

RECONSTRUCTIVE TRANSPLANTS IN INDIA

Need for reconstructive transplants

Reconstructive transplants involve the transplantation of composite tissues. The other terminology used to describe these transplants include vascularized composite allotransplants (VCA) and Composite tissue Allotransplants (CTA). They differ from solid organ transplants that they are not life saving but done to enhance the quality of life. The commonest among these transplants is that of the upper limbs. Next common is the face, either full or parts of it.

Hand transplants has been accepted as one of the best methods of rehabilitation for the persons who have lost their hands. The risk benefit analysis so far has been favorable for hand transplants in those with loss of both hands. For persons who have lost single hands this may not be true. Hand transplants are indicated for traumatic losses and not for congenital absence. The outcome is best in distal amputations, even though it has been done also at proximal levels. The number of such handicapped persons is not available from our country. But the number of enquiries that has been made from different parts of the country after the successful outcome of the transplants done at Amrita Institute in Kochi denotes that this number could be large. The alternative to hand transplants is prosthetic rehabilitation. This is which is associated with lot of drawbacks which include high cost and difficulty to maintain them, chances of periodic breakdown, lack of availability, lack of sensations and fine motor movements and inconvenience to use due to its weight.

Face transplants are indicated in the cases where conventional reconstruction cannot restore function to severely mutilated face. The cause for this mutilation can be burns, accidents and diseases like neurofibroma. In India the main indication would be burn injuries and neurofibroma compared to the gunshot injuries that are common in the west. Considering the vast number of burn injuries that are seen in India and the gross face deformities associated with them there could be a large number of potential facetransplant recipients in the country

Guidelines for donor and recipient

Hand recipients

As mentioned previously the risk benefit ratio ie. when the risk and cost of lifelong immunosuppression is considered, hand transplants will be strongly justified only in bilateral hand amputees. So in all hand transplant programmes in the country these patients could be given priority till the time more robust data is available from our country with regards to the behavior of our patients to long term immunosuppression after hand transplants.

The recipient and the family need to know about the implications associated with the transplants. These are mainly the need of adhering to immunosuppressant medications lifelong and its associated possible complications like hypertension,

opportunistic infections, diabetes etc. They need to know about the financial burden. Apart from the cost of the surgery which could be variable from center to center, the cost of immunosuppression and its investigations currently amounts to Rs 3 lakhs for first year and about 1,5 lakhs in subsequent years. They also have to know the need for commitment toward rigorous physiotherapy for 1 - 1½ years after the transplant. This will necessitate staying near the institution for this length of time.

The recipient and the family needs to undergo multiple counseling sessions with knowledgeable transplant coordinators. The social and financial background of these potential recipients needs to be evaluated and fully found to be satisfactory before they are put in the waiting list for transplants.

Another issue that can be very important deterrent to potential recipients is the lack of centers doing hand transplants in the country. The time available after a brain dead donor is identified and transplant has to be carried out is only 6 -12 hours. The donor numbers will be scarce. Hence the potential recipient will need to stay near the transplant center for an indeterminate time waiting for the suitable donor.

Face recipient

The recipients for face transplants are more difficult to choose than the hand recipients. Their functional deficits have to justify the transplants. These could include inability to talk, eat properly as well as disfigurement affecting their social interactions. Associate eyelid loss leading to corneal opacities resulting in a blindness which could be reversed by corneal surgery after a transplant may make the indication for face transplant stronger. But the risk benefit ratio has not been established in face transplants and is difficult to do estimate. A potential chance of rejection exists in all these cases, even though minimal. If it occurs a safe exit strategy should be able to be implemented so that the patient returns to the pre transplant state with not much added morbidity.

Donors

Getting adequate donors are going to be difficult for both transplants as compared to donation of internal organs. The donation of internal organs like heart, liver and kidney from brain dead donors has picked up well in the country. But both the hands and face donation have the inherent drawback of causing external disfigurement after their donation. This disfigurement is masked to some extent by prosthetics. Hand donation will be comparatively more acceptable than that of the face since the mutilation masked by the prosthetic may be less noticeable since it can be covered well during the funeral rites. There need to be a strong education of the public regarding the benefit with such donations.

There are well accepted donor criteria like free from HIV/cancer etc. Differing from the internal organs, hand and face could be procured from brain dead donors even when the biochemical parameters and internal organ dysfunction is present which may not allow liver or heart to be procured. Matching of the donor and recipient needs to be standardized across the country. Currently most centers including ours use CDC cross matching on peripheral blood or using more advanced assays like

luminex platform. When multiple organs are procured from the same donor, the sequence of organ procurement need also to be decided with interteam discussions.

Ethical and legal issues

Composite tissues fail to get specifically mentioned in the new organ transplant act of India. So all these transplants have to follow the guidelines for "other organs". The permission to perform them is to be obtained from the state government, which does so after the mandatory inspections are conducted. The prerequisites for a transplant center for doing kidney and liver has been detailed in the act. But no such guidelines are available for hand or face transplants. This needs to be provided at a national level as an addendum to the act to facilitate the state governments. The requisites of a hand transplant center would include the following

- a) Institutional capability of procuring organs and performing solid organ transplants
- b) Adequate number of hand/micro/orthopedic surgeons and anesthetists. At least five to six senior surgeons need to be associated with each programme with two to three assigned surgical assistants to each of them. There should be adequate anesthetic help to perform prolonged (14-20 hours) surgical procedures.
- c) Good ICU support for 2weeks with staff capable of looking after both transplant and microsurgery nursing requirements
- d) Transplant immunology support. This could be from the renal physicians who are engaged in transplants in the institution.
- e) Transplant pathologist
- f) Transplant social worker team

Similar requisites need to be prepared for face transplants.

The ethical and legal issues involved in the identity of the donor being carried by the recipient has been raised. In case of the hands thumb impression is the issue, but this is more of theoretical debate in the current scenario .In case of face transplants this may be different. The face in the recipient doesnot exactly same as per the experience so far worldwide. But the counseling and consenting process with donor families and the recipient need to specify this before the transplant is carried out

