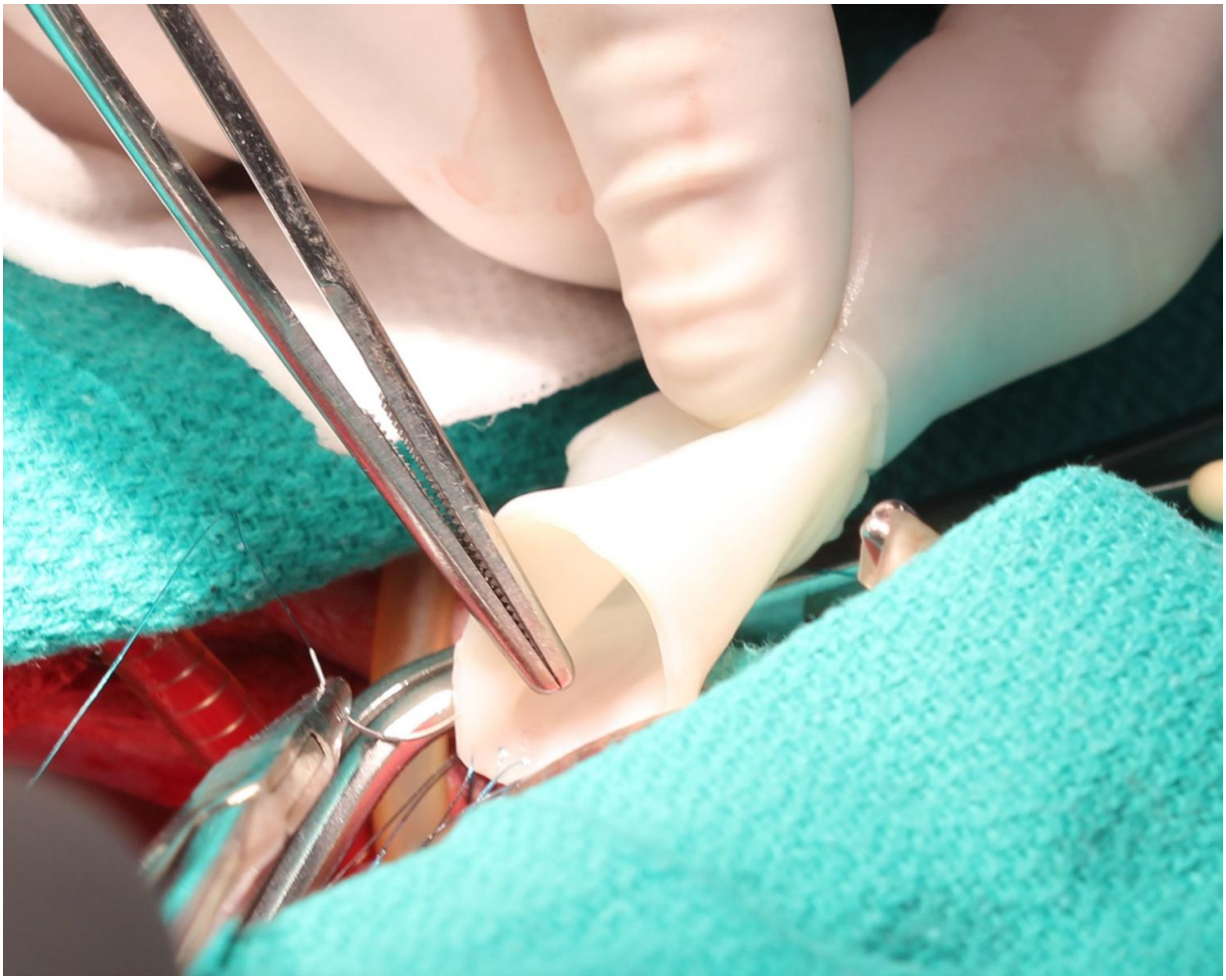
Medical Xpress

Engineered blood vessels grow in lambs

September 27 2016



Surgical field showing implantation of the "off-the-shelf" tissue-engineered graft into a lamb that grew to adulthood. Credit: Univ of Minnesota

In a hopeful development for children born with congenital heart

defects, scientists said Tuesday they had built artificial blood vessels which grew unaided when implanted into lambs, right into adulthood.

If repeated in humans, such grafts would spare afflicted children the need for repeated surgeries, an expert team from the University of Minnesota reported in the journal *Nature Communications*.

"This might be the first time we have an 'off-the-shelf' material that doctors can implant in a patient, and it can grow in the body," study co-author Robert Tranquillo said in a statement.

Children born with heart defects often need five or more open-heart operations to replace synthetic blood vessel grafts which cannot grow or regenerate.

In the quest for a longer-lasting alternative, Tranquillo and a team grew vessel-like tubes in the lab from a donor sheep's skin cells.

After about five weeks, they used special detergents to wash away all the sheep cells, leaving scaffold-like tubes, which were used to replace a part of the pulmonary artery—which carries blood from the heart to the lungs—in three lambs.

The lambs' own cells repopulated the tubes, allowing them to grow and preventing their rejection by the immune system as foreign tissue, said the team.

"This is the perfect marriage between tissue engineering and regenerative medicine where tissue is grown in the lab and then... the natural processes of the recipient's body makes it a living tissue again," said Tranquillo.

The lambs developed normally into adulthood.

The next step would be human clinical trials, hopefully "within the next few years," said the team.

More information: Tissue engineering of acellular vascular grafts capable of somatic growth in young lambs, *Nature Communications*, nature.com/articles/doi:10.1038/ncomms12951

Citation: Engineered blood vessels grow in lambs (2016, September 27) retrieved 20 September 2024 from https://medicalxpress.com/news/2016-09-blood-vessels-lambs.html