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Letter to the editor

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Published in:
Hepatology

DOI:
[10.1002/hep.32342](https://doi.org/10.1002/hep.32342)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2022

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

de Ville de Goyet, J., Baumann, U., Karam, V., & Verkade, H. J. (2022). Letter to the editor: Organ shortage and pediatric liver transplantation: David against Goliath ... *Hepatology*, 75(5), 1342-1343.
<https://doi.org/10.1002/hep.32342>

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First, the study shows that there was a significant increase in the use of split liver grafts from deceased donors, representing one third of all pediatric LTs today. However, 10% of split liver grafts had prolonged cold ischemia time over 12 h (compared with only 5% for whole liver grafts), which was associated with a significant reduction in graft survival. Ex vivo machine perfusion is a promising strategy to reduce static cold ischemia and improve outcomes in split grafts. Our group has recently reported a standardized technique for liver graft splitting during HOPE, which is now prospectively used at our center and allows us to reduce cold ischemia time for split grafts.^[2]

Second, the study showed that over the last 50 years, only 86 whole donation after cardiac death (DCD) grafts were transplanted into pediatric recipients, with very encouraging 5-year graft survival of 93%. As for adult DCD LT, the use of machine perfusion may allow us to expand the use of DCD liver grafts for pediatric LT despite additional donor warm ischemia. For example, in a recent randomized controlled trial, HOPE has been shown to reduce ischemic cholangiopathies compared with static cold storage in DCD LT.^[3] Real-time viability assessment during machine perfusion could be an additional incentive to use DCD grafts for pediatric LT.^[4] Machine perfusion strategies may also allow us to split selected DCD livers by reducing cold ischemia time and mitigating the cumulative risk of cold and warm donor ischemia.



In conclusion, the study of de Ville de Goyet et al. identifies at least two promising applications for machine perfusion in pediatric LT. All of the stakeholders should set the necessary ethical and legal framework for future studies to investigate the feasibility and safety of machine perfusion in pediatric liver transplantation.



CONFLICT OF INTEREST

Nothing to report.

AUTHOR CONTRIBUTIONS

Manuscript draft: Guillaume Rossignol and Xavier Muller; *Manuscript review, revisions, and approval:* Jean-Yves Mabrut, Kayvan Mohkam, and Remi Dubois.

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Letter to the editor: Organ shortage and pediatric liver transplantation: David against Goliath...

To the editor,
Rossignol et al. reacted to our recent European Liver Transplant Registry (ELTR) analysis and questions whether our data support machine perfusion strategies in pediatric liver transplantation (PLT). The

authors argue that machine perfusion strategies may reduce total cold ischemia times. Rossignol et al. also interpret our data to extend indications for splitting non–heart-beating donor (NHBD) livers. Although we acknowledge that machine perfusion strategies are


currently proving their value in transplantation surgery of adult patients, procedures for PLT still lack sufficient data on safety, quality, and short- and long-term outcome. The same argument holds for extending the indications for splitting NHBD livers for pediatric patients.

The ELTR has been collecting data on liver transplantation (LT) in Europe for the last 50 years. One of ELTR's key objectives has been to report that information on a regular basis in the form of "catalogue" papers—a way to return information to the medical and scientific community and to stimulate clinical research. These reports are based on retrospective data, with comments, statistical analyses, and clinical conclusions. ELTR has strong reservations to discuss and interpret data other than its own and to hypothesize on procedures that are presently still in a phase of clinical experimentation or development.

The recent ELTR report^[1] was dedicated to pediatric LT (PLT) performed from 1968 until 2017, a period with no machine perfusion use. The very first reports of PLT after machine perfusion dated back only to 2018 for full-size liver graft (FSLG)^[2] and to 2020 for left and right split grafts (SG), respectively.^[3] All these PLT were performed after 2017; moreover, ELTR do not acquire data about machine perfusion and related information cannot be extracted from the registry or studied.

Our analysis demonstrated that the number of FSLG PLT from pediatric donors had strongly decreased already before the year 2000 and that the number of SG PLT steadily decreased in the last decade.^[1] Similar observations were made on LT in adult patients, with domino LT and living donor LT also declining in the last decade while the use of NHBD has increased rapidly—one third of donors in 2016^[4] and growing nowadays. In children, 86 NHBD had ever been used in ELTR before 2018—a 0.5% figure of all donors; of these grafts, 58 were FSLG and only 28 were SG. Despite relatively long ischemic time (around 500 min overall), outcome was good but, again, only in a very small and selected group of patients.

Though resilience and optimism are necessary to continue facing donor organ shortage and pursuing the search for alternatives, there is a time for hypothesizing, a time to build evidence, and a time for conclusions. It is a call to the authors and to the whole transplant community to pursue this quest and these studies, collecting further data, analyzing the results with caution—and then progress toward improved chances for pediatric patients in need of LT.

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