



Media Release

SGH performs Singapore's first blood group incompatible living donor liver transplant

Singapore, 20 September 2018 - As father and son, they share a close bond and blood link. But 56-year-old Chen Yu Hui and his 32-year-old son, Qingzhong, do not share the same blood group. This meant that a liver transplant between them would not have been possible if not for a treatment used by the Singapore General Hospital's (SGH) liver transplant team.

In July 2017, the elder Mr Chen, who has blood group B positive and Qingzhong, who has blood group A positive, underwent a 12-hour blood group incompatible living donor liver transplant at the SGH. To increase the chances of a successful transplant, stringent medical tests were carried out to ascertain the suitability of both donor and recipient before the transplant. Post-transplant, both father and son were closely monitored by the care team.

Today, more than a year after the procedure, they are both recovering well and continue to receive medical follow-up with their doctor. Qingzhong even became a new father last November.

In line with international practices, blood group compatible organs continue to be the first line option for liver/kidney transplants in view of the reduced risk of acute antibody mediated rejection.

An organ from a blood group incompatible (ABOi) donor is likely to trigger the recipient's immune system to release antibodies. The antibodies attack the donated organ, thinking that it is a foreign body. To overcome this, the liver transplant team adapted an overseas treatment protocol to remove the antibodies in the blood. They also drew experience from the SGH kidney transplant team, which has been performing ABOi living donor kidney transplant and tissue incompatible transplant since 2009 and 2013 respectively.

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“Typically, the blood group of the donor and recipient must match for liver transplant. With this treatment protocol, ABO incompatible liver transplant may be possible between some recipients and living donors. Both must undergo stringent tests prior to surgery and go for regular medical follow-up with their doctor post-transplant to facilitate recovery,” said Associate Professor Jeyaraj Prema Raj, Director, Liver Transplant Programme, SGH, and Head, SingHealth Duke-NUS Liver Transplant Centre.

According to data from an overseas study¹ conducted in 2015, 71 per cent of ABOi living donor liver transplant recipients were still alive five years after their transplant, compared to 71.5 per cent of ABO-compatible recipients. The study acknowledged that while further studies were needed to understand the post-transplantation immunological reactions in ABOi living liver transplants, the survival results were encouraging.

The elder Mr Chen had liver cancer, hepatitis B and liver cirrhosis. His only option was a liver transplant, without which, he had only less than two years to live. To prepare his body for the ABOi liver, he was given rituximab through intravenous infusion to suppress the production of antibodies in his blood. This was done three weeks before the transplant surgery. Rituximab is a drug used to treat certain autoimmune diseases and cancer. A special dialysis machine was then used four days before the transplant surgery to remove the amount of antibodies in his blood to a level that is low enough for transplant.

The first two weeks after the transplant were crucial. The elder Mr Chen had to go through another round of dialysis, and the level of antibodies in his blood was measured daily to ensure it remained low.

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¹ Lee CF, Cheng CH, Wang YC, Soong RS, Wu TH, Chou HS, Wu TJ, Chan KM, Lee CS, Lee WC. Adult Living Donor Liver Transplantation Across ABO-Incompatibility. *Medicine (Baltimore)* 2015 Oct;94(42):e1796

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Media Fact Sheet

SGH Liver Transplant Programme

SGH introduced its liver transplant programme in 2005. The transplant team performed its first liver transplant with an organ from a deceased donor on 15 Feb 2006 and living-related adult donor on 22 May 2006. The team has also performed the first split-liver transplant involving two centres in Singapore in December 2008. It has performed more than 120 liver transplants to date.

The multi-disciplinary liver transplant team of specialists comprises liver surgeons, hepatologists, anaesthesiologists, intensivists, infectious disease physicians, radiologists, psychiatrists, cardiologists, endocrinologists, histopathologists, nurses, transplant coordinators, medical social workers, dieticians, occupational therapists, physiotherapists, and pharmacists.

“We are proud of the liver transplant programme in SGH, which is now 13 years old. This case of blood group incompatible liver transplant is just a start. This year, as we celebrate our 120 cases of liver transplant, let us also honour the donors, both living and deceased, who so selflessly gave a part of themselves to offer others a new lease of life,” said Associate Professor Jeyaraj Prema Raj, Director, Liver Transplant Programme, and Senior Consultant, Department of Hepato-pancreato-biliary Surgery, SGH. He is also Head, SingHealth Duke-NUS Liver Transplant Centre and Director, SingHealth Transplant.

The Hospital had signed a Memorandum of Understanding with Changi General Hospital to also care for their patients who need liver transplants.

Liver Transplant Trivia

- A liver recovered from a donor whether living or deceased has to be transplanted within 12 hours.
- The large majority of liver transplants use the entire liver from a deceased donor for transplant, particularly for adult recipients.
- In living donor transplants, about 40 to 60 per cent of the donor’s liver is removed for transplant.
- The liver starts to regenerate almost immediately and will actually grow larger in size to compensate for the "loss".
- Some liver transplant patients go off immunosuppressant completely.

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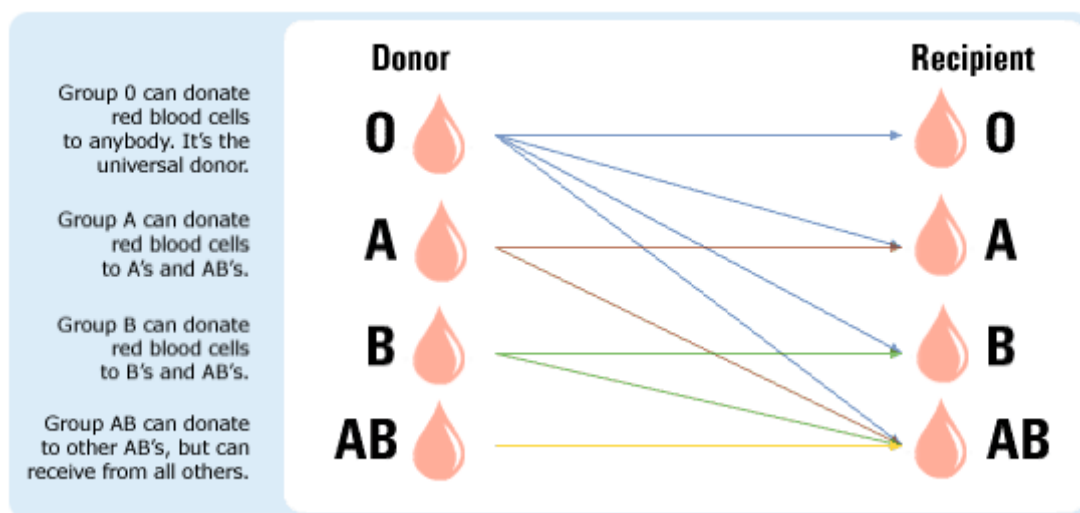
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Blood Typing (ABO Compatibility)

Blood typing or ABO typing is a test to determine a person's blood group (or blood type) based on the presence or absence of certain proteins on his red blood cells. These proteins are called antigens. The presence or absence of two antigens, A and B, determines the four major blood groups A, B, O and AB (commonly termed ABO). In addition to A and B antigens, a third antigen called Rhesus (Rh) factor is either present (+) or absent (-) and is often seen next to the ABO blood group.

Blood typing is done to determine if a person's blood is a match with the potential donor's blood. This test detects antibodies that react with different blood groups. Since some antigens can trigger a patient's immune system to attack a foreign body including blood, careful blood typing and cross-matching is critical.

There are very specific ways in which blood types must be matched for a transplant as detailed in the following chart:



(Source: American Red Cross)

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