suit the new technology, we should examine if the thoughtful eye of an experienced aortic surgeon isn't already meeting the standard.

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ADULT

Commentary: Measure twice, cut once

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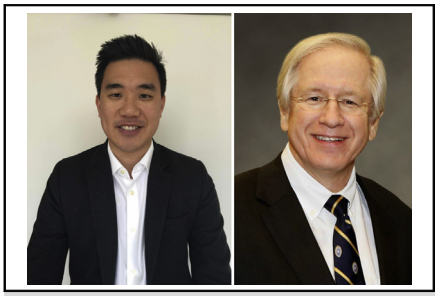

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CENTRAL MESSAGE

Intraoperative direct caliper measurements of the ascending aorta correlate well with preoperative CT and TTE measurements at a high-volume aortic institution.

The risk of aortic rupture and dissection is directly related to the diameter of the aorta according to Laplace's law. For more than 2 decades, the natural history studies from the Aortic Institute at Yale-New Haven Hospital have emphasized the increased incidence of aortic complications at larger aortic diameters.[1,2] Diameter-based aortic thresholds, based on radiographic findings, are a critical consideration for surgical decision-making and form the basis of the clinical practice guidelines for surgical repair.[3] For asymptomatic patients, the timing of operative repair is largely determined by preoperative imaging studies; modalities include echocardiography (transthoracic [TTE] and transesophageal), computed tomography (CT), and magnetic resonance imaging. However, the ascending aorta can be challenging to image due to motion, oblique course, and variability of measurement techniques, as recently described by Elefteriades and coauthors.[4]

In this current issue of the *Journal*, Vinholo and coauthors[5] from the Aortic Institute at Yale-New Haven Hospital compared intraoperative, direct caliper measurements to preoperative imaging studies, primarily CT and TTE measurements. In this study of 35 patients, preoperative measurements corresponded well with intraoperative measurements of the ascending aorta. Nuances of measurement included the exclusion of the aortic

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wall by CT angiography, the inclusion of the aortic wall via caliper, and partial exclusion of the aortic wall by leading-edge-to-leading-edge techniques of TTE. Despite inherent differences between preoperative and intraoperative measurements, such as how the aortic wall was captured, the authors found preoperative radiographic measurements to be well correlated with intraoperative measurement. Notably, because the natural history of aortic disease is tied to preoperative imaging studies, it is reassuring that these radiographic techniques approximate the true aortic diameter as obtained through direct intraoperative measurement. However, the use of intraoperative measurements has limited value in scheduling patients for repair. In dynamic scenarios in which the patient is on the table for other reasons (ie, valvular concerns or to address coronary artery disease) and aortic disease presents unexpectantly, the surgeon may gain confidence knowing that intraoperative, direct measurement by caliper is highly correlated to established diameter-based thresholds of repair.

Vinholo and coauthors provide a key contribution in empirically examining the assumption that preoperative imaging correlates well to the true dimensions of the ascending aorta. Even so, the aortic dimensions were measured at a high-volume aortic surgery institution with well-defined protocols in preoperative imaging and may not be generalizable to all institutions. Elefteriades and coauthors[4] recently described the various sources of discrepancy that occur within and between imaging modalities. Elsewhere, the transcatheter community has recently put forth an expert consensus on CT imaging in the context of transcatheter aortic valve replacement.[6] Similarly, aortic surgeons should work together with imaging specialists in standardizing how we measure the aorta, thereby strengthening the foundation upon which our surgical decision-making rests. In addition, literature describing aortic repair should aim to be more precise when we describe diameters and include the measurement technique. For the foreseeable future until we have better ways to assess the strength, thickness, and integrity of the aortic wall, measurements of the aortic diameter will continue to serve as the hinge point for repair.

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