

SHOULDN'T WE FIRST FOLLOW THE GUIDELINES BEFORE IMPLEMENTING ALTERNATIVE



MECHANICAL CIRCULATORY SUPPORT MODALITIES?

To the Editor:

With interest we have read the recent article by Sommer and colleagues¹ on their experience using the Impella 5.0 or 5.5 microaxial pump in patients with ischemic cardiomyopathy undergoing coronary artery bypass grafting surgery. However, we were astonished not to read that any of these patients was treated with an intra-aortic balloon pump (IABP). Despite the fact that the majority of patients presented with an acute myocardial infarction, almost 35% of the patients were classified either as elective or as urgent cases, typically leaving time for preoperative implantation of an IABP as the least-invasive and most widely used mechanical circulatory support system. Moreover, also in the patients classified as emergent, the early application of an IABP might have been a reasonable choice to immediately improve hemodynamics.

The authors cite the German S3-guideline on the use of the IABP in cardiac surgery recommending the use of this device in stable, high-risk patients undergoing cardiac surgery as well as patients presenting with cardiac decompensation with a grades of recommendation B.² In line with this, a more recent expert consensus document of the American Association for Thoracic Surgery gives a class I recommendation to consider an IABP in patients with active/decompensated heart failure and anticipated need for postoperative mechanical support.³ Of note also the 2020 European Association for Cardio-Thoracic Surgery/Extracorporeal Life Support Organization/Society of Thoracic Surgeons/American Association for Thoracic Surgery expert consensus cited by the authors clearly states that the "IABP remains the mainstay for and first approach to postcardiotomy shock management..." and restricts the class I recommendation for early use of extracorporeal life support for failure to wean from cardiopulmonary bypass and marginal hemodynamics after cardiac surgery to patients "with an IABP in place" and optimal medical therapy!⁴ Recent multicenter data highlight the appropriateness of these recommendations, especially if the IABP is inserted preoperatively and a sheathless IABP is used.⁵

Consequently, it remains unclear why the authors did not start aortic counterpulsation preoperatively or immediately after induction of anesthesia in at least some of these patients with a substantial risk for failure to wean from

cardiopulmonary bypass and/or postoperative low cardiac output syndrome. We completely agree that extracorporeal life support for treating postoperative low cardiac output syndrome should be avoided due to the excessive mortality associated with this treatment modality, and we of course acknowledge the beneficial effects of improving hemodynamics and unloading the left ventricle early, if a low-output state develops. However, while adequately powered prospective randomized data showing a beneficial effect of microaxial pumps are lacking, an overwhelming number of observational and register data point to increased mortality and morbidity of these devices in comparison with the IABP (Figure 1).^{E2-E6} Thus, until robust evidence from adequately powered randomized controlled trials comparing the IABP and large microaxial pumps in high-risk cardiac surgical patients is available, we feel that it might be more appropriate to base mechanical circulatory support in such vulnerable patients primarily on the established and recommended treatment modality IABP and to restrict the use of new technologies to well-defined experimental conditions.

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Conflict of Interest Statement

M.V. reported honoraria for lectures on atrial fibrillation by AtriCure. M.H. reported honoraria for lectures and scientific advice by Edwards Lifesciences, Orion Pharma, AOP Health, and Medtronic. A.K. reported honoraria for lectures with Getinge regarding endoscopic vein harvesting (not intra-aortic balloon pump use) and regarding atrial fibrillation with AtriCure. S.S. reported no conflicts of interest.

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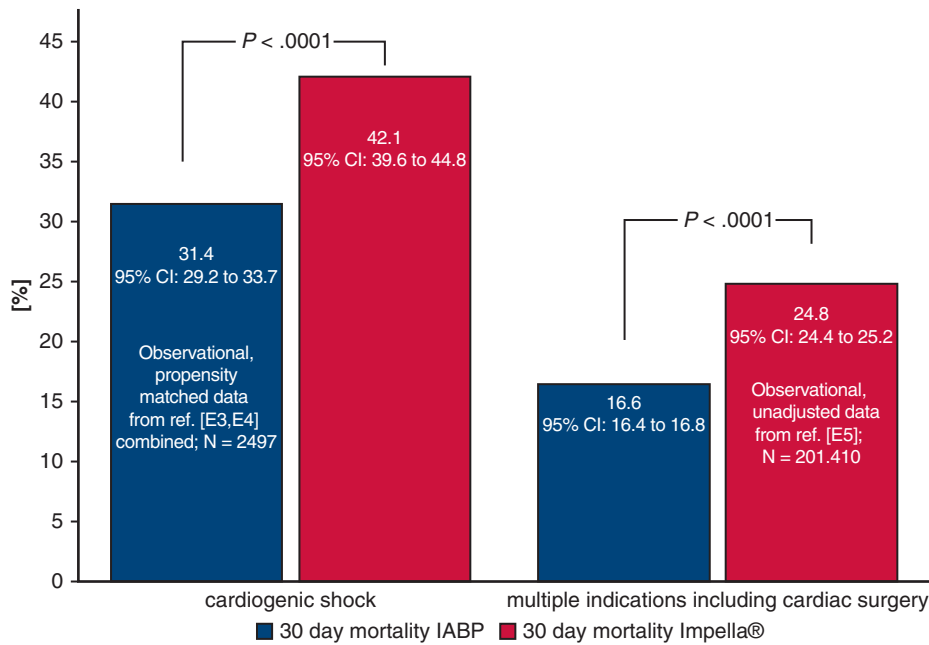


FIGURE 1. Hospital mortality rates from recent studies^{E2-E5} analyzing the effects of mechanical circulatory support with an intra-aortic balloon pump (IABP) or a microaxial pump (Impella). Data are given as mean and 95% confidence interval (CI) of the mean. “Multiple indications” include 46.7% patients undergoing percutaneous coronary interventions and 32.7% patients undergoing coronary artery bypass grafting.

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