

Stem cell technology used in unique surgery

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This is a picture of surgeon and professor Michael Olausson. Credit: Björn Larsson Rosvall

Surgeon and Professor Michael Olausson was able to create a new connection with the aid of this blood vessel between the liver and the intestines, necessary to cure the girl. The girl is now in good health, and her prognosis is very good. The girl developed during her first year of life a blood clot in the blood vessel that leads blood from the intestines to the liver. This introduced the risk that she would experience life-threatening internal bleeding. The condition can be cured if it is possible to direct the blood along the correct path, back into the liver. In optimal cases, the surgery can be performed using blood vessels from other parts of the patient's body, but a liver transplant may be necessary if the surgery is unsuccessful due to a lack of sufficient blood vessels. A liver transplant will involve subsequent lifelong treatment with immunosuppressive drugs.

Blood vessels from a dead donor were used in the present case. The vessel was then chemically treated to remove all cells RNA and DNA. This left just the supporting tissue. [Stem cells](#) were then obtained from the girl's bone marrow and these were added to the supporting tissue. A new blood vessel grew in just under four weeks. This was used during the surgery in order to create the new connection between the liver and the [intestines](#), necessary to cure the girl.

"We carried out the surgery over three months ago now, and the result was very good, with no serious complications. To our knowledge this is the first procedure of this type in the world, says Michael Olausson. The girl is in [good health](#), and we believe that her prognosis is very good. Since the vessel was created with the girl's own stem cells, she does not need to take drugs to prevent rejection", says Michael Olausson at the Transplant Centre, Sahlgrenska University Hospital and professor at the Sahlgrenska Academy.

The procedure shows that it is possible to create new [blood vessels](#) from stem cells, using a previous blood vessel as a template. This can lead to the condition that the girl suffered from being treated more easily, and with less risk for the patient. The result of this operation may have implications not only for the condition the girl was suffering from, but also in a number of other fields of research.

"The next step is to intensify research into the recreation of other organs, and to develop methods that can be used for arteries. This can help, among others, patients who need dialysis and those needing surgery for the coronary arteries. It may also help those needing complete organs", says Michael Olausson, who adds:

"There may also be major financial benefits for the healthcare system, particularly if it proves possible to produce, for example, complete kidneys by this method, since the consumption of drugs will be

dramatically reduced. For the patients, it means that the undesired effects of the drugs that must currently be used will be avoided."

Provided by University of Gothenburg

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