Organ Donation: Victory after Death

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Abstract

Despite the Transplantation of Human Organ Act passed in Indian Parliament in 1994, cadaver liver and/or kidney transplant are infrequently performed (in a few private hospitals) in our country compared to living donor liver or kidney transplant. The need for performing more cadaver liver and/or kidney transplants in private and public hospitals is obvious. Immediate measures which should be taken to facilitate more cadaver organ transplant both in private and public hospitals are suggested. Organ donation is for an individual or a family an invaluable opportunity, to register victory after death.

In our country, cornea (eye) donation from a dead patient is popular among the population for a few decades. Even a kidney donation from a living relative is frequently performed in India, as humans have two kidneys and one kidney is sufficient for an individual’s survival. However, donation of liver, kidney, heart from a dead patient (brain death – heart beating) is performed infrequently in our country. The term “brain death” was introduced in 1965 and was well defined – complete cessation of midbrain and cortical (brain) function, in 1968.1,2 Once a patient is certified brain death - heart beating, there is no question of survival of that patient.

In June 1994, Indian parliament passed the Transplantation of Human Organ Act which allowed removal of organs (liver, kidney, heart, etc.) from brain death-heart beating patients and which became a law in 1995.1,3 One of the aims of organ transplant act was to reduce illegal kidney sale for monetary gains, from unrelated poor persons. Despite this law in our country since 1995, kidney and/or liver transplants (LT) from brain death-heart beating patients are done infrequently.3,4

Liver and/or kidney transplant is possible, only when a patient in an intensive care unit (ICU) of a hospital, who is on a ventilator (respiration assistance), is declared brain death-heart beating, and whose close relative gives a written permission for the removal of organs. Heart beating patient is the most essential requirement for liver, kidney or heart transplant, as the organ (liver) should continue to receive blood supply till it is removed.3 Liver is immediately preserved in a container filled with ice, till transplanted in a patient (same blood group), within 24 hours after its removal. The liver is transplanted in the abdomen, in the same place from where the damaged liver of the patient is just removed (orthotopic liver transplant: OLT).

Relatives of a brain death-heart beating patient are never approached by the doctors of a transplant team but transplant coordinators (social workers) of the hospital approach the relatives. Any coercion or monetary temptation is avoided. Relatives are explained that by donating two kidneys and one liver, three lives can be saved. Even after the death of a close relative, a healthy organ from a relative suffering from liver disease for several decades and save the life of 3 dying patients, is emphasized.

LT performed by using whole liver of brain-death heart beating patient, is called deceased donor liver transplant (DDLT). In contrast, in living donor liver transplant (LDLT), a portion (250-650 g) of liver from a healthy adult (18-60 years) is removed and transplanted, in a relative with serious liver disease (advanced cirrhosis or acute fulminant failure).5 Liver grows to normal size in the next 8 weeks, both in the patient and the donor.

There are certain differences, in the LDLT and the DDLT. They are: (i) In LDLT, there is a minimal but definite risk of death to a healthy donor. The risk to the donor is greater in adult receiving LDLT (0.5%; 1 in 200) than a child receiving LDLT (0.1%; 1 in 1000),6 as a large portion of right lobe (50-60% of liver) is required for adults while a small left lobe (20-30% of liver) is sufficient for children. An adult patient weighing 60 kg will require about 480-600 g liver from a living donor while a child weighing 30 kg will require 240-300 g liver from a living donor; the graft:recipient body weight (GR BW) ratio should be at least 0.8 and ideal is 1. Those institutes which believe “doctors should do no harm” do not advocate adult LDLT (because of higher risk to the donor),7 unless surgeons with vast experience are available. (ii) In LDLT only a portion of liver is available while whole liver is available in DDLT. Two patients (1 child and 1 adult or rarely even two adults) can be treated in LDLT, by splitting the whole liver in two parts (split-liver graft).5,6 (iii) LDLT is a planned operation (allowing improvement of nutrition of the patient prior to operation), in which a relative’s one lobe of liver is transplanted into a family member suffering with a serious liver disease. In contrast, DDLT is an emergency operation, in which a dead donor’s liver is transplanted into the most serious patient, on the waiting list. Thus a LDLT solves an individual’s problem while DDLT solves the problem of the most seriously ill patient on the waiting list. (iv) In LDLT, cold ischemia time (time interval between removal of donor liver and its replacement in recipient), is much shorter than in DDLT. (v) LDLT involves 2 operations on 2 living persons and hence the cost is at least 25% more (20 lakh) than DDLT (approx. 16 lakh). In both LDLT and DDLT, daily oral immunosuppressive therapy is required for life-time, further adding to the cost. (vi) Biliary complications are frequent in adult LDLT.5,7 (vii) LDLT can be offered to patients considered not eligible for DDLT (e.g., alcohol liver disease with abstinence less than 6 months or a patient with hepatocellular carcinoma with extended Milan criteria,8,10,11 or a patient ≤ 70 years old).

Initially (1960), LT were performed from donors declared dead or cardiopulmonary arrest and were considered an experimental procedure. None of the patient survived more than 23 days, amongst 9 patients (reported in 3 studies) operated.12,13 In humans, DDLT was first successfully performed in USA in 1967 and in UK in 1968.14,15 From 1983, LT is the standard recommended therapy for advanced chronic liver disease and fulminant hepatic failure. The first successful LDLT was performed (from a mother to her son) in Australia in 1989.9,15 The first successful adult LDLT was performed in Japan in 1994 and later in USA (1999).16,17 In the world, 15000 LT are performed every year (90% DDLT; 10% LDLT). In USA alone, 6500 LT are performed every year; about 10-15% of patients on the waiting list die, as only 20% of potential donors ultimately donate their organs.

In India, unsuccessful attempts of LT were made in 1995, 1996; the first successful LDLT from a father to a child (girl) was performed on 28 November 1998.1 In our country, every year approximately two lac people die of liver disease, twenty thousand patients require LT and only two hundred LT (90%
incentives according to their performance.24

The patient’s survival after LT has markedly improved, due to proper selection of patient (neither too early nor too late), precise prognosis to judge mortality within 3 months, with Model for End-stage Liver Disease (MELD) score (February 2002),19,20 better preservation solution (University of Wisconsin Solution),21 expert anaesthetic care, standardized operative technique (avoiding venovenous bypass during anhepatic phase and preferring partial clamping of inferior vena cava (“piggyback”),22 effective immunosuppressive drugs (cyclosporine, tacrolimus, mycophonate mofetil) and rapid tapering of steroids,23 early diagnosis and treatment of complications (fungus, virus, infection, etc.).

In India, LDLT can be increased, if a family (trying hard to cope with a personal tragedy), feels for the suffers of 3 other families, and agrees for organ donation to 3 unknown dying patients, is recognized by the society as a noble family. Medical fraternity and public, should understand the urgent need and requirements for organ donation. A small country (Spain (Spanish model), is so well organized that highest organ donation rate (34.2 per million population) is achieved, by appointing transplant coordinators in hospitals and providing incentives according to their performance.24

It is possible to achieve higher rate of cadaver organ (liver - kidney) donation in India by: (i) appointing one transplant coordinator in ICU of all major (>300 beds or >20 ICU beds) private and public hospitals in cities with transplant facilities; (ii) to educate ICU staff to suspect early, to confirm immediately (by neurophysicists) and to maintain appropriately, a brain death heart beating patient, till the organs are retrieved. (iii) to keep a record of brain death patients in all ICU of a city; every 6 months, a meeting of all heads of ICU is desirable; to enable further appropriate action; (iv) informing the public about excellent results of liver transplant and requesting their cooperation for permission to remove organs, from a brain death heart beating patient in an ICU. (v) for a medico legal case, postmortem should be completed in the hospital by a forensic expert, soon after organ retrieval.25 (vi) to allow retrieval of organs in several hospitals (modifying the human transplant act). If these measures are taken, LT will not remain restricted for treatment of a few rich patients, in a couple of private hospitals in our country.

Since the option of organ (liver and kidney) donation of brain death heart- beating patient, is restricted to families of patients dying in ICU, the families of patients who die at home or in hospital (not in ICU), have still the chance of dehadan in Government teaching hospitals, to enable medical students to learn. Remember, your capacity to do good to the society does not end on the stroke of your demise. Organ donation or dehadan is for an individual or a family an invaluable opportunity to register victory after death.

References
