Survival in Real-World Patients Receiving Left Ventricular Assist Devices

TO THE EDITOR: Use of left ventricular assist devices (LVADs) in the real world is guided by findings of clinical trials, conducted most often in highly selected populations.[1] However, the proportion of real-world patients who meet the same inclusion criteria is unknown. A study by Brescia and colleagues[2] has shed light on this issue by determining, in 14,679 real-world patients, the proportion who met the criteria of LVAD clinical trials. An association of trial ineligibility with death rate was found: the hazard ratio (HR) for death at 3 years was 1.29 in trial-ineligible vs eligible patients (95% confidence interval, 1.21-1.37; $P < .001$).

Despite its long-established use, the HR has important limitations in survival analysis, particularly when the proportional hazard assumption is violated. In fact, a wide literature has emphasized the advantages of restricted mean survival time (RMST) compared with the HR.[3]

We have reanalyzed the curves published by Brescia and colleagues[2] by determining the RMST rather than the HR. Our aim was to compare the survival observed in trial-eligible vs trial-ineligible patients and extrapolate both survival curves by a lifetime perspective. Statistical calculations were made as previously described.[4]

The 3-year RMST was estimated as 28.8 months for trial-eligible patients compared with 26.4 for trial-ineligible patients (difference, 2.4 months). The values of mean lifetime survival were 66.8 vs 58.0 months, respectively. According to these results, the risk of death in trial-ineligible patients is increased to an acceptable degree (+29% and +9% at 3 years according to HR and RMST, respectively; +15% according to lifetime survival).[2]

In conclusion, our analysis, based on a likely more stable survival model, indicates that the current boundaries for selecting LVAD recipients do not need to be narrowed, but could even be extended to some degree.

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Terminologic Confusion Related to the Elephant Trunk Technique

TO THE EDITOR: We appreciate the reply from Bakhtiary and colleagues,[1] who in their reply asserted that their technique[2] is different from our graft insertion technique[3] by not only strengthening the aortic annulus with the graft but by also inserting the graft and placing it along the entire left ventricular outflow tract as a reversed elephant trunk. I indeed agree there is a conceptual difference.

I would however like to make an additional comment about terminology related to the elephant trunk technique. Bakhtiary and colleagues described their technique of aortic root reconstruction as a "reversed elephant trunk." However the reversed elephant trunk technique as originally described by Carrel and associates[4] is used when creating a proximal anastomosis during descending aortic replacement. The cranial end of a descending aortic graft is invaginated into the cranial part of the descending aortic graft before the doubled edge is anastomosed with the distal end of the aortic arch. The floating invaginated graft can be pulled out toward the heart and used as the arch graft if aortic arch replacement becomes necessary in the future.

Meanwhile the "modified elephant trunk technique" described by Dr Svensson[5] is used when creating the distal anastomosis for aortic arch replacement. In the modified elephant trunk technique the elephant trunk with an invaginated graft into it is inserted entirely into the descending aorta and anastomosed with the proximal end of the descending aorta. After the anastomosis the invaginated graft can be pulled out toward the heart and used as the arch graft during the same operation.

In other words the reversed elephant trunk technique refers to an invagination made and left invaginated for possible use in future proximal-side aortic surgery, whereas the modified elephant trunk technique refers to an anastomosis technique by inserting the elephant trunk with an invagination made temporarily for facilitating anastomosis. Therefore we believe the technique Bakhtiary and colleagues used in aortic root reconstruction should have been referred to as a modified elephant trunk technique.

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