

Thirty-five years of eye banking in Hong Kong – a metamorphosis and a commitment renewed

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Abstract

The Hong Kong Eye Bank and Research Foundation (HKEBRF) was established 35 years ago. Its primary objective was to serve as a collecting and distributing center of corneas for transplantation by eye surgeons in Hong Kong. In the early years, its call for eye donation was not met with any success and it has been rendered into a passive liaison office. However, in the last few years, a change in the medical environment, in the patients' needs and surgeons' demand for corneal tissue, has ushered the HKEBRF into a new era of an active Eye Tissue Laboratory (ETL). The ETL of the HKEBRF, with a modified and assertive approach to eye donor recruitment, is ready to make good the Eye Bank's original commitment of promoting and effecting eye donations.

The early years

In antiquity, surgeons had already tried to operate on the cornea. But it was not until 1935 that Filatow in Odessa showed that autopsy corneas, removed soon after death, could be used for corneal grafting.¹ It was soon recognized that the immunologic graft reaction was one of the reasons why a corneal transplant operation might fail. The operation became more successful with more delicate surgical instruments, and the availability of antibiotics and corticosteroids. In the early 1960s, new knowledge about the fate of transplant tissue made it possible to initiate a more rational treatment of complications and to introduce prophylactic measures. And corneal transplantation became a well accepted surgical technique to cure blindness from opacified corneas.

Eye surgeons in Hong Kong had always been faced with a host of patients with corneal scars from chronic infections, like trachoma and corneal ulcers, and they were most intrigued by this newly, popularized operation of corneal transplantation. Dr Thomas A Dooley, who was with the Tung Wah Eastern Hospital in 1961, was instrumental in bringing from the USA three renowned eye surgeons: Dr Harry King, Dr Charles Iliff, and Dr John McLean, to Hong Kong to demonstrate the modern technique of corneal grafting.² These American ophthalmologists brought with them a dozen fresh corneas donated from eye banks in the USA and in two weeks, performed more than 10 grafts. The enthusiasm in corneal transplant generated from that visit finally crystallized into the formation of the Hong Kong Eye Bank and Research Foundation (HKEBRF) in 1962. This eye bank was supported by and large from donations from the Lions Club of Hong Kong and was made up of professionals from the Hong Kong Ophthalmological Society, and community-service-minded Lions Club members. It is a non-profit service organization devoted to sight conservation with a primary objective of serving as a collecting and distributing center of human eye tissue (corneas) for eye surgeons in Hong Kong and neighboring areas for corneal transplant. The work of the Eye Bank prompted the Hong Kong Government to enact the Tissue Act in 1968, permitting the removal of parts of the human body for medical use and transplantation provided that the approval of such removal was given by the next of kin of the deceased.

Difficulties in the 60s to the early 80s

Although the HKEBRF was set up with its primary aim to promote and harvest corneal donation, nevertheless, to successfully press towards such an objective proved to be a daunting if not an impossible task in the early years. At that time, organ or tissue transplant was a very novel concept shrouded in mystery, disbelief and suspicion.³ During those formative years, although microsurgical technique had been widely practiced in ophthalmic communities in the West, the majority of ophthalmic cases in Hong Kong were still undertaken without the benefit of microsurgery. And the success rate of corneal

transplant had not been that impressive. Consequently ophthalmic surgeons were not really that keen to undertake or to promote the corneal transplant operation, and in the end, the enthusiasm on the part of the surgeons and of the patients and therefore the public faded with time.

The HKEBRF tried incessantly to promote corneal donation and foster an interest in the sight saving transplant operation. All along, it had around 10,000 registered potential eye donors, the majority of whom are young people who would not be expected realistically to contribute significantly to the imminent local need for corneal tissue.⁴ Furthermore, when patients who had bequeathed their corneas died, the next of kin, in their grief and confusion, frequently forbade the removal of any organ or tissue from the deceased, and they were within their legal rights to do so. Such reluctance on the part of family members of the deceased to agree to organ donation had its roots in the Confucian teaching that one's skin and hair, in fact all of one's bodily parts, came from one's parents, and should be treasured accordingly. In the 60s and 70s, when land burials were still widely practiced, the traditional Chinese concept that the body would not be "whole" once a part of it was removed, coupled with the notion that the body of the deceased would be disfigured by eye donation, accounted for the poor response to any plea for corneal donation. Only on very rare occasions were corneal tissues donated by local residents. Between 1980 and 1990, there were 10 local donors.

During the first 25 to 30 years when the HKEBRF was established, local needs for corneal tissues were answered by the International Eye Bank in Colombo, Sri Lanka, through the goodwill of its people. The existing Hong Kong Eye 'Bank' had been in actual practice a passive 'Bank' — a liaison office. When need arose, the eye surgeon called up the Hong Kong Eye Bank office and conveyed the requirement. The request was then relayed to the Sri Lanka Eye Bank by wire. Air Lanka, which flew to Hong Kong twice weekly, carried the tissue grafts and the surgeon would be notified of the arriving flight carrying the tissue so that the surgeon, himself or his assistant, could go to the air cargo terminal to retrieve the tissue. The Sri Lankan source of corneal tissue, albeit inconvenient, had kept Hong Kong eye surgeons and eye patients from total despair with the inavailability of local corneas. Between 20 to 40 corneas were flown to Hong Kong annually from the 70s to the mid 80s.

The changing environments of the 80s and 90s

The mid 1980s witnessed a new breakthrough in the social environment surrounding organ transplantation. Kidney transplantation had been made more successful by the discovery of new immunosuppressive therapies and drugs. The clinical values of bone marrow transplant had been substantiated. News and emotive issues regarding vital organ transplantation such as heart and liver transplants had significantly heightened the public awareness of human organ transplant and donation. In the 90s, organ transplantation and donation has gradually become, although far from being well accepted, not so novel or mysterious a procedure and a concept anymore. The notion of letting one's organ live after one's death was particularly received sympathetically by the younger generation which has been exposed to western culture and education, returning from abroad, and in increasing number. Such members of the society were more receptive to the suggestion of donating their deceased parents' organs. After all, in recent years, as available land for whole-body burial was rapidly dwindle-

ing, the majority of Hong Kong families had found cremation a realistic alternative. The harsh reality of cremation has helped to do away with the tradition of saving the body 'whole' for burial and after life. Furthermore, with an ever-escalating standard of living, the visual requirement and the public's demand for a better quality of health and life had also modified society's need for modern surgery and material for transplant. In the competitive society of the 90s, a patient with only one seeing eye would naturally aspire to have equally good vision in both eyes. Eye surgeons who some twenty years ago would only consider performing corneal transplant on patients with bilateral blindness will today have to entertain the request of patients with unilateral diseased cornea. Medical science and the ophthalmic community also contributed to the changing requirement of corneal transplantation. The increasing and popular use of standard microsurgical techniques in eye surgery, improved sutures and treatment techniques, and the availability of new anti-inflammatory drugs, had all significantly enhanced the success rate of corneal transplantation.

The most crucial factor determining the outcome of the graft had always been the quality of the donor material. Despite its general accessibility to Hong Kong surgeons and patients, corneas from Sri Lanka had been found to be of varying quality. The average age of the donors was around 70 years, and many parameters considered essential in the quality assessment of the donor tissue by the International Federation of Eye Banks had not been considered by the Sri Lanka Eye Bank. The escalating demands for corneal tissue is reflected in the soaring number of corneas flown to Hong Kong from Sri Lanka in the last five years (Table 1). Indeed, local demand had risen so much that the Sri Lankan source was unable to entertain any further increase in requests. When demand had outstripped the supply, the HKEBRF was ushered into a new era of an 'active' Eye Bank.

The Eye Tissue Laboratory of the HKEBRF

In view of the difficulties of the Sri Lankan Eye Bank in meeting the local need and to respond to the demand of the local community, the HKEBRF, in 1991, had resolved to set up an Eye Tissue Laboratory (ETL). The ETL, accommodated in a regional hospital, was made possible with an initial generous contribution of HK\$1 million by Mr Simon KY Lee, a director and vice president of the HKEBRF, and named after his wife. The Kung Wah Lee ETL of the HKEBRF was officially inaugurated on April 25, 1992, officiated by the Secretary for Health and Welfare.

The objectives of the ETL are:

1. Public education and promotion of corneal donation
2. Donor recruitment, solicitation and grief counselling
3. Retrieval, processing and distribution of corneal tissue
4. Quality control and assurance of corneal tissue

In recent years, various lay and professional organizations in Hong Kong have expended much effort to educate the public regarding corneal transplantation, and numerous campaigns for eye donation have been organized. Public education and promotional exercise remain among the most important objectives of the ETL. However, such campaigns can only be launched when they are supported by an effective mechanism to harvest tissues. Individuals must be trained to approach families of the recently deceased to participate in grief counselling and at the same time introduce the idea and offer the opportunity of

organ donation. To be effective, these individuals should not be members of the medical team involved in the care of the deceased. Bereaved families tend to misconstrue such a request coming from the deceased's doctor or nurse as being inappropriate and a conflict of interest. The ETL employs social workers and lay personnel to be trained for the task of grief counselling and donor recruitment. Plans are underway to organize eye patients, recipients of corneal grafts, or their relatives, and other volunteers to be trained for such function. The last thirty years have taught us, that if we need to secure corneas for our patients, we have to adopt an active and assertive "go out there and get them" approach.

With the family's consent, the corneas must be harvested expediently, preferably within 24 hours after death is pronounced. The tissue is then assessed by an expert for the appropriateness to be used for transplant purposes and stored in the ETL until they can be distributed to the surgeons or hospitals in need of the tissue.

Important screening tests for transmittable diseases such as syphilis, hepatitis B, and HIV are routinely performed on every case before the corneal tissues are dispatched for transplantation. We adopt a policy that no eye donation will be refused, and all eye tissue will be put to good use one way or the other, either for transplantation, research, or education and training. The steps involved in tissue procurement are outlined in Figure 1.

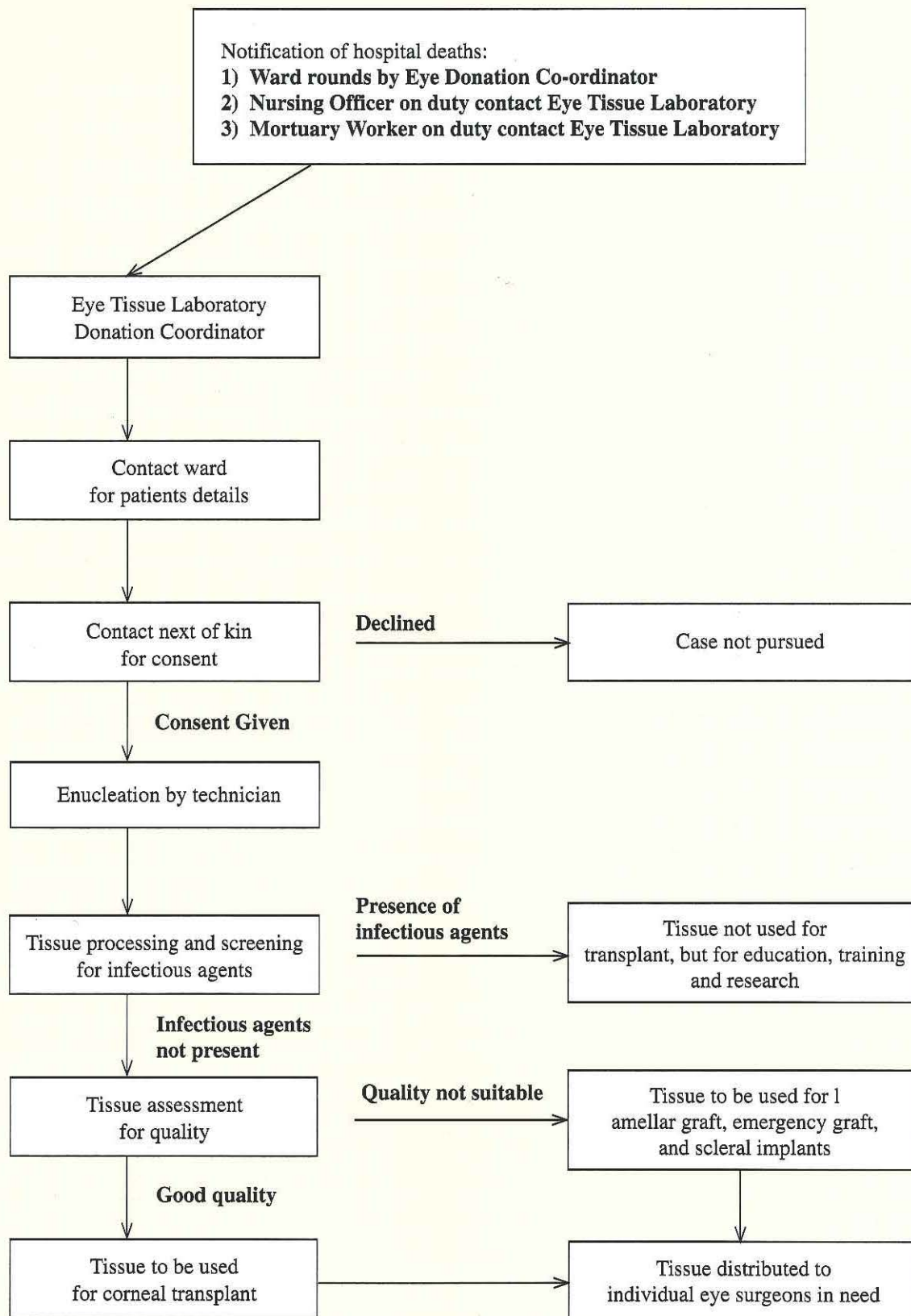
The first five years of the ETL

Since the establishment of the ETL in November 1991, yearly targets were set in terms of corneal tissue harvest with an aim to phase out import of corneal tissue from Sri Lanka in the ensuing years and as soon as practically feasible so that the Hong Kong community could become self supporting in providing local corneas to local patients. The recruitment network was extended to involve a second general hospital, the Caritas Medical Centre, in June 1994; and to a third hospital, Kwong Wah Hospital, in January 1996. Not only did the number of donors multiply in the first five years, painstaking steps were also taken to improve the yield of usable, quality local corneal tissues by involving ophthalmic professionals and consultants to screen the records of potential donors before active plans were organised to approach the next-of-kins and the families so that productive efforts could be focused and resources effectively utilized. Such diligence was favorably reflected in the increasing number of corneas collected from 1992 to 1996 and in the improvement in the yield of usable corneas from 50.0% in 1993 to 85.2% in 1996 (Table 1). Correspondingly the utilization of imported corneas from Sri Lanka was diminishing. Since November 1991, the ETL has approached a total of 2150 families for potential corneal donations, and only 438 cases consented to donation with a success rate of 20.3% and a collection of 876 corneas. However, only 597 of these corneas were found suitable and used in transplantation resulting in a 5-year overall yield of 13.8%.

Table 1. Corneal recruitment from 1986 - 1996

Source	Sri Lanka		Local Corneas		Total No. of Corneas
Year	Received	Used / % of Received	Collected	Used / % of Collected	Used / collected (% of usage)
1986	36	36 (100%)	0	0	36/36 (100%)
1987	54	54 (100%)	0	0	54/54 (100%)
1988	76	76 (100%)	0	0	76/76 (100%)
1989	111	111 (100%)	0	0	111/111 (100%)
1990	118	118 (100%)	0	0	118/118 (100%)
1991	126	126 (100%)	0	0	126/126 (100%)
1992	112	84 (75%)	43	28 (65.1%)	112/155 (72.3%)
1993	107	85 (79.4%)	180	90 (50%)	175/287 (60.9%)
1994	107	74 (69.1%)	205	109 (53.1%)	183/312 (58.6%)
1995	100	67 (67%)	211	168 (79.6%)	235/311 (75.6%)
1996	71	48 (67.6%)	237	202 (85.2%)	250/308 (81.1%)
Total	1,018	879	876	597	1,476/1,894

Figure 1. Corneal tissue procurement procedure.



For every 100 potential donor families the ETL approached, about 14 corneas were made available for use.

The way ahead

Eye donation differs from that of vital organs such as kidney, liver or heart which are best harvested during brain death when the organs are still perfused with blood. Eyes can be donated ideally 24 hours after death has been pronounced according to the conventional criteria. However, the 24 hours immediately following expiration of the deceased can be a very confusing time and represents a very narrow window of opportunity for the ETL personnel to approach the family members and present to them the option of organ donation. In hospitals of many states in the USA, "required request" is widely practised. Ward personnel are required to inform the tissue banks of a death when the mortuary and the next-of-kin are notified. A close working relationship between the ward managers, nursing officers and personnel, and the ETL donor recruiter is essential to the success and effectiveness of the ETL. In this regard, support from the Hospital Authority, Government agencies, and the individual hospitals is indispensable.

Time and sustained efforts are necessary to change public attitudes and behavior regarding organ donation. Through concerted and steadfast efforts by the local medical community, the lay public, hospitals, and governmental agencies, organ transplantation can achieve a far greater effect. Eye banks and eye tissue laboratories are costly to set up and to run. However, blindness is also costly for society. The HKEBRF, with a renewed commitment, is now prepared to take on the challenges of the 21st century. ㊟

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