

The First Clinical Use of a Novel Cold Storage System of Donor Hearts

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Abstract

Purpose: Current cold storage heart preservation technique is associated with wide fluctuation of organ temperature and may result in freeze injury. Paragonix SherpaPak™ Cardiac Transport System (CTS) (Paragonix Technologies, MA, USA) was recently approved in the United States for clinical use. This single-use disposable device is designed for static hypothermic preservation of a donor heart during transport. We report the first clinical use of the Paragonix SherpaPak™ CTS.

Methods: Since July 2018, the Paragonix SherpaPak™ CTS has been used in 6, non-consecutive heart transplant procedures at a single institution. All organs were procured from brain dead donors and had normal systolic function. Donor hearts were procured in standard fashion and positioned within the Paragonix SherpaPak™ CTS per the manufacturer's instructions. The hearts were removed from the system in the recipient operating room and prepared for implantation in standard fashion.

Results: Six recipients (5 male; mean age 60.3 ± 19.1 years) underwent heart transplantation using donor hearts transported with Paragonix SherpaPak™ CTS. All donors were categorized as PHS high risk and 5 of them were hepatitis C positive. Donor heart transportation time within the shipper was 24 to 205 (109.67 ± 66.60) min and donor heart total ischemic time was 116 to 312 (225 ± 70) min. Donor hearts were preserved at static hypothermia with a mean temperature of $5.99 \pm 0.52^\circ\text{C}$. Among the patients transplanted there was no observed primary graft failure, and the ICU length of stay ranged from 3 to 21 (8.5 ± 6.3) days. All recipients are alive and well beyond 30 days with normal systolic function at discharge (LVEF $72 \pm 6\%$).

Conclusion: The Paragonix SherpaPak™ CTS provides consistent organ temperature regulation throughout the transport observed process. Organs transported using this system demonstrated normal perioperative function even including an organ with more than 5 hours of total ischemic time. This system may decrease cold injury during organ transportation and increase the safe interval of tolerable cold ischemia.