Commentary: From primary graft dysfunction to delayed graft function after heart transplantation with veno-arterial extracorporeal membrane oxygenation: A life-saving approach!

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Severe primary graft dysfunction (PGD) after heart transplantation remains a devastating complication. Registry data indicate a 30-day mortality up to 10% after transplantation, most likely resulting from PGD. The causes are multiple and related to a series of donor heart insults from brain death and its sequelae, hypothermic ischemia during transport, warm ischemia, and reperfusion injury at surgery. Moreover, donor and recipient characteristics such as pulmonary hypertension, age, and body weight might play a significant role.¹

The most severe form of PGD requires mechanical circulatory support and is usually associated with dismal results. In the present issue of *The Journal of Thoracic and Cardiovascular Surgery*, DeRoo and colleagues² present the result of an aggressive and prompt initiation of veno-arterial extracorporeal membrane oxygenation (ECMO) support of dysfunctional donor hearts at the time of transplantation. Thirty-eight patients (38/362; 11%) were given ECMO support within 24 hours of transplantation because of PGD between 2011 and 2017. Twenty patients who underwent ECMO implantation 2 hours after cross-clamp release at transplantation (the prompt ECMO group) were compared with 18 patients who underwent ECMO implantation 7 hours after clamp release (conservative ECMO). In the former group, the indication for mechanical support was on the basis of hemodynamic instability despite the use of high-dose inotropes and vasopressors after weaning of cardiopulmonary bypass at transplantation. In the latter group, instability plus signs of hypoperfusion after reaching the intensive care unit were used as an indication for support.

In-hospital mortality averaged 28% of patients in the conservative ECMO group compared with 5% of the early implantation ECMO group of patients. One-year patient survival averaged 67% and 90% of patients, respectively. De facto, the prompt ECMO protocol proposed by the authors transforms PGD syndromes into a real delayed graft

ECMO support system readily available at the time of transplantation.

Central Message

A prompt ECMO implantation on the basis of hemodynamic instability at the time of transplantation and support for a few days is the best approach to save patients with severe primary graft dysfunction.

See Article page 1576.

function syndrome (DGF) status in which donor heart function recovered after prompt ECMO implantation and support duration averaging 5 days.

The DGF is well known after kidney transplantation and requires several days and weeks of dialysis after surgery.³ Although the physiopathology appears to be multifactorial and quite difficult to treat with a pharmacological approach, DGF results in a significant decrease in long-term kidney graft survival.

DeRoo and colleagues² should be congratulated for sharing their prompt ECMO implantation protocol on the basis of hemodynamic instability at the time of transplantation. Thirty-day mortality of 5% and 90% patient survival at 1 year are truly excellent results in this group of patients. Although all of us should implement such a protocol with patients who show signs of PGD early at the time of transplantation, we should also investigate ways to prevent PGD with better donor and recipient matches, approaches to reduce ischemic and reperfusion insults, pharmacological targets to reduce inflammation cascade, and protocols to reduce blood loss and transfusion requirement during heart transplantation.

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