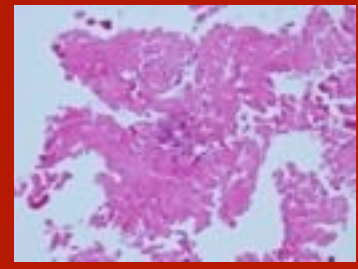


# Cardiac Transplantation



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## Transplantation: Definitive Treatment for Terminal Organ Failure

The past few years have seen rapid progress in the medical therapeutics of heart failure, which has gone hand in hand with advances in device treatments of heart failure. Modern ventricular assist devices are handy, durable and more or less trouble free. However, their costs remain prohibitive. Heart transplantation provides the most durable results at a fraction of the cost, an unsurpassable quality of life. The best centres in the world can claim one year survival of as much as 93%.

Cardiac transplantation was initiated half a century ago, with periods of reckless enthusiasm in the late sixties tempered by stunning failures that forced transplant centre shutdowns. Failures forced advances in immunomodulation and quantum improvements in early and late post-transplant survival. Limitations of donor availability globally have not permitted cardiac transplant numbers to increase beyond 2500 p.a. over three decades.

Organ procurement from deceased donors is still in its infancy in India. The process of identifying brain death, counseling families about the possibility of organ donation, maintaining donors until organ procurement, transport and allocation of organs has yet to be standardized. The lead in deceased donation was taken by Tamil Nadu where support from the state government, efforts of the transplant community and a well informed population resulted in a higher rate of deceased organ donation than in other parts of the country. In Delhi the rate of deceased donor organ donation is low and the kidney and liver transplant programs are predominantly dependent on living donors.

Cardiac transplantation obviously is impossible without a thriving brain-stem-death beating-heart cadaver organ donation programme.

In India we are at the threshold for rapid advances in all transplant related activities, with imminent

increases in health budgets and serious efforts to usher in a National Organ Transplant Programme. Minor adjustments in the legal framework that led to over a hundred cadaveric donations in Tamil Nadu last year, can be replicated nationwide. Our own experience at Sir Ganga Ram Hospital is that hesitations towards cadaver organ donation can be overcome with concerted efforts to that end.

### Case summary: Dilated Cardiomyopathy

44 F, shortness of breath 4 years, pedal edema. Poor systolic heart function, LVEF 20-25%, global LV hypokinesia, grade 2 diastolic dysfunction, moderate mitral regurgitation— compatible with Idiopathic DCM. She remained on intensive medical management with an once in 6 months hospitalisation for augmentation of medical therapy. During the recent morbidity over 6 months she was admitted to the hospital 6 times with class 4 dyspnoea, paroxysmal nocturnal dyspnoea, orthopnoea, frank pulmonary edema and hypotension. Despite maximal therapy, she remained home bound.

### Detailed cardiac transplant

assessment was carried out to exclude treatable causes of heart failure as well as to identify latent pulmonary disease. Additionally each organ system was checked, serology for common infections and

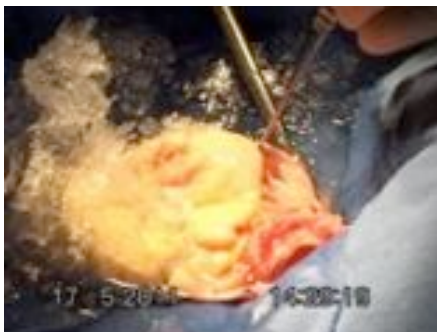
patients sensitisation to alloantigens were excluded and the patient stabilised medically prior to discharge to home awaiting a call from the hospital.

As soon as a potential donor was identified, the patient received a call from the hospital to be admitted. Upon admission basic blood tests were performed including cross match for blood and blood products. Patient (recipient) is wheeled into

the recipient operating room a short while after the donor is wheeled into the donor OT. Both OT's work in tandem such that once the donor heart has been retrieved, valuable time is not wasted and the the donor heart can be implanted swiftly and reconnected to recipient circulatory system. It is believed that the total ischaemic time should be no more than 4.5 hours. **For our first cardiac transplant, this was 3 hours and 10 minutes.**

### **Receipient OT:**

The bowl containing the donor heart was passed to a recipient OT nurse. Receipient was connected to Cardio-pulmonary bypass. Donor heart anatomy was re-examined, left atrial and pulmonary artery cuffs were fashioned and heart was replaced in ice cold ringer's solution.

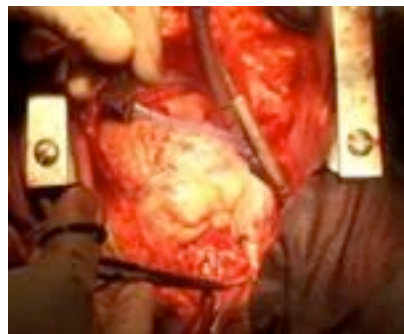


Recipient heart was excised creating satisfactory tissue at each anastomotic site. Donor heart was brought into the operating field and donor left atrium was sutured step by careful step to the recipient atrial cuff ensuring a blood tight anastomosis. IVC to inferior Right atrium, SVC- SVC and pulmonary artery to main pulmonary artery anastomoses were performed one by one taking care to avoid leaks, rotation, stricture or injury.

Finally with the aorta to aorta anastomosis the suturing part of the operation was completed.

### **Reperfusion/ Initial recovery:**

1 gm of methylprednisolone is injected IV, all air bubbles are



carefully removed from the cardiac chambers and the cross clamp is removed from the ascending aorta to allow recipient blood to fully contact the donor heart. Slow cardiac reperfusion, gradual patient rewarming and careful attention to hemostasis are essential. The cardiac performance was satisfactory and the patient was returned to the Post-op ICU in a stable condition on minimal inotropes and no mechanical support.



She made a gradual recovery to walking on the ward by day 7. Triple drug immunosuppression was used along with induction with RATG. She suffered drug interactions, fluctuations in drug levels and other incidents. Grade 2R rejection was identified on endomyocardial biopsy at 6 weeks, this was treated with augmented immunosuppression. This led to candida oesophagitis and CMV disease also required specific treatments.

### **Carry Home message:**

Cardiac transplant was the only therapy that could help this patient and we conducted it safely. We overcame many a post-transplant complication with aggression and patience. There are many similar patients who are desperate for another shot at life. Together we can help them.

Cardiac Transplantation is complicated, demanding and challenging. The operative processes must work with utmost precision. Transplant patients remain fragile for weeks afterwards and cannot be neglected ever so briefly.

**Return to daily life and employment remain the goals for all transplants.**