Kidney transplantation or **renal transplantation** is the organ transplant of a kidney into a patient with end-stage renal disease. Kidney transplantation is typically classified as deceased-donor (formerly known as cadaveric) or living-donor transplantation depending on the source of the donor organ. Living-donor renal transplants are further characterized as genetically related (living-related) or non-related (living-unrelated) transplants, depending on whether a biological relationship exists between the donor and recipient. Exchanges and chains are a novel approach to expand the living donor pool.

The Indication For Kidney Transplantation

Is end-stage renal disease (ESRD), regardless of the primary cause. This is defined as a glomerular filtration rate < 15 ml/min/1.73 m2. Common diseases leading to ESRD include malignant hypertension, infections, diabetes mellitus, and focal segmental glomerulosclerosis; genetic causes include polycystic kidney disease, a number of inborn errors of metabolism, and autoimmune conditions such as lupus. Diabetes is the most common known cause of kidney transplantation, accounting for approximately 25% of those in the US. The majority of renal transplant recipients are on dialysis (peritoneal dialysis or hemodialysis) at the time of transplantation. However, individuals with chronic kidney disease who have a living donor available may undergo pre-emptive transplantation before dialysis is needed. If a patient is put on the waiting list for a deceased donor transplant early enough, they may also be transplanted pre-dialysis.

Source of kidney

1- Living donors

Approximately one in three donations is now from a live donor. Potential donors are carefully evaluated on medical and psychological grounds. This ensures that the donor is fit for surgery and has no disease which brings undue risk or likelihood of a poor outcome for either the donor or recipient. The psychological assessment is to ensure the donor gives informed consent and is not coerced. In countries where paying for organs is illegal, the authorities may also seek to ensure that a donation has not resulted from a financial transaction.

2- Organ trade

In the developing world some people sell their organs illegally. Such people are often in grave poverty or are exploited by salespersons. The people who travel to make use of these kidneys are often known as 'transplant tourists

3- **Deceased donors**.

Deceased donors can be divided in two groups:

- Brain-dead (BD) donors
- Donation after Cardiac Death (DCD) donors

Contra-indications for kidney transplantation

1- Cardiac disease
2- Pulmonary insufficiency
3- Hepatic problems
4- Cancer
5- Morbid obesity
6- Heavy smoker
7- Infectious disease such as HIV
8- Mental illness with drug abuse

Compatibility

In general, the donor and recipient should be ABO blood group and cross match (human leukocyte antigen — HLA) compatible. If a potential living donor is incompatible with their recipient, the donor could be exchanged for a compatible kidney exchange, also known as "kidney paired donation" or "chains" have recently gained popularity. In an effort to reduce the risk of rejection during incompatible transplantation, ABO-incompatible and desensitization protocols utilizing intravenous immunoglobulin (IVIG) have been developed, with the aim to reduce ABO and HLA antibodies that the recipient may have to the donor. The level of sensitization to donor HLA antigens is determined by performing a panel reactive antibody test on the potential recipient.

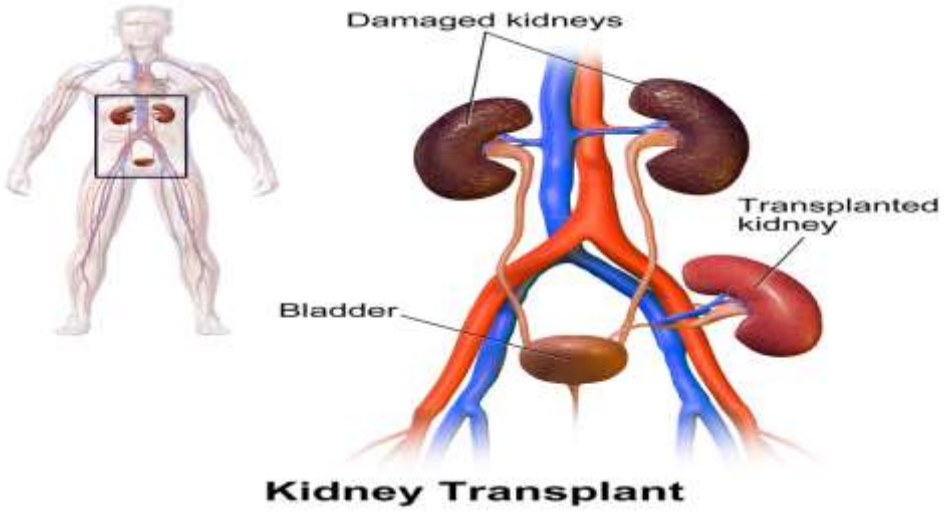
Procedure of kidney transplantation

In most cases the barely functioning existing kidneys are not removed, as removal has been shown to increase the rates of surgical morbidity. Therefore, the kidney is usually placed in a location different from the original kidney. Often this is in the iliac fossa so it is often necessary to use a different blood supply:

- The renal artery of the new kidney, previously branching from the abdominal aorta in the donor, is often connected to the external iliac artery in the recipient.
- The renal vein of the new kidney, previously draining to the inferior vena cava in the donor, is often connected to the external iliac vein in the recipient. The donor ureter is anastomosed with the recipient bladder.

Complications of kidney transplantation

1. Transplant rejection (hyperacute, acute or chronic)
2. Infections and sepsis due to the immunosuppressant drugs that are required to decrease risk of rejection
3. Post-transplant lymphoproliferative disorder (a form of lymphoma due to the immune suppressants)
4. Imbalances in electrolytes including calcium and phosphate which can lead to bone problems
5. Other side effects of medications including gastrointestinal inflammation and ulceration of the stomach and esophagus, hirsutism (excessive hair growth in a male-pattern distribution) with ciclosporin, hair loss with tacrolimus, obesity, acne, diabetes mellitus type 2, hypercholesterolemia, and osteoporosis
6. Hypertension
7. Proteinuria



Kidney Transplant

Definition

Inability of the kidneys to regulate fluid and electrolyte balance and remove toxic products from the body .Two types from renal failure

- **Acute Renal Failure**
- **Chronic Renal Failure**

Cause of acute renal failure

- **Cardiovascular problems**
  - Heart failure
  - Pulmonary embolism
  - Myocardial infarction
- **Hypovolemia**
  - Burns
  - Dehydration
  - Hemorrhage
  - Diuretic abuse
  - Peripheral vasodilatation
  - Antihypertensive abuse
  - Sepsis
- **.Renovascular**
  - Aterial embolism
  - Aterial or venous thrombosis
  - Tumor
- **Sever vasoconstruction**
  - Malignant hypertension
  - Vasculitis

Cause of chronic renal failure

1. Chronic glomerular disease
2. Urinary tract obstruction

3. Diabetes mellitus
4. Vascular disease
5. Congenital abnormalities
6. Nephrotoxic

❖ **Clinical manifestation**

A. Decrease urine out put
B. Hypotension or hypertension
C. Peripheral edema
D. Cardiac arrhythmia
E. Abdominal pain
F. Poor skin turgor
G. Dry mucous membrane
H. Uremic breath odor
I. Paler of skin
J. Brown line on nails

❖ **Diagnostic test**

Θ **Blood chemistry:-** increase potassium ,phosphorus, magnesium, calcium, sodium

Θ **Hematology:-** decrease Hb, PCV, increase PT and PTT

Θ **Urine chemistry:-** albuminuria, protein urea, increase red blood cells

Θ **Abdominal ultrasound :-** small size of renal

Θ **Abdominal CT scan, MRI** may show underlying cause

Θ **Renal biopsy**

❖ **Medical management**

- Monitoring vital signs and laboratory studies
- diuretic such as furosemide (lasix)

- Peritoneal dialysis or hemodialysis
- Diet :-low-protein ,low sodium, low potassium, low phosphorus, high calorie with fluid restrictions
- I.V therapy : fluids as needed
- Activity: as tolerated
- Erythropoietin
- Cardiac glycoside :- digoxin
- Vitamins :vitamin B6 and vitamin C

❖ Final treatment of renal failure is kidney transplantation should prepare patient by dialysis (hemodialysis or peritoneal dialysis)

❖ **<u>Complication for renal failure</u>**

- ✓ Electrolyte imbalance
- ✓ Arrhythmias
- ✓ Heart failure
- ✓ Pulmonary edema
- ✓ Anemia
- ✓ Platelet dysfunction
- ✓ Sexual dysfunction
- ✓ Metabolic acidosis