

THE USE OF INTRAOCULAR LENSES IN APHAKIA

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Virtually all ophthalmologists would agree that the ideal solution to aphakia would be the replacement of the defective human lens with a clear prosthetic intraocular device. While acknowledging that aphakia presents specific problems for the patient, ophthalmologists have no unanimity of opinion for the proper RX of surgical aphakia. Aphakic glasses with such disadvantages as excessive magnification and defective side vision are certainly not the perfect answer. Contact lenses, hard or soft, are a partial solution with only 1/3 of the magnification of spectacles and essentially normal side vision. However, contact lenses are not always feasible and like spectacles do not offer the possibility of satisfactory 24 hour vision. Without them the patient is reduced to bare traveling vision. Keratophakia, the brilliant technique of refractive keratoplasty developed by doctor Jose Barraquer eliminates most of the difficulties of both glasses and contact lenses but it requires donor tissue, time, skill and instrumentation beyond the limits of most of the world's ophthalmologists.

Why then has intraocular lens implantation not been embraced with enthusiasm by cataract surgeons since the existing need is so apparent? It is the purpose of this presentation to explain this paradox.

Following the initial lens implantation successes of Harold Ridley as reported in the early 1950's a number of the world's surgeons attempted to follow his lead. The technique of the time called for the placement of a lens fifteen times the weight of current lenses and with no intrinsic means of support. The heavy and bulky Ridley lens, without hooks, loops, iris configuration or sutures relied on capsular support and at times even only on vitreous support to maintain its proper position within the eye. Many of these lenses became subluxated within the eye causing irregular damage. Hindsight is inevitably better than foresight and its hardly fair to judge

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doctor Ridley's work adversely. He had demonstrated that clinical quality polymethylmethacrylate could be tolerated in the human eye and now 25 years later some of these first lenses are still providing good vision for the patient bearers. Though no longer leading, doctor Ridley shined the light along the path and others pursued his course. Utilizing polymethylmethacrylate, Strampelli, Dannheim and others attempted to obtain support by struts in the anterior chamber. Their first blush of success faded with the development of a particularly malignant type of endothelial corneal dystrophy. Intermittent corneal touch led to regional edema and endothelial cell depopulation which in time affected the entire corneal metabolism. Keratoplasty for this dystrophy was notoriously unsuccessful. Nevertheless even to this time a very carefully contoured angle support lens is in successful use by Peter Choyce of England.

Late in the 50's several ophthalmic surgeons, including Binkhorst of the Netherlands, conceived of pupillary support lenses with loops anterior and posterior to the iris. These loops impinged in such a fashion as to completely support the lens. Fixation was often encouraged by miotics which in turn produced atrophy of the sphincter as the loop bases cut into the iris stroma. Even with these loop-lenses endothelial corneal dystrophy occurred sometimes years after lens placement. Careful studies have demonstrated that if a lens is inserted with anterior loops, the total lens length should be longer than 8 millimeters and because of lateral rotation of the eye it is safer still to align the anterior loops vertically. Despite these various forms of attachment, subluxation still occurred with potential risk to the eye.

More recently Worst of the Netherlands has created a lens which is supported either by a suture in the iris or by fixation through an iridectomy with a platinum clip. With this support he has been able to discard the anterior loops.

Doctor Binkhorst has also created a lens which has eliminated the anterior loops. After performing a planned extracapsular extraction the posterior loops are permitted to adhere to the posterior capsule while iris adhesions are discouraged by periodic dilating.

The various advantages and disadvantages of intracapsular cataract surgery versus extracapsular lens surgery are material for an entire presentation. It should be noted that the planned extracapsular procedure of Europe can be sophisticated by utilizing certain steps of the Kelman phacoemulsification procedure as performed in the United States.

This series of slides will illustrate the problem as presented with the solution in each stage of advancement of the intraocular lens.

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A more satisfactory need for the correction of aphakia is acknowledged by most ophthalmologists. Progressive problem solving in the development of the intraocular lens has been demonstrated. The major problems have been solved though residual more minor difficulties remain. The normal human resistance to change necessary scientific evaluations has slowed acceptance of prosthetic lens replacement in the past. Now an increasing number of ophthalmologists are utilizing intraocular lenses because they believe the advantages to the patient far outweigh the slightly increased risk.

SUMMARY

Aphakia would be ideally solved by replacement of the lens with a clear intraocular device. However, proper Rx of surgical aphakia is still in question. Aphakia glasses and contact lenses (hard or soft) have their disadvantages, as well as keratophakia, which, even though it eliminates most of the difficulties of the above mentioned, requires donor tissue, time, and superior skill and instrumentation.

Harold Ridley introduced lens implantation in the early 1950's. The Ridley lens, weighing 15 times that of a current lens, relied on capsular support and at times on vitreous support alone to maintain proper position.

Strampelli, Dannheim, and others, follow the path of Ridley's technique; attempts were made using polymethylmethacrylate to obtain support by stryts in the anterior chamber. But complications followed, such as a malignant type of endothelial corneal dystrophy, regional edema and endothelial cell depopulation.

In the late 50's several surgeons introduced a pupillary support lens with loops anterior and posterior to the iris. Even with complete support of the lens, endothelial corneal dystrophy occurred. Various forms of attachments were introduced, still with potential risk to the eye.

Recently, the anterior loop has been discarded, being replaced by either a suture in the iris or fixation through iridectomy with platinum clip. Binkhorst has also created a lens which discourages iris adhesions and permits posterior loops to adhere to the posterior capsule. The major problems of intraocular lens development have been solved, and an increasing number of ophthalmologists are now using these lenses, believing that their advantages to the patients far outweigh the risk involved.

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