Editorial

JOURNAL OF HEPATOLOGY

Anonymous living donation in liver transplantation: Squaring the circle or condemned to vanish?

Christophe Duvoux[1,*]

[1]*Medical Liver Transplant Unit and Liver Department, Henri Mondor Hospital-APH, Paris Est University, France*

See Article, pages 951–959

There is more than one way to perform living donor liver transplantation (LDLT). Besides the usual related/directed LDLT in which the donor and the recipient are biologically or emotionally related, unrelated LDLT has also been developed over the last 2 decades as a possible response to organ shortage.[1] In this setting, donation involves living donors who are not known by the recipients. This type of donation includes directed donation, *i.e.* domino transplantation, in which the recipient may be pre-identified, and also undirected donation. In the latter setting, unrelated, undirected LDLT is referred to as anonymous, or altruistic or good Samaritan donation.

Although related/directed LDLT accounts for the vast majority of LDLT, undirected anonymous donation has progressively emerged as a possible, complementary procedure to directed living donation (LD)[2] under the pressure of potential non-directed donors volunteering to donate anonymously, and who proactively approached transplantation centers.

However, this latter procedure is not allowed in all countries nor adopted by all centers in countries in which national regulations authorize the principle of anonymous LD. In countries as diverse as the USA, Canada, the UK, Iran, Saudi Arabia, Israel, the Netherlands, Switzerland and Hong Kong, anonymous LDLT has been allowed; in other countries, such as France, Germany, Poland or Italy, anonymous LDLT is not permitted, thus reflecting controversial approaches among organ sharing organizations, practitioners and societies.

In fact, undirected anonymous LDLT raises a number of issues that have not been fully solved so far. In the case of anonymous LD, non-directed donors do not receive any tangible benefit as directed donors could from helping a family member in need of an organ. Is it therefore ethical to submit a healthy person to a major operative stress[3–5] including the risk of death with no direct compensation as in directed LDLT[6]? What is the psychological profile of these super altruistic donors? Do they share specific mental traits, are they just thrill-seekers or just good Samaritans[2]? Is this procedure equally acceptable for kidney and liver donation[7]? How it is considered by the transplant community and the general population? What is the actual potential of ALD to counteract organ shortage? How easy it is to actively promote this kind of donation[8] and how applicable it is on a large scale?

In the current issue of the *Journal*, Goldaracena[9] *et al.* report on their unique 12-year experience of using anonymous LDLT in Toronto. Focusing on acceptability of the procedure and on donors' psychological traits, this study brings up amazing insights for the case of anonymous LD.

Results in both donors and recipients were excellent and the team should be congratulated for that. There was only one Dindo-Clavien grade 3 complication (2%) and 13 (26%) minor complications among 50 donors, including 21 (42%) right lobe donations. No death was reported. Median stay in hospital was 6 days. One-year survival was >90% in recipients, indicating an excellent risk benefit ratio for donors in this highly experienced center.

Over the study period, anonymous LD accounted for 6.7% (50/743) of all LDs in Toronto and for 2.45% (50/2,037) of all LT procedures, suggesting that anonymous LD may actually be considered as a part of the armamentarium to balance organ shortage.

The study also shows that anonymous LD was really well-accepted among donors with no concern about their mental status: donation had been preceded by a thorough mental assessment and by subsequent post-donation psychosocial follow-up. Those assessments indicate that donors often had a history of altruistic behavior before donation (68%); personality traits were characterized by agreeableness and conscientiousness with no evidence for thrill seeking. The concept of a good deed, a random act of kindness that would contribute to helping someone in need without the expectation of reciprocity or repayment, was identified as a core motivator, frequently triggered by an emotional reaction to an appeal from a potential recipient in the news or social media. No anonymous living donors expressed regret.

All together, these data strongly support this practice as an option to address organ shortages in highly selected individuals. As estimated by the authors, if 1 out 17,000 US citizen between 18 to 65 volunteered to anonymously donate a part of their liver, the entire list could be eliminated, thus squaring the circle.

Keywords: Liver transplantation; Living donation; Altruistic; Anonymous Living donation; Organ shortage; Good Samaritan.
Received 29 August 2019; accepted 30 August 2019
☆ DOI of original article: http://dx.doi.org/10.1016/j.jhep.2019.06.027.
* Corresponding author. Address: Medical Liver Transplant Unit and Liver Department, Henri Mondor Hospital APHP, Paris Est University, UPEC, France.
E-mail address: christophe.duvoux@aphp.fr.

On the other hand, the landscape might be not that rosy, and it could be a long time before this final goal is reached. The conclusions of the present report might be biased, as only 50% of the donors answered the post-donation survey. Therefore, one cannot exclude a less optimistic perception of ALD in donors who did not respond. More data should be collected at a larger, multicenter, multinational scale to confirm the optimistic conclusions of the Toronto experience.

Registry data reporting on anonymous LD for LT also give more pessimistic figures than in Toronto, scarcity of anonymous donation being the rule. Data from the United Network for Organ Sharing[10] show that over the last 4 years, LDLT accounted for 4 to 5% of all LT procedures (280 to 401 LDLTs/year) with no increasing trend, contrary to deceased LT. In 2017, after excluding domino LT, 98 unrelated LDLTs were performed, including only 12 anonymous unrelated LTs, among 367 LDLTs. This means that pure anonymous unrelated donation accounted for 3.2% of LDLTs and 1.5% of all LTs. Similar figures are also available from EuroTranplant[11]: between 2014 and 2018, the rate of LDLT was between 4 to 7.5%. However, between 8 to 15 unrelated ALD were performed annually, accounting for 8 to 13% of LDLTs but only 0.4 to 0.9% of all LTs. Those figures are clearly below the rate of anonymous LD reported by the group of Toronto and show that globally, anonymous LDLT cannot currently be considered the ultimate solution to organ shortage.

The reasons why anonymous LD is not expanding that much should be clarified. The reasons are probably multifactorial and related to the positions of organ sharing organizations and practitioners; rarity of super altruistic behavior in the general population cannot be excluded, intrinsically limiting the potential of the procedure. For the purpose of this Editorial, as Chair of the European Liver and Intestine Transplantation Association (ELITA), I conducted a short survey among the 11 ELITA board members who represent transplant surgeons and hepatologists from 8 countries across Europe. Among those countries anonymous LDLT was allowed in 3 (Belgium, the Netherlands and Switzerland) and not allowed in 5 (France, Germany, Italy, Poland and Spain). Among boards members, 7 considered anonymous LDLT as ethical in adult recipients and 9 in pediatrics, with the remainder viewing it as unethical. The majority (8 board members) considered that anonymous LDLT does not have the potential to compensate for organ shortages, although some considered anonymous LDLT as one tool among others for that purpose. Interestingly, one member reported on a highly active and well-structured program in Saudi Arabia. Answering the question "what could be the best indication for anonymous donation?", the majority replied "kidney transplantation", with others replying "conditions underserved by the MELD system or pediatrics". One of the board members declared that he would feel uncomfortable in actively promoting anonymous LDLT, another stressed a potential for organ trafficking.

This poll reflected how diverse the perception of anonymous LDLT was among transplant practitioners and, overall, skepticism regarding the potential of the procedure as a sustainable solution to organ shortages.

Two other ethical issues are also raised by the Toronto study. In 2 cases, altruistic donors gave a part of their liver after having previously donated a kidney, additional donors are currently being investigated for subsequent kidney-liver donation. This strategy should be questioned. How ethical it is to expose the same donor twice to the risk of LD? The other issue refers to anonymity. Despite a strict anonymization process, 12% of anonymous LDs were able to get in touch with their recipients, resulting in a deviation to the universal principle of anonymity in organ transplantation.

A major question is therefore to evaluate if we can afford to submit an anonymous healthy person to the risk of liver resection when LT is on the cusp of major advances which will expand the donor pool, including donation after circulatory death liver transplantation combined with normothermic regional perfusion[12] and reconditioning of expanded criteria grafts with perfusion machines[13]? In other terms, should organ sharing organizations, following the Toronto experience, start to actively promote anonymous LDLT, in order to fill in the gap between the need for LT and the liver graft offer, or is anonymous LDLT condemned to vanish, because recent advances in organ preservation will make the ethical balance of anonymous LDLT less favorable?

The experience of the group of Toronto is really unique and amazing. However, a rapid overview shows that the case for anonymous LDLT is not straightforward. Controversy still persists and guidelines/consensus meetings from competent authorities and scientific societies are eagerly needed to revisit and globally harmonize policies regarding this strategy. Scrutinizing the perception of general populations across various socio-cultural conditions will also be critical to objectively assess the potential for anonymous LDLT.

Conflict of interest

Please refer to the accompanying ICMJE disclosure forms for further details.

Acknowledgments

The author thanks all ELITA board members for participating the survey, by alphabetic order: René Adam, Marina Berenguer, Luca Belli, Constantino Fondevilla, Giacomo Germani, Silvio Nadalin, Wojtek Polak, Roberto Troisi, Christian Toso, Krzysztof Zieniewicz. The author also thanks Prs Daniel Charqui and Christian Toso for their useful comments.

Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jhep.2019.08.028.

References

[1] Wright L, Ross K, Abbey S, Levy G, Grant D. Living anonymous liver donation: case report and ethical justification. Am J Transplant 2007;7:1032–1035.
[2] Reichman TW, Fox A, Adcock L, Wright L, Abbey SE, Levy G, et al. Anonymous living liver donation: donor profiles and outcomes. Am J Transplant 2010;10:2099–2104.
[3] Lee JG, Lee KW, Kwon CHD, Chu CW, Kim BW, Choi DL, et al. Donor safety in living donor liver transplantation: the Korean organ transplantation registry study. Liver Transpl 2017;23:999–1006.
[4] Lauterio A, Di Sandro S, Gruttadauria S, Spada M, Di Benedetto F, Baccarani U, et al. Donor safety in living donor liver donation: An Italian multicenter survey. Liver Transpl 2017;23:184–193.
[5] Werner JM, Schlitt HJ. Living donor liver transplantation. Transplantation 2016;100:1173–1174.
[6] Reichman TW. Bioethics in practice: anonymous living donor transplantation: ethical or medically reckless?. Ochsner J 2017;17:18–19.
[7] Jendrisak MD, Hong B, Shenoy S, Lowell J, Desai N, Chapman W, et al. Altruistic living donors: evaluation for nondirected kidney or liver donation. Am J Transplant 2006;6:115–120.

[8] Fortin MC, Buchman D, Wright L, Chandler J, Delaney S, Fairhead T, et al. Solicitation of anonymous organ donors: a position paper by the Canadian Society of Transplantation. Transplantation 2017;101:17–20.
[9] Goldaracena N, Jung J, Aravinthan AD, Abbey SE, Krause S, Pritlove C, et al. Donor outcomes in anonymous live liver donation. J Hepatol 2019;71:951–959.
[10] view-data-reports/national-data. hothgd. p. https://optn.transplant.hrsa.gov/data/ view-data-reports/national-data.
[11] http://statistics.eurotransplant.org. p. http://statistics.eurotransplant.org.
[12] Hessheimer AJ, Riquelme F, Fundora-Suarez Y, Garcia Perez R, Fondevila C. Normothermic perfusion and outcomes after liver transplantation. Transplant Rev (Orlando). United States: 2019 Elsevier Inc; 2019.
[13] Hessheimer AJ, Fondevila C. Liver perfusion devices: how close are we to widespread application?. Curr Opin Organ Transplant 2017;22:105–111.