

Peer review file

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Reviewer A

Comment 1: Please rewrite the manuscript by a more experienced English writer.

Reply 1: Thank you very much for the revision. Manuscript was revised and English was improved.

Comment 2: Separate the results section from methods section. Results in the current form is rather superficial.

Reply 2: “Results” section was separated by “statistical analysis” section as requested

Comment 3: Please place the results (complications/mortality) of the current study in perspective of literature. What is reported in literature for repeat sternotomy and for minimally invasive access?

Reply 3: at the end of “results” few lines were added to correlate our findings to current literature
Changes in the text: lines 195-196, page 10;

Comment 4: Present the current paper in perspective of the whole palette of redo surgery (EABO + VF + clamp). In the current study, only patients with prior AVR or MVP/R are presented. Patients with prior CABG are excluded. Please include the excluded patients.

Reply 4: Patients of “EABO group” and “ventricular fibrillation group” were added as requested. Patients with prior CABG were included.

Changes in the text: lines 148-150 page 7-8

Comment 5: Major limitation is the sample size of the current study, please mention in the limitation section.

Reply 5: this limitation was mentioned in the section “limitations”

Changes in the text: “limitation” section was added. Page 12, lines 256-259. Other limitations are mentioned in the section “conclusions”

Comment 6: Please write a limitation section and describe if there are more limitations of the current study other than sample size. Even though the mortality and stroke rate are good in the current study, the best studies are those which are able to describe their limitations and not only presenting perfect results.

Reply 6: other limitations are mentioned in the “conclusions”

Comment 7: If the authors include the other patients (VF and EABO) in the cohort, sample size would be more adequate, but still small.

Reply 7: Patients undergoing mitral surgery with VF and EABO were added in the cohort. The limitation of sample size was mentioned.

Comment 8: Please discuss what this study adds to literature. In the current form and current size, there is no news. Perhaps describe the differences in outcome of VF vs EABO vs clamp?

Reply 8: In the section “results” were added difference in complications rate and outcome between the three groups of patient (EAC, EABO and VF)

Comment 9: Perhaps an idea to propensity match the current cohort with patients who undergo primary surgery with clamp and compare the results? Perhaps with adequate patient selection, there

is no increased risk by the redo status. This could be an interesting message of this paper: redo status does not increase risk in minimally invasive surgery.

Reply 9: A propensity match analysis was performed comparing patients undergoing redo surgery with elective patients undergoing first-time mitral valve surgery via mini-thoracotomy.

Changes in the text: lines 151-158, page 8.

Comment 10: Please describe the learning curve and mention this in the discussion. How is it possible to achieve zero mortality and zero stroke rate?

Reply 10: learning curve was mentioned. Stroke rate was adjourned in the section results.

Changes in the text: lines 244-246, page 12; lines 177-181 page 9

Point-by-point feedback

Comment 1: Page 1 line 24/25: "Minimally invasive cardiac surgery has become routine, and performing that in could significantly reduce the surgical risk". Please rephrase this sentence.

Perhaps: "Minimally invasive cardiac surgery has become routine, and could significantly reduce the surgical risk in redo surgery.

Reply 1: done

Changes in the text: page 2, lines 21-22

Comment 2: Page 2 line 58- 61: why were these patients excluded for analysis? The current results provide clear results of external clamping. However, would be very interesting to compare the different techniques: EABO vs VF vs clamp, especially in patients with prior CABG. What was the mortality/morbidity in the patients excluded?

Reply 2: After data recovery, the patients undergoing EABO and VF were included.

Comment 3: Page 3 line 66-71: Please consider MVARC definitions for major complications.

Reply 3: For the definition of complications were introduced MVARC criterions.

Changes in the text: page 2, lines 38-40

Comment 4: Page 3 line 71/72: median follow up was 12.5 months. Can the authors describe the results? Was this echocardiographic follow up, or mortality? Please elaborate more on the endpoints of follow up.

Reply 4: primary and secondary endpoints were modified and elaborated as requested.

Changes in the text: line 71-75, page 4

Comment 5: Page 3 line 89/90: Please rephrase sentence: "sometimes was required pleural adhesions rupture using electrocautery". Incorrect grammar.

Reply 5: grammar was corrected

Comment 6: Page 3 line 92-95: Please describe the decision making regarding adhesiolysis. when was decided to free the adhesions, and when was decided to perform VF or EABO? Was this decision made pre-operatively? Again, would be interesting to present the results of EABO and VF.

Reply 6: the decision was taken intraoperatively. If was not possible to isolate the aorta at least anteriorly and posteriorly to place the clamp, EABO was preferred. When EABO was not applicable, for example in presence of proximal graft in ascending aorta, VF was selected as the last solution.

Changes in the text: see text highlighted page 5-6, lines 103-106

Comment 7: Page 4 line 97: Please use 'adhesions' instead of 'adherences'

Reply 7: done

Changes in the text: see text highlighted

Comment 8: Page 4 line 106-108: Mitral valve repair in preoperative setting can be very difficult. A good replacement is better than a poor repair. Can the authors elaborate on the indication for surgery? Please describe whether previous mitral valve repair failed due to regurgitation or stenosis. Same for mitral valve prosthesis. Why was it necessary to re-replace a mechanical valve?

Paravalvular leakage? Endocarditis?

Reply 8: Indications and common scenarios were mentioned at the top of “surgical technique” paragraph

Changes in the text: page 4-5, lines 79-84

Comment 9: Page 4 line 117: Please separate 'statistical analysis' and 'results'. Statistical analysis should be in the methods section and 'results' should be a section on itself.

Reply 9: the two sections were separated as requested

Comment 10: Page 5 line 136: Did you found a bleeding focus?

Reply 10: It was not a particular bleeding focus. Hemostasis was optimized.

Comment 11: Page 5 line 137: I would like to congratulate the authors with the very good results of zero mortality. Can the authors please elaborate more on how they achieved zero mortality in this high risk patient cohort? Please discuss this in the discussion section and place this in perspective of literature.

Reply 11: the discussion section was improved with references to literature.

Comment 12: Page 5 line 147/148: lateral access is beneficial compared to repeat sternotomy since there is no necessity to free adhesions from prior surgery and there is low risk in injuring patent grafts. In the current study however, adhesions are freed to place a a clamp for aortic occlusion. As mentioned before, how did the authors select patients who are suitable and who are not? How far did they go in adhesiolysis? Were these patients then operated with VF or EABO? Please comment.

Reply 12: In the section “surgical technique” it was discussed about patient selection to candidate to aortic direct cross-clamping or EABO or VF. Generally, patients just operated via median sternotomy do not have so heavy pleural adhesions to contraindicate the lateral minithoracotomy access.

Comment 13: Page 5 line 158: AOBO, you mean EABO?

Reply 13: there was a grammatical mistake: we mean EABO.

Changes in the text: page 5, line 103

Comment 14: Page 6 line 161-163: This is a very important issue. In redo surgery, there is no one size fits all and choice of technique and access should be tailored to the patients characteristics. As current technique represents the results of trans thoracic clamping, the results are biased due to patient selection. Please elaborate on the patient selection protocol for the current technique.

Reply 14: Patient selection protocol was better explained and patients who underwent VF or EABO were added to the cohort as required.

Comment 15: Page 6: line 169-171: please mention reported stroke rate in literature and please explain why the authors have zero stroke rate. Was this due planning and choice of access for cardiopulmonary bypass? Was this due to patient selection or small sample size?

Reply 15: we added a mention about stroke rate in literature in the “discussion” section. As explained in the manuscript our low stroke rate depends on good planning of procedure and choice of site of arterial perfusion. Furthermore, the small sample size can influence this low rate.

Comment 16: Page 6 line 174-176: How can the incidence of complications be overestimated due to small studies and long observation periods? There are studies available with moderate number of patients (e.g. Leipzig) and even a meta-analysis. Second, what do the authors mean by long observation period? You mean small number of patients included in a long time period (e.g. 80 patients in 15 years?)

Reply 16: We wanted to mean that a small sample size can distort the perception of the real incidence of an event, for example the post-operative stroke. However we changed the sentence in a new one more generic.

Comment 17: Page 7: Reference 4 and 9 are duplicates.

Reply 17: duplicated references were removed

Comment 18: Page 11, table 1: how can EuroSCORE be that high if mean age is 66 and most patients had good LV? What was the incidence of endocarditis?

Reply 18: Euroscore II was re-calculated and results were adjusted on the basis of new patients elaborated.

Comment 19: page 11, table 1: How many patients had pre operative atrial fibrillation? did the authors consider MAZE?

Reply 19: we excluded patient undergone to maze for the complexity of the procedure. In principle in our institution maze procedure is reserved to a small number of patients in which atrial fibrillation has a heavy impact on the symptoms with poor results with medical therapy.

Comment 20: Page 11, table 2: can the authors elaborate more about the stroke rate? What was the minor stroke rate? (transient, resolved < 24 h)

Reply 20: transient ischemic attack resolved in <24h was not considered and collected as data.

Comment 21: Page 11, table 2: can the authors elaborate more about the zero pacemaker rate?

Especially in patients with prior AVR, it is expected that there is some increased risk in pacemaker implantation or conduction disorders.

Reply 21: Reconsidering patients of EABO group and VF group the pace-maker implantation rate was increased. Our findings are more or less aligned with literature.

Comment 22: Page 11, table 3: What was the rate of low cardiac output syndrome? Any patients requiring ECMO or longstanding inotropic support?

Reply 22: No patients in the group object of study suffered for prolonged low cardiac output requiring massive inotropic support or ECMO.

Reviewer B

Comment 1: First of all, what is the hypothesis of this study? It is expected that the authors examine the way to simplify the treatment of redo mitral valve surgery, but there is no hypothesis that reminds us of such an examination. Also, the purpose is not clear. The conclusion states that redo mitral valve surgery via right mini-thoracotomy can minimize postoperative complications. However, they did not compare their results with those with other approach. The authors should

also clarify what they wanted to show in this study by describing the appropriate purpose of the study.

Reply 1: thank you very much for the revision. Patients cohort was increased according with reviewer A, including patient with EABO and VF. The title of the paper could be misleading and for this it was changed.

Comment 2: This study simply states that their operative results were good, and their result alone does not mean that this minimally invasive approach is as safe as conventional approach. Also, it is not clear what is the way to simplify the difficult things.

Reply 2: The title was changed. It was introduced a comparison of results with a group of mitral valve patients “non redo” in a propensity match.

Comment 3: From the patients who underwent redo mitral valve surgery via right mini-thoracotomy, the authors only selected the patients who had direct aortic cross-clamping. However, the reason is unknown. It is necessary to clarify why they chose those patients.

Reply 3: patient with EABO and VF were added to the cohort as requested also by the reviewer A.

Comment 4: It might be better to examine the patients with endo-aortic balloon occlusion and ventricular fibrillation as well as the patients who underwent external aortic cross clamping in order to show the usefulness of this approach, which would give more useful information to the reader.

Reply 4: patient with EABO and VF were added to the cohort as requested also by the reviewer A.

Comment 5: Overall, it is important to clarify the hypothesis and purpose to which the examination method corresponds, and the conclusions should be based on the results which are obtained from the examination method.

Reply 5: conclusion section was modified in according with comments.