

CORNEAL GRAFTING AT ST. LUKE'S HOSPITAL

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Abstract

This is a report on corneal graft operations carried on at St. Luke's Hospital in 1969 and 1975. For the first time in Malta, fresh corneal tissue was used from eyes of patients in St. Luke's Hospital.

A corneal graft is a resection of a part of a diseased and opaque cornea, and its substitution by a clear fragment of equal size taken from a healthy cornea of a person who has just died.

It was Pellier de Quensy of Montpellier University in 1789, who first suggested that the opaque cornea should be replaced by a transparent crystal. In 1818, Franz Reisinger carried out corneal grafts in rabbits. The results were not successful. Although Bigger in 1835 suggested the use of human cornea, for forty years animal cornea (rabbit, dog, deer) was used in research work. The problem of rejection was added to the difficulties of technique. It became obvious that the use of human cornea was fundamental. In 1885, Von Hippel by means of his trephine and using fresh human cornea obtained the first successful result. Mag'tot may be considered the founder of the Eye bank. In 1911, he showed that if the eyes are removed as soon as possible and kept in an ice box at a temperature between +2C and 4C, the cornea keeps well for a period between 3 to 4 days. The successful results in the majority of cases of corneal graft are due to the absence of blood vessels in the corneal tissue and to the low antigenic power of the cornea. These factors are not present in other tissues.

Since 1950, the prognosis of corneal grafting has improved enormously as a result of the following developments.

1-The use of general anaesthesia which is essential to provide maximum adequate hypotony of the eye as well as complete relaxation of the patient. Post operative complications such as vomiting and restlessness are minimal using modern anaesthetic agents such as fluothane, and adequate sedation as well as antiemetics.

2. The introduction of sharp and adequately curved needles, fine suturing material and very sharp trephines and the use of the microscope and slitlamp have been very important steps. The operating microscope represents a fundamental advance in corneal surgery and instrumentation had to be adapted to its demands. It provides a precise visual control of the surgical manoeuvres.

3. The use of antibiotics which prevent infections or will afford treatment if it is present.

4. The use of corticosteroids, which can control the inflammatory reaction. They also can prevent and treat the exceptional cases of immunological reaction or rejection of the graft.

5. The selection of the corneal graft. Fresh tissue grafts are preferred to preserved grafts. The eyes should be removed within two hours after death. There is likely to be some endothelial degeneration after that period. Soon after death contamination of all parts of the body occurs very rapidly. The cornea is liable to develop some infection.

6. The selection of cases suitable for operation is very important. There are cases where corneal surgery is definitely contra-indicated.

7. A good knowledge of possible complications will help to prevent them and treat them if present.

Things were quite different in January 1945 when as a House Surgeon to

Sir A.J.B. Goldsmith, helped him to perform a corneal transplant operation. The case was one of a central corneal opacity caused by Interstitial Keratitis. One had to wait until a suitable eyeball was found for enucleation.

The donor graft was cut soon after enucleation, and immediately placed into the prepared recipient cornea. The trephine was quite satisfactory. The present fine sutures and suturing material were not yet available.

The donor graft was kept in place by means of 4 silk sutures passed into the recipient's cornea over an egg membrane. No operating microscope or magnifying glasses were used. The result was successful.

Corneal grafting was performed on two occasions at the ophthalmic depart-

ment of St. Luke's Hospital. In April 1969, thanks to the British Council and to Admiral Gurd of the Royal Naval Hospital, Bighi, Mr. Leigh of Moorfields Eye Hospital was invited to come over to perform corneal grafting. He brought with him donor material from Moorfields Eye Hospital.

Five cases were operated upon, (Table 1) four perforating and one lamellar. One perforating and one lamellar Keratoplasty were successful. In one case, the graft gradually became opaque. Success was not expected in the other two cases one suffering from extensive lime burns and the other one suffering from a necrotic infected cornea.

In April 1975, through the good offices of the Malta Embassy in Washington and the Lions Washington Eye Bank and

NAME	AGE	DISEASE	VISION BEFORE OPERATION	SIZE OF GRAFT	TISSUE USED	RESULT
B A	60 MALE	INTERSTITIAL KERATITIS + CATARACT	COUNT FINGERS at 1 FOOT	8 mm	FRESH	VISION $\frac{6}{12}$ WITH CORRECTION
F M	17 MALE	DENDRITIC ULCER	COUNT FINGERS at 1 FOOT	7.5 mm	FRESH	UNSUCCESSFUL
M.G	34 MALE	KERATO CONJUNCTIVITIS	COUNT FINGERS at 1 FOOT	7 mm	FRESH	VISION $\frac{6}{12}$ WITH GLASSES
D.J	49 MALE	INTERSTITIAL KERATITIS	HAND MOVEMENT	7.5 mm	FRESH	HIGH MYOPE $\frac{6}{60}$ WITH CORRECTION
C.M	34 MALE	DENDRITIC ULCER	COUNT FINGERS at 1 FOOT	7.5 mm	FRESH	VISION $\frac{6}{60}$ WITH GLASSES
D.M	33 FEMALE	DENDRITIC ULCER	HAND MOVEMENTS	7.5 mm	CRYO PRESERVED	UNSUCCESSFUL
V.J	21 FEMALE	DENDRITIC ULCER	HAND MOVEMENTS	8 mm	TISSUE CULTURE MEDIA TC199	VISION $\frac{6}{18}$ WITH GLASSES
P.C	50 FEMALE	KERATO CONJUNCTIVITIS	COUNT FINGER at 1 FOOT	7 mm	CRYO PRESERVED	VISION $\frac{6}{18}$ WITH GLASSES
C.C	59	KERATO CONJUNCTIVITIS AND CATARACT	LIGHT PROJECTION	7.5 mm COMBINED CATARACT GRAFT OP.	TISSUE CULTURE MEDIA TC199	VISION $\frac{6}{18}$ WITH GLASSES

Table 1

the Malta Lions, two corneal transplant surgeons from Dr. McTigue's clinic, Dr. Beauchamp and Dr. MacGovern were invited to our eye department to examine and perform corneal surgery for these cases requiring it. Nine cases were operated upon.

One would ask why these cases could not be operated upon by the ophthalmic surgeons at St. Luke's hospital. Because of the small population on the island, the indications for a corneal graft are few and far between. One could only hope for an occasional operation every three years. Results cannot be as satisfactory as those in the hands of surgeons who perform three or four cases a week.

Five males and four females were operated upon.

There were: Three cases of Keratoconus. Four cases of dendritic ulcer. Two cases of interstitial keratitis.

In five cases, fresh tissue obtained locally was used. In two cases tissue culture media. t.c. 199 was used. In two cases cryo-preserved tissue was employed. In two cases, a combined cataract extraction and corneal graft operation was performed. One case suffering from dendritic ulcer had already been operated upon twice.

The technique employed was somewhat different from the usual one. The donor button and the window in the recipient's cornea were cut at the same time, the former by a technician and the latter by the surgeon. The donor cornea along with a fringe of sclera was placed with the endothelium upon a plastic rest. The donor button was cut from the endothelial side (fig. 1). In order to get a perfect edge, the sharp trephine is just pressed upon (no rotation is made) and rocked back and forth until the tissue is penetrated.

In the recipient's cornea, the window is outlined by means of the trephine and the cornea is slightly entered into. The groove thus produced is gradually deepened all around by means of a razor blade knife. At one point, the anterior chamber is entered into. The section of the disc is continued by means of Troutmann's scissors. The donor graft is laid into the recipient's

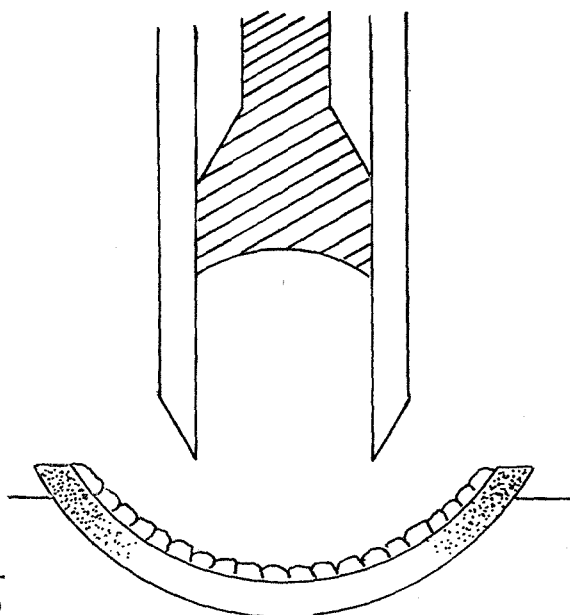


Figure 1

prepared cornea and kept in place by four 8/0 black virgin silk, initial sutures. The latter are removed at the end of the operation. A continuous 10/0 Ethicon black monofilament nylon micropoint spatula sutures was passed through two thirds of the thickness of the donor and recipient tissues. The perfect apposition of the tissues by means of this suture is vital to the successful result. This running suture ending with one knot creates minimal inflammatory reaction. (fig 2).

No iridectomies were performed except in the combined cataract-graft cases. No fluid or air injection were carried out.

Treatment after the operation consisted of:

- 1 — atropine drops.
- 2 — Maxidex drops.
- 2 — Prednisone

The aim was to combat homograft reaction and to prevent complication.

Comment

Three varieties of tissue were used: cryopreserved, tissue culture media 199 (brought by the surgeons from Washing-

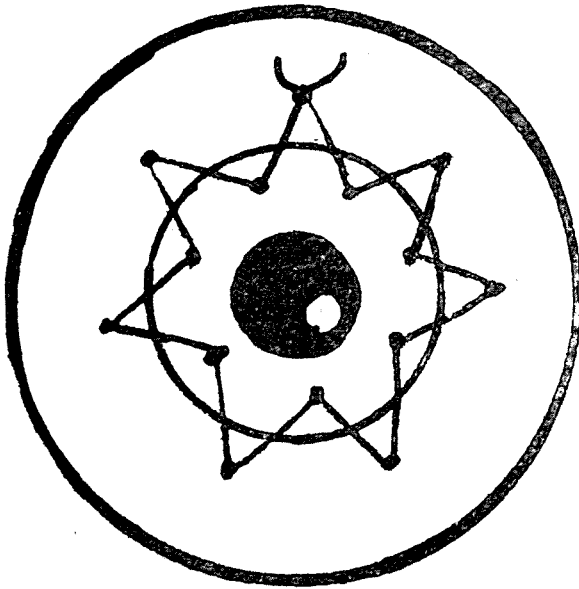


Figure 2.

ton) and fresh tissue. The results were equally good in all cases in spite of the

different tissues.

In one failed case, fresh tissue was used. In an other failed case it was cryo preserved. Both cases were suffering from the sequelae of a dendritic ulcer.

It is interesting to record that this was the first time that use was made of fresh corneal tissue of eyes removed from patients who had just died at St. Luke's Hospital. We are very grateful to the relatives of these patients.

The case suffering from dendritic ulcer operated upon for the third time, is still doing well six months after the operation.

Acknowledgements:

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References.

BARAQUER, J., Primera Leccion de Catedra pp. 6,7.