

COMBINED KERATOPLASTY AND CATARACT EXTRACTION

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The surgical approach to patients with corneal pathology and cataract requires thoughtful consideration. The surgeon must decide whether keratoplasty or cataract extraction alone might sufficiently benefit his patient as to make the other unnecessary. Many elderly patients such as these with developing cataracts have had corneal opacities since infancy which despite their appearance are not inconsistent with acceptable vision if the cataract should be removed. On the other hand it is often difficult to estimate the density of a cataract viewed through a semiopaque cornea. Keratoplasty alone may suffice, or subsequent cataract extraction can be required. The past history and the course of recent visual loss must be carefully evaluated. Cataract may accompany any type of corneal pathology requiring keratoplasty but many of the patients presenting this problem suffer from Fuch's Dystrophy since both reach their highest incidence in the elderly.

If both keratoplasty and cataract extraction are deemed necessary there are three choices, keratoplasty following cataract extraction, keratoplasty preceding cataract extraction or simultaneous surgery.

Authors in the past cautioned against penetrating keratoplasty in the presence of aphakia. In 1955 Paton advised deferring cataract extraction till after keratoplasty, and in 1958 Castroviejo felt that aphakic keratoplasty was not likely to be successful. In 1964, however, Fine reported a 65% success rate in keratoplasty for aphakic bullous keratopathy, and subsequent reports have indicated that refined surgical technique, the use of the operating microscope, ocular hypotensive agents, improved instrumentation and suture materials, have altered the prognosis favorably. Success rates up to 95% have been achieved. Nevertheless keratoplasty in the

ARNOLD I. TURTZ

presence of aphakia remains a more difficult and hazardous procedure due to the presence of iris and vitreous corneal adhesions often vascularized, secondary glaucoma and a tendency for post-operative shallow anterior chamber and vitreous touch syndrome.

Vitreotomy has been helpful in obtaining clear grafts in the presence of aphakia but unfortunately the visual acuity does not always parallel graft clarity. In some series of cases with up to 80% graft clarity only 40 to 50% achieved vision of 20/70 or better. The newer mechanical vitreous infusion suction cutters may improve surgical results, but it is important to remember that uveitis, vitreitis, late vitreoretinal traction phenomena and secondary glaucoma are not innocuous and may result in functional deterioration of the globe. This eye suffered corneal laceration with avulsion of iris and lens. The initial repair followed by subsequent penetrating keratoplasty resulted in 20/25 vision. Some aphakic grafts do very well and others very poorly. This eye has intractible glaucoma. Although this graft remains clear vitreoretinal traction has caused cystoid macular disease.

Cataract extraction after keratoplasty is also associated with some risk. Previously successful grafts may become edematous and fail following subsequent cataract surgery. The graft endothelium may be injured by mechanical trauma or by a delayed onset allograft reaction due to post-operative inflammation. Authors generally agree that any subsequent intra-ocular surgery poses a threat to graft clarity. Although results have improved perhaps 20% of clear grafts can be expected to fail after cataract extraction despite all surgical precautions and appropriate waiting periods. This eye suffered a corneal burn with perforation by molten metal. 20/40 vision was restored by penetrating keratoplasty followed by cataract extraction. This previously clear graft has had persistent peripheral edema for three years following cataract extraction. Another graft has become totally edematous and opaque. In this case cataract extraction was followed by a severe late graft rejection which fortunately responded well to graft replacement seen here at six months and two years post-operatively.

In view of the hazards and difficulties, the lost time, the long wait for useful vision particularly in an elderly individual with limited life expectancy, and the late failures which occur regularly in the two-stage procedures, one is tempted by a combined procedure and corneal surgeons appear to be turning increasingly toward simultaneous surgery. Some authors have warned of greater inherent risks, but success rates of 80%

COMBINED KERATOPLASTY

and better have been reported and this may be expected to improve with technical advances.

The combined procedure is indicated for cases of Fuch's Dystrophy and cataract when sufficient corneal and lens pathology exist to suggest that both procedures will be necessary. It is often indicated when an opaque graft and cataract are present particularly when anterior synechiae and a shallow anterior chamber coexist. Trauma involving the cornea and lens often mandates simultaneous surgery. Blind, elderly or poor risk patients and keratoplasty candidates with aphakic fellow eyes might also benefit.

This patient had bilateral corneal scarring and cataracts. Her right eye had penetrating keratoplasty followed by cataract extraction one year later. Her left eye did equally well with combined keratoplasty and cataract extraction. This eye suffered a central corneal laceration and traumatic cataract. Simultaneous graft and cataract extraction was performed. This patient had bilateral combined procedures for cataract and Fuch's Dystrophy.

Keates described an extracapsular technique designed to maintain a capsulozonular barrier to prevent operative vitreous loss and post-operative vitreocorneal complications. This irrigation-aspiration technique as well as other extracapsular techniques including phaco-emulsification and the Katzin Hydropulse procedures illustrated in these post-operative photographs may make simultaneous surgery less hazardous and more effective.

Preoperative ocular hypotensive agents and digital compression reduce the operative risk. The pupil should be dilated.

Some form of scleral support such as the Flieringa ring is important. The use of alpha chymotrypsin facilitates intracapsular cataract extraction and does not increase operative risk. One or more peripheral iridectomies must be performed and a water tight closure is imperative. Vitrectomy is indicated only if vitreous is lost or continues to bulge through the trephination. Excision of vitreous should continue until one achieves a concave vitreous pseudoface behind the iris plane.

Local antibiotics, steroids and mydriatics are begun after the first dressing. Diamox is prescribed routinely to control secondary glaucoma which commonly occurs.

ARNOLD I. TURTZ

Summary:

The combination of cataract with corneal pathology warranting keratoplasty places the patient in some jeopardy. There is risk involved in both separate and simultaneous procedures. Where minimal pathology exists in either cornea or lens the surgery should be directed toward the elimination of the other problem. When significant changes are present in both locations simultaneous surgery offers an equally safe feasible and more practical solution for the patient.

There are three surgical procedures in cases of corneal pathology and cataract:

- 1 — Keratoplasty preceding a cataract extraction.
- 2 — Keratoplasty following a cataract extraction.
- 3 — Simultaneous cataract surgery and keratoplasty.
 1. In cataract extractions following a keratoplasty the following problems may arise: A clear graft may become edematose due to an inflammatory reaction or endothelial trauma. This shows that any intraocular surgery may produce changes in the graft.
 2. In keratoplasties performed in aphakic eyes there are complications due to its associate pathology. Such complications may include: corneal adherences of iris and vitreous, very often vascularized, secondary glaucoma, and a tendency to a shallow anterior chamber. When a vitrectomy was performed in these patients, it helped to obtain clear grafts. There was no relation between the transparency and the visual acuity because in only 40-50% of cases where the transparency of the graft was 80% the visual acuity reached 20/70.
 3. In view of the difficulties inherent to the mentioned procedures, such as loss of time, a long waiting period to obtain acceptable vision, and technical errors, it has been decided to perform the combined cataract and keratoplasty surgery. This procedure is indicated in cases of Fuchs, dystrophia and cataract, in those cases in which the graft is not clear and simultaneously there is

COMBINED KERATOPLASTY

a cataract, and in traumas involving cornea and lens. During surgery, hypotension agents and digital compression must be used; the pupil must be dilated and a filtering ring must be placed and, in some cases, alfachimotripsine must be applied. One or two iridectomies, followed by a vitrectomy (according to the case) must be performed. Antibiotics and mydiatics are applied topically simultaneously with treatment with corticoids to avoid the secondary ocular hypertension which usually takes place.

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