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Commentary: Surgical threshold for ascending aortic aneurysm: A moving target begging for randomized controlled data

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Despite improvements in surgical technique and perioperative care, ascending aorta surgery remains a complex operation associated with nontrivial risks of perioperative morbidity and mortality. Over the years, results have improved, and elective ascending aorta replacement has become a safer and more reproducible operation. In a recent analysis from the Society of Thoracic Surgeons database, including >22,000 patients who underwent isolated ascending aorta replacement, in-hospital mortality was 3.4%.¹ Conversely, surgery in the context of acute aortic dissection is a more complex operation, with mortality ranging between 10% and 25% in large series. In the latest International Registry of Acute Aortic Dissections report, in-hospital mortality after type A dissection surgery was 22%.^{2,3}

This stark difference in outcomes highlights the need to operate on patients with aortic aneurysm before dissection, or even worse, rupture. Presented with such data, most patients would choose prophylactic surgery instead of an emergency operation associated with a higher risk of mortality. However, aortic aneurysm being an indolent and silent disease, surgery aims to alter the course of the disease rather than to alleviate symptoms. Consequently,

The concept of “time until treatment equipoise”.

CENTRAL MESSAGE

Discrepancies exist within the surgical community regarding thresholds for prophylactic aortic aneurysm surgery. Data from the TITAN:SvS trial will provide much-needed answers regarding this issue.

because surgery does not help patients “feel better,” it is crucial to ensure that the procedure does not portend a higher risk of death than watchful waiting. In the short term, this is almost impossible to achieve. In fact, for a given patient, the risk of death on the day of an elective ascending aorta replacement almost certainly outweighs that of watchful waiting during that same day. However, over time, the hope is that this early risk will translate into long-term benefits and survival. Thus, following a concept known as “time until treatment equipoise,” there comes a point after surgery where the risk of the intervention is outweighed by the cumulative risk of conservative management (Figure 1).⁴

Guidelines are meant to provide guidance to surgeons and clinicians caring for patients with aortic aneurysms. In recent years, the indications for prophylactic surgery, which are based mainly on aneurysm size, have changed regularly.⁵⁻⁸ These changes reflect our understanding of the natural history of this disease and have come about thanks to dedicated clinicians’ invaluable research efforts. Nevertheless, most of the current data regarding prophylactic ascending aorta replacement comes from observational or retrospective studies.

In this issue of the *Journal*, Guo and colleagues⁹ present the results of a nationwide survey looking at the surgical threshold for ascending aortic aneurysm among 148 Canadian cardiac surgeons from 29 different cardiac centers. Although only 62% of Canadian cardiac surgeons

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FIGURE 1. The concept of “time until treatment equipoise.” The dashed blue line identifies the “time until treatment equipoise.” Following this point, the risk of the intervention is outweighed by the cumulative risk of conservative management.

responded to the survey, the authors were able to capture an institutional response rate of almost 90%. More than 20% of the respondents performed ≥ 50 aortic cases/year, indicating that the authors likely succeeded in surveying the surgeons performing the majority of aortic cases in Canada. The survey comprised 18 questions and included an initial clinical scenario that was varied subsequently (modifying factors including age, body surface area, and a familial history of aortic dissection) to create the entire questionnaire. The results are quite telling. Although the majority of surgeons opted to follow current guidelines, $>20\%$ of respondents would offer prophylactic surgery at lower thresholds than those currently recommended. Furthermore, almost 25% of surgeons interviewed estimated the risk of mortality associated with watchful waiting for an asymptomatic patient with a nonfamilial ascending aortic aneurysm of 5.3 cm and a tricuspid valve as $\geq 3\%$.

Taken together, these results highlight the discrepancies that exist within the surgical community regarding thresholds for prophylactic aortic aneurysm surgery. Although many surveys such as this may leave the reader wondering “so what?,” the Canadian Thoracic Aortic Collaborative should be commended for their leadership in the field of aortic surgery research. Following the results of this survey, the group has already planned for a randomized controlled trial comparing early surgery and watchful waiting for patients with an ascending aortic aneurysm between 5.0 and 5.4 cm (TITAN:SvS Trial; [ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT03536312) identifier NCT03536312). This trial, which plans to enroll >600

patients, will provide much-needed answers in an area in which the surgical indications have been a moving target for quite some time.

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