Commentary: How old is too old for aortic arch surgery?

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In this issue of the *Journal*, Preventza and colleagues¹ evaluated short- and long-term outcomes after elective aortic arch surgery with particular focus on elderly patients aged >75 years old. They identified 805 patients >50 years old over a 10-year period who underwent elective proximal or total arch repair. In their multivariable analysis, age was found to be an independent predictor of mortality. Older age also conferred an additional risk of prolonged ventilatory failure and renal insufficiency. Although the authors report excellent outcomes, each decade added increased operative mortality, with octogenarians having an operative mortality of 16.9%. The authors should be congratulated for these excellent outcomes in elective aortic arch surgery. As they point out, these data will serve as an important benchmark of surgical repair against which the outcomes of emerging endovascular therapies will be compared.

An important distinction must be made between a hemiarch operation versus total arch replacement. Although hemiarch repair increases perfusion time and includes a brief period of circulatory arrest time, in our experience it does not affect safety or operative mortality.² A total arch replacement, however, is a more complex operation that requires longer cardiopulmonary bypass time, longer circulatory arrest time, and cerebral protection adjuncts.³ Indeed, in this study total arch as compared with hemiarch was found to be an independent risk factor for operative mortality.

Advancing age is known to be an independent predictor of mortality across the spectrum of aortic arch surgical interventions.⁴ A number of risk-stratification models aim to determine a patient's fitness for surgery by focusing on physiological age instead of chronological age.⁵ Specifically, markers of frailty and comorbidity profile can predict operative mortality in aortic arch surgery. Postoperative quality of life, however, plays an important role in determining the optimal treatment of complex aortic arch pathologies. Among patients >75 years old in this study, 50.4% of patients were discharged home, whereas 49.6% were discharged to a nursing home, rehabilitation

Central Message

Aortic arch surgery in elderly patients carries significant risk of morbidity and mortality. Novel endovascular therapies may be better for quality of life and mortality in elderly patients.

See Article page 973.

center, or long-term care facility. Comparably, among patients aged 50 to 74 years old, 81.5% were discharged home whereas only 18.5% were sent to another care facility. This difference underscores the high toll that open surgical repair plays on the quality of life of elderly patients.

As total endovascular or hybrid therapies evolve to treat aortic arch pathologies, patients >75 years old will likely be better served with these less-invasive interventions, particularly in quality of life. Similar to the transcatheter aortic valve replacement experience in high-risk and prohibitive risk elderly patients, endovascular therapies will undoubtedly offer less perioperative morbidity, decrease hospital lengths of stay, and obviate the adverse effects of cardiopulmonary bypass and hypothermic circulatory arrest. A number of thoracic endovascular aortic repair aortic arch trials are currently underway to assess their feasibility in treating arch pathologies.⁶⁻¹⁰ We are not there yet, but as transcatheter therapies evolve to treat aortic arch aneurysms and dissections, it will become harder to justify open surgical repair in lieu of endovascular treatment in elderly patients.

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