Editorial

Living Donor Kidney Transplantation - Is It Safe?

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The words of Homer Smith "Bones can break, muscles can atrophy, gland can loaf, even brain can go to sleep without immediately endangering one's survival, but should the kidney fail, neither bone, muscle, gland nor brain could carry on" - suggest the importance of normal healthy kidney. Nothing is more exciting in the field of nephrology than restoring health by replacing diseased kidneys' function, so that bone, muscles, gland and brain can carry on their work orderly. The first successful kidney transplant was a living donor transplant. Joseph Murray and his team at the Peter Bent Brigham Hospital, Boston, USA performed it on 23rd December, 1954 between identical twins. The year two thousand four marked the 50th anniversary of first successful kidney transplantation from a live donor. Since this historic event kidney transplantation has progressed from an experimental procedure to preferred treatment for End Stage Renal Disease (ESRD). Renal transplant offers longer survival, better quality of life at lower cost than dialysis. The majority of kidney in UK for transplantation comes from deceased donor, cadaver donor. In India majority more than 95% kidneys come from live donors. The numbers of patients awaiting kidney transplantation in United States are increasing. There is large gap between demand and supply of cadaver organs. The number of living donors is currently greater than number of deceased donors. This increase in the number of living donors (including living unrelated) in USA may ameliorate gap between demand and supply. A living transplant have many benefit over those who receive cadaver donor grafts. Living related donor grafts have better survival. Surgery can be planned, limiting waiting time on dialysis. Availability of living donor makes possible to have pre-emptive transplantation (transplantation prior to dialysis). The live-related donor transplantation becomes economical than cadaver transplant. The final reason for continued expansion of living donor transplant is insufficient supply of cadaver organs required to fulfill the needs of ESRD victim awaiting transplantation.

Despite its advantages, the living kidney donation remains complex ethical, moral and medical issue. Hippocratic principle "Primum non nocere" first do no harm. The living donor procedure could not be justified if unacceptable morbidity or mortality were to be incurred by the donor. The concept of removal of an organ for transplantation is unique among major surgical procedures, however in that it seems to expose the healthy donor to the risks of surgery solely for the benefit of another person. This concept has been evaluated carefully not only by the medical profession but also by the courts and by life insurance carriers. Some courts have ruled in favour of donation even by a minor, on ground that the donor would not only benefit psychologically and spiritually from the act of charity, but also might be psychologically harmed if prevented from donating at little risk, when the life of a close relative is at stake. In 1988 survey of major life insurance companies it was found that 100% accepts applications from kidney donors after nephrectomy, assuming the remaining renal function is normal, of companies 94% do not consider the otherwise healthy donor to be increased risk for shortened survival or medical problems. Only 2% had indicated, they would raise the premium for such persons. Most kidney donor experience no change or improved in their psychological health after donation. Fifty one studies examined 5139 donor who were assessed an average of 4 years after nephrectomy. Majority experienced no depression (77-95%) or anxiety (86-94%) with questionnaire score similar to control. The majority reported no change or improved relationship with their recipient (86-100%), spouse (82-98%) family member (83-100%) and non-recipient children (95-100%). Some experienced an increased self-esteem and many scored high on quality of life measures.

What Is The Risk To The Healthy Potential Donor?

The complications from kidney donation can be divided into those arising immediately from operation and whose which may emerge many years after the operation. The perioperative mortality rate for kidney donors is estimated to be 0.03%. Approximately 20 deaths have been reported after living allograft donation over 35 years. These data included donations made in the early years of transplantation; it is likely that perioperative mortality has since declined. Apart from the risk of mortality, Major complication of nephrectomy are very rare around 0.2% while minor complications occurs around 8% which included wound infection, pneumothorax atelactasis, pneumonia, urinary tract
infection and deep vein thrombosis with or without pulmonary embolism. The long-term risk can be assessed precisely because of the careful follow-up on thousands of renal donors and extensive information available from other unilaterally nephrectomized patients. Survival studies indicated that the 5 year life-expectancy of a unilaterally nephrectomized 35 year old male donor is 99.1% compared with 99.3% normal expectation. This has been compared with the risk incurred in driving a car 16 miles every working day. In Swedish experience 85% of donors were alive after 20 years of follow up where as the expected survival rate was 66%, suggesting donor survival is even better than that of the general population.

After unilateral renal ablation, rats develop hyperfiltration leading to proteinuria, hypertension and chronic renal failure. A concern had been raised that healthy human donors might develop hypertension, proteinuria and renal dysfunction years after unilateral nephrectomy. At 20 year or more after donation Najarian et al showed similar mean Creatinine clearance, blood pressure and proteinuria value between 57 donors (mean age 61 years) and 65 healthy (siblings mean age 58 years). A similarly benign clinical course has been described in two studies. After 45 years in 62 men who had kidney removed due to trauma during world war II, mortality rate were similar to those of world war servicemen of the same age and prevalence of hypertension was not increased. Five of 28 surviving subjects had level of proteinuria between 377 and 535 mg/day and three had increased serum creatinine value (1.7-1.9 mg/d). Glomerular sclerosis was not increased in 10 subjects who had autopsy examination. Kasikse et al conducted a meta-analysis of 48 studies of 3124 patients that had been unilaterally nephrectomized for a variety of reasons. After nephrectomy there was a mean decrement of glomerular filtration rate by 17.1 m/min. However decline was not progressive but tended to improve with each 10 years of follow up. Although proteinuria progressively increased (76 mg/day per decade) among patients nephrectomized for other reasons, it was negligible after nephrectomy for kidney donation. The prevalence of hypertension did not change after nephrectomy, but systolic blood pressure increased slightly.

**Does Genetic Background, Ethnicity and Environmental Factor Make Difference?**

In this issue of JAPI, Manisha Sahay et al reported pilot study of 50 living donor for duration 3 months to 20 years. Study shows that Indian patients do not behave differently form their Western counterpart. Although they show significant increase in proteinuria, microalbuminuria, renal size, blood pressure and decline of GFR after donation, the long term implications of these needs to validated in large number of donor over longer period. Thus unilateral nephrectomy in healthy subjects does not cause progressive renal dysfunction but at most may be associated with micro-albuminuria and slight increase in blood pressure. Although these abnormalities are mild and not alarming it may be prudent to perform annual assessment of each donor.

**References**

7. Masden Harrison: Massachusett's Supreme Judicial Court Equity Number 68651 (Quoted in 6).