

Kidney Transplantation from Donors after Cardiac Death with 20 minutes of no-touch period: Single-Center Experience.



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Background

The use of kidneys from deceased donors after cardiac death (DCD) is now considered a well-established strategy to address shortage of organs. In Italy law requires 20 minutes of no-touch period that prolongs drastically the warm ischemia period, which can affect organ quality. We present our experience with kidney transplants from DCD donors using normothermic regional perfusion (NRP) *in situ* followed by End-Ischemic Hypothermic Machine Perfusion (EIHP). This combination offers several benefits, mainly reduction in ischemia-reperfusion injury.

Methods

From March 2019 to May 2025, 56 transplants from DCD were performed, including 20 dual kidney transplants(35.7%). The average age of donors and recipients was 60(21-81) and 55(21-73) yo, respectively. Single and double allocation was performed according to our regional guidelines based on age, renal function, and biopsy score data. Donors underwent NRP during procurement, and kidneys were placed in a hypothermic machine perfusion system after bench surgery using two different EIHP systems, Waves IGL[®](22 cases) and PerLife Aferetica[®](34 cases).

Results

Delayed graft function (DGF) was recorded in 35.7% of all cases: HOPE (PerLife) vs HMP (Waves) showed 27% vs 50 % DGF. Further stratification of the cases based on perfusion duration (short [≤ 6] vs long [> 6 h]) resulted in decreased DGF rate for prolonged perfusions (shortDGF = 48,5% and longDGF = 27,77%). In 10% of patients, there was functional DGF (fDGF), while no primary non-function (PNF) was recorded. The mean creatinine at discharge was 2.9 mg/dL (0.9-9.8) and 1.5 mg/dL (0.9-2.9) at 30 days. The average length of stay was 14 days (9-30). The kidneys were perfused in the hypothermic machine for an average of 432 minutes (160-930). The mean arterial flow of the machine perfusion was 98.5 ml/min (60-171); the arterial resistances were 0.219 mmHg per min/ml. The perfusion pressure was 22.8 mmHg (16-28) and the mean temperature was 6.4 °C (4.8 –7.7).

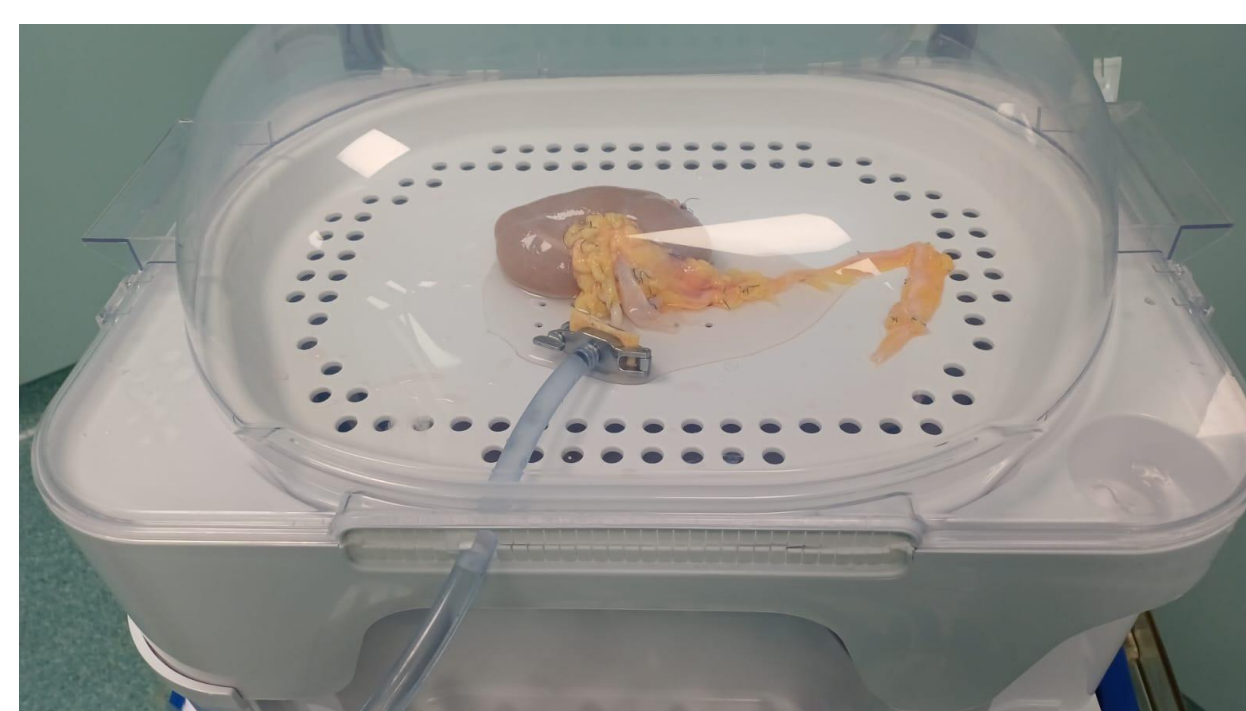


Figure: PerLife[®] Kidney treatment

Conclusions

The donation program from DCD donors supported by NRP at procurement and the use of EIHP pre-transplant appears effective and safe. In the absence of PNF, graft survival at 30 days was 100%, achieving optimal organ function. The clinical evaluation of the donor, combined with the physiological response parameters of the organ during normothermic *in situ* and hypothermic *ex vivo* perfusion, along with the biopsy score, allows for the implementation of available organs for transplant using this category of donors with reasonable safety.