Title: Bipolar radiofrequency ablation is useful for treating atrial fibrillation combined with heart valve diseases

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Author's response to reviews:

Dear editor,

We are resubmitting the Manuscript ID 1829593983929550 entitled “Bipolar radiofrequency ablation is useful for treating atrial fibrillation combined with heart valve diseases” to “BMC surgery”. Our responses to the comments by the reviewers are outlined below. Please also see the revised manuscript for details.

For easily reading, we use the TRACK function of MICROSOFT WORD. Please simply select “Accept changes” to get rid of the TRACK markers if you do not like the tracks.

Editorial comments:

- Please ensure that your Authors Contributions and Competing Interests sections are formatted in accordance with our formatting guidelines (http://www.biomedcentral.com/bmccomplementalternmed/authors/instructions/researcharticle#formatting-competing) and are correctly located at the end of your manuscript. Please also ensure that they have the correct headings.

Response: As suggested, we have carefully checked the Authors' contributions and Competing interests sections to ensure that they are formatted in accordance with the formatting guidelines, correctly located at the end of our manuscript and have the correct headings.

- We recommend that you ask a native English speaking colleague to help you copyedit the paper. If this is not possible, you may need to use a professional language editing service. For authors who wish to have the language in their manuscript edited by a native-English speaker with scientific expertise, BioMed Central recommends Edanz (www.edanzediting.com/bmc1). BioMed Central has negotiated a 10% discount to the fee charged to BioMed Central authors by
Response: As suggested, we have asked a native English speaker to help us copyedit our manuscript and improve the English writing of our revised manuscript.

Reviewer #1 comments
Reviewer’s report
Title: Bipolar radiofrequency ablation is useful for treating atrial fibrillation combined with heart valve diseases
Version: 2 Date: 27 September 2013
Reviewer: Myura Nagendran

Reviewer’s report:

- 1] Overall, it is hard to follow many parts of the study report due to grammatical errors. While the study utilises a large cohort of patients, it is purely observational (as opposed to controlled) in nature and consequently does not add much more to the existing literature on safety and efficacy of bipolar RF ablation for treatment of AF during concomitant cardiac surgery.

Response: As suggested, we have corrected the grammatical errors in the revised manuscript. We have also asked a native English speaker to help us copyedit our manuscript and improve the English writing of our revised manuscript.

This study is an observational cohort study aimed to investigate the safety and efficacy of bipolar radiofrequency ablation (BRFA) for treating AF combined with heart valve diseases. Our results were consistent with previous studies of BRFA and further confirmed the safety and efficacy of BRFA for treatment of AF during concomitant cardiac surgery. Interestingly, in this study, we found that the percentage of patients with early postoperative respiratory failure was 3.7%, which was relatively high. And, left ventricular rupture occurred in 2 old female patients with severe mitral stenosis combined with AF. Thus, we suppose that more attention should be paid to the complications of lung injury and left ventricular rupture during BRFA. In addition, based on our results, we recommend the urine catheter guided BRFA clamp technique when performing MVR concomitant BRFA. Compared with the bipolar forceps, dissociative clamp has short operating handle and appropriate radian. Dissociative clamp of the appropriate size can be chosen according to the size of heart. It is of great flexibility and is easy to control. With dissociative clamp, the procedure is simplified and the surgical trauma and risk are reduced during separating the left and right pulmonary veins. Meanwhile, when the left atrial is significantly enlarged and pulmonary vein is widened, arm of bipolar radiofrequency forceps might be too short to fully cover pulmonary vein. Traction the urine catheter could support the bipolar radiofrequency clamp to completely cover the pulmonary vein. When catheter is removed, ablation pulmonary vein could be more
thorough.
We have also made corresponding changes in the revised manuscript. Please check the revised manuscript for details.

- 2] Abstract --> Must state that this is an observational cohort study in either the background or methods.
Response: As suggested, we have stated that this is an observational cohort study in the background of the Abstract section in the revised manuscript.

- 3] Abstract --> The results state that 322 patients were cured but that only 287 patients were in sinus rhythm. What is the definition of ‘cure’ in this regard? And at what time point is this? 12 month follow up? Both must be reported.
Response: As suggested, we have added the following information to the Abstract section of the revised manuscript.
Overall survival rate was 99.38% (322 cases) with sinus rhythm conversion rate of 89.13% (287 cases) at discharge. The sinus rhythm conversion rate was 87.54% and 87.01% at 6 and 12 months after operation. Sinus bradycardia occurred in 3.42% of patients at 6 months after operation and in 3.03% of patients at 12 months after operation.

- 4] Materials and methods --> In the general information section, should this say 136 males and 188 females instead so that it adds up to 324?
Response: Yes, there were 136 males and 188 females in this study. As suggested, we have corrected this mistake correspondingly in the revised manuscript. We have also carefully checked our revised manuscript to avoid such mistakes.

- 5] Materials and methods --> Is the definition of persistent AF lasting more than 7 days and were the ECGs performed at least 7 days apart to confirm this?
Response: Patients enrolled in this study had AF history for 1 year to 15 years. According to 2011 ACCF/AHA/HRS and 2013 EACTS Guidelines [10-11], they all had long-persistent AF. Preoperatively they were confirmed of persistent AF by 12 lead electrocardiogram (ECG) examination and 24 hour holter ECG monitoring.
The above mentioned information has been added into the Materials and Methods section of the revised manuscript.

Reference:

- 6] Materials and methods --> Under the methods sub-heading, last paragraph, it states that all patients had a pacemaker. What group does this refer to? The abstract states that only 213 patients received temporary pacemakers.
Response: Since the occurrence rate of sinus bradycardia is higher at early postoperative, all patients (324 cases) received prophylactic temporary pacemaker implantation in this study. However, the temporary pacemaker was used only when the heart rate was less than 70 beat/minute in the ICU. Thus only 213 patients used the implanted temporary pacemakers. No patient had a permanent pacemaker.
We have made corresponding changes in the Abstract section, the Materials and Methods section and the Results section of the revised manuscript.

- 7] Tables --> I cannot make comment on these as they were not present in the manuscript file (only one supplementary table present in the appendix file). This has clearly made it harder to interpret and review the results.
Response: We have included the four tables (Table 1 to Table 4) in a separate file.

- 8] Results --> There is repetition with the methods section on the number of patients undergoing various valvular procedures. This should be in one section or the other and I would favour placement in the results section.
Response: As suggested, we have placed the number of patients undergoing various valvular procedures in the Results section of the revised manuscript.

- 9] Results --> The confusion re: pacemakers is again present here: "All patients had implanted pacemaker. Because of the slow heart rhythm in the ICU, 213 patients received temporary pacemaker (65.74%)." This needs to be clarified.
Response: Since the occurrence rate of sinus bradycardia is higher at early postoperative, all patients (324 cases) received prophylactic temporary pacemaker implantation in this study. However, the temporary pacemaker was used only when the heart rate was less than 70 beat/minute in the ICU. Thus only 213 patients used the implanted temporary pacemakers. No patient had a permanent pacemaker.
We have made corresponding changes in the Abstract section, the Materials and Methods section and the Results section of the revised manuscript.

- 10] Results --> See point 3 in abstract re: cure definition
Response: As suggested, we have revised the Results section and added the following information to the Results section of the revised manuscript.
Overall survival rate was 99.38% with SR conversion rate of 89.13% at discharge. The SR conversion rate was 87.54% and 87.01% at 6 and 12 months of follow-up. Sinus bradycardia, with heart beat ranging from 50-58 beat/minute, occurred in 3.42% of patients at 6 months after operation and in 3.03% of
patients at 12 months after operation. They had no chief complaint, and therefore there were no permanent pacemaker implantation.

- 11) Results --> I can see that the long term sinus rhythm conversion rates are reported in the discussion but they should be stated in the “postoperative follow up” section of the results.
Response: As suggested, we have stated the results of sinus rhythm conversion rates in the Results section of the revised manuscript. Please check the revised manuscript for details.

- 12) Discussion --> There is no mention of study limitations, this must be included.
Response: As suggested, we have included the study limitations in the Discussion section of the revised manuscript. Please check the revised manuscript for details.

- 13) Discussion --> There is very little discussion on the comparison of these results with the existing literature. This must be expanded upon.
Response: As suggested, we have discussed and compared our results with findings from the existing literature in the Discussion section of the revised manuscript. Please check the revised manuscript for details.

Reviewer's report
Title: Bipolar radiofrequency ablation is useful for treating atrial fibrillation combined with heart valve diseases
Version: 2 Date: 18 December 2013
Reviewer: Spencer J Melby
Reviewer's report:

This is a report made of a series of patients who underwent valve surgery and some portion of the Cox-Maze procedure. Although it is a very large series with good reported outcomes, there are several points which should be revised and or fixed prior to publication.

Compulsory

1 The authors did not report the lesion sets. This is critical to the success of any Maze procedure.
Response: As suggested, we have stated the lesion sets in the Materials and Methods section of the revised manuscript. Please check the revised manuscript for details.

2 Did not quote current literature, specifically on outcomes with MV replacement with Maze (old citations made, there are leading surgeons who have done excellent work in this field and reported their outcomes which are not referenced)
Response: As suggested, we have quoted several current literatures in the Discussion section of the revised manuscript. Please see the revised manuscript
for details.

3 Did not define the type of afib in patients according to current standards (e.g. AHA definitions).

Response: As suggested, we have added the following information into the Materials and Methods section of the revised manuscript.

According to 2011 ACCF/AHA/HRS and 2013 EACTS Guidelines [10-11], they all had long-persistent AF.

Reference:

4 Did not report outcomes based on known definitions of success by AHA/ACC

Response: As suggested, we have reported our outcomes based on known definitions, cited related references and discussed the effects of BRFA in the revised manuscript. Please check the revised manuscript for details.

5 Did not reference articles detailing the efficacy of bipolar radiofrequency ablation (although in the text they discuss this, the references used are not pertinent to what is discussed)

Response: As suggested, we have cited related references and discussed the efficacy of BRFA in detail in the revised manuscript. Please check the revised manuscript for details.

6 Poor English throughout which makes several parts difficult or impossible to understand. Some statements are obviously wrong.

Response: We have asked a native English speaker with scientific expertise to revise our manuscript and improve the English writing of the revised manuscript according to the reviewer’s comment.

Minor essential revisions:

1. Many of these are related to the poor English and poor translation.

Response: According to the reviewer’s comment, we have asked a native English speaker with scientific expertise to revise our manuscript and improve the English writing of the revised manuscript.

2 What is LV wall fracture III? “There were 2 cases of posterior wall fracture of the left ventricle with occurrence rate of 0.62%. One appeared 8 hours after
transferred to ICU, the other appeared after the machine shut down, and the two patients were all recovered.” Later another statement is confusing. What is posterior wall fracture? Is this atrioventricular dehiscence? What “machine shut down”? there should not be any surgery on the left ventricle unless debridement from the annular calcification of the valve caused an A-V dehiscence (usually fatal). This is difficult to understand.

Response: To be more clear, the sentences “There were 2 cases of posterior wall fracture of the left ventricle with occurrence rate of 0.62%. One appeared 8 hours after transferred to ICU, the other appeared after the machine shut down, and the two patients were all recovered.” in the Results section have been changed into “There were 2 cases of left ventricle rupture, with occurrence rate of 0.62%. One left ventricle rupture appeared 8 hours after transferred to ICU and the other left ventricle rupture appeared as soon as weaning off CPB. After treatment, they were both recovered.” in the revised manuscript.

We have also made corresponding changes in the Discussion section of the revised manuscript and carefully checked our revised manuscript to avoid such mistakes.

3 The authors state: “For those had operation before or with pericardial adhesions, severe bipolar ablation operation should not be performed.” Based on what information? This is an untrue statement, a relative contraindication, yet the authors state it twice.

Response: The correct sentence should read “For patients with heart rate less than 60 beat/min, LAd more than 85 mm, received operation before or with severe pericardial adhesions, concomitant BRFA were not performed”.

We have made corresponding changes in the Materials and Methods section of the revised manuscript.

4 Outcomes reported as “should”—we need to know what was done, not what should be done

Response: As suggested, we have corrected the word “should” in the revised manuscript. We have also carefully checked our revised manuscript to avoid such mistakes.

5 “All patients had implanted pacemaker” This is stated but confusing—did they have temporary or permanent, when, etc? It is also stated that no patients had a pacemaker.

Response: Since the occurrence rate of sinus bradycardia is higher at early postoperative, all patients (324 cases) received prophylactic temporary pacemaker implantation in this study. However, the temporary pacemaker was used only when the heart rate was less than 70 beat/minute in the ICU. Thus only 213 patients used the implanted temporary pacemakers. No patient had a permanent pacemaker.

We have made corresponding changes in the Abstract section, the Materials and Methods section and the Results section of the revised manuscript.
In this study, surgical isolation of the pulmonary veins was 20 to 35 minutes until the completion of ablation—this is likely wrong, as the ablations usually take seconds not minutes.

Response: The correct sentence should read “For performing the procedure of maze ablation, extra 10 to 15 minutes was required for cross-clamp and extra 20 to 35 minutes for bypass. Our results were consistent with previous findings. Von Oppell et al reported that an average of 30 minutes extra was required both for bypass and cross-clamp when performing the procedure of maze ablation [4].”

We have made corresponding changes in the Discussion section of the revised manuscript.

Reference:

7 Reporting this complication is nonsensical: “and left atrial pressure is very high after thoracotomy and up to 26 mmHg, which indicated intact function of valve in vitro blood ring exploration butdied in the operation because of the difficult of shutting down machine.”

Response: As suggested, we have deleted this nonsensical complication from the revised manuscript.

8 This statement is hard to understand, I don’t know what is being state In addition, in the process of separating the left and right pulmonary veins by bipolar radiofrequency clamps, the fore-arm and the post-arm may interfere with each other. Therefore, the ordinary catheterization tube-guided bipolar radiofrequency clamp technique (Figure 1 and Figure 2) was used.

Response: To be more clear, we have extensively revised the statement about the dissociative clamp in the Discussion section of the revised manuscript. Please check the following and the revised manuscript for details.

We recommend the urine catheter guided BRFA clamp technique when performing MVR concomitant BRFA. Compared with the bipolar forceps, dissociative clamp has short operating handle and appropriate radian. Dissociative clamp of the appropriate size can be chosen according to the size of heart. It is of great flexibility and is easy to control. With dissociative clamp, the procedure is simplified and the surgical trauma and risk are reduced during separating the left and right pulmonary veins. Meanwhile, when the left atrial is significantly enlarged and pulmonary vein is widened, arm of bipolar radiofrequency forceps might be too shorter to fully cover pulmonary vein. Traction the urine catheter could support the bipolar radiofrequency clamp to completely cover the pulmonary vein. When catheter is removed, ablation pulmonary vein could be more thorough.