

05/29/2023

<http://idw-online.de/en/news815084>

Research projects, Research results
Medicine
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World's first birth after uterus transplantation with robot-assisted surgery alone

For the first time worldwide, in yet another breakthrough by the world-leading research team at the University of Gothenburg, a child has been born following a uterus transplantation achieved solely by robot-assisted surgery on both donor and recipient.

The baby, a boy measuring 49 centimeters (19.3 inches) and weighing 3 100 grams (6 pounds 13 ounces), was delivered by planned cesarean section Thursday, May 25. The child and the rest of the family are well, as is the donor. The new mother is 35 years old, and the donor is a relative.

What distinguishes this case is the surgical method used in the transplantation itself. This time, the donor and recipient alike were operated on entirely by means of robot-assisted laparoscopic (keyhole) surgery ----- simply stated, "robot surgery" — with no open-surgery stage.

Robot surgery is considerably less invasive than traditional open surgery. In other types of operation, risks of infections and hemorrhages, for example, have proved to be lower when robot surgery is used. With it, in general, patients operated on get back on their feet faster.

The method entails insertion of cameras and robotic arms with surgical instruments attached to them through small entry holes in the lower belly. The surgeons then steer the robotic arms by means of tools resembling joysticks at consoles, where they can simultaneously see mobile 3D images and operate with great precision.

Minimally invasive, highly precise

In the present case, the transplantation was carried out at Sahlgrenska University Hospital in October 2021. In the donor, the uterus was freed one step at a time, supported by robot surgery. The last step involved detaching the uterus from its blood vessels and removing it vaginally in a laparoscopic pouch.

In the recipient, it was then possible to insert the uterus into the woman's pelvis through a small incision; first suture it with the blood vessels; and then suture it to the vagina and supportive tissue. All these steps were assisted by robot surgery.

Ten months later, an embryo created by in vitro fertilization (IVF) before the transplantation was inserted in the transplanted uterus, and a few weeks later pregnancy was verified. The mother-to-be felt well throughout her pregnancy, which has thus now concluded with a planned C-section in the 38th week.

Pernilla Dahm-Kähler, adjunct professor of obstetrics and gynecology at Sahlgrenska Academy, University of Gothenburg, is also a gynecologist and senior consultant doctor at Sahlgrenska University Hospital. As the principal surgeon in the intricate operation on the recipient, she describes the technique.

“With robot-assisted keyhole surgery, we can carry out ultra-fine precision surgery. The technique gives a very good access to operate deep down into the pelvis. This is the surgery of the future, and we’re proud and glad to have been able to develop uterine transplantations to this minimally invasive technical level,” she says.

Previously considered impossible

Niclas Kvarnström is the transplant surgeon in charge on the research project, and the one who performs the complicated blood-vessel suturing in the recipient.

“With the robot assisted technique procedures can be done that were previously considered impossible to perform with standard keyhole surgery. It is a privilege to be part of the evolution in this field with the overall goal to minimize the trauma to the patient caused by the surgery”, he says.

The transplantation represents a further development of the uterus transplantation surgery that began with open-surgery technique in Sweden 2012. The work is headed by Mats Brännström, professor of obstetrics and gynecology at Sahlgrenska Academy, University of Gothenburg, and gynecologist and senior consultant doctor at the University Hospital.

“This is the 14th baby born in the uterus transplantation project at Sahlgrenska Academy, and more births are awaited this summer. The research project continuously evaluates numerous variables in donors, recipients, and children after the uterus transplantation, following up the operation for several years afterward. All this is done to maximize the efficacy of the operation and minimize side effects in the patients”, Brännström says.

In 2014, the research culminated in the world’s first birth after a uterus transplantation. Altogether, eight births took place within the same research project before anyone outside Sweden delivered a baby after a receiving uterus transplant.

The research group has spread the methods and technique further through direct knowledge transfer to several centers around the world. An estimated 90 uterus transplantations worldwide have been performed, and some 50 babies have been born as a result.

Images (see Internet-links): Pernilla Dahm-Kähler, Niclas Kvarnström and Mats Brännström (photo: Johan Wingborg)

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URL for press release: <https://www.gu.se/en/research/research-on-uterus-transplant>

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