a table, as well as the postoperative evaluation.

Reply:we have added table 2.

2. Lines 89-92 should be included in the results section.

Reply: we have modified our text as advised (see line 159-161)"

3. In line 135, vBBP should be changed to svBBp.

Reply: we have modified our text as advised.

4. In lines 145-147, this is a single-group study, and no log-rank test was performed.

Reply: we have modified our text as advised.

5. In line 157, please replace "pulmonary atresia/ventricular septum integrity" with "pulmonary atresia/intact ventricular septum." This form is more common.

Reply: we have modified our text as advised.

Since RVOTR with single-valved patch is not an infrequent procedure, this report should more focus on the information and risk assessment of the product.

Reply: we have modified our text as advised.

**Reviewer C**

This is a retrospective anlysis of patients undergoing RVOT reconstruction using BalMonoc svBPP (mocuspid valve , single-valved bovine pericardium).

It certainly would be of use to the readers, but with at least, some comments.

First of all, congatulations for your work.

Over the years, surgical techniques to treat pulmonary valve disease have improved, but long-term valve durability remains unsatisfactory, leading to a growing number of patients needing pulmonary valve replacement, conduit replacement, and reinterventions. These replacements

pose fundamental limitations resulting in valve stenosis, regurgitation, infection, and compromised durability. Ultimately, all current valve options lead to reintervention, with rates varying by valve type, and with children having a greater risk of early reintervention than adults.

1-The surgical method was well described
Reply: Because it is a single valve with fixed specifications, the surgical method is relatively simple, and satisfactory results can be achieved as long as the precautions in the article are selected.
2-In your work you described significantly reduced pulmonary regurgitation and protected right heart function, that is so important for the post-operative period. It might be useful to have a table with patient characteristics (Age, weight, type of CHD,...) and post-operative variables (PICU stay, hospital stay, complications (such chylothorax, renal failure, arrythmias, etc..., ECHO findings at discharge ). In my opinion this is the main advantage of this approach, to control RV failure in the postoperative state.
Reply:we have added table 2.
2. RVOT reconstruction has been successfully done by creating monocusp, valves in the past. Monocusp valves have been constructed with bovine or autologous pericardium, allograft pulmonary valve cusp, and PTFE membranes.

You can discuss about monocusp valve advantages (simplicity, reproducibility, lower cost, and rarely have associated stenosis) and disadvantages (early failure when the monocusp fails to close and allograft monocusp valves are more expensive and challenging to optimally fit into the RVOT...); also why not a Nonbiologic monocusp PTFE to avoid the biodegenerative process...

3- You comment that this approach significantly reduced the reoperative rate, 1, 5, and 10 years of 98.8%. This is better than other reported monocuspid RVOT reconstruction series (Brown J.W., Ruzmetov M., Vijay P., et. al.: Right ventricular outflow tract reconstruction with a polytetrafluoroethylene monocusp valve: a twelve- year experience. J Thorac Cardiovasc Surg 2007; 133: pp. 1336-1343.) 192 patients at a median age of 3.3 years undergoing monocusp valve RVOT reconstruction with PTFE. Freedom from pulmonary insufficiency greater than moderate was only 86% at 1 year, 68% at 5 years, and 48% at 10 years. Kaplan-Meier freedom from reoperation was 96%, 89%, and 82% at 1, 5, and 10 years, respectively. Despite leaving native annular tissue for growth, considerable failures occur with PTFE monocusp in less than 5 years. Do you think your results with svBPP are better and why (what are the advantages)?
Reply: The reasons for this good result are: 1. The placement of the single valve; 2. The precise dredge of the right ventricular outflow tract; 3. The right ventricular incision does not extend beyond the infundibular part of the right ventricular outflow tract

4. You comment that it had growth potential, but in those cases you performed MRI, you see that the single valve have no growth potential.... "With the growth of pulmonary arteries, incomplete closure will inevitably worsen in the long term. Fortunately, by such time, the patients would have become adults or close to adulthood, and valve replacement may be performed to avoid a second thoracotomy." So, beyond the immediate postoperative period and that rarely have associated stenosis, what are the advantages compared to other monocusp, bicuspid, and tricuspid valves, or other RVOT reconstruction techniques strategies, at mid and long term...?
Reply: The medium - and long-term advantage of the pulmonary artery is that it is growable and less prone to stenosis than the valved duct reconstruction RVOT

5. In those patients you performed MRI (n=19), the median time for the MRI is 7 years and the median pulmonary regurgitation is 23.5% (24% mean); and in the last follow up only 22/82 (26%) had moderate to severe PR, this is not congruent, probably more than 25% of patients had moderate to sever PR. You have to explain this, and probably also the RV volume and function, did not offer
many differences regarding the evolution in the medium-long term, compared to other techniques, or at least it is not a great advance.., you have to explain or clarify this.
Reply: The reasons for this difference are as follows: 1. Children who underwent cardiac MRI were followed for a longer period of time, which would theoretically increase the chance of valve regurgitation. 2. The evaluation of pulmonary valve regurgitation by echocardiography is more subjective and less accurate than cardiac magnetic resonance.

**Reviewer D**

First, the title needs to indicate the short- and long-term outcomes of BalMonoc TM svBPP in RVOT reconstruction.
Reply: we have modified our text as advised.

Second, the abstract needs some revisions. The background did not have comments on the knowledge gaps on the short- and long-term outcomes of BalMonoc TM svBPP in RVOT reconstruction and what the clinical significance of this study is. The methods need to describe the follow up procedures, and the measurements of short- and long-term outcomes. In the results, please first briefly summarize the clinical characteristics of the study sample. There were still some died cases, so the authors need comments on how to improve the short- and long-term outcomes of BalMonoc TM svBPP in RVOT reconstruction in the conclusion.
Reply: we have modified our text as advised.

Third, in the introduction of the main text, the authors did not explain the clinical needs for the

data on the short- and long-term outcomes of BalMonoc TM svBPP in RVOT reconstruction, what has been known on this research focus, and what limitations of prior studies are.
Reply：Thank you for your comments. The stenosis of the valved duct is serious, the reoperation rate is high, other single valve materials are prone to calcification, the suture of PTEF materials is difficult, and the matching degree is poor.

Fourth, in the methodology of the main text, the authors need to clearly describe the clinical research design of this study, i.e., a retrospective cohort study, the sample size estimation, inclusion criteria for the subjects, details of follow up, assessment of baseline clinical factors, and measurements of short- and long-term outcomes. The authors need to report the study strictly according to the STROBE guideline. In statistics, please explain why the authors did not analyze prognostic factors.
Reply：Thank you for your comments. This paper is only a single-method retrospective clinical study, and no cohort study has been conducted, which will be our next work direction.In our center, 3 methods including BalMonocTM svBPP, manual sewing of autologous pericardium, and manual sewing of Gore polymers have been applied for RVOT reconstruction in 88, 126, and 22 patients, respectively. Therefore, our current study on BalMonocTM svBPP was limited by its small sample size (n=88) and relatively short follow-up period. Our future studies will be based on the analyses of multi-center data and the comparisons of different materials.

The prognostic factors were 1, selection of single valve and suturing technique 2, anti-calcification treatment of single valve, which were described in the article.

**Reviewer E**

1. Please check your Running title. It's confusing.

21 Huang et al. Running title: An ideal material, a perfect result

Reply：running title: BalMonocTM svBPP has good performance in RVOT reconstruction.

2. Your abstract is too long. The abstract should be 200-350 words, but you have 379. Please revise.
Reply: we have modified our text as advised

3. Please check the below two Keywords. You choose them as a Keyword but they cannot be found in the main text.

70 **Keywords:** Infants; single-valved bovine pericardium patch (svBPP); right
71 ventricular outflow tract (RVOT); long-term durability; risk factors

Reply: we have modified our text as advised.REV;Barbero-Marcial

4. Please unify the time span in your abstract and main text.

38 **Methods:** A retrospective analysis was performed on patients undergoing RVOT
39 reconstruction using BalMonoc™ svBPP from November 2010 to August 2020. A

98 A total of 88 patients undergoing RVOT reconstruction using svBPP between October
99 2010 and August 2020 were enrolled. Preoperative assessments including cardiac

Reply: we have modified our text as advised.

5. The below cited reference is wrong. Should it be reference 11?

281 reconstruction, thereby ensuring the growth potential of the pulmonary artery after
282 reconstruction and avoiding the high reoperation rate caused by the valved conduits
283 (10). However, REV is not feasible in all patients. For example, the usable pulmonary

Reply: we have modified our text as advised.

6. Tables 1-2:

1) Please check whether "Mean" should be "Mean" in Tables 1-2.

5 **Table 2** Right heart function on cardiac MRI in 19 cases

| Item | Range | Median | Mean |
|---|---|---|---|

2) Please check whether the full name of "RVEDV" is correct.

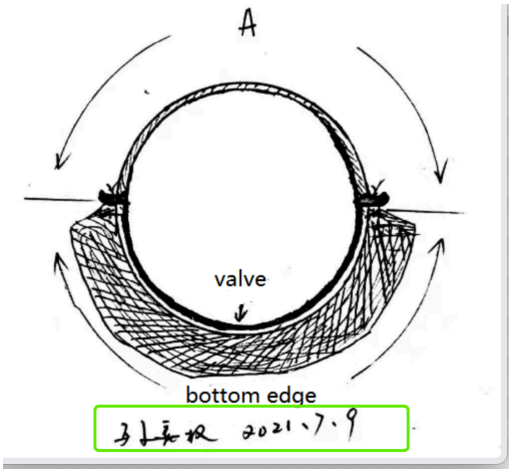
MRI, magnetic resonance imaging; RVEDV, right ventricular diastolic volume index.

Reply: we have modified our text as advised.

7. Figure 1:

1) Please confirm your Figure 1 is original, made by the authors, and not published.

2) Please remove the information below from Figure 1.




Reply: we have modified our text as advised.

8. Figure 2:

Please confirm your Figure 2 is original, made by the authors, and not published.

9. Figure 3:

1) Please confirm your Figure 3 is original, made by the authors, and not published.

2) Your Figure 3 legend below is grammar mistake. And please check below two "line1". One should be line2.

411 after after reconstruction with svBPP. (B) The lowest opening point of the free margin
412 of the single valve The installed height of the free margin of the single valve (line1) is
413 3–5 mm higher than the normal annulus (line1). The opening of the right pulmonary

Reply: we have modified our text as advised.

10. Figures 4-5:

1) Figures 4-5 are too vague. Please resubmit them in higher resolution.

2) Please check whether your Figures 4-5 are correct. It looks like they don't match with your main text below.

193 During the follow-up period, 1 patient died after a long period of time (accidental
194 death due to vaccination) and 1 patient underwent reoperation (reoperation due to
195 infective endocarditis 2 months after surgery). The 1-, 5-, and 10-year survival rates
196 were 98.8%, 98.8%, and 98.8%, respectively, and the reintervention-free rates for the
197 same time intervals were 98.8%, 98.8%, and 98.8%, respectively (Figures 4,5). The

Reply: we have modified our text as advised.

11. As for your STROBE checklist, please kindly check item 6a, 6b, 14c, and item 15. This should be a cohort study. Please re-fill these items.

Please fill corresponding information in line 1 of item 15 and fill N/A in line 2, 3.

Reply: we have modified our text as advised.