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Key Words: TA-AVI, Tao-AVI, complications, predictors, outcome

EDITORIAL COMMENTARY

Of mice and men and surgical transcatheter aortic valve insertion

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The best-laid schemes of Mice and Men / go oft awry
— Robert Burns (1759-1796)¹

Readers of the *Journal* will find interest in article by Scherner and colleagues² about transapical and transaortic transcatheter aortic valve insertion. The authors have christened the procedures “surgical transcatheter aortic valve insertion.” I like the term and think it is an appropriate moniker. The objectives of the study were as follows: (1) to identify periprocedural complications and their impact on 30-day and 1-year survivals and (2) to develop a risk stratification model of

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Central Message

Early mortality is procedure related; late mortality is baseline patient characteristic related.

See Article page 841.

1-year survival that can be derived from baseline patient characteristics.

The group of patients is described as having severely increased risk in undergoing conventional aortic valve replacement. Baseline patient characteristics are more in line, however, with a group of patients at intermediate risk. For example, the median Society of Thoracic Surgeons predicted risk of mortality in this study was 5.5% with a 75th percentile value of only 8.4%. This should be compared with data from the Placement of Aortic Transcatheter Valves (PARTNER) trial, in which the mean predicted risk was greater than 11%.³ This study also reports a prevalence of peripheral vascular disease of only 26.1%, which is much lower than the over 60% prevalence reported in the PARTNER trial.

The most striking finding in this study is the operative mortality of 12.7%, which is well over 2 times the predicted risk of 5.5%. Importantly, emergency cardiac surgery was performed on 24 patients (10%). The authors report that the need for cardiopulmonary bypass support was not predictive of 30-day mortality, but it is unclear whether the 9 patients who had conversion to conventional aortic valve replacement had any operative deaths. An all too common situation is one of a procedure complicated by misadventure that then leads to a protracted postoperative course and mortality. In this study, such a scenario played out for 54% of the operative deaths.

The 1-year survival was 69%, which is similar to the 71% reported for the premarket approval PARTNER patients.³ One of the important findings in this study was that emergency cardiopulmonary bypass itself had no impact on 1-year survival. The authors rightly point out that the need for circulatory support may be more dependent on the preoperative condition of the patient and that such support represents a lifesaving option without apparent long-term consequences. Furthermore, bleeding, reoperation, dialysis, and reintubation were also not associated with 1-year survival. These findings support an aggressive posture to treat all operative and postoperative complications. This strategy should be clearly articulated to and understood by the heart team, the patient, and their family before the operation.

The impetus behind any 1-year risk stratification model is to identify patients who will die with their aortic stenosis, rather than from their aortic stenosis (the cohort C type of

patient).⁴ The risk stratification model in this article identifies a subset of such patients on the basis of coronary artery disease risk profile (presence of coronary artery disease or previous myocardial infarction) and the logistic euroSCORE. Figure 3 of the article shows that a patient with the unfortunate triad of a logistic euroSCORE greater than 20%, coronary artery disease, and previous myocardial infarction has an expected 1-year survival of only 47%, and that, dear readers, meets the definition of a cohort C patient.

The strength of this study is the focused analysis on surgical transcatheter aortic valve insertion beyond the usual 30-day outcome metrics. The study provides a simple model for the identification of one type of cohort C patient on the basis of baseline coronary artery disease risk. The weaknesses of the study include the perceived high operative mortality and the use of the out-of-date logistic euroSCORE.⁵ A subtle point is that surgeons and cardiologists practicing in the United States may be less familiar with the logistic euroSCORE than they are with the Society of Thoracic Surgeons predicted risk of mortality, which the nation's regulatory agencies use to define candidacy and payment for operation.

I will add the 1-year outcome data and risk stratification model to my armamentarium of tools used to assess patients for surgical transcatheter aortic valve insertion. I think that their most effective use will be in the preoperative counseling of the patient and family, because "the best-laid schemes ... go oft awry."

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