

KERATOPLASTY AND IOL IMPLANTATION IN SPECIAL CASES TECHNICS, BIOMETRY AND RESULTS

G. STIEGLER

Heiden, Suiza

Microsurgery combined with the advanced technology of intraocular lenses allow today an extended range in eye surgery. 20 - 30 years ago such surgery was unthinkable, it was like a russian roulette. Important today is to discover a so called optimal technique in order to reach the desired result.

In the beginning I performed firstly penetrating Keratoplasty and lateron cataract surgery. The extraordinary good results encouraged me to perform penetrating keratoplasty in aphakic eyes eliminating corneal dystrophy and secondary lens implantation in order to rebuilt the anterior segment and to prevent the corneal graft from vitreous touch. The so called triple procedure showed its own and new problems, but one of the main progress is the short time for visual rehabilitation and the optimal wound configuration by no touching the chamber angle structures.

Especially for single eyes the triple procedure has to be selected very carefully, because there is no suture of security like a net beyond a thightrope walker.

The selection of the type of intraocular lens to be implanted is today a philosophy. In all of these following cases two types are used.

1. The Omnifit anterior chamber lens with the features of:
 - a. one piece PMMA
 - b. not to small foot plates with minimum contact in the chamber angle

G. STIEGLER

- c. no vaulting and stabile postoperative anterior chamber depth of 2.9 mm
- d. UV absorbing.

2. the Bechert posterior chamber lens with the features of:

- a. one piece lightweight PMMA.
- b. laser ridge and 7 mm optic
- c. no possibility of decentration
- d. an excellent barrier between anterior and posterior segment.

For myself I prefer also the possibility of easy reversibility, so I am very satisfied with the Omnifit lens due to the fact to reach constant results.

The excellent Bechert lens is useful in case of Aniridia and injuries to rebuilt the anterior segment seperating the both segments like a barrier.

Very important is the biometry in connection with the donor material and the eye of the recipient.

For lens power calculation there are the following features.

1. Keratometry of the donor eye under an IOP of 20 - 30 mm of MC
2. the expected anterior chamber depth
3. the axial lenght or recipients eye eventually included preexcistent keratectasis
4. the relationship to the partner eye.

In this way there is to achieve an excellent visual rehabilitation.

Never forget that a decentered corneal graft combined with a decentered posterior chamber lens creates optical problems they never could be corrected due to the complete unmeasurable irregular astigmatism. In addition a not clear posterior capsule combined with a partly cloudy corneal graft makes YAG Laser capsulotomie disable.

SURGERY TECHNIQUE

A good preoperative tranquilizing of the patient and bulbus hypotonia is a must. The better way for such surgeries is general anaesthesia presupposing an anaesthetist, who is familiar with surgery habits in ophthalmology.

The donor eye is stored under normal eye pressure in a special container to hold the cornea humid and refrigerated on 4 degrees Celcius. For measuring and control purposes the bulbus is filled with balanced salt solution with an insulin needle through the optic nerve.

In the meantime, the patient is prepared, corneal diameter is determined. The eyelid is held open with Oertlis blepharostat and an appropriately sized Flieringa ring is sutured to firm episcleral tissue. The recipient bed size ranged normally between 7 and 8 mm, the donor cornea 0.1 mm larger. In order to get a similar cone, trephination is performed in donor and recipients eye from the same side. Presetted depth depends on corneas thickness ranging from 1.0 to 1.7 mm. Penetration should be totally, but so carefull, that no iris or lens structures should be violated. Used is the Barraquer Mateus motor trephine setted on maximum rotation speed. In case of anterior synechias, penetration should be only partial that one can safe the iris structures in order to get afterwards a round pupil. In these cases preparation of anterior segment should be performed very carefully. In case of an rigid iris peripheral iridectomy and iridotomy should be performed, I do recommend to prepare in all cases a peripheral Iridectomy. This prevents the eye from pupillary block. this postoperative complication could be delicate, because in the early postop. Phase Laser-Iridectomy is impossible to perform. In case of iridotomy or sphincterotomy two 11.0 Nylon sutures should be preplaced in order to receive after lens extraction a round pupil. In case of ECCE polishing of posterior capsule that can be done easily but carefully, because the mid of the capsule is the thinnest part. In case of secondary implantation the anterior chamber should be cleaned completely from vitreous and the coloboma should appear as in good function.

After lens extraction an reconstruction of pupil lens insertion has to be performed very carefully, specially looking for the correct placing of the feet. After this you will find a very helpful phenomenon the anterior chamber is rebuilt and deep, the implanted IOL pushes all structures backwards. This is the mains cause for preferring these lens styles, because there are not only an optical correction, they are a really helpful bulbus stabilizing instrument.

Now the donor cornea is fitted in the recipients bed and you will see that a spontaneous air bladder occurs like a cushion, so there is no need for viscoelastic

substances. In general - anterior chamber should only be irrigated by balanced salt solution. Other drugs might be harmful to the sensitive endothelium and can cause post operative irritation and pressure elevation.

The donor cornea is sutured into the recipient bed with four 10.0 Nylon sutures, just in case of a monocular patient 8 sutures should be preplaced for security reasons. The following running suture should give a watertight wound closure, that never IOL could touch the endothelium.

The preplaced sutures were removed and the anterior chamber filled with balanced salt solution. Removing of air bubble is not necessary. Crystalline betamethasone and gentamycine is injected beyond tenons capsule.

The postoperative treatment and control is the half of the success. The eye should be covered for 2-8 days, afterwards closed only in nighttime with a plastic cover for about one month to avoid serious injuries. In ordinary cases no systemic therapy with steroids or cyclosporin A is indicated. Instructions about immunological graft reactions have to be given properly. Monthly controls should be done and running suture removal should not be done too early, because a wound blasting may create a lot of unexpected problems.

If the procedure is done properly, complications are seldom and depend more on the preexistent disease. Acid injuries, recurrent herpes infections and secondary glaucoma, trachomatous and other eyelid defects and reduced tearing may complicate the situation.

But none of these problems are correlated to the intraocular lens. The intraocular lens is an additional helpful instrument due to the fact, that glaucoma surgery and keratoplasty are much easier to perform than in aphakic eyes. This is also an important advance for monocular patients.

From 1980-1987 68 cases are operated. In so called "normal" cases like corneal dystrophy or corneal scars the success rate is between 95-100% for a good visual rehabilitation. Hopeless cases do not figure in statistics, but it could be interesting to see where the limits of surgery and treatment is set. Also in these cases exist a minimized chance for a partly visual rehabilitation and we should try to give the patient a chance.

These described surgery modes are a real challenge for an enthusiastic surgeon satisfying due to the fact, that visual rehabilitation could be achieved in a safe and anatomical correct way.