

Appendix 'D'

DONOR EYE ENUCLEATION PROCEDURE, HANDLING AND PROCESSING¹

By

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Removal of a donor eye Ball for an Eye Bank and for a corneal graft needs greater care in removal, handling and processing than removal of a deceased blind eye. The former is to be used to give sight to somebody. The Doctor / Technician who removes the eye ball and processes it has a very great responsibility. His action should not be the cause of a graft failure.

The following are guidelines to be kept in mind from the moment a message is received that a donor has died and his relatives would like to donate his eyes to the Eye Bank for corneal grafting.

(a) - IMMEDIATE ACTION FOLLOWING DEATH OF A DONOR

Following instructions should be communicated as soon as a message is received in the Eye Bank :

- (1) The upper lids should be gently pulled down so that the eyes remain closed to prevent drying of the cornea.
- (2) A small ice pack should be placed on the closed eyelids to help prolong usable condition of the cornea.
- (3) The head should be raised by about 6 inches to minimize bleeding after enucleation.

(b) - PREPARATORY ESSENTIALS

- (1) The Doctor / Technician should reach the place of the donor soonest after the message is received, preferably within half hour.

¹ (While the practice of removal of whole eyeball is no longer in existence in developed countries like the USA etc., still in India in a large majority of enucleations, the whole eyeball is removed as the in-situ cornea excision requires a lot of training. This paper describes the procedure for the removal of whole eyeball).

- (2) Before starting enucleation, a word of sympathy for the family and a word of appreciation for donation for a humanitarian cause should be expressed.
- (3) Consent form should be signed by the nearest relation.
- (4) As far as possible, enucleation should not be done in the presence of family members.
- (5) Before starting enucleation the following should be completed :
 - (a) Name of the deceased, age and full address.
 - (b) Time and date of death.
 - (c) Time and date of enucleation.
 - (d) Cause of death.

The information regarding cause of death is extremely important and must be sought for as far as possible. If the relatives do not know the cause, medical papers should be scrutinized. If the person has died in suspicious circumstances or if there is history of dog bite, the eyes should not be enucleated and reason explained to relatives.

- (6) Before starting enucleation, it is also important that the eyes should be examined with good torch illumination. If there is evident corneal opacity, the eye is not usable as donor eye and should not be enucleated.
- (7) History of eye operation, if any, should be inquired. The Doctor / Technician should be able to identify if the cataract operation was followed by some complication, in which case, it is advisable not to accept the eye as donor eye.
- (8) The procedure should be as aseptic as while performing an operation on a patient.
- (9) All equipments, bottles and linen should be kept autoclaved before use.

(c) - PROCEDURE OF ENUCLEATION

- (1) Skin around the eyes should be cleaned with betadine spirit and conjunctival sac is irrigated with disinfectant solution.
- (2) A sterile hole-sheet is placed on the face exposing one eye at a time.
- (3) A speculum with guards to protect the eye lashes is applied to separate the lids in one eye first.

- (4) Conjunctiva is incised very close to the limbus all round and is undermined towards the fornices.
- (5) The four recti muscles should be hooked by turn and cut close to their insertion in the order, superior, medial, inferior and lateral the last. Lateral rectus should be cut leaving 2 – 3 mm stump for holding the eye.
- (6) The eye ball is turned outward by holding lateral rectus stump and an enucleation scissors introduced from the nasal side because the optic nerve is nearer from the nasal side. The optic nerve is cut. The eye ball is now pulled forward and the two oblique muscles cut. The eye ball can now be taken out from the socket.
- (7) Each eye ball is then placed in a sterile bottle to be transported to Eye Bank / Corneal Surgeon and further processing done there.
- (8) A cotton ball is introduced in the cavity left after enucleation and conjunctiva covered over it.
- (9) A plastic shell or an artificial eye is now introduced in conjunctival sac to over-come any cosmetic blemish of the face.
- (10) Before leaving the place, one should ensure that bleeding, if any, should have stopped.
- (11) The medical man / technician can now leave for the Eye Bank after expressing a word of appreciation and thanks for the good act of the next of the kith and kin.
- (12) The donor eyes should be carried in a Thermos flask with ice in it maintaining 4 deg. C. temperature.

Two things in enucleation procedure are extremely important :

- (1) No loose tissue should be remain attached to the eye ball. That can be a source of contamination and give a very unclean appearance.
- (2) After the muscles have been cut, the eye ball should be pulled forward and optic nerve cut as far back as possible so that an optic nerve stump of least 2 –3 mm length must remain attached to the sclera behind.

(d) - PROCESSING OF DONOR EYES

As soon as the eyes are received in Eye Bank or in the hospital, the following steps should be taken:

- (1) The eyes are washed with a stream of sterile normal saline. Any eye lashes sticking to the eye ball or extraneous matter should be removed. Any conjunctiva or loose tissues should be excised with scissors and forceps.
- (2) The eye is examined under focal illumination for any gross corneal change and then more critically examined under the slit-lamp beam to note the degree of stromal oedema and folds in the descemet's membrane, if any. The findings are recorded in the donor register.
- (3) The Eye Ball is immersed in antibiotic solution like Neosporin for 5 – 10 minutes.
- (4) Each eye ball is now transferred to another sterile bottle with a thin Cotton pad at the bottom. The eye ball should be held in position by a metal holder inside the bottle so that the cornea faces up. 2 - 3 cc of Neosporin solution is dropped on the eye ball so the pad in the bottom becomes wet.

For storage of fresh eye balls in moisture at 4 deg. C

The bottle is now screw capped tight and labelled with the name of the donor and cause of death. The bottle is stored at 4 deg. C temperature outside the ice chamber of the refrigerator kept there till the time of operation.

For short term preservation in a culture medium

The cornea with 3 mm rim of sclera is excised, processed and stored in the M.K. culture medium. This procedure must be done by a well qualified technician or preferably by the surgeon himself. The details of the procedure are not given at this time.

Note : *Removal of blood samples :- The paper does not mention about the removal of blood samples. As it is necessary to carry out serological tests viz. Syphilis, Hepatitis B & C and HIV for suitability of corneas for transplant, it is required to have blood sample taken from the body of the deceased. This is done by puncturing the heart or from jugular vein or femoral vein.*

(e) – INSTRUMENTS ETC. REQUIRED FOR DONOR EYE ENUCLEATION PROCEDURE

1. Instruments and linen :

(a) Lid speculum with guard.	1
(b) 1 in 2 conjunctival Forceps.	1
(c) Small straight Scissors	1
(d) Muscle Hook	1
(e) 3 in 4 forceps	1
(f) Curved enucleation scissors.	1
(g) 10 cc Syringe	1
(h) Hole Sheet	1
(i) Roller Gauze Cotton Balls	2
(j) Wide mouth bottles, with thin cotton pad at the bottom and a metal holder inside.	2

(Three sets always kept autoclaved sterile in eye bank ready for use and reautoclaved every week if not used).

2. Other items :

- (a) Bottle of antiseptic solution (0.5% Betadin)
- (b) Antibiotic eye drops.
- (c) Methylated spirit of tincture iodine.
- (d) Wide mouth Thermos flask with ice.
- (e) A torch light
- (f) A Kidney Tray
- (g) Plastic artificial eyes
- (h) Consent form.