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Reply: Horizontal aorta in transcatheter aortic valve replacement – several open questions

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We appreciate the interest of Veulemans and colleagues[1] in our article "Impact of horizontal aorta on procedural and clinical outcomes in second-generation transcatheter aortic valve implantation"[2].

In their letter, three main remarks can be outlined, for which we provide the following comments.

1. The previously established threshold to define horizontal aorta (HA) for first-generation valves (aortic angulation [AA] ≥48°) as proposed by Abramowitz et al[3] should be adjusted to current prosthesis generations and even further to several device sizes.

We addressed this issue in the paper by assessing the association of the AA as a continuous variable and device success. As we found no association (area under the curve=0.478, AA in device success vs failure [mean±standard deviation]: 45.9±10.0° vs 46.9±10.1°, p=0.614), we adopted the previously validated cut-off for subgroup analysis, which is commonly used to define HA in clinical practice. Furthermore, no interaction of AA with device success according to valve size was found (valve size ≤27 mm, AA in device success vs failure: 45.8±9.6° vs 48.9±9.2°, p=0.064; valve size >27 mm, AA in device success vs failure: 46.2±10.8° vs 43.4±11.3°, p=0.128).

2. The handling and controllability of the 34 mm device (CoreValve® Evolut™ R [ER-34]; Medtronic, Minneapolis, MN, USA) are limited in anatomies with pronounced angulation of the aortic root. Concordantly, in the current study, the use of the ER-34 in HA anatomy was very low with only five cases (2.2%), which may be considered a result of a noteworthy pre-selection process related to unfavourable anatomic conditions.

In the study population the use of the ER-34 valve was low overall, with no significant difference between selected valve types according to HA status (among ER-34 and non-ER-34 valves the prevalence of HA was 27.8% vs 42.5%, respectively, p=0.158). Accordingly, this finding may not be clearly attributed to a pre-selection process, which, considering the numerical trend, cannot anyhow be excluded. Notwithstanding this, as Veulemans

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and colleagues note, the low number of ER-34 valves in our analysis warrants investigation in adequately powered studies, to assess the generalisability of our finding in this technically challenging subset.

3. As knowledge of risk factors for intraprocedural adverse events in HA could direct the best implantation strategy in self-expanding new-generation valves, were there any associations of valve size and calcification burden with adverse events in HA with self-expanding devices?

We performed the suggested insightful analysis; no difference in device success was observed in HA anatomy with self-expanding valves according to the presence of more than moderate aortic valve calcification (89.6% vs 87.0%, p=0.373) or to valve size (≤27 mm vs >27 mm: 86.4% vs 94.2%, p=0.101).

Conflict of interest statement

The authors have no conflicts of interest to declare.

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