Heart Transplantation in the Current Era: Thinking Outside the Box of Normal Donor Criteria

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We are very appreciative of the thoughtful comments and insights raised by Piperata and colleagues[1] into our manuscript titled "Impact of Center Donor Acceptance Patterns on Utilization of Extended-Criteria Donors and Outcomes".[2] We too hope this manuscript will support the further consideration of extended-criteria donors (ECD) for heart transplantation.

Without a doubt, we are facing a shortage of available cardiac donors to meet the needs of an ever-increasing heart failure population. In the wake of an evolving candidate waitlist, with increasing age and complexity of medical comorbidity, we are also witnessing an evolution within our available donor populations. In North America and Europe, median age and medical complexity of available donors are also increasing.[3] In order to meet the increasing demands for heart donations, it is important to give thorough consideration of donors outside the box of normal acceptance standards.

ECD donation has certainly been a controversial topic since its conception. As Piperata and colleagues have stated[1,4], ECD donation has been previously been linked to increased risk of primary graft failure, as

features such as increasing age and/or left ventricular hypertrophy have been associated with this outcome.[5] Additionally, multiple studies have reported reduced survival with ECD donation, especially when high-risk donors are paired with high-risk recipients.[6–8] However, it is important to note that these outcomes are still far better than the natural history of heart failure without transplantation.

As the heart failure population continues to grow, and the supply-demand balance continues to tip in the wrong direction, transplanting centers must start looking outside the box of normal conventions. While it is simply unethical to demand surgeons to accept unsuitable organs to keep up with a rising demand, we must therefore work towards optimization of the current donor pool. One method, as suggested by Piperata[4], may be to perform concomitant procedures such as coronary revascularization and/or valvular intervention during transplantation in order to optimize donor grafts. Another method may be to focus on the development of better diagnostic tools for centers to critically evaluate, and in some instances resuscitate, organs outside normal acceptance criteria. Though still in early phase of clinical practice, pretransplant *ex vivo* perfusion and evaluation of marginal hearts has shown promise. Several centers have published their results of normothermic, ex vivo perfusion of marginal hearts. In these reports, short- and mid-term outcomes have been comparable to non-ECD transplants performed at these centers[9,10], all while increasing transplant volumes.[11] While we cannot increase the number of donors, we can certainly take steps towards a more critical evaluation and more efficient usage of our available donor pool.

Disclosures and Conflicts of Interest

Arman Kilic, MD is a speaker and a consultant for Abiomed. He is also a speaker and a consultant for Abbot. These affiliations are not in conflict with the contents of this letter.

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