Commentary: Size still matters

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Disclosures: Author has nothing to disclose with regard to commercial support.

Received for publication Oct 4, 2018; accepted for publication Oct 4, 2018; available ahead of print Nov 17, 2018.

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J Thorac Cardiovasc Surg 2019;157:e319

0022-5223/\$36.00

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<https://doi.org/10.1016/j.jtcvs.2018.10.013>

Currently, aortic diameter (size) remains the primary indicator that determines intervention for thoracic aortic disease. Much of our knowledge is based on observational work reported nearly 3 decades ago.¹ As such, we recognize the limitations of using size as the sole determinant for intervention—as many patients who suffer acute aortic dissection present with aortic diameters less than that of the current threshold of 5.5 cm.²

In this issue of the *Journal*, Ueka and Tsuneyoshi³ use computational fluid dynamics (CFD) to analyze the wall shear stress (WSS) of the dissected aorta. In chronic type B aortic dissection, the authors provide various examples of high WSS as identified using CFD in the false lumen (Figure 2) as well as in the distal thoracic aorta beyond the stent graft (Figure 3). Importantly, they also present an example of reduced WSS with closure of the fenestration with the stent graft placement (Figure E4).

It must be recognized that the images are only a few examples of how current technology may be applied, but its clinical relevance is yet to be determined. CFD—as a potential modality for predicting late complications after acute aortic dissection—is intriguing but limited by the accuracy of the data entered and the fluctuating conditions not always accounted for by the modeling, as it assumes ideal conditions. The formation of an aneurysm and the initiation of acute aortic dissection occur as an imbalance between the biomaterial properties of the aortic wall and the biomechanical forces applied to the aortic wall. CFD may address the “biomechanical forces” portion of the equation but not the “biomaterials” part. The authors should be encouraged to

Aneurysm formation and the initiation of acute aortic dissection occurs as an imbalance between the biomaterial properties of the aortic wall and the biomechanical forces applied to the aortic wall.

Central Message

Although we recognize the limitations of using aortic diameter as the sole determinant for intervention in thoracic aortic disease, until we can better predict acute aortic syndromes before they occur, size still matters.

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continue this work, as it may expand our overall understanding of the pathobiology of acute aortic dissection. In the meantime—until we are better able to predict acute aortic syndromes before they occur—size still matters.

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