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Science Editor, *World Journal of Cardiology*

Dear Editor,

### **TAVI Operators – get involved in imaging!**

We thank you and your reviewers for your interest in the above-mentioned manuscript. The comments helped us to revise and improve the manuscript which we would like to re-submit for publication. All changes to the manuscript have been high-lighted.

#### **Response to Comments by Reviewer #1:**

**Thank you for submitting this work. The authors present an interesting viewpoint and argue why TAVI operators should get involved in imaging and learn how to perform 3-D reconstructions. The authors recommend to review their patients' MSCT immediately before the procedure. I have some comments: 1. Ideally, all information derived from MSCT is already available at the Heart Team meeting. What is the authors' opinion of the role of the Heart Team? Do the authors mean that the imaging data and heart team decision is checked by the operator just before the procedure?**

Thank you for your interesting comment. The role of the multidisciplinary *HeartTeam* is crucial to select those patients who will benefit most from a percutaneous therapy. In particular, evaluation of associated comorbidities that may limit the life expectancy or the recovery after the procedure is important. Some teams may just decide on treatment modality and suitability for TAVI. Other *HeartTeams* may perform multiplanar reconstructions at the time of the heart team meeting already. However, the TAVI operator performing the procedure will always be responsible for the patient and make the final decision. Therefore, we recommend to review the MSCT images immediately before the procedure to recapture the anatomy in detail and improve procedural planning.

- We added the following reference to the manuscript (see also answer to comment by reviewer 6):

Delgado V, Kapadia S, Schalij MJ, et al. Transcatheter aortic valve implantation: implications of multimodality imaging in patient selection, procedural guidance, and outcomes. *Heart* 2012;98:743-754.

We added a new section:

“[The important role of multislice computed tomography.](#)”

In addition, we made the following changes:

- Some of the key elements contributing to these impressive results are pre-procedural patient evaluation by the multidisciplinary HeartTeam, and pre-procedural imaging(3,4).

- Potential TAVI candidates are discussed by the interdisciplinary *HeartTeam* consisting of non- invasive cardiologist, interventional cardiologists and cardiac surgeon to define the best treatment option for the individual patient. Evaluation of associated comorbidities that may limit the life expectancy or the recovery after the procedure is of particular importance. Results from pre-procedural invasive angiogram, echocardiogram and MSCT are reviewed for each patient during this meeting. We would like to encourage all TAVI operators to review their patients MSCT again immediately before the procedure.

**2. The authors claim that "many TAVI operators rely on reports by the radiologist". Although they might be correct, ideally this statement should be supported by a literature reference.**

We agree and added the following references.

Marwan M, Achenbach S. Role of cardiac ct before transcatheter aortic valve implantation (tavi). Current cardiology reports 2016;18(2):21.

Leipsic J, Gurvitch R, Labounty TM et al. Multidetector computed tomography in transcatheter aortic valve implantation. JACC Cardiovascular imaging 2011;4(4):416-429.

Cocchia, R, D'Andrea A, Conte M, et al. Patient selection for transcatheter aortic valve replacement : A combined clinical and multimodality imaging approach. World J Cardiol;9(3):212-229.

Manuscript change:

- Most of the TAVI operators rely on such reports or on numbers and measurements reported by the radiologist (8-10).

### **Response to Comments by Reviewer #2:**

**Short letter. Nothing new.**

We agree that this is a short letter but it highlights the important value of being involved in pre-procedural imaging as TAVI operator to improve patient outcome. Our recommendation that TAVI operators (interventional cardiologists and cardiac surgeons) should get involved in cardiac imaging is not common practice yet. There are not many interventional cardiologists who know how to perform a multiplanar reconstruction. We strongly believe that a specialized training in cardiac imaging will be implemented in the training program of structural operators in the future.

### **Response to Comments by Reviewer #3:**

**The authors wrote a letter to the editor regarding their opinion on the MSCT for TAVI. In general, the letter was well written. I would like to suggest to accept the letter at the current stage.**

We would like to thank this reviewer for his/ her interest in our manuscript.

**Response to Comments by Reviewer #4:**

**The authors present here a good summary on TAVI procedure. However, the authors reported that " TAVI operators rely on reports by the radiologist", I cannot fully agree this opinion.**

Thank you very much for your comment. Of course our statement “TAVI operators rely on reports by the radiologist” is strong and we agree that it does not reflect the situation for all TAVI operators. However, from my experience working as a TAVI proctor in different centers across Europe, I have seen that many TAVI operators rely solely on reports by the radiologist and most are not able to perform a multiplanar reconstruction.

We made the following change in the manuscript:

- Most of the TAVI operators rely on such reports or on numbers and measurements reported by the radiologist.

**Response to Comments by Reviewer #5:**

**Comment #1: please describe how the relationship between an Imaging specialist (Radiologist/non-invasive Cardiology Imaging Specialist) and Interventional Cardiologist/Surgeon ideally should be organized. What is the role for each specialist and how does communication and collaboration improve outcome? In other words, do the authors agree that a dedicated imaging specialist adds to the TAVR team or is such a specialist unnecessary?**

We fully agree that a dedicated imaging specialist is a key member of the Heart Team. We believe that communication and collaboration with all specialists of the Heart Team might help to improve outcome of our patient.

We made the following change in the manuscript to clarify that a dedicated imaging specialist is an important member of the Heart Team:

- Potential TAVI candidates are discussed by the interdisciplinary *HeartTeam* consisting of non- invasive cardiologists specialized in cardiac imaging, interventional cardiologists and cardiac surgeon to define the best treatment option for the individual patient.

**Response to Comments by Reviewer #6:**

**This is a guidance of pre-procedural planning of TAVI for TAVI operator. This manuscript should have more concise information by quoting other important literature. In addition, more demographic figures or tables that would help the understanding of appropriate TAVI planning should be added.**

Thank you for your comment and your interest in our manuscript. We added the following papers and quotes to the manuscript:

Delgado V, Kapadia S, Schlij MJ, et al. Transcatheter aortic valve implantation: implications of multimodality imaging in patient selection, procedural guidance, and outcomes. *Heart* 2012;98:743-754.

Maeno Y, Abramowitz Y, Kawamori H, et al., A highly predictive risk model for pacemaker implantation after TAVR. *JACC: Cardiovascular Imaging*, in press.

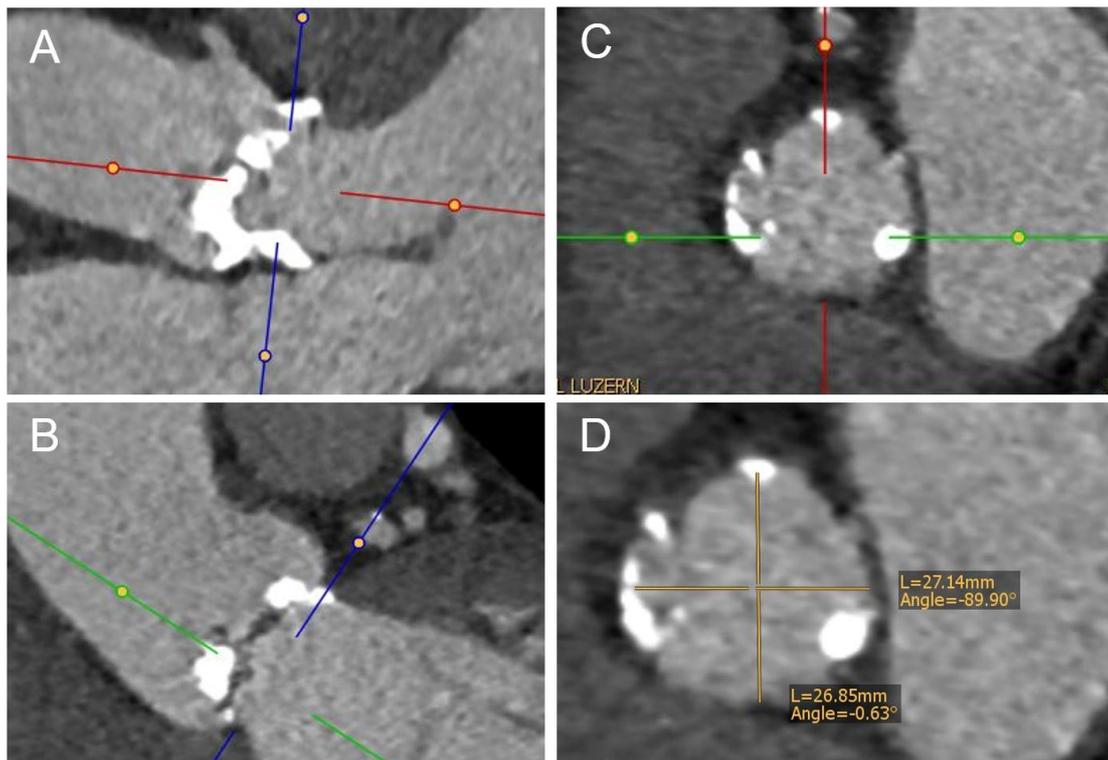
Jilaihawi H, Makkar RR, Kashif M, et al. A revised methodology for aortic-valvular complex calcium quantification for transcatheter aortic valve implantation. *Eur Heart J Cardiovasc Imaging* 2014;15:1324-1332.

Salgado RA, Leipsic JA, Shivalkar B, et al. Preprocedural CT evaluation of transcatheter aortic valve replacement: what the radiologist needs to know. *RadioGraphics* 2014;34:1491-1514.

We made the following manuscript changes:

- Some of the key elements contributing to these impressive results are pre-procedural patient evaluation by the multidisciplinary HeartTeam, and pre-procedural imaging(3,4).
- Extensive calcifications at the native aortic valve may increase the risk for paravalvular regurgitation or need for a permanent pacemaker.

In addition, we added a new Figure 1 showing an example of a multiplanar reconstruction of the annulus including measurements.



**Figure legend to Figure 1.** Example of a multiplanar reconstruction of the aortic annulus

A and B: Double-oblique MSCT images at the basal insertion of the calcified native cusps

C: Double-oblique reconstruction at the level of the aortic annulus. The aortic valve leaflets are just barely visible at the level of the ventriculoarterial junction.

D: Measurement of the short and long diameter at the level of the aortic annulus

#### **Response to Comments by Reviewer #7:**

**The authors presented succinctly recommendations highlighting the value of multislice computed tomography in pre-procedural planning for transcatheter aortic valve implantation. Minor error: Line 1 in the Abstract section: "of" should be deleted. Line 1 in the Core tip section: "of" should be deleted.**

We would like to thank this reviewer for his/ her interest in our manuscript. Errors are corrected in the manuscript.

We changed the manuscript as followed:

- Pre-procedural planning is the key element of transcatheter aortic valve implantation (TAVI).

Kind regards,

Stefan Toggweiler, MD