Reviewer’s report

Title: Improved Operative and Recovery Times with Mini-Thoracotomy Aortic Valve Replacement

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Reviewer: Kalman Benke

Reviewer’s report:

The authors compare the outcomes and perioperative aspects of minimally invasive aortic valve replacement (AVR) surgeries, namely right anterior mini-thoracotomy- and mini sternotomy AVR, to the conventional full sternotomy approach in their retrospective study. 503 adult patients who underwent surgical aortic valve replacement between January 2012 and December 2015 in a single center were involved.

As a result, they found the mini-thoracotomy approach the most favourable because of the following advantages compared to the other two techniques: significantly shorter aortic cross clamping and cardiopulmonary bypass time, significantly shorter ICU-, postoperative- and total hospital length of stay, significantly lower incidence of prolonged ventilator time, lower incidence of stroke, reoperation for bleeding, renal failure and atrial fibrillation. Minimally invasive techniques showed lower 30-day mortality rate than conventional sternotomy.

This study is of great clinical importance as minimally invasive approaches in cardiac surgery have been in the spotlight for many years, but their safety and advantage have been highly questioned due to their complexity. Data are needed to demonstrate if minimally invasive techniques have clear benefit for patients, therefore this research has great value.

In this article the aim is clearly identified and its significance is highlighted. The sample size is large enough to draw conclusions. The article is well written and structured making it easy to read and understand. Both tables provide information not mentioned in the text.

Limitations of this study and suggestions for further investigations are noted by the authors.

Questions:

What were the criteria for patient selection for mini-thoracotomy approach?

How did you decide between mini-thoracotomy and mini-sternotomy?

The STS score was lower in the mini-thoracotomy group than in the other two groups, meaning that they were lower risk patients. How much could this contribute to the better outcomes of this group? How could you take this into consideration when drawing conclusions?
When the general condition of a patient does not allow us to carry out conventional sternotomy, could mini-thoracotomy be an option?

Are you planning to compare the results of mini-thoracotomy in low risk patients to a high risk group and mini-thoracotomy to conventional sternotomy in high risk patients? It has been mentioned in the article that this approach is being expanded to include patients with higher risk.

What is the learning curve like for mini-thoracotomy?

Are you planning to follow these patients to investigate their medium-term survival (1-5 years)? So far only a few studies have reported it to be increased.

Do you have information on blood transfusion requirements among the three groups? Blood transfusion is considered to decrease medium-term survival.

Did you use any technologies like automated suturing that could have reduced operative time?

I would suggest this article for possible publication after minor revision as it has great potential to add important information to the current literature and can be part of the evidence needed to decide on the best surgical option for aortic valve replacement.

**Level of interest**

Please indicate how interesting you found the manuscript:

An article of importance in its field

**Quality of written English**

Please indicate the quality of language in the manuscript:

Acceptable

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