

# Thoracic endovascular aortic repair in type A aortic dissection: inching toward an endovascular solution

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Reply to the Editor:

Yang and colleagues<sup>1</sup> are certainly right in corroborating our statements regarding some shortcomings of the current generation stent grafts. These shortcomings are particularly relevant for grafts used in the ascending aorta, the aortic segment typically not only moving in 3-dimensional space but also changing dimensions with every systole.

First, current stent-graft technology is certainly still far from mimicking those beat-to-beat changes, and stent grafts are rather rigid. Such noncompliant fabric is thus likely to transmit steep pulse waves in absence of the physiologic Windkessel effect, both to the arch region and to the descending aorta, thereby provoking increased afterload to left ventricular contraction<sup>2,3</sup> and possibly promoting heart failure in already failing hearts. This mechanism is well recognized and underlines current technologic limitations. Nevertheless, in some patients of advanced age, potentially with a host of comorbidities (disqualifying them for open surgery), the individual risk-benefit assessment may only allow a nonsurgical endovascular approach, considering the cumulative risk of thoracotomy, cardiopulmonary bypass, and cardiac arrest (regardless of the subsequent loss of Windkessel function). Moreover, surgical interposition grafts may have similar impact, because they also lead to loss of compliance and reduction of Windkessel and untempered pulse waves and thus probably to similar effects on left ventricular afterload and vascular-ventricular coupling, with some inherent risk of promoting heart failure.<sup>4</sup>

Secondly, we realize certainly that not all cases of ascending aortic dissection are anatomically suitable to be considered for an endovascular approach, but rather at best between 30% and 50%.<sup>5,6</sup> This is because of various limitations, including the involvement of coronaries or valve structures as we had clearly outlined, on the basis of electrocardiographically gated multidetector computed tomographic angiography as the current imaging standard.

Finally, our extremely careful selection of patients, as described in our article,<sup>7</sup> appears to be the most likely reason for the encouraging early survival of more than 90% of those patients with type A aortic dissection not considered candidates for classic open repair. A broader endovascular application clearly depends on technologic progress to produce better and more suitable materials in sync with the complex motion and characteristics of the ascending aorta, but there is little doubt that we are inching toward the aortic valve.

## Reference:

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