Concomitant replacement of the ascending aorta is free—for some

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Prophylactic replacement of the ascending aorta is warranted when the risk of death from dissection or rupture exceeds the risk of surgical repair. Calculating these risks is an imperfect science, however, and risk estimates differ according to several patient, surgeon, and institutional variables. In their small, single-institution, single-surgeon study in the current issue of the *Journal*, Peterss and colleagues¹ from Yale have attempted to determine the added incremental risk of concomitant supracoronary ascending aorta replacement with aortic valve replacement (AVR; Wheat procedure²; Figure 1) relative to patients undergoing AVR alone. Patients were selected for concomitant ascending aorta replacement on the basis of a size threshold of 4.5 cm, and approximately 70% of patients had bicuspid aortic valves. Peterss and colleagues¹ then compared 2 techniques for ascending aorta replacement, either a clamped distal anastomosis or an open distal anastomosis (hemiarch) with femoral artery cannulation and straight circulatory

Wheat procedure: Replacement of the aortic valve and supracoronary ascending aorta.

Central Message

Concomitant ascending aorta replacement can be performed with trivial incremental risk in elective low-risk patients when operations are performed by a high-volume aortic subspecialist.

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arrest without adjunctive cerebral perfusion. By means of a propensity matching approach, Peterss and colleagues¹ found that there was essentially no added surgical morbidity or mortality with the addition of ascending aorta replacement to isolated AVR and that the perioperative mortality was 0% regardless of treatment group. These data suggest

FIGURE 1. Wheat procedure: Replacement of the aortic valve and supracoronary ascending aorta.

that the incremental risk of concomitant ascending aorta replacement with AVR is infinitesimally small, and thus the threshold for concomitant ascending aorta replacement should be infinitesimally low. Peterss and colleagues¹ concluded that concomitant ascending aorta replacement with or without an open distal anastomosis should be performed “without any hesitation” in patients with small aneurysms at experienced centers.

These results need to be interpreted in the context of the study limitations, of which there are several. First, all operations were performed by a single high-volume aortic surgeon at an experienced aortic center. It has become clear during the last decade that outcomes of thoracic aortic operations are heavily influenced by surgeon experience, and therefore the results reported here are likely not generalizable at the national level.³ Second, the patient population consisted primarily of patients with bicuspid valves who were at low risk, with predicted mortality scores lower than 1%. Caution should therefore be taken in extrapolating these data outside the young, elective, low-risk patient cohort. Finally, the study is small and woefully underpowered (<100 patients per treatment group) to detect the mortality differences it intends to identify. A back-of-the-envelope power calculation reveals that a study would require approximately 900 patients in each treatment arm to detect with 80% probability a mortality difference between 1% and 3%, which represent the approximate mortalities of elective AVR and elective ascending aorta replacement reported at the national level.⁴ Determining differences in freedom from late aortic events

is similarly impossible to document without a larger sample size, given that late aortic events occur after AVR in fewer than 1% of patients with bicuspid aortic valves.⁵ The study by Peterss and colleagues¹ is thus unable to provide meaningful comparative data between treatment arms and serves primarily to document the excellent surgical outcomes achieved at this center.

In short, this study from Peterss and colleagues¹ demonstrates that concomitant replacement of the ascending aorta at the time of AVR is free—at least for some surgeons, patients, and centers. These results should be extrapolated to other arenas of care with caution, however, and are insufficient to inform national recommendations for prophylactic ascending aorta replacement. A larger population-level data set is required to better define the risk of concomitant ascending aorta replacement at the time of AVR.

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