
Eye Banking and Hospital Cornea Retrieval Program

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Eye bank is an organization which deals with the collection, storage and distribution of the cornea for the purpose of corneal grafting, research and supply of eye tissue for other ophthalmic purposes.

The history of corneal transplantation dates back to 1824 when Franz Reisinger transplanted a cornea in a rabbit. For the several decades next, there was no headway in this regard until 1906 when Edward Zirm of Czechoslovakia performed first human cornea transplantation for an alkali burned cornea on Mr. Alois Gloger. Perhaps the most remarkable advancement in corneal transplantation occurred around 1935 when Russian ophthalmologist Filatov popularized it so much that he earned the name of the father of Keratoplasty. The first eye bank was established in New York in 1944. In the following year (1945) Dr. Muthiah established the first eye bank in India at Govt. Hospital, Madras. The first corneal transplantation in India was done by Dr. Dhanda in Indore. In order to co-ordinate, maintain quality, collaborate to solve common challenges, sharing of information, fostering innovation among the eye banks and also to advocate for sight restoration by corneal transplantation, Eye Bank Association of America was founded in 1961. A similar organization was established in India at LVP, Hyderabad 4th January 1989, known as Eye Bank Association of India (EBAI).

Eye banks have an Administrative and Medical section, each headed by a Director. The Administrative Section deals with public awareness, fund raising, liaisoning with Govt. and NGOs, staff activities, donor and tissue related issues and quality issues. Medical

Section looks after donor and tissue suitability while ensuring medical standards.

Each eye bank has the following three components

1. Eye Information Centre.
2. Eye Collection Centre.
3. Eye Bank Proper.

Eye information center (EIC)

Its main purpose is to create awareness among the general public about eye donation by distributing literatures, posters and showing films. It also issues eye donation card to the pledger and handover the signed pledge forms to the eye bank. Here the Medical Social Worker has an important role to play.

Eye collection center (ECC)

Eye Collection Center deals with the collection of eyes from the deceased and handing over the tissue to the eye bank. An ideal place for ECC is a Primary Health Center or any other place with an MBBS doctor trained for enucleation. Thus, the ECC receives call for eye collection, collects the eye, informs the eye bank, dispatch the eye tissue to the bank and issues an appreciation letter to the deceased family. To carry out these works, ECC requires a doctor, technician, driver, assistants and grief counsellor. For this purpose a universal telephone number 1919 is usually installed at the ECC and other equipments like refrigerator, hot air oven / autoclave, enucleation set with enucleation drum, thermocool boxes with containers for eye ball, stethoscope, and 10cc syringes and bottles for blood collection, artificial eyes and consent forms are provided with.

Eye bank proper

In order to establish an eye bank, permission from the Government is necessary. Generally, an Ophthalmologist trained for one year in eye banking and corneal grafting remains in charge of the eye bank, other staff like Technician, Clerk cum Store Keeper, Medical Social Worker and Grief Counsellors are appointed to assist him. For proper functioning, the eye bank needs to be equipped with telephone, refrigerator, slit lamp, specular microscope, autoclave, hot air oven, vehicle and surgical instruments.

Setting up of infrastructure does not ensure adequate supply of cornea. Hence various activities are taken up to abridge the demand supply gap. Legislation goes a long way by not only creating awareness but also providing a legal direction to achieve such goals. Transplantation of Human Organs Act, 1994 is a milestone in this regard. Every year National Eye Donation fortnight is observed from 25th August to 8th September with wide media coverage, public shows, seminars and CMEs to create awareness not only in general public but also among the medical fraternity. To augment the collection of quality cornea, a novel Hospital Cornea Retrieval Programme has been launched.

HOSPITAL CORNEA RETRIEVAL PROGRAMME

Hospitals are chosen for collection of cornea due to some inherent advantages in this settings; availability of medical history, availability of tissue from younger individuals, reduction in time interval between death and corneal excision, cost effectiveness and large number potential donors.

The eye bank signs memorandum of understanding (MoU) with the hospital and some voluntary organizations having experience in this field to start Hospital Cornea Retrieval Programme. They jointly

organize seminars, CMEs and other activities to create awareness among the hospital staff. In order to motivate the public, posters are displayed at various places within the hospital premises like critical care units, waiting lounges and wards. An Eye Donation Counsellor is appointed to motivate the family members of the deceased to donate eyes. The entire success of the programme depends on this person. Hence, they are selected with great care. Only committed persons with pleasing personality and good communication skill especially in regional language are selected for the job. He approaches the family members of the deceased, after expressing sympathy and gaining their confidence, tries to motivate them for eye donation. He should be able to answer their queries properly. If they agree for donation, he promptly informs the eye bank so that they can send the team to collect the eyes in time.

Eye Donation

Eyes can be removed after death for corneal grafting in the following cases.

1. If the donor pledges that his eyes can be removed after death for corneal grafting. However, the consent of next of kin is required.
2. If it is donated by next of kin even if not pledged by donor.

Clause 42 of Transplantation of Human Organ Act, 1994 forbids removal of eye from living person for the purpose of donation.

Cornea is the clear transparent outer cover of the eye. It becomes opaque in various conditions like corneal ulcer, trauma, chemical injury, keratomalacia, trachoma, corneal degeneration and dystrophy, keratoconus, ABK, etc.. Cornea transplantation can restore useful vision in these cases. In order to obtain a viable corneal graft certain measures are taken on the death of the donor.

The eye needs to be removed within six hours of death. The donor eyes are kept closed and a small piece of ice is put over the lids. The head end is raised by six inches by using pillows. Fans are switched off and if A.C. is there, it is kept running. The death certificate is kept ready to avoid unnecessary delay.

A donor can belong to any age but all donor corneas are not necessarily suitable for grafting. The absolute contraindications include:-

Death from

- Unknown diseases
- Rabies
- Congenital Rubella
- Encephalitis
- Septicaemia
- Leukemia
- Hepatitis
- HIV +ve
- Lympho sarcoma
- Hodgkin's diseases
- Eye Diseases (glaucoma, corneal diseases, malignant tumours)
- Keratoconus

And relative contraindications are:-

- Multiple Sclerosis
- Jaundice
- Diabetes
- Tuberculosis
- Syphilis
- Aphakia

Collection of eyes:-

The collection team should get full address of the donor and reach the spot promptly. The team should examine the body to ensure that the donor is dead and try to ascertain the cause of death. The consent form is

properly filled up and signed by the next of kin and witnesses. After expressing sympathy for the bereaved family and appreciation for the noble cause of donation, the process of collection begins.

Collection Procedure:-

The tissue can be removed by enucleation or by corneo-scleral disc (rim) excision where the incision is made 3mm away from the limbus.

The procedure should not be conducted in view of the general public or in presence of the family members. The tissue is removed under aseptic condition as in live surgeries. After removal of eye, the conjunctiva is stitched and artificial eyes are put into socket. Then the lids are stitched together to give normal appearance. The eyes removed one after the other are transferred to a wide mouthed collection bottle. Eyeballs to be kept, cornea facing upward over cotton roll moistened with antibiotics. The bottles are sealed, put into the thermocool box with ice cubes and transported to the eye bank. 10 ml of blood from the heart is taken for the purpose of laboratory investigations for HIV & Hepatitis C.

In the eye bank the tissues are cleaned and examined under the slit lamp for epithelial status, stromal oedema, Descemet's fold, corneal thickness and endothelial count. Tissue processing is done in the eye bank in a laminar flow head. Excess conjunctival tissue attached to the cornea is removed and the cornea is cleaned with normal saline and disinfected with one of the following antibiotic solutions.

GENTAMYCIN - 5 MINUTES

POVIDONE IODINE - 3 MINUTES

NEOSPORIN WITH 0.01% THIOMERSAL SOLUTION- 3 MINUTES

Then with the help of slit lamp and specular

microscope, the cornea is graded. As per Dhanda and Kalevar, the cornea can be grade as

FOLDS-

FO-TRANSPARENT CORNEA=PK & LK

F1+-FEW FINE FOLDS=PK & LK

F2+-DEEP FOLDS IN CENTRAL CORNEA=LK

F3+-FOLDS 2/3RD OF CORNEA=not suitable for transplantation

F4+-FOLDS ALL OVER CORNEA= not suitable for transplantation

As per National Eye Bank, the cornea is graded as

GRADE A-MILD EPITHELIAL OEDEMA = THICKNESS INCREASED 10%

GRADE B+-MILD OEDEMA, MILD FOLD =THICKNESS 10-25%

GRADE B-MODERATE EPITHELIAL OEDEMA++, STROMAL OEDEMA+ =THICKNESS 25-50%

GRADE C-MODERATE TO SEVERE FOLDS =THICKNESS 50-100%

GRADE D-HAZY, DETAILS OF A.C. & IRIS NOT SEEN

The tissue is then preserved in any one of the following medium:-

Moist Chamber method upto 48 hours.

M.K medium method upto 4 days.

Glycerine preservation method upto 1 year

Cryo-preservation method.

Organ culture method.

Eye bank keeps all records for 5 years and it is confidential. It includes the age of donor, cause of death, date & time of death, date & time of enucleation, date & site of preservation and slit lamp grading. The recipients name is recorded with full address, age, pre-operative cause, date of surgery and postoperative complications.

In order to maintain quality, standard operating procedures are followed. The tissue has to pass through different laboratories after being received at the eye bank. It travels through the decontamination lab., tissue processing lab. and tissue evaluation lab., before it is stored in a sterile storage room. Standard operating procedures also include disposal of left over or rejected tissues as per Pollution Control Board's guidelines. Verification of consent procedure, death certificate, cause of death and laboratory reports with systematic documentation of all events form a part of standard operating procedures.

In order to make the entire process fair and transparent, certain code of ethics are followed.

CODE OF ETHICS FOR EYE BANKS

- No rivalry with other eye banks.
- Free exchange of eye with other banks.
- No eye to be enucleated during life.
- Eye not to be bought or sold.
- No discrimination during the distribution.
- Donor identity not to be disclosed to the recipient.
- Proper wait list to be maintained.
- Bank not to have commercial publicity.
- Pledging and funding to be done in defined manner.

CODE OF ETHICS FOR EYE SURGEONS

- Donor cornea not to be bought or sold.
- Competence to perform corneal surgery.
- Cornea to be obtained from recognized bank only
- Donor identity not to be disclosed to the recipient.
- Should process all medical details of donor and cornea.

CODE OF ETHICS FOR COLLECTING PERSONNEL

- Should be polite, courteous, and sympathetic with donor relatives.

- ❑ Enucleation to be done in privacy.
- ❑ Eye removal only by ophthalmologist or medical practitioner trained in enucleation .
- ❑ Should be respectful to the deceased's body.
- ❑ Mutilation to the body to be avoided.
- ❑ Relatives to be intimated about the artificial eyes.
- ❑ Donated eyes to be collected even if unsuitable.
- ❑ Legal consent form to be signed and obtained.

Eye banking requires a mass movement with an open mind for the benefit of the society. We have to put our heart and soul to make it fruitful, otherwise it will be just a cheap propaganda to project ourselves in mass media whereas the actual sufferers will continue to suffer. So we appeal to all the ophthalmic fraternity to give a helping hand in promoting eye donation, which will benefit the needy in the long run.

DONATE YOUR EYES.

EYE DONATION MAKES A MAN IMMORTAL.



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