

Successful Adult to Child Cardiac Transplantation Applying Normothermic Ex Vivo Perfusion in Congenital Heart Disease

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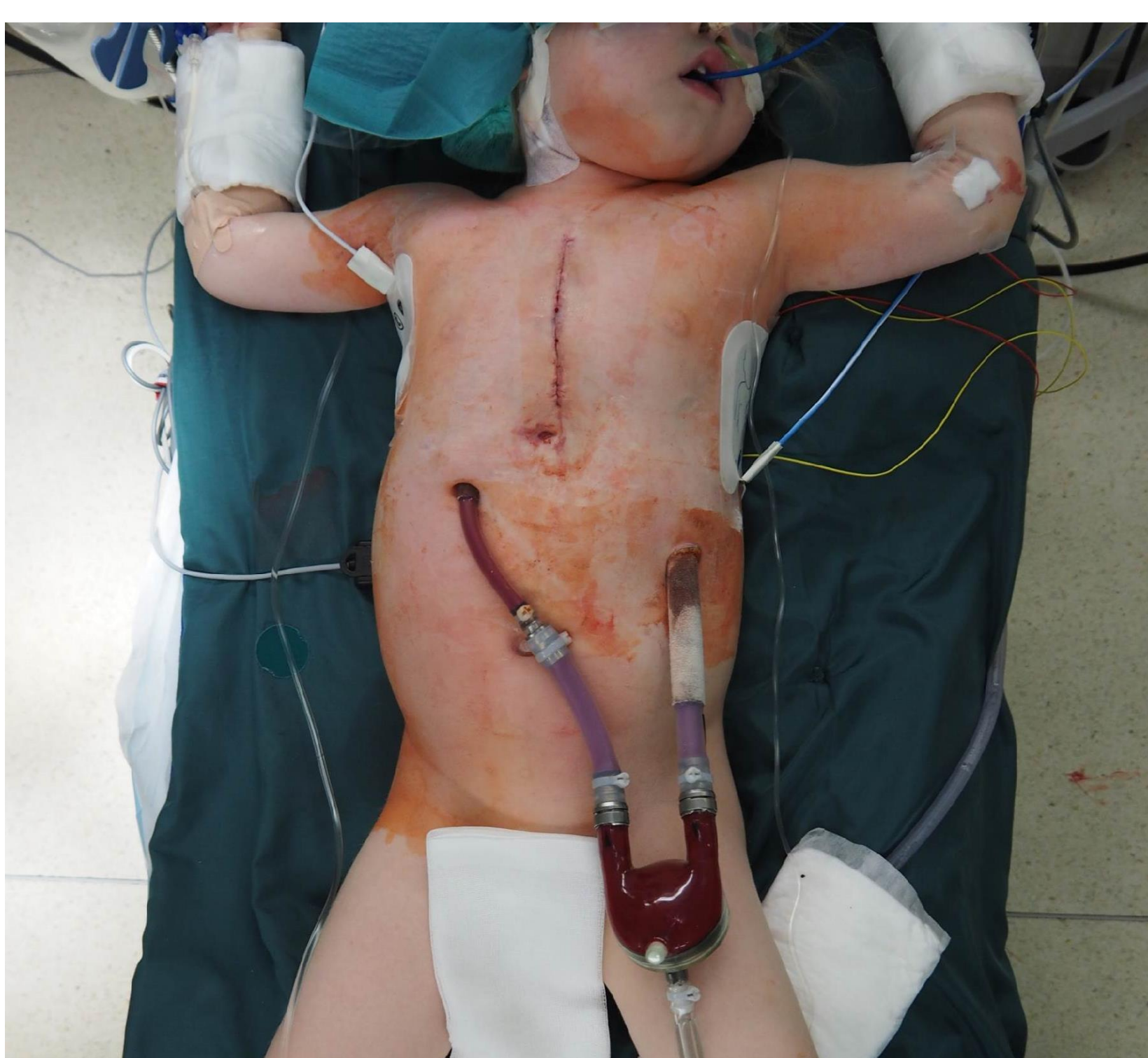
Introduction

Pediatric heart transplantation represents the gold standard for the treatment of terminal heart failure in children following correction of complex congenital heart disease. However, limited pediatric donor organ availability is a major challenge to overcome. Thus, novel strategies are needed to enlarge the pool of potential donors.

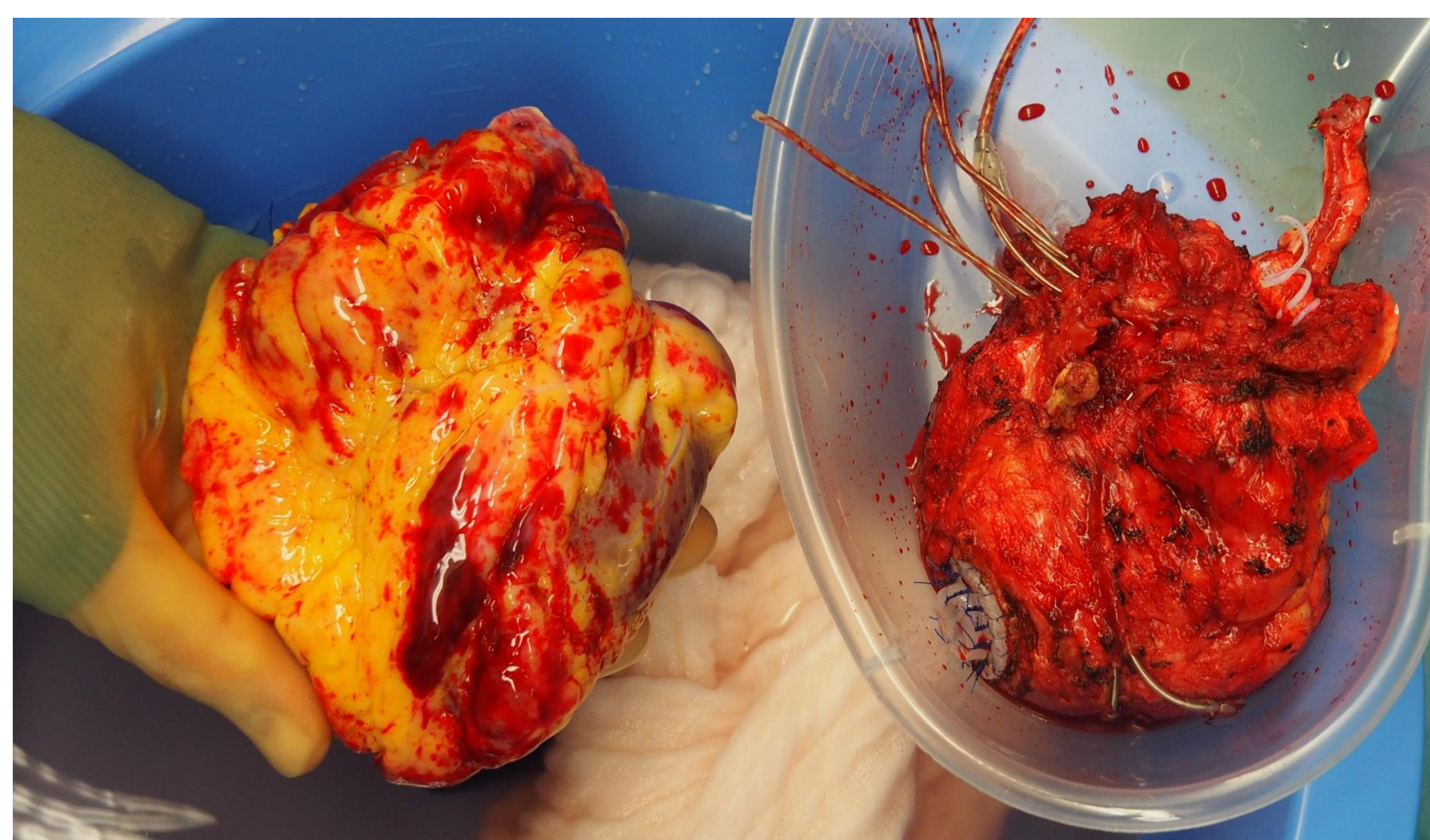
Case report

A 3-year-old girl had a history of Shone-Complex with hypoplastic aortic arch, bicuspid aortic valve with aortic stenosis and mitral valve stenosis. As infant a resection of aortic coarctation and aortic arch reconstruction had been performed. One year later, she underwent further resection of subaortic stenosis. After an uneventful period, the patient was admitted to our institution with residual high-grade left ventricular outflow obstruction and progressive left ventricular failure and NYHA Class-III symptoms. Aortic root replacement with homograft, mitral valve replacement and Konno-Procedure was performed. However, postoperatively she developed a low-cardiac output syndrome eventually requiring LVAD implantation.

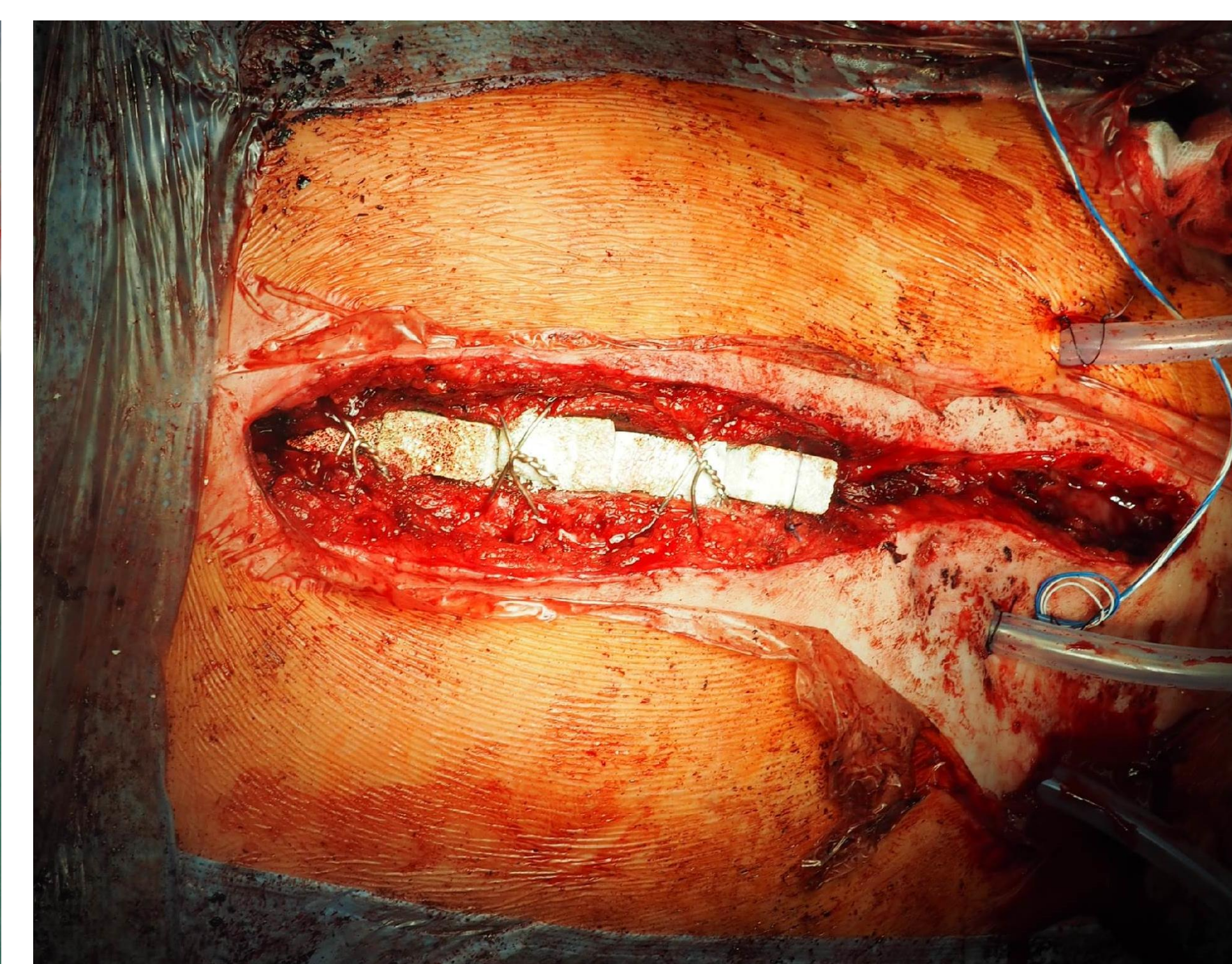
Thereafter, she was listed as a high-urgent candidate for cardiac transplantation. The child was supported with VAD for a period of 6 months. Due to the lack of donor hearts in her age group, an adult heart was accepted. Because of long transport time and history of multiple previous cardiac operations we used an OCS™ HEART device (TransMedics, Inc., Andover, MA) for normothermic preservation of the donor heart (perfusion time: 370 min). She underwent successful orthotopic heart transplantation (HLM time: 246 min, clamp time: 115 min) with a rather uneventful clinical course thereafter. Graft function was excellent at one year following transplantation.



PreTX photo from recipient with implanted LVAD (EXCOR®, Berlin Heart)



Left- the heart from female donor (age: 30 years, height: 143 cm, weight: 46 kg); right-explanted recipient heart (height: 94 cm, weight: 15.6 kg)



For sternal closure, ca. 1 cm of hydroxylapatite was used as a spacer between the two sternal bone halves

Conclusion

The use of adult organs in pediatric recipients can make a contribution to the enlargement of the pediatric donor pool. In addition, the OCS heart appears to be particularly suitable for previously operated patients, who require time-consuming release of tissue adhesions.



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