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UMCG puts donor organ perfusion unit into use

From now on, the UMC Groningen Transplant Center will store and optimize donor organs in a specially equipped organ perfusion chamber before transplant. The donor organs are stored in Organ Assist perfusion machines and continually rinsed with oxygen-enriched fluid and nutrients, not only preserving but also enhancing their quality. As more organs can now be prepared for transplantation, more donors can be used. The success rate for transplants will also be higher. The UMCG is the first transplant center in the Netherlands, and one of the first in the world, to have this facility.



The 'Organ Preservation & Resuscitation' unit in the operation center can preserve four donor organs in four perfusion machines at the same time. The unit implemented Organ Assist's Kidney Assist, Liver Assist, Lung Assist and ECOPS. The machines ensure that the organs are continually rinsed with oxygen-enriched fluid and nutrients for several hours before transplantation. The organs can also be kept warm. Years of research have shown that this method is the best way to preserve organs such as lungs, liver and kidneys, and even enhance the quality.

Preservation and quality

Until now, during procurement, donor organs were rinsed once with cold, deoxygenated preservation fluid before being stored on ice. This 'cold storage' brought the metabolism of the organ to a virtual standstill, enabling the organ to 'survive' without oxygen. However, the quality of the organ deteriorated during the preservation period, and the risk of it being unable to resume normal function after transplantation increased. In addition, increasing numbers of donors suffer from conditions such as diabetes and obesity, which means that the quality of their organs is already compromised. However, these organs are vital in terms of transplants, because the supply of donor organs still falls short of demand.

Better function

Mechanical perfusion enhances the preservation and quality of donor organs. The process of dying causes inflammatory substances to be released inside the donor's body and damages, for example, the lungs. Fluid then collects (edema) in the lungs, hampering the absorption of oxygen and emission of carbon dioxide after transplantation. As a result, otherwise healthy donor lungs are sometimes declined for transplantation because they have been damaged during the process of dying. Mechanical perfusion can remove the fluid from the lungs, and make them suitable for transplantation. In some donors, who have died after cardiac

arrest, damage may also occur due to absence of blood circulation during a certain time period. In the case of kidneys, this could lead to the recipient being put back on dialysis for a while after the transplant. Kidneys that have been treated with mechanical perfusion are more likely to work properly immediately after transplantation, making dialysis unnecessary. Livers also benefit from mechanical perfusion. Patients who receive a liver from a cardiac-dead donor often develop bile duct problems after the transplant. Administering oxygen to the donor liver via machine perfusion can reduce this risk.

From research to clinical practice

UMCG and Organ Assist have spent many years researching storage and preservation techniques for donor organs. Several innovative products have been developed, including oxygen-enriched mechanical perfusion systems, that are manufactured and marketed by Organ Assist. The technique differs depending on the organ and the stage of technical development of the system. In 2013, the UMCG launched two brand new techniques. One involved donor lungs that had initially been rejected, suitable for transplant, and the other kept isolated donor livers alive at body temperature. These new techniques are now being used in clinical practice in the organ perfusion unit.

Since 2013, the UMCG has carried out a total of 26 pilot studies, whereby patients were given transplants using donor lungs, livers and kidneys that had undergone mechanical perfusion. As the development and use of mechanical perfusion differs per donor organ, it is not yet standard treatment for all donor organs. At the moment, lungs from donor with lung edema are treated with mechanical perfusion in the organ perfusion unit in the UMCG before being transplanted.

Randomized controlled trials (RCTs) using donor livers and kidneys (some of which will have been declined for transplantation) will be carried out in the forthcoming period to optimize the results of transplanting these organs even further. These organs will also be preserved and optimized in the organ perfusion unit. Mechanical perfusion is expected to increase the number of transplants using organs from deceased donors. This means that the average number of lung transplant operations performed in the Netherlands every year (currently 70) could increase by 10 to 20 transplants.



Note for the press

For more information, please contact the UMCG press information office on +31 (0)50 361 22 00, or Organ Assist on +31 (0)50 313 19 05.

See also: www.organ-assist.nl

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