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greater than in younger patients (mortality rate of 1.8%-6.0% in patients 60-70 years). The addition of stroke rate in the octogenarian patients of 22% made the authors believe that the surgical risk may be "barely acceptable" for the nonurgent situations. It is also notable that the rate of discharge home was only 56% in the octogenarian patients. Based on these observations, the authors suggested that careful consideration of complex arch surgery in octogenarian patients under comprehensive risk evaluations and detailed informing of the estimated surgical outcomes to patients. This is an important argument because the discharge-home rate, even in the study by Ikeno and colleagues, was only 67.7% despite a high surgical success rate.[3]

We as surgeons know, however, that there are certain subsets of octogenarian patients who tolerate extensive surgery as well as younger patients, and therefore, that age is not the sole indicator to determine surgical risks and postoperative performance. Frailty is probably the best description to define overall performance status for CV surgical candidates, which also well correlate with our results of "eyeball test" as a physician. The frailty issue has been extensively studied in recent years, and by these efforts it has been well established as an excellent surrogate to predict operative outcomes (better than patient's age) and more importantly it does not necessarily correlate with patient's age.[5,6] Therefore, for a more reasonable approach to determine operability, balanced approaches considering the patient's age, frailty index, and other key baseline factors as well as institutional performance and by obtaining fully informed consent from the patient are needed. Ideal surgical risk stratification is yet to be established, and therefore, we look forward to further studies that aim to contribute to address this issue in complex aortic arch surgery of super-aged patients in larger cohorts.

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REPLY: JUST BECAUSE WE CAN, SHOULD WE? QUANTITY VERSUS QUALITY OF LIFE

Reply to the Editor:

Nearly all aortic disease can be addressed with contemporary open and endovascular therapies for repair, including hybrid strategies using both. However, the ability to perform a procedure does not always equate with the ability to recover from a procedure; this dichotomy markedly increases with age. In training, we were told that patients (especially the elderly) always act their age under anesthesia and surgical intervention. Just because we can do it does not always mean we should. With regard to the entirety of physiologic insult, there are few surgical procedures that rival the complexity of extensive aortic surgery.

Ikeno and colleagues[1] from Kobe University, Kobe, Japan, recently shared their experience with 740 patients undergoing total arch replacement between 1999 and 2018, 139 of whom were aged 80 years or older.[1] In the advanced aged group, operative mortality was 8.6%, stroke was 4.3%, and overall survival was 55.4% at 5 years. In contrast, for younger patients, operative mortality was 4.0%, stroke was 3.7%, and an overall survival of 78.1% at 5 years. The authors conclude that total arch replacement could be

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reasonably performed in octogenarians, although the risk of early and late death are greater.

The letter by Harky and colleagues[2] from Liverpool's renowned cardiovascular and aortic center provides an opposing view. They provided their own vast experience with 457 patients undergoing deep hypothermic circulatory arrest during a variety of aortic arch repairs, 24 of whom were octogenarians. They observed elevated rates of operative mortality and stroke in these elderly patients—16.7% and 22.2%, respectively—although improvement was noted in recent years. Furthermore, Harky and colleagues[2] note that surviving octogenarians may face a grueling recovery, with nearly half discharged to rehabilitation and institutional care. They caution that although these elderly patients are technically able to survive such procedures, octogenarians have a marginal capacity of recovering from significant physiologic insult.

My own work regarding complex aortic repair in octogenarians has found increased operative risk and prolonged recovery are common in these patients.[3-5] Regarding thoracoabdominal aortic repair in octogenarians, survival decreases dramatically with even a single system of organ failure, and this risk is greatly increased in the most extensive form of repair (ie, extent II repair), and an extended period of recovery is the norm in these elderly, high-risk patients.[3,4] However, we concluded that octogenarians should not be denied repair based solely on age, although procedures should be performed with caution.

Over a 10-year period we examined 805 patients aged 50-89 years undergoing elective surgery for repair of the proximal aorta.[5] Operative mortality was significantly higher in the octogenarian group—16.3% versus a rate of 4.1% in the youngest age group (50-59 years). Expanding on this within our institutional database, we reviewed 2961 aortic arch repairs necessitating hypothermic circulatory arrest and identified 118 patients aged 80 years or older. We found operative mortality to be significantly greater in octogenarians than in younger patients (15.3% vs 8.7%, respectively). In contrast, we found no difference in the stroke rate between elderly and young patients (3.1% vs 5.1%, respectively, for stroke persisting at the time of discharge or death). Only a very small portion of repairs involved octogenarians undergoing extensive total arch repair; for these 16 patients, the operative mortality rate was 18.8%, which was much higher than the 13.0% found in younger patients (n = 731). Regarding less complex hemiarch repairs (n = 2189), operative mortality remained elevated in octogenarians (14.9% [n = 101]) versus 7.2% in 2088 younger patients. Echoing the findings of Harky and colleagues,[2] we found that octogenarians surviving repair typically need additional care upon hospital discharge because only 43% were discharged home (our ad hoc analysis is previously unpublished).

Taking this experience as a whole, caution is recommended when pursing complex aortic surgery in patients of advanced age, and consideration must be given to each patient's capability to recover. Elderly patients face not only death—with or without surgery—but also a loss of social independence and bodily function that may greatly diminish the quality of their remaining years.

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