

Optimizing The Outcome Of Transcatheter Aortic Valve Implantation Using Patient-specific Computer Simulation In Grey Zone Aortic Valves

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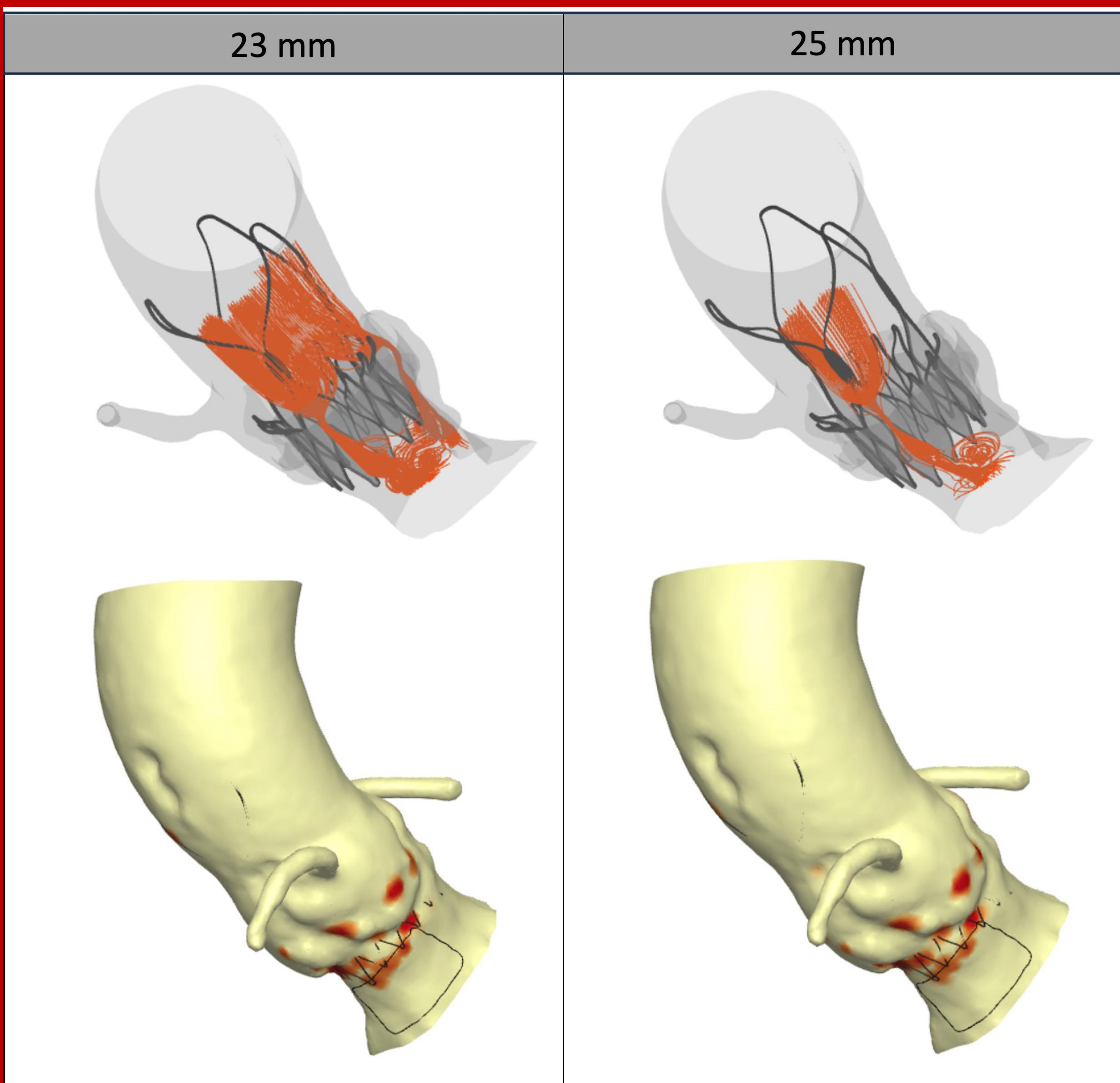
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Background

- Patient-specific computer simulation of transcatheter aortic valve implantation (TAVI) can predict the interaction between the TAVI device and the patient's unique anatomy.
- This enables a patient-specific assessment of the risk for paravalvular regurgitation (PVR) and conduction disorders in advance to the TAVI procedure.
- Patient-specific computer modeling as part of preprocedural planning may be especially of interest when the aortic annulus size falls within the “grey zone” between two TAVI sizes.
- The aim of this study was to evaluate the use of computer simulations in TAVI for grey zone aortic annulus measurements.

Methods

- Aortic annulus diameter within the upper quartile range of the corresponding transcatheter valve size was defined as the grey zone.
- In total, patient-specific computer simulations of the TAVI procedure were made for 13 patients with grey zone aortic annulus measurements as part of preprocedural planning.
- All patients were scheduled for TAVI with a self-expandable transcatheter valve.
- Predictive patient-specific simulations were performed for the device sizes adjacent to the grey zone and included prediction of PVR and conduction disturbances.



Results

- Based on the predicted outcome, upsizing was considered preferable in 62% (8/13) patients.
- Procedural aortography directly after valve deployment showed none/trace PVR in 12 patients (92%) and mild PVL in 1 patient (8%).
- Permanent pacemaker implantation was performed in two patients (14%), in whom final implantation depth was deeper than the target depth based on simulation.
- This low implant depth was in these two cases associated with a high predicted risk of conduction disorders.

Conclusions

- Patient-specific computer modelling can provide guidance during preprocedural decision-making in TAVI, especially in grey zone aortic annulus sizes for self-expandable transcatheter valves.

Disclosures

- None to declare.

