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Response to Reviewers

20th of June 2016

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Point-to-point response to the reviewer:

We would like to thank the reviewers for their constructive criticism and comments. We have addressed their concerns on a point-by-point basis below.

Reviewer #1:

Very interesting paper, regarding the anatomical cross-section study of the aortic root in an effort to receive valuable information for the planning and performance of TAVR. I recommend the acceptance of the paper in our esteemed journal.

No comments

Answer:

Thank you very much for the very positive feedback.

Reviewer #2:

The authors are congratulated with their meticulous work on the use of rotational C-arm 3D heart model for prediction of an optimal C-arm configuration to be used before and during the procedure of transcatheter aortic valve replacement.

No comments:

Answer:

Thank you very much for the encouraging feedback.

Reviewer #3:

This is a well-written manuscript about the accuracy of a model to predict the optimal C-arm configuration during TAVR. This work should be considered a pilot study to prepare prospective studies with more standardized protocols and a more powerful sample size looking to possible clinical benefits. The fact that the model cannot be done for more than 10 % of patients is a weakness of the study. Did you compare the amount of contrast used for the rotational C-arm CT based 3D heart model with the total amount of contrast used for the many small aortography at the time of TAVR? For rapid pacing, you needed to install a temporary pacemaker wire. Did you experience complications related to the presence of that wire? Is the model can be done at the time of the TAVR to prevent the installation of temporary pacemaker wire at the moment of the pre-procedural catheterization? Is MSCT will not be necessary if the model is accurate or will be always necessary? Minor comments. Write the reference, not only the number (Examples references 8 or 19). Review the word widespread (in one word).

Answer:

Thank you very much for your encouraging feedback. This study was meant to be a proof-of-concept-attempt for further prospective studies with more standardized protocols and a more powerful sample size.

You are absolutely right: The fact that the model cannot be done for more than 10 % of patients is a weakness of the study. In around 10% image quality was too bad for a valid evaluation, especially for a proof-of-concept study and the associated learning curve.

RCT was only performed as part of the pre-implant diagnostic coronary angiography study,

so we did not compare the amount of contrast used for the rotational C-arm CT based 3D heart model with the total amount of contrast used during TAVR because this would compare 2 different procedures.

We did not have problems with the temporary pacemaker wire, because the system is able to ignore the pacemaker wire. We more experienced a negative impact of the pigtail catheter concerning the resulting somehow changing aortic valve morphology and orientation.

In the future, the model can possible also be done at the time of TAVR but is actual more meant to be a MSCT-like pre-procedural work-up to accurately plan TAVR, the line of perpendicularity and the appropriate sample size. This has to be proven in following studies.

For the moment we are in a very early stage to give a prognosis concerning the MSCT as ongoing gold-standard. Actually MSCT has still its indisputable advantages in the visualisation of calcium amounts. This means a great challenge for the further development of RCT.