

The Donor Kidney Transplantation

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Introduction:

The first human kidney transplant, carried by, Voronoy in 1933. The first use of live related donor, Paris Michon et.al. 1953, while in 1954 the first transplant between identical twins, Boston (Murray et.al., 1958).

In 1962, first use of tissue matching to select a donor and recipients (Hamburger et.al., 1962 Terasaki, et.al., 1965, Dausset, 1980). In 1978, first clinical use of cyclosporine (Calne et.al. 1978).

1978 application of matching for HLA-DR and renal transplantation (Teing and Morris 1978).

In contrast to non-paired vital organs like heart and liver, the kidney is paired in each normal individual each has 4-5 folds of minimal required functions, thus it has become an accepted medical procedure using living volunteers of cadavers as kidney transplant.

Materials:

The first kidney unit in Iraq established in Rasheed Military Hospital in 1973. I took my share as a permanent donor nephrectomy surgeon during the end of 1979, since then 67 cases of renal transplantation were done, as such operations were done as a routine work together with the excessive work of surgery that the present Gulf war had been imposed on us despite many peace attempts by Iraq.

No cadaveric kidney transplant attempted, all 67 donors were living related donors, each one of them was submitted to close medical check up as follows:

Past medical history includes:

- Serious systemic illness
- Previous blood pressure record
- Renal or U.T. disorder
- Previous operation

General medical examination:

Investigations included:

- Tissue type
- Chest X-ray
- Blood pressure
- General urine examination chemistry
- Blood urea
- Serum creatinine
- Complete blood picture
- Blood group
- G.F.R
- I.V.U
- Selective renal arteriogram
- Serum Ca, inorganic phosphate, chloride, glucose, uric acid, bilirubin and S.G.O.T.

Only 2 donors have symptoms of duodenal ulcer, with suspicious Ba-meal films, gastroscopy confirmed active ulcer, both received a course of medical treatment with Tagamet.

Gastroscopy revision was done later and showed normal duodenal finding with disappearance of symptoms before nephrectomy.

Only 2 donors had previous operations one had tonsillectomy, the other appendectomy, neither of them formed an obstacle to proceed with the nephrectomy.

Looking into details and particulars of these 67 donors, it was found that the list comprising 31 brothers, 31 sisters, 2 mothers one daughter and one son (slide 1) the age distribution of donors (slide 2) showed a mean value of 24 years 20 below age 19, 29 between age 20-29 16 between age 30-39 and only 2 above age 40.

35 of the 67 donors were females (slide 3) and 32 were males.

45 of the donors were single (slide 4) while 22 were married of these, 18 had children.

The routine donor Kidney in Rasheed Dialysis and transplant unit was the left one, (slide 5) so 55 out of 67 Kidneys were left Kidneys, the 12 right kidneys were taken because the left kidneys have a technical problem as 10 of them have double left renal artery, one had sizable aberrant artery to upper pole and one the left renal artery showed a suspected stenosis.

Most of the donor kidney has a high percentage of tissue compatibility HLA, ABO group (slide 6).

32 showed 100% compatibility
12 showed 75% compatibility
23 showed 50% compatibility

Regarding blood grouping (slide 7):

19 have blood group A- Rh +ve
18 have blood group B- Rh +ve
28 have blood group O- Rh +ve
2 have blood group AB- Rh +ve

These values coincide with general population values in Iraq.

2 years ago in Iraq the Government established a law for controlling of organ transplant, articles are similar to those elsewhere permitting cadaveric transplants forbidding donation under force or for money, still in Rasheed Centre we stick to choosing donors who are first relatives. So many reasons were proposed in my country families comprises at least 6 persons, the family ties are so strong that rarely you find one of the family members refuse to donate his kidney even if he is married with many children, actually we have no shortage of donors for the time being we have a sum of 44 patient on dialysis in our centre and the number of waiting patient for transplant who has already donors available are 12.

Other reasons of choosing living related donor is the better results that cadaveric kidney transplant (Kreis, 1981).

Also that the operation can be specifically well planned which limit waiting time of dialysis reducing it with economic advantages (Barnes, 1977). But also prolonged dialysis increases development of antibody to HLA antigen with repeated blood transfusion.

In my country it is rather difficult to make donor family appreciate the needs of the organ transplant on clinical death. (Stuart et. al.,1981).

Also such manoeuvre will lead to less living related donor to be available.

Technique of living donor nephrectomy:

Principles are:

- Adequate exposure
- Careful handling of tissue
- Careful periarterial dissection to limit vascular spasm
- Preservation of periarterial and periureteric fat to ensure adequate vascularity and to limit the possibility of subsequent ureteral necrosis
- Maintenance of an active diuresis during nephrectomy to ensure immediate post-transplant function.

Anaesthesia: General endotracheal anaesthesia.

Position: Lateral position with table flexed to extend the presenting flank.

Incision is made routinely over 12th rib and the latissimus dorsi muscle posteriorly and external oblique muscle anteriorly are divided, exposing periosteum with subperiosteal removal of the rib.

The internal oblique and transversus abdominis muscles are divided with the underlying transversalis fascia, entering into the retroperitoneal space.

The peritoneum is swept off the back surface of anterior abdominal wall and posterior abdominal and abdominal surface of adjacent diaphragm and off the perinephric fat and Gerota's fascia, the later lies in the centre of the wound are entered exposing the anterior surface of the kidney which is dissected free of the underlying perinephric fat then the posterior surface and upper lower poles trying to avoid handling the kidney i.e. pence and scissors dissections as much as possible avoiding also dissection in the renal hilus in order to protect the arterial and venous supply of the ureter.

The renal vein is dissected to its junction with the vena cava on right side securing and ligating the adrenal and gonadal tributaries.

Big veins or plexus of veins joining the posterior surface of renal vein mainly on left side coming through junction of psoas muscle and vertebral bodies should always be secured and ligated.

There is always one or more small tributaries from extraperitoneal tissue they should be ligated too.

The renal artery is much better to be exposed posteriorly after lifting the kidney from its beds and rotating it anteriorly starting from its origin, the branch to the suprarenal gland is ligated and cut.

An inch length of the main renal vessels is to be dissected and separated from each other.

During dissections an adequate infusion of crystalloid solution and Mannitol has been used. The kidney is taken out when it becomes attached only by its vascular connections it is then perfused with a chilled heparinized electrolyte solution.

The wound is closed in layers as usual.

Post-operative period in all patients was uneventful, donors being discharged on the 7th post-operative day.

Results:

26 of the kidney transplant did not show any sign of rejection.

24 of the kidney transplant had a mild rejection but are doing very well.

6 have chronic renal failure and are maintained on dialysis.

11 died after complication, 5 of them being due to rejection accompanied by cellular viral infection.

2 died within the 1st month post operatively, 4 died between 1-6 months post operatively, 5 died between 6-12 months post operatively.

Conclusion:

In Iraq there is no problem in the availability of live donor kidney for transplantation for the time being, the technique is of importance for the future of its function.