

Machine Perfusion: Can It Become a Standard Practice in Organ Transplantation in Türkiye?

Makine Perfüzyonu Türkiye’de Organ Naklinde Standart Uygulamaya Dönüşebilir mi?

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Dear Editor,

The ongoing shortage of donor organs has underscored the need for improved preservation strategies in transplantation. Machine perfusion (MP) technologies have been shown to enhance the utilization of organs obtained from donors after brain death and from extended-criteria donors, compared with conventional static cold storage (1,2). In a setting such as Türkiye, where the donor pool remains limited and donation rates have not yet reached optimal levels, MP represents a substantial opportunity to expand organ availability.

In kidney transplantation, hypothermic MP has been associated with a significant reduction in delayed graft function and with improved one-year graft survival (3). In liver transplantation, hypothermic oxygenated perfusion (HOPE) has demonstrated reductions in biliary complications, non-anastomotic strictures, early allograft dysfunction, and graft loss in multiple meta-analyses (4-6). These data provide compelling evidence for the role of MP in preserving organ quality and improving recipient outcomes.

The implementation of MP as a standard practice at a national level requires considerations that extend beyond device procurement. Adequate device availability, the development of trained perfusionist teams, standardization of clinical protocols, and systematic long-term outcome monitoring are essential

components of this process. Ongoing training initiatives and quality efforts in cardiac surgery in Türkiye suggest that such infrastructure can be successfully established (7).

International experience further demonstrates that MP technologies are moving rapidly toward routine clinical use. In the Netherlands, Germany, and the United Kingdom, HOPE and *ex vivo* assessment platforms are increasingly applied, particularly for high-risk and marginal donor livers, with reported improvements in early graft dysfunction and biliary complication rates (8,9). In the United States, the widespread clinical adoption of portable normothermic perfusion systems has increased acceptance of extended-criteria donor organs and has been associated with reduced waiting-list mortality (10). These observations indicate that MP has transitioned from an experimental technique to an established component of contemporary transplantation practice.

MP offers a strategic opportunity for Türkiye to both expand the donor organ pool and enhance transplant outcomes. Realizing this potential, however, requires parallel progress in training, infrastructure, protocol harmonization, and nationwide data collection. Accordingly, gradual integration of MP into national transplantation programs, long-term evaluation in selected pilot centers, and strengthening of perfusionist training and quality standards are key steps toward effective and sustainable implementation.



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