

Aortic Valve Replacement by Lower Median Mini-Sternotomy Versus Full Sternotomy a Ten-Year Monocentric Experience

Aunac S*, Catry A, Crispin V and P Van Ruysevelt

Department of Anesthesiology, Hopital de Jolimont, Belgium

***Corresponding Author:** Aunac S, Department of Anesthesiology, Hopital de Jolimont, Belgium.

Received: February 26, 2020; **Published:** May 25, 2020

Abstract

Although full sternotomy remains the standard approach for aortic valve replacement (AVR) many publications recently report mini sternotomy as new a way to treat severe aortic valve stenosis. Since lower median mini-sternotomy (LMMS) has not been yet described in the literature, we report here a monocentric retrospective study comparing full sternotomy (FS) with lower median sternotomy in a J-shaped for aortic AVR. The aim of the study is to see if the technique is safe and not inferior to the standard management of severe aortic stenosis. For this purpose, 79 LMMS have been recorded over a ten-year period and compared to 68 comparable despite not matched patients undergoing full sternotomy AVR. Statistical analysis showed longer coronary bypass duration, a trend to shorter ICU stay and no difference for other data. Of course, the absence of postoperative analgesia and the retrospective characteristic of the study represent some limitations. More prospective randomized study is needed to analyse the benefits of this new approach.

Keywords: *Lower Median Mini-Sternotomy (LMMS); Full Sternotomy (FS)*

Introduction

Although Aortic stenosis due to rheumatic fever has dramatically decreased in recent times, surgical aortic replacement remains one of the most frequent cardiac surgeries [1]. The first surgical aortic valve replacement with cardiopulmonary bypass (CBP) has been reported by Karken and colleague in 1960 [2]. Since then, the standard approach for treatment of severe aortic stenosis has been proven to be the median full sternotomy. Recent evolution in the management of severe aortic stenosis has led to the development of minimal approach of the valve in order to reduce the “invasiveness” of the surgical procedure, while maintaining the excellent efficacy, quality and safety of a the standard management [3].

Background

Several types of surgical incision have been described and developed during the last years [4]. And according to Brown., *et al.* [5] numerous studies have been published on the subject. This meta-analysis including 2054 aortic valve replacements (AVR) has shown that, despite longer cross clamp time there may be some reduction in pain, that the technique is both feasible and safe and that it may have advantages: shorter ICU stay, shorter ventilation time and cosmetic benefits. But the author concluded that true advantages must be further evaluated.

Despite several different incisions, there is currently no publication assessing the lower median mini-sternotomy extended in j-shaped AVR technique. This is why we have chosen to report this monocentric experience with a new approach.

Study

We review here a ten year retrospective of a monocentric experience of lower median J-shaped sternotomy for AVR. The aim of this report is to see if: it is a safe surgical technique for AVR, not inferior to the traditional approach, and if there is an advantage in terms of the immediate outcome.

For this purpose, we recorded through medical charts all patients receiving this surgical approach for AVR between 2007 and 2017. All patients for whom arterial cannulation was femoral or having combined procedure were excluded. The group of patients thus obtained were compared with a similar, although not matched group of patient undergoing standard AVR.

Result and Statistical Analysis

79 patients in Lower sternotomy group have been compared with 68 undergoing AVR through full sternotomy. Statistical analysis has been conducted as follow: chi-square test for categorical data (group comparison, postoperative complication...), and Mann-Whitney U-test for the continuous data analysis (Euro score, Age...).

Although not matched, the 2 groups were statistically similar for age, gender, size and comorbidities.

The preoperative data showed a statistical difference for CBP as seen in the literature (mean time 92 min versus 84 min $p = 0,001$) and no difference for Aortic cross clamp duration (mean time 69 versus 63 minutes $p = 0,028$). Conversion rate to full sternotomy was here to 3% like described in the literature [5].

The postoperative data showed no statistical difference: hospital stay, revision for bleeding, overall mortality, pneumonitis and a trend for shorter ICU stay ($p = 0.034$).

Conclusion

In this monocentric evaluation, the new AVR approach by low median J-shaped mini-sternotomy appears to be safe and not inferior to the other approach described in the literature. Despite towards a shorter ICU stay, we did not demonstrate immediate outcome advantage with the technique. But our sample size may have limited the statistical power of the study.

This study has some limitations. First the retrospective characteristic limits the statistical meaning. Second the fact that the two groups, although statistically comparable were not matched. And last, the patients for whom mini sternotomy has been converted to full sternotomy have not been considered as full sternotomy.

Due to lack of computerized chart, we were unable analyse the postoperative pain data which is a limitation of the study.

We believe that there is a need for more prospective studies to analyse the possible benefits of mini sternotomy for AVR and if it is possible to apply fast track recovery for this surgery.

Bibliography

1. Carabello BA and Paulus WJ. "Aortic stenosis". *Lancet* 373.9667 (2009): 956-966.
2. Harken DE., et al. "Aortic Valve Replacement With a cage Ball Valve". *American Journal of Cardiology* 9 (1962): 292-299.
3. Cosgrove DM., et al. "Minimally invasive Valve Operations". *Annals of Thoracic Surgery* 65.6 (1998): 1535-1538.

4. Mattia Glauber, *et al.* "Minimally invasive aortic valve surgery: state of the art and future directions". *Annals of Cardiothoracic Surgery* 4.1 (2015): 26-32.
5. Brown ML, *et al.* "Mini sternotomy Versus Conventional Sternotomy for Aortic Valve Replacement: A Systematic Revue and Meta-analysis". *Journal of Thoracic and Cardiovascular Surgery* 137.3 (2009): 670-679.

Volume 6 Issue 6 June 2020

© All rights reserved by Aunac S., *et al.*