

## Adult live donor liver transplantation: routine, commonplace, standard care for end stage liver disease (we hope)

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In the last issue of Annals of Hepatology, Fisher and colleagues,<sup>1</sup> from the liver transplant program of the Virginia Commonwealth University, reported their prospective decade long experience with adult live donor liver transplantation (ALDLT) compared to their adult deceased donor liver transplant (ADDLT) outcomes. The cumulative number of transplants performed in each of the study groups was impressive (n = 107 ALDLT, n = 465 ADDLT), the outcomes, however, were even more impressive and add to the growing collection of papers in the medical/surgical literature suggesting that ALDLT is a very feasible venture when performed at experienced centres. Fisher et al reported that overall graft and patient survival between ALDLT and ADDLT were similar (1, 3 and 5 year patient survival: 82.7%, 76.9% and 75.5% ALDLT *vs.* 86.1%, 77.1% and 72.0% ADDLT, p value not significant) and the incidence of acute graft rejection was significantly less in the ALDLT group *vs.* ADDLT (12.7% *vs.* 21.7%, p = 0.05). Although the larger NIH ALDLT *vs.* ADDLT study,<sup>2</sup> of which Fisher et al's group participated, reported no significant difference in acute graft rejection between the two groups (in contrast to Fisher, *et al.*) it is apparent that acute rejection is not a problem in ALDLT. A noteworthy finding was that with hepatitis C (HCV), which constituted almost half of the transplants in both groups, histologic graft recurrence at one year was not significantly different between groups. Moreover, there did not appear to be any significant

graft or patient HCV survival difference confirming a previous retrospective nine-centre HCV ALDLT *vs.* ADDLT study<sup>3</sup> that also reported no differences in graft or patient survival after the centres had experienced > 20 live donor transplants. Not all clinical variables, however, were equal between ALDLT and ADDLT groups in Fisher et al's study. Biliary complications, well recognized to be significant in ALDLT,<sup>4</sup> were found to be greater in the ALDLT group (27.1% *vs.* 17.6%, p ≤ 0.026). Although the overall outcomes of the Virginia Commonwealth University experience are impressive, it is important to note that the ALDLT group was younger, more likely to be female and had less hepatocellular cancer. Another important is that a distinct learning curve effect was reported as patient survival was worse in the first 22 live donor transplants compared to the latter 82 transplants (1, 3, 5 and 10 year survival: 68.2%, 59.1%, 59.1%, 35.4% *vs.* 86.9%, 82.4%, 80.5%, 67.4%; p < 0.005). A similar effect was noted within the first 20 live donor transplants in the 9 centre HCV study.<sup>3</sup> Moreover, after the first 22 transplants, the Virginia Commonwealth University center adopted a policy that significantly decompensated patients with a MELD score > 25 were no longer considered for ALDLT because of poor outcomes, a finding previously reported in Germany.<sup>5</sup>

Despite excellent outcomes in experienced centres, with appropriate patient selection, ALDLT appears to remain a relatively infrequent occurrence and ADDLT continues to dominate. A look at the American Organ Procurement and Transplantation Network website<sup>6</sup> reveals that in 2008, 21,747 ADDLTs were performed in the USA but only 249 ALDLTs. Admittedly, ALDLT is more costly, a fact confirmed by a recent American cost-effectiveness study.<sup>7</sup> We appreciate that some centers in the USA may have the luxury of not needing a large ALDLT program because of a large volume of deceased cadaveric donors, a luxury not shared in Canada. Furthermore,

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Manuscript received: February 06, 2010.

Manuscript accepted: February 06, 2010.

a significant proportion of patients with end-stage cirrhosis in our experience, simply do not have a family member or close friend who may be an appropriate live donor candidate. Concern for the well-being of the potential live donor should also be paramount in the minds of both the liver transplant recipient candidate and the transplant team and this concern may limit ALDLT volumes. It is a 100% certainty that the live donors will experience some degree of pain and require post-operative convalescence. Significant post-operative sequelae have been reported in approximately 9%<sup>8</sup> including biliary complications, re-operation and patient death (0.03%). We note that in one extremely tragic circumstance reported in India, the donor suffered a post-operative cardiac arrest and remained in a persistent vegetative state and the recipient died shortly after liver transplantation.<sup>9</sup> Potential donors, therefore, must give a truly informed consent and must be aware of all of the material risks of live donation. The transplant program must ensure that potential donors are free of coercion (which can happen in some familial circumstances) and are not so encumbered by the overwhelming emotional aspects of the end-stage cirrhotic patient's situation that their consent is not rationally given. Provided programmatic safeguards are in place to protect the best interests of the donors (and to protect the transplant program from conflicts of interest), there is no reason why these obstacles should not also be resolved.

In British Columbia, Canada, we have had an ALDLT program in place for close to a decade because of necessity yet deceased donor transplants remain the mainstay of our program. The Virginia Commonwealth University group stated that their ALDLT program was instituted when the mortality on transplant waiting list increased to 20%,<sup>1</sup> in our province, we experienced a similar wait list mortality that has continued to increase. In 2008, our mortality on the waiting list was 30% and in 2009, a tragic year that saw the number of available deceased donor allografts fall by more than 25%, our waiting list mortality was 45%. The situation has become so desperate that liver transplant candi-

dates from our province and other Canadian provinces have recently attempted to solicit live donor candidates via classified advertisements in the local newspapers, and on the internet, with both situations receiving wide-spread media attention. The paper by Fisher and colleagues,<sup>1</sup> the subject of this editorial, has emphasized that there should no longer be any medical or surgical obstacles to ALDLT. For the sake of those who suffer end-stage liver disease and their families, the non-medical/surgical obstacles to adult live donor transplantation will be similarly overcome and in the years after 2010, ALDLT will become not only commonplace but mundane. *Inshallah* (God willing).

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