Chapter 1

INTRODUCTION

Corneal Opacity

Blindness can be due to several causes including cataract, damage to optic nerve, xerophthalmia (Vitamin 'A' deficiency), retina detachment, damage to cornea, glaucoma, etc. The cornea is the transparent front portion of the eye separated from the pupil by a fluid-filled space. Together, the cornea and lens focus light rays on the retina and via the optic nerve to the brain, the objects are interpreted. The damage to cornea can occur due to nutritional deficiency, injury to eye due to accidents and diseases or infections like trachoma, conjunctivitis and small-pox. Sometimes it can also become opaque after cataract or other eye surgery. The opaque cornea prevents the light from entering the inside of an eye thus causing partial or total blindness.

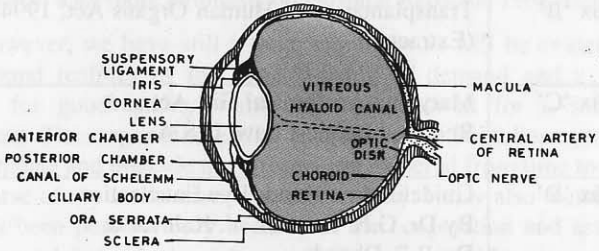

Illustration 1 : The HUMAN EYE Cross-section

Younger Age Group

We have about ten million blind people in India out of which about 15% to 20% are estimated to have lost vision due to corneal opacity. This figure further swells by the addition of about 25,000 to 30,000 new patients every year. A majority of these blind patients are unfortunately young persons unlike the cataract patients who are usually in a higher age group. Research and advanced techniques of modern surgery have made it possible to remove the opaque and defective cornea and replace it with a transparent healthy cornea. Out of the total estimated 1.5 to 2 million corneally blind people[1], a

[1] It may be mentioned that out of this, a large majority of them are unilaterally corneally blind. The percentage of bilaterally corneally blind i.e. those having either both the corneas damaged or having corneal opacity in one eye and loss of vision in the other eye due to any other problem may be around 10 to 20 percent.

substantial percentage of them can gain vision by means of a proper corneal transplant. However, the new cornea to be transplanted cannot be artificially produced and has to come from a human body. As it is possible to use a cornea removed from a dead body, the necessity of removal of donor cornea from a live person does not arise. The transplant operation also known as **'Keratoplasty'** takes about an hour to an hour and a half (see Chapter VI for details).

Illustration 2a: Opaque cornea

Illustration 2b: Removing opaque cornea

Illustration 2c: Replacing opaque cornea with donor cornea

Eye Bank

An eye bank can be defined as a place where the corneas received from the dead bodies are collected and sent to the needy blind patients for transplant after proper evaluation. Functions of an eye bank may be listed as follows:

(a) Receiving donor human eyes, evaluating, processing and preserving them in a proper medium (to increase their shelf life) and making them available to the needy patients and the eye surgeons doing corneal transplant surgery. It must also have proper facilities on its own or have a tie-up with a pathology laboratory to carry out necessary serological tests viz. HIV, Hepatitis B, Hepatitis C and Syphilis.

(b) Educating the people for willing donation of eyes after death and motivating them to give consent for removal of eyes when their relative or a friend has died.

(c) Providing Training and Research facilities for necessary upgradation from time to time.

Eye Donation Centres

As far as ground realities are concerned, most centres in our country which are termed as Eye Banks are actually Eye Donation Centres where the facilities exist only for the removal of eyes and for attending to the calls received for eye donation and sending the required personnel for removal of eyes. They do not have the necessary facilities for evaluation, processing the eyes or testing of blood samples etc. They can be appropriately termed as 'Eye Donation or Collection Centres'.

Misconceptions

It may be mentioned that there is a misconception among the common man that the entire human eye removed from a dead body is utilised for the corneal transplant and most of the blind people can gain vision by means of this transplant.

In this regard, it must be clarified that except for the cornea, no other portion of the donor eye is useful for the purpose of the transplant. It is just like replacing an outer lens of the camera and unless all other organs of the eye such as the retina, the lens and the optic nerve are functioning normally, it is not possible to provide vision to a blind person merely by means of a corneal transplant.

Meagre Supply

It is estimated that in order to provide vision to over a million corneally blind people and to prevent further addition to this huge backlog, we need at least 50,000 to 60,000 pairs of corneas for transplant every year. As against this, the current annual procurement is a mere 10,000 to 12,000 pairs of corneas and the number of corneal transplants performed is estimated to be 8000 to 9000 (not all corneas are viable for transplant due to several factors – see Chapter 4). Of these, a majority (50% to 60%) of donations are from Gujarat and Maharashtra (mainly Mumbai) thus indicating that there is a vast scope for augmenting the procurement of corneas from the rest of the country.

Though the eye donation movement has been in existence in our country for the last forty to forty-five years, the statistics reveal that it has still not gathered the required momentum and there is a tremendous scope for improvement in terms of both quality and quantity. It is difficult to believe that for a large country like ours where annually over 10 million deaths take place, the procurement is so meagre. However, this is a fact and we all must strive hard if the challenge is to be met squarely.

Consent Required

As health is the State subject, some of the states have passed Corneal Grafting Acts governing the removal of corneas and other related matters. Recently, the Central Government has enacted the "Transplantation of Human Organs Act, 1994", which governs, inter alia, the removal of eyes for therapeutic purposes and other related matters inasmuch as the term "Human Organs" has been defined under the Act as meaning any part of the human body including the eyes. The said Act applies, in the first instance, to the States of Maharashtra, Goa and Himachal Pradesh and to all the Union territories. The Acts passed by the States including the aforesaid Act passed by the Central Government permit the removal of corneas after the death of the person either with the written consent of the donor (while he is alive) or after obtaining the necessary authority of the person lawfully in possession of the dead body of the donor. (see Chapter 3 read with Appendices A, B and C wherein the Legislative aspect of eye donation has been discussed in greater detail). The identity of the donor is generally not revealed and to avoid any commercial misuse of corneas they are provided free of cost for transplantation. However, to cover the actual cost of blood tests, processing, evaluation and preserving them in suitable media many eye banks charge 'Tissue processing fees' (similar to the blood banks charging the cost of actual blood tests for supply of blood). (If the eye banks are attached to an eye hospital where corneas are utilised for the transplant, this amount is included and recovered as a part of total expenses incurred for the transplant). (see Chapter 5 for details).

Need to Provide Corneas on Priority basis

Due to the scarcity of good quality corneas, it is recommended that such corneas should be provided on priority basis to **children or young patients or to those who have lost vision in both the eyes** so that atleast their vision can be restored in one of the eyes with a proper corneal transplant. **Restoration of vision in atleast one eye enables the person to lead and enjoy a near normal life.**