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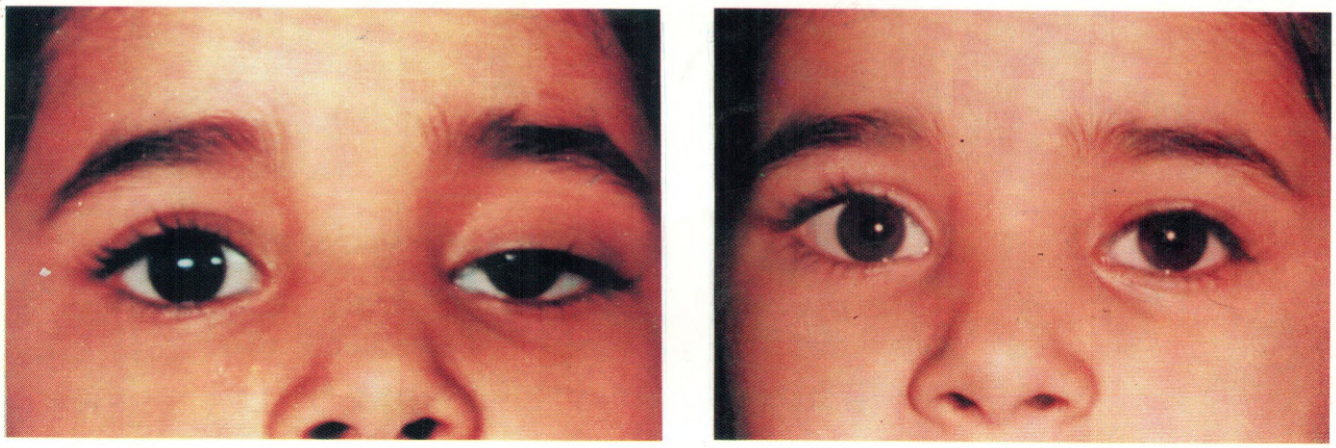

At Page 11 Figures Ia & 1b: Ptosis left eye before and after surgery

In This Issue

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Editorial

The Scourge of Endophthalmitis: An Ophthalmologist's Nightmare

See also pp..... 28-33

"Endophthalmitis is one of the most devastating complications that can occur following intraocular surgery"[1]. Since cataract extraction is the most frequently performed intraocular procedure — one million extractions annually in the USA alone[2] and millions more the world over — obviously, postoperative endophthalmitis (POE) is more common after such intraocular surgery than any other. By and large cataract surgery has been an extremely gratifying procedure over the last 2½ millennia. From the ancient times (Susruta, circa 600 BC)[3], through the medieval era to the modern times, ophthalmic surgeons have been striving to restore the sight of the cataract blind worldwide. According to the World Health Organization (WHO), cataract-related blindness tops the list of the most common causes of global blindness. There are 16 million people blind from cataracts globally, trailed by trachoma (6 million), glaucoma (5 million) and onchocerciasis or river blindness (0.3 million)[4], and the number keeps on increasing by 20% annually. Thus, a large segment of world population is subjected to cataract surgery every year, besides other intraocular procedures.

Once the protective outer coats of the eye are penetrated, as in intraocular surgery or penetrating trauma, all kinds of microbes can gain entry into the eye and cause devastating intraocular infection with dire consequences. In fact, 70% of cases of endophthalmitis have been reported to be the result of intraocular surgery[2]. An incidence of 0.1% for POE following cataract extraction and intraocular lens (IOL) implantation has been reported by the FDA[5]. The risk of infection was higher among patients who had undergone intracapsular extraction (0.17%) than among those who had had extracapsular surgery or phacoemulsification (0.12%)[6]. Once the sanctity of vitreous is violated, the risk of POE rises further. Thus vitreous loss with any technique increased the risk of rehospitalization for POE within one month of surgery to nearly 4.5 times (0.41%) that following uncomplicated cataract surgery[6].

Our efforts to avoid and overcome postoperative infections in the eye have paralleled the developments in the fields of surgical maneuvers and instrumentation. Aseptic techniques coupled with improved laboratory and clinical investigations as well as development of newer, more effective antibiotics, are the steps in that direction.

Once a clinical diagnosis of POE is suspected, both aqueous and vitreous samples are cultured on freshly reduced thioglycolate broth enriched with hemin and vitamin K, chocolate agar and Sabouraud dextrose agar and sensitivity tested.

Over the years we have learnt that conventional infectious disease treatment in the form of topical, periocular, and many oral or parenteral antibiotics, fails in POE, since antibiotic penetration into the avascular vitreous never reaches high enough concentrations to inhibit microbial growth. Injection of antibiotics into the vitreous cavity, alone or in combination with pars plana vitrectomy, has evolved as *the* treatment for POE[7]. Vancomycin is effective against the coagulase negative staphylococci which are the most frequent cause of POE. This drug covers the predominant pathogens, S. epidermidis including their methicillin and cephalosporin resistant strains, as well as Propionibacterium acnes and Bacillus sp[8]. In 1mg intravitreal doses it is effective and non-toxic. Amikacin, an aminoglycoside, has a broad spectrum of activity against gram-negative bacilli including

some gentamicin resistant organisms, as well as some strains of gram-positive S. aureus. In a dose of 0.4mg intravitreally, amikacin is the aminoglycoside of choice for POE. Ceftazidime, a third generation cephalosporin (1.5-2.0G) and amikacin (6-7.5mg/kg) every 12 hours intravenously were administered to Endophthalmitis Vitrectomy Study patients randomized to intravenous treatment, and found to have shown no improvement in the final visual acuity or media clearance[9].

The timing of intravitreal injection and of reinjection, if needed, as discussed in a related article in this issue of the Journal, is of the utmost importance in successful treatment outcomes as well as in avoiding retinal toxicity.

Oral or parenteral corticosteroids may be of great help in retarding the host inflammatory response to POE. If one is fairly certain from clinical features and gram-stain cytology that coagulase negative staph are the cause, one may initiate steroid therapy with the initial antibiotic regimen, or else wait till the culture and sensitivity reports are available.

Cycloplegia with 1% atropine or 0.25% scopolamine topically several times a day is helpful in relieving pain.

Periocular antibiotic injections and fortified solutions for topical application (gentamicin, vanomycin, cefazolin etc) have certainly been used in treating POE and are useful in the presence of wound infections but their usefulness in treating intravitreal infections has not been proven.

Vitrectomy, alone or with intraocular antibiotics with or without steroid treatment, is advisable for severe cases of POE, while milder forms may initially be managed by intravitreal antibiotics, topical and periocular, as well as intravenous antibiotics. The Endophthalmitis Vitrectomy Study Group concluded that routine immediate pars plana vitrectomy was not necessary in patients with better than light perception vision at presentation but was of substantial benefit for those who had light perception-only vision[9]. It was also concluded that there was no difference in final visual acuity or media clarity whether or not systemic antibiotics were used.

Intraocular steroids at the time of intravitreal antibiotic injection or within 48 hours thereof, following a debulking of a quantity of inflammatory necrotizing toxins and necrotic tissue, may help prevent severe complications that follow development of inflammatory membranes adherent to the collagen framework of the vitreous gel[10].

Presence of IOL in some cases may lead to such dense fibrin deposit on the surface of the lens as to hamper visualization during vitrectomy. Tissue plasminogen activator (*t* PA) and viscoelastic may be helpful in these situations. In one study[11] IOLs were removed in 28% of pseudophakic eyes with endophthalmitis to facilitate performance of vitrectomy prior to the use of tPA. In another study IOLs were left in place in all cases with equally good results[10].

And as an ounce of prevention is better than a pound of cure, the dictum provokes us to take appropriate steps in that direction. Coagulase negative staphylococci from periocular surfaces are the most common source for POE[12] and have been shown to be present in the anterior chamber fluid of some patients at the end of uneventful cataract surgery[13,14]. S. aureus in the nose, streptococci in the nasopharynx and obstructed nasolacrimal passages, gram-negative bacilli colonizing a quiet eye, may all gain access to the aqueous and vitreous during cataract surgery. Preoperatively one must look for clinical signs of chronic microbial blepharitis, dacryocystitis and infections elsewhere, like sinusitis, gingival and dental abscesses, cystitis etc. Even though there are no controlled studies establishing the value of preoperative topical antibiotics in preventing POE, their use involves minimal, if any, risk. Thus a broad-spectrum topical agent may be helpful in decreasing bacteria colonizing the conjunctival sac. Careful prepping, with 5% povidone-iodine solution, of ocular and periocular surfaces and draping to exclude the eyelashes and lid margins out of the operative field should be a routine procedure. IOLs should be copiously irrigated and not allowed to touch the lid margins or conjunctiva. Although no conclusive data are available on the effect of periocular antibiotics on prophylaxis against POE, clinical judgement should be employed when considering their use at the end of surgery.

Thus may we hope to avoid this scourge and to take it head on, if it does appear despite our precautions, and not have nightmares.

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Ophthalmic "Pastpourri"

Keratoplasty The Seedling Sprouts

In the fall of 1838, Dr. Kissam, presented with a one-eyed patient "with a staphyloma and adherent iris, capable of distinguishing only a very bright light", decided to give the patient the only chance that was available. With little more than Bigger's report to guide him, Dr. kissam elected to transplant a new cornea from a six-month-old pig to the seat of the patient's opaque one.

After enucleating the pig's eye, a piece of tissue, about half as large as a thumb nail, was cut out of the pig's cornea, placed upon the end of a piece of cork, and two ligatures passed through the tissue at opposite sides.

Dr. Kissam then removed the necessary portion of the protruding cornea from the patient's eye with a Beer knife and the cornea from the animal, which looked like cobweb, was carefully laid *over* the aperture in the patient's eye, and secured by two ligatures on a line with the angle of the tarsi. The ligatures were cut short and the lids carefully closed.

Immediately following the operation, the patient's vision was improved. The cornea continued transparent a fortnight, when it commenced to become opaque; in the course of a month it was "absorbed". After the "absorption" of the new cornea, the remains of the old one contracted upon itself. This left the patient with a more comfortable and better appearing eye than he had before the operation--nothing more.

Of one of the great problems of keratoplasty of the time, Kissam had this to say; "From the delicacy of the parts it would be utterly impracticable to *fit* in an aperture, a piece of foreign substance equally delicate".

Excerpted from: Richard Sharp Kissam And "Ceratoplastice in Man". In: Our Ophthalmic Heritage by Charles Snyder. Little, Brown and Company, Boston. 1967; pp 101-4.

Jehangir Durrani
MD, FACS, FRC OPHTH.

Professor Mahmood Ali Shah Memorial Lecture*

Status of IOL Implantation in Pakistan

Khwaja Shariful Hasan

Department of Ophthalmology, Baqai Medical University, Karachi

Mr. Chairman, Distinguished colleagues, Ladies and Gentlemen,

I feel greatly honoured to deliver the first Professor Mahmood Ali Shah Memorial Lecture. It is indeed a healthy tradition being established by the Ophthalmological Society of Pakistan (OSP) by creating Prof. M.A. Shah Memorial Lecture. Let us hope that this tradition is continued in the future and that more learned people than I, do better justice to the memory of Prof. Shah.

My association with Prof. Shah was first as his student and later as his junior colleague in the profession, which really amounted to being his student forever. As a teacher, Prof. Shah started his career as an anatomist, over fifty years ago. The anatomy museum at the Dow Medical College, Karachi bears ample testimony of his hard and dedicated work. At the same time he was an honorary ophthalmologist at the Civil Hospital, Karachi. Later he opted for being full-time ophthalmologist and was appointed the first Professor of Ophthalmology at the Dow Medical College & Civil Hospital, Karachi. He occupied this chair for nearly seventeen years. As an anatomist he had many research papers to his credit. As an ophthalmologist he was equally brilliant, if not more. He also had great administrative capabilities and served as the Vice Principal, Dow Medical College; Medical Superintendent, Civil Hospital, Karachi; Director Health Services and lastly as the Principal, Dow Medical College for nearly fourteen years.

He was an impressive and methodical teacher with a kind and amiable personality. He was a man with great sense of humour. He was deeply religious and practised high ethical and moral values.

His contributions to ophthalmology are many. He described a new suturing technique in cataract surgery which was published in the British Journal of Ophthalmology in 1954[1]. He was the first Pakistani ophthalmologist to have implanted the original Ridley's intraocular lenses (Fig-1). Beginning in 1953[2], he implanted thirteen such lenses but abandoned them because of the "disasters", to quote his own words. "Total number of IOL implants done was 13. Results in two (which could be followed, one for 15 years or more and the other also for a considerable length of time) were excellent. Although in many cases the lenses became hazy due to deposition of cells/pigments (low grade uveitis?). One lens slipped into the vitreous. Two had to be removed within a month for acute pain due to fulminating uveitis. The rest could not be followed" (Personal communication: letter dated 21-8-85) (Fig-2). Our group reviewed IOL implantation at Prof. Shah's hospital, i.e. Civil Hospital, Karachi in 1985, after a lapse of nearly thirty years. In my opinion that was his biggest achievement in ophthalmology and, therefore, I chose this topic of "**Status of intraocular lens Implantation in Pakistan**" for his first Memorial Lecture as a befitting tribute to his memory. The history of cataract surgery in Pakistan is a long one but is deficient in documentation. Therefore, I will confine myself to the contemporary one.

From Intracapsular Cataract Extraction (ICCE) with 180 degrees Grafe's knife limbal section, tumbling or sliding the lens intracapsularly with Arruga's forceps and later with cryo, or expressing the hypermature cataracts using Smith's technique, without suturing of any kind, the ophthalmologists in this country adopted the microsurgical techniques in the early 1980s and gradually learned the planned extracapsular cataract extraction. The transition from intracapsular to extracapsular cataract extraction was relatively smooth, in experienced hands in particular. Posterior chamber intraocular lens implantation became the standard technique of IOL implantation from 1985 onwards. We were lucky to have learnt

**Delivered during the 20th Annual Meeting of the Ophthalmological Society of Pakistan held at Karachi in March 1997.*

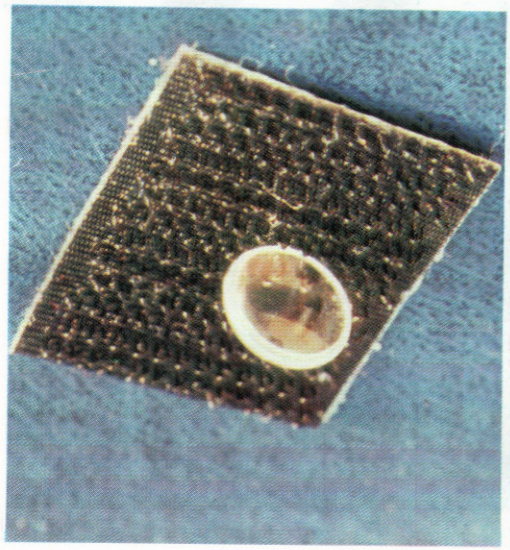


Fig-1:
Ridley's original intraocular lens

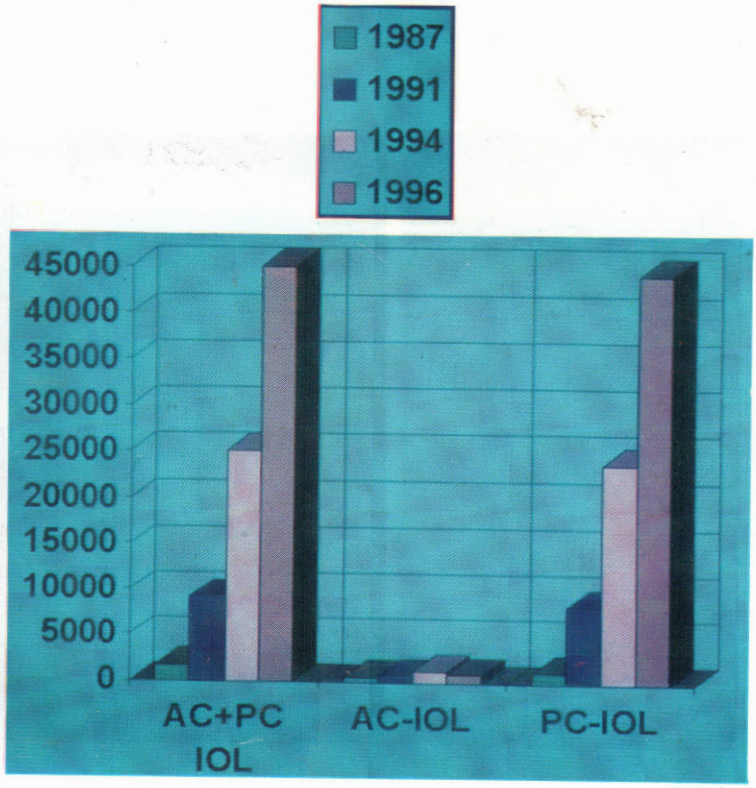
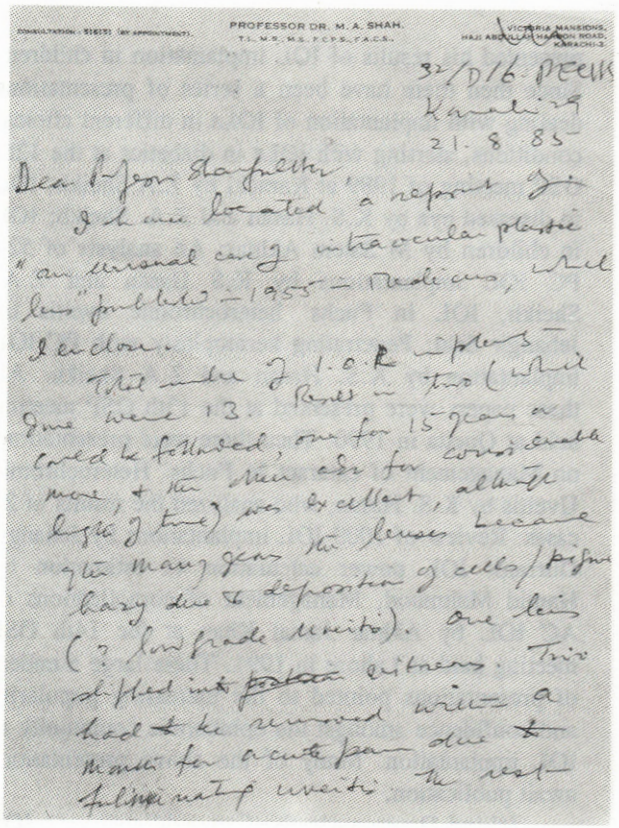


Fig-3:
Sale of intraocular lenses in Pakistan from 1987-96



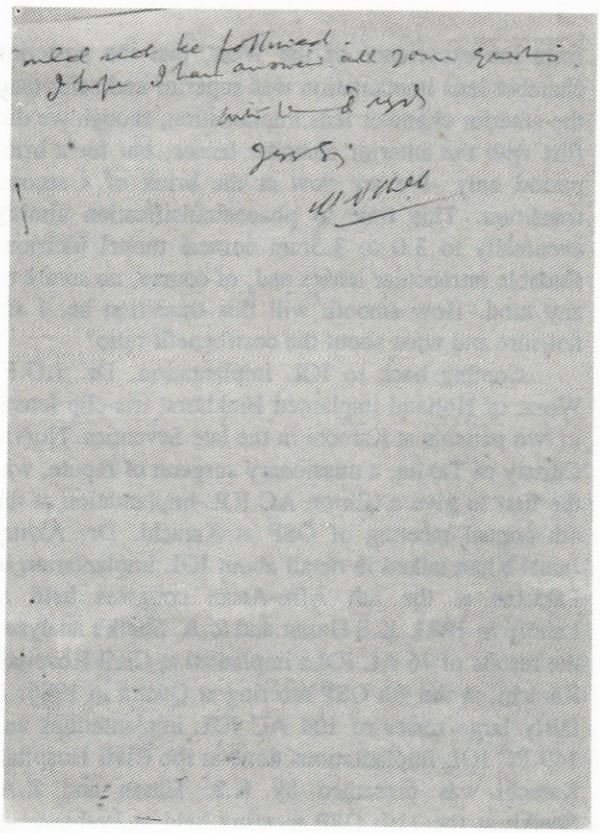


Fig-2:
Letter of Prof. M.A Shah to the author, dated 21-8-95

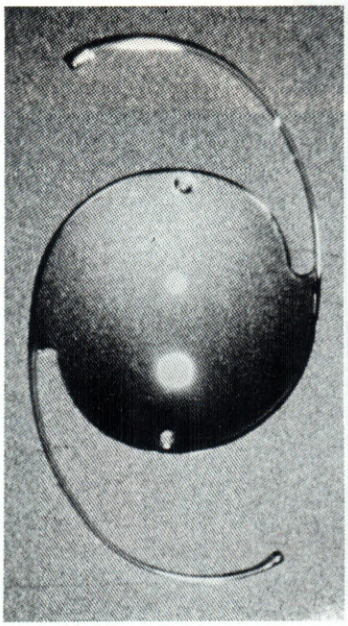


Fig-4:
AC IOL implantation Vs PC IOL implantation from 1987-96

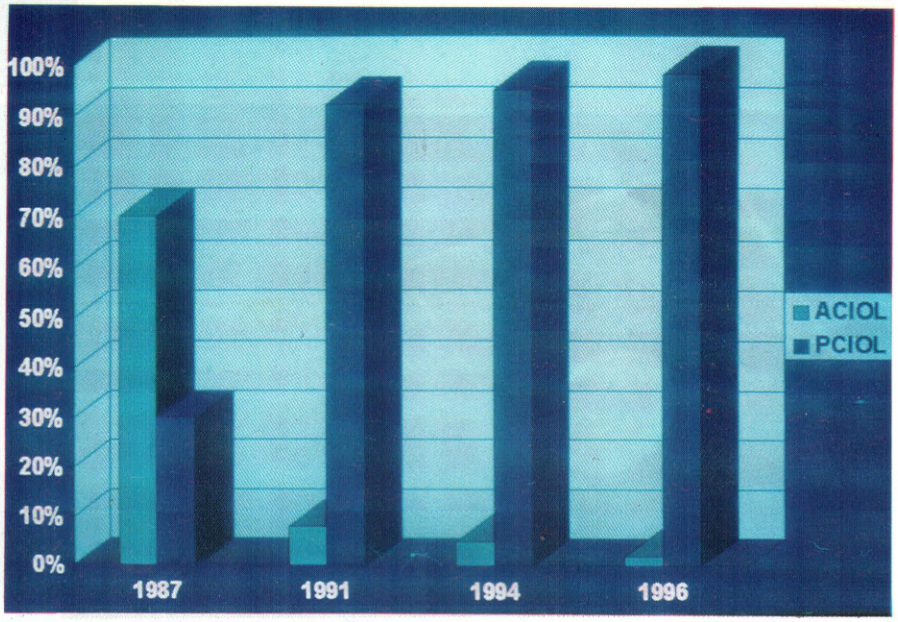


Fig-5:
All PMMA modified C-loop posterior chamber intraocular lens

from the experience of the West, that the posterior chamber lens implantation was superior and safer than the anterior chamber lens implantation, though we did flirt with the anterior chamber lenses, but for a brief period only. We are now at the brink of a second transition. This time to phacoemulsification aiming eventually to 3.0 to 3.5mm corneal tunnel incision, foldable intraocular lenses and, of course, no suture of any kind. How smooth will this transition be, I am not sure and what about the cost/benefit ratio?

Coming back to IOL implantation, Dr. J.G.F. Worst of Holland implanted Binkhorst iris-clip lenses in two patients at Karachi in the late Seventies. Norval Christy of Taxila, a missionary surgeon of repute, was the first to give a talk on AC IOL implantation at the 4th annual meeting of OSP at Karachi. Dr. Akhtar Jamal Khan talked in detail about IOL implantation in Pakistan at the 8th Afro-Asian congress held at Lahore in 1983. K.S Hasan and Z.A. Sheikh analyzed the results of 76 AC IOLs implanted at Civil Hospital, Karachi, at the 9th OSP meeting at Quetta in 1986. A fairly large series of 104 AC IOL implantations and 149 PC IOL implantations done at the Civil Hospital, Karachi was presented by K.S. Hasan and Z.A. Sheikh at the 11th OSP meeting held at Peshawar in 1988. At the same meeting late Dr. Jamshed Wania presented his results of IOL implantation in children. Since then there have been a series of presentations dealing with implantation of IOLs in different clinical conditions, starting with IOLs in diabetics at the 12th OSP meeting of 1989 at Karachi by Z.A Sheikh; IOL in diseased eye by K.S. Hasan and Z.A. Sheikh; IOL in children by M Salem Akhtar; An analysis of 527 PC IOL implantations by K.S Hasan and Z.A. Sheikh, IOL in Fuchs' heterochromic uveitis by Jehangir Sahi; Penetrating keratoplasty with PC IOL implantation by K.S. Hasan and Z.A Sheikh. All these papers were presented at the 13th OSP meeting held at Quetta in 1990. Then there were presentations on Management of cataract in Fuchs' Heterochromic Uveitis by K.S. Hasan, who analyzed the results of 22 cases; Review of 1000 IOL implantations by Jehangir Durrani; IOL power calculation vs estimation by Hamid Mahmood, Management of complications of AC IOL by Akhtar Jamal Khan at the 14th OSP meeting held at Lahore in 1991. These large numbers of presentations pointed to the increasing popularity and confidence amongst the ophthalmic community in IOL implantation. Many of the above presentations await publication.

Jalilud Daula made the first publication on IOL implantation in 1987. He implanted AC IOLs after

lensectomy and vitrectomy in eight cases of traumatic cataract in children[3], seven of whom had the best-corrected visual acuity of 6/12 or better after one year of follow-up. Hasan and Sheikh published the results of 104 cases of AC IOL implants done at Civil Hospital, Karachi[4]. They reported the final visual acuity of 6/12 or better in 77.5% of cases using AC IOLs of different makes. The first publication on PC IOL implantation was made by Jahangir & Kadri who analysed the results of 20 cases[5]. The largest series on PC IOL implantation published so far is by Hussain & Durrani[6]. They reviewed the results of implantation of PC IOLs in 2527 eyes. This large study had a final visual outcome of 6/12 or better in 88% of cases.

The increasing popularity of IOL implantation can be judged by the rising sale of IOLs in the country (Fig-3). This data obtained from a few multinational companies shows an annual growth rate of well above 50%, the total sales of IOLs rising from a few thousand in 1987 to 45000 in 1996. The actual figures may be much higher, as many of the smaller companies declined to give their data. AC IOLs were used enthusiastically for a brief period of time, their share dropping from 60% in 1987 to 8% in 1991 and 2% in 1996 (Fig-4). They are now used as backup lenses during PC IOL implantation or are implanted in cases with dislocated lenses or as secondary IOL implantation in patients where ICCE had been done previously.

Mainly because of IOL implantation, our indications of cataract surgery have changed over the years. Though we still rely on Snellen's visual acuity, we are now prepared to operate on early cataracts and even on normal lenses. Extracapsular cataract extraction and IOL implantation is largely being done with facial block and retrobulbar and surface anaesthesia. Methylcellulose is the commonly used viscoelastic substance. Can-opener technique of capsulotomy is giving way to continuous curvilinear capsulorrhexis (CCC). Ringer's lactate is used as irrigating fluid with two-way Simcoe cannula for removing the cortex manually. One-piece all PMMA modified C loop intraocular lenses (Fig-5) are being preferred for in-the-bag implantation. The use of antiprostaglandins pre and postoperatively have lessened the need for strong corticosteroids. Anterior limbal or corneal section with five interrupted 10/0 monofilament suture with buried knots are the preferred wound construction and closure techniques. The sutures are preferably removed in two to four month's time. Nd:YAG capsulotomy for posterior capsular opacification is now the treatment of choice. It is safe when used with caution and minimum energy should be used with minimum number of precisely focused shots[7].

With the improvement in phacoemulsification technique and good results achieved in the USA, where nearly 86% of surgeons are using this technique satisfactorily[8], the interest of Pakistani surgeons has developed in adopting this technique. Many British and American surgeons have, over the past two years or so, demonstrated modern methods of phacoemulsification in Pakistani patients at Karachi and other places. Some of them have not been so successful, probably because of hard nuclei that we so often encounter in our patients. The race to establish the superiority of one phaco machine over another to conquer the hard lens nucleus, however, goes on. The first publication on results of phacoemulsification in Pakistan was recently made by Hussain & Durrani[9]. Their review of 210 cases showed a final visual outcome of better than 6/12 in 70% of cases. Postoperative astigmatism of > 1.5D was present in 14.9% of cases having an IOL implantation done after enlargement of phaco incision to accommodate the IOLs of 5.0 to 6.5mm optics. All cases in this study enjoyed an early recovery. The same authors in their series of 2527 PC IOL implantations by conventional method reported 6/12 or better vision in 88% of cases.

The true benefits of phacoemulsification, however, lie in making a small corneal tunnel incision, using the foldable intraocular lenses and not using any sutures. Even then the benefit is in the early postoperative period. At three to four months postoperatively there is not much to choose between the phacoemulsification and the conventional extracapsular cataract extraction as far as the visual results are concerned[10-12].

The high cost of phaco machine, its maintenance, relatively high cost of foldable lenses, the long learning curve, the types of cataract one largely deals with in Pakistan and the high rate of sight-threatening complications as compared to conventional extracapsular cataract extraction, necessitating at times the services of the vitreoretinal surgeons, are some of the deterrents in popularizing the technique of phacoemulsification in the country. At present we depend heavily on the imported diagnostic and surgical instruments. Our position today vis-a-vis the developed countries is the same as of the USA as compared to Germany in the 19th century. I would like you to note carefully what was mentioned in an editorial of the American Journal of Ophthalmology in 1918[13]: "Medical men have depended on Germany for certain drugs, dyes, appliances, etc. In as much as such articles could be

purchased from Germany and were of superior quality and cheap, Americans have purchased them and have used them with satisfaction. But there is really no reason why all these things cannot be produced at home, and as a matter of fact they will be produced at home, and all we need to do is to realize that they must be manufactured in this country; and before long, this object will be attained. It is up to us, therefore, to learn to be independent and to make what we need here in the United States and then to protect our own industry. Let all chemicals and other manufacturers, therefore, realize that they are facing this problem and must conquer it. Until this condition of affairs is reached, however, let us cheerfully go without those articles we have previously imported from Germany, but we have not yet learned how to produce".

How true it is for Pakistan today. Unless we start manufacturing most of the commonly used diagnostic and surgical ophthalmic equipment it will not be possible to progress and deliver the fruits of scientific advancement to the masses in the country. With the imported thoughts and machines we may become good followers but not the leaders in our field.

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Levator Resection in Congenital Ptosis with Levator Function of 5-10mm

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ABSTRACT

16 patients of congenital ptosis were operated upon. 8 (50%) patients were male and 8 (50%) were female, ranging in age from 3 to 25 years with a mean of 12.7 years. Follow-up range was from one month to two years and four months with a mean of 4.8 months. The amount of ptosis varied from 3-5 mm with a mean of 3.5mm and the extent of preoperative levator function was 5-10mm with a mean of 6.9mm. The necessary levator resection was from 15-26mm with a mean of 19.6mm.14 (87.5%) patients had good results, 1 (6.3%) had a fair lid level and 1(6.3%) patient was lost to follow-up. The combined method of levator resection gives very satisfactory results in the management of patients with congenital ptosis with good levator function.

INTRODUCTION

Drooping of the upper eyelid is due to inadequate lift by the dystrophic levator palpebrae superioris (LPS) muscle[1-3]. The normal LPS muscle function as measured on a ruler held in front of the eye, taking a note of the total excursion of the upper eyelid from extreme downgaze to extreme upgaze, while holding the brow to eliminate compensatory frontalis overaction, is considered to be 14-16mm[1,2]. Resection of the dystrophic LPS muscle is considered as the procedure of choice in case of adequate levator function of more than 5mm[1,2]. When the function of LPS is less than 4mm, it is generally considered to have adverse effect on successful resection[4] although success has been reported under similar circumstances[5].

PATIENTS AND METHODS

Complete eye examination was carried out in all patients. Ptosis was measured by recording the Marginal Reflex Distance (MRD), which is the distance between the center of the upper eyelid margin and the corneal light reflection in the primary position of gaze, normal being 2.5-3mm. Ocular muscle balance was normal in all of our patients. Levator function was assessed by noting the total upper eyelid excursion, while asking the patient to look in extreme downward direction followed by extreme upward gaze. Firm pressure was maintained just above the eyebrow to negate the compensatory frontalis overaction.

General anesthesia was employed in all patients. The upper eyelid skin crease was marked and a 4/0 black silk suture was applied just above the lash line at the center of the upper eyelid. The upper eyelid was then everted and 1cc of 2% xylocaine with 1:100,000 adrenaline was injected beneath the upper tarsal border with the needle tip being positioned on the anterior tarsal surface. This created a plane of hydrodissection separating the levator aponeurosis from the overlying orbicularis muscle. A blunt-ended scissors was then passed in a spreading motion from the lateral side keeping its ends close to the anterior tarsal surface and bringing it out on the medial side by giving a nick in the conjunctiva with a knife close to the medial end of the upper tarsal border. One end of the ptosis clamp was than held within the scissors ends and guided along the track made by hydrodissection and brought out from the lateral side, where the scissors ends were initially introduced. The clamp was then secured, thus holding the upper border of the tarsal plate together with the levator aponeurosis, Muller's muscle and the conjunctiva. An incision was given by a Bard-Parker blade along the upper tarsal conjunctival surface, thus cutting away the levator aponeurosis, Muller's muscle and the conjunctiva. The conjunctiva was then dissected away from the aponeurosis and skin expansions of the

levator were also freed. Upward dissection was carried out beyond the lower edge of the orbital septum till the orbital fat pad was reached, which was left undisturbed. The conjunctiva was then sutured to the upper tarsal border with 5/0 absorbable sutures. The levator aponeurosis was then anchored to the tarsus by passing a double-armed 5/0 Ethibond (polyester) suture through the center of the anterior tarsal surface at the junction of the upper one-third and the lower two-thirds, in such a manner as to cover the upper limbus for 2mm or so. When the central marking suture was found giving a satisfactory lid lift, two additional sutures were passed in a similar manner and the excess levator aponeurosis was then excised. The skin and muscle layer was then closed by interrupted sutures of 5/0 Ethibond. After inserting the suture needle through the skin and orbicularis muscle from one side, it was also passed through the newly created levator aponeurosis insertion and tarsus in an attempt to create a future skin crease and fold. A 5/0 suture was passed through the skin below the lower lid margin and anchored above the eyebrow with a tape to avoid the problem of exposure in the early postoperative course. A broad-spectrum antibiotic was applied and dressing was done. The lower lid suture was removed on the day following the operation and the lid level was noted. The skin sutures were removed on the fifth postoperative day. Follow-up was at two weeks, four weeks, three months, six months and then every year.

RESULTS

The study spans from July 1991 to June 1996, comprising a total of 16 cases, operated on by one of us (HM). The follow-up range was from a minimum of one month to a maximum of two years and four months with a mean of about five months (4.8). 8 (50%) patients were male and 8 (50%) were female. The age range was 3-25 years with a mean of 12.7 years. The amount of ptosis varied from 3-5mm, the mean being 3.5mm. 10 (62.5%) had a moderate amount of ptosis (3mm) and 6 (37.5%) had severe ptosis (>4mm) (Table-1). The levator function ranged from 5-10mm with a mean of 6.88mm; 12 (75%) had fair (5-7mm), while 4 (25%) had good (8-10mm) levator function (Table-2). The necessary levator resection carried out varied from 15-26mm with a mean of 19.56mm. 11 (68.8%) had a moderate levator resection of 18-22mm, 3 (18.8%) had a minimum of 14-17mm resection and 2 (12.5%) had a maximum resection of more than 23mm (Table-3). The upper eyelid level was adjusted on the table in such a manner as to cover the upper 2mm or so of the superior corneal limbus. Peroperatively, two patients were found to have a rarefied aponeurosis which did not adversely alter the result. Postoperatively, 14 (87.5%) patients had a good cosmetic result (within 1mm of normal), 1 (6.3%) patient had a fair result (within 2mm of normal) while 1 (6.3%) patient was lost to initial follow-up (Table-4).

Table 1: Amount of ptosis.

Amount (mm)	No	Percentage
Mild (2mm)	-	-
Moderate (3mm)	10	62.5
Severe (≥4mm)	6	37.5
Total	**16**	**100.0**

Table 2: Levator palpebrae superioris function (mm).

Function (mm)	No	Percentage
Poor (<4mm)	-	-
Fair (5-7mm)	12	75.0
Good (8-10mm)	4	25.0
Total	**16**	**100.0**

Table 3: Levator palpebrae superioris resection (mm).

Resection (mm)	No	Percentage
Minimum (14-17mm)	3	18.8
Moderate (18-22mm)	11	68.8
Maximum (>23mm)	2	12.5
Total	**16**	**100.0**

Table 4: Postoperative results.

Lid Level	No	Percentage
Good (within 1mm of normal)	14	87.5
Fair (within 2mm of normal)	1	6.3
Lost to follow-up	1	6.3
Total	**16**	**100.0**

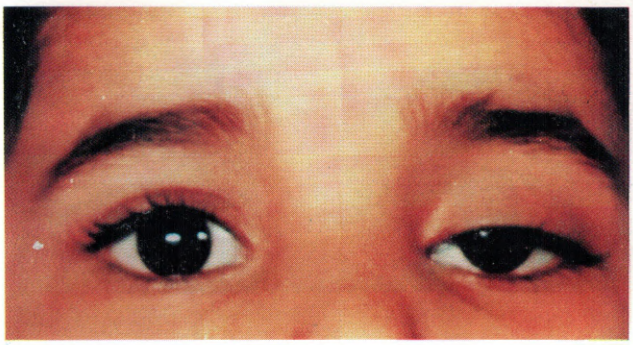

Fig-1(a)
Preoperative. 3mm ptosis and 6mm levator function.
Notice the absence of the lid crease and fold.

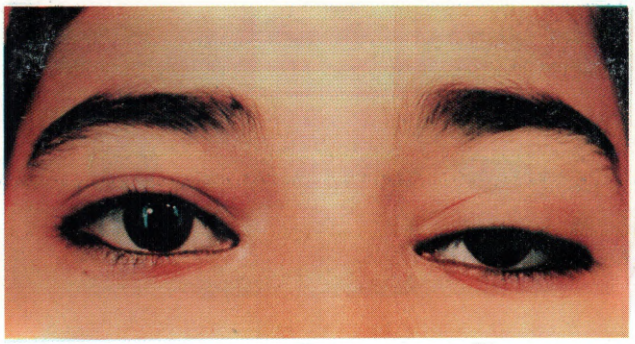

Fig-2(a)
Preoperative 4mm ptosis and 7mm levator function.

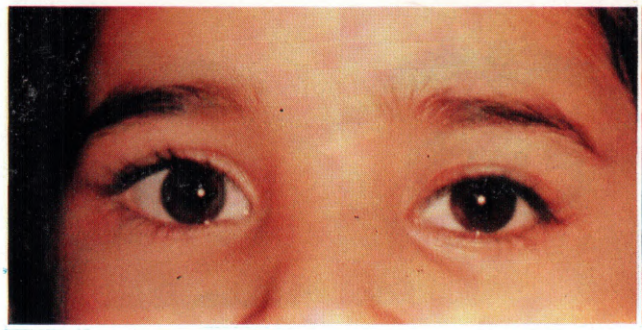

Fig-1(b)
Result two months after 26mm of levator resection. Excellent
lid crease and fold were created.

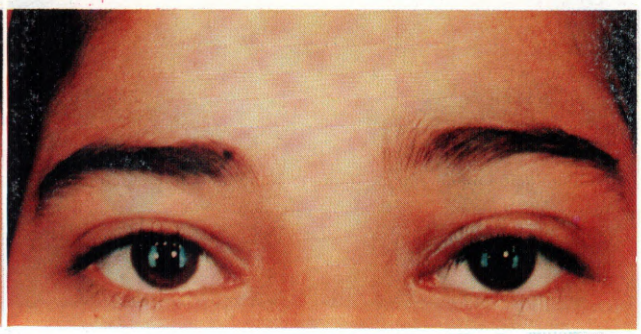

Fig-2(b)
Result two weeks after 22mm of levator resection. Good lid fold
and crease were created. The mild apparent
lid edema resolved completely.

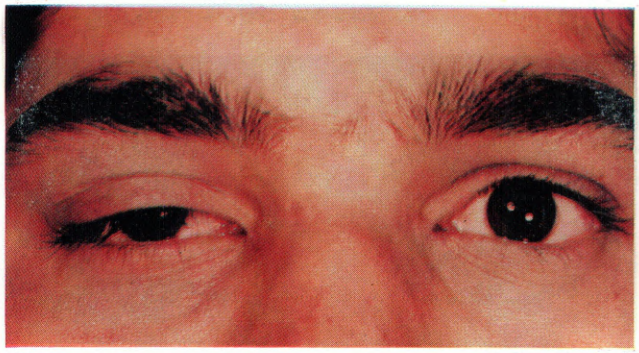

Fig-3(a)
Preoperative 4mm ptosis and 7mm of levator function.

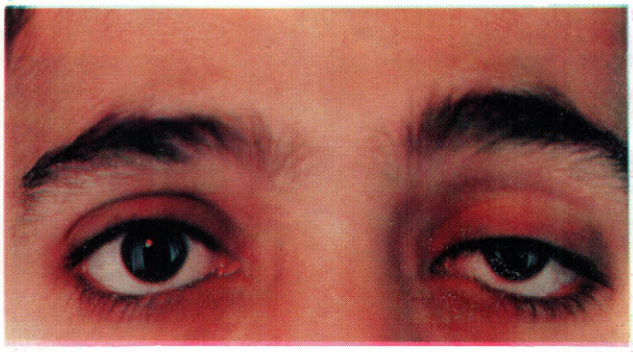

Fig-4(a)
Preoperative 5mm ptosis and 7mm levator function.

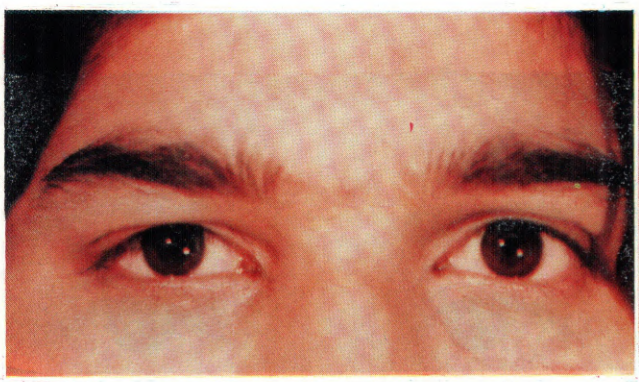

Fig-3(b)
Result after 18mm of levator resection.

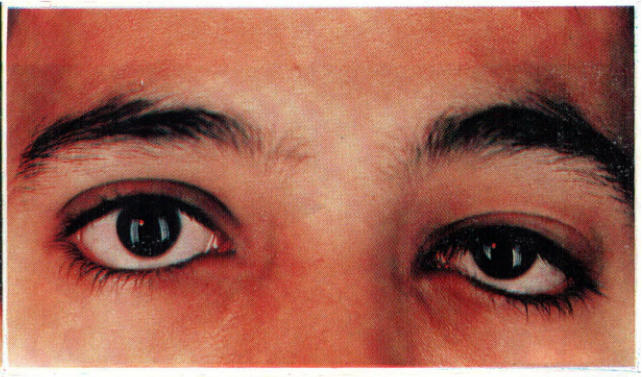

Fig-4(b)
Result four months after 18mm levator resection.

DISCUSSION

The maintenance of the normal upper eyelid level covering the upper 2mm or so of the superior cornea in primary position of gaze depends to a large extent on the intact functional tone of levator palpebrae superioris muscle[1-3]. Strengthening of the weak levator aponeurosis to restore the normal level of the upper eyelid is favourably influenced by adequately good preoperative levator function[1-3] and poor function is thought to result in inadequate correction[4]. Success has been reported even when the levator function was poor, i.e. less than 4mm[5]. Ideally, LPS muscle force should be measured by means of a transducer[6]. Clinical assessment of LPS function is done by measuring the total movement of the upper eyelid on a transparent ruler held in front of the eye and eliminating the frontalis overaction by firm thumb pressure just above the eyebrow[1,2,7]. Normal LPS muscle excursion is reported to be 13-16mm in 78.5% of healthy subjects[7].

There is a consensus amongst oculoplastic surgeons that resection of LPS muscle is the procedure of choice when its function is better than 4mm. Posterior or transconjunctival[8,9] and anterior or transcutaneous route[10,11] have been variously advocated. The combined approach of transconjuctival isolation and transcutaneus resection of levator enables us to benefit from the advantages of both the methods[12,13]. The extent of preoperative levator function is thought to influence the amount of necessary corrective resection of the muscle. Some consider that the major factor in determining successful resection is the amount of ptosis, whereas levator function seems to have no effect[14]. General anaesthesia was employed in all of our patients and it has been reported that the type of anaesthesia does not seem to influence the surgical results[12]. The adjustment of the lid level on the table at the desired postoperative level covering the upper cornea for 2mm or so has been a very dependable surgical landmark. Adjustable sutures have been advocated but are obviously impractical in the pediatric population[15].

A postoperative lid level of within 1mm of normal is considered to be a good result and 90%[15],83%[16] and 95%[17] success rates are mentioned. Our results compare favourably as 87.5% had good results. The results were well maintained in our study with an average follow-up of five months, which is relatively on the lower side but very much indicative of the general follow-up trend in our part of the world. Nonabsorbable 5/0 polyester suture was used to anchor the resected end of the levator to the upper anterior surface of the tarsal plate to avoid late drooping due to disinsertion of the aponeurosis attributed to the use of absorbable sutures[16].

CONCLUSION

In conclusion, the combined method of levator isolation and resection gives good results in correction of ptosis. The amount of preoperative levator function significantly affects the amount of necessary levator resection. We obtained good results in 87.5% of cases of congenital ptosis with fair to good levator function by performing levator resection by the combined approach of transconjunctival isolation and transcutaneous resection of levator.

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Ophthalmic "Pastpourri"

Keratoplasty Further Developments

In 1878, Sellerbeck wrote of using donor material from the enucleated eye of a child, aged 2 1/2, with glioma of the retina on an eye blinded by an old but healed gonococcal infection. Several months after the operation the patient could count fingers up to 3 meters; the central portion of the graft was hazy; one part of the leukoma near the transplant had cleared up.

Von Hippel, in 1886, using a clockwork trephine of his own devising, implanted as a lamella into the cornea of a girl a full-thickness rabbit graft. Her vision improved from counting fingers to 20/200. Von Hippel showed her before his colleagues of the Ophthalmological Society in Heidelberg in 1886 and 1887.

Excerpted from: Alois Glogar, Karl Brauer, and Eduard Konrad Zirm. In: Our Ophthalmic Heritage by Charles Snyder. Little, Brown and Company, Boston. 1967; p 107.

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Role of Perfluorocarbon Liquids in Complicated Retinal Detachment

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ABSTRACT

We performed three-port pars plana vitrectomy in twenty-five eyes of twenty-four patients with complicated retinal detachments using perfluorodecaline (D-K-line) as intraoperative tool. The mean age was 46 years. 17(71%) were males and 7(29%) were women. Four patients (16%) were only eyed. Five patients (20%) were aphakic and 5 (20%) were pseudophakic. Twelve eyes (48%) had history of previous ocular surgery at other centres. Twenty patients (80%) had proliferative retinopathy (PVR) grades ranging from C_P-D_A. Two patients were highly myopic. Eight patients (33%) had giant retinal tears, six (25%) were traumatic detachments and four (16%) had retinal detachment (RD) with vitreous hemorrhage. In fourteen eyes (56%) no tear could be identified. Majority of the patients (56%) had marked loss of vision, i.e. PL only. All patients underwent three-port pars plana vitrectomy and perfluorocarbon liquid (PFCL) was used intraoperatively. Silicone Oil was used in 19 eyes (76%) and sulphur hexafluoride (SF_6) in 6 eyes (24%) as internal tamponade. Limited peripheral retinal detachment (RD) and silicone oil in A.C. were the commonest intraoperative complications. Recurrent RD due to PVR was the commonest postoperative complication. The overall anatomical success rate was 64% and functional success rate 44% after a mean follow-up of 7 months.

INTRODUCTION

Besides the conventional techniques, various methods have been used to facilitate complicated retinal detachment surgery, such as endophotocoagulation, internal drainage, internal tamponades and heavy liquids[1].

This is now a well-recognized fact that the commonest cause of redetachment is Proliferative Vitreoretinopathy (PVR)[2]. Thus elimination of all tractional forces on the retina is the key to the successful retinal reattachment. Though silicone oil has been used to facilitate the removal of PVR membrane intraoperatively, the results are not satisfactory. Since 1989[3] perfluorocarbon liquids (PFCLs) or heavy liquids have been used effectively and safely as intraoperative hydrokinetic tool in the treatment of complicated retinal detachments. In cases of retinal detachment complicated by severe PVR, PFCL has been used with much ease and great success[4-6]. Because of their physical and chemical properties it becomes easy to visualize the tractional areas, to hold back the retina to retinal pigment epithelium (RPE) and to drain the subretinal fluid (SRF) internally through the preexisting peripheral retinal tear. Heavy liquids have proved their effective role in traumatic retinal detachment (RD), giant retinal tears and dialyses.

We have used perfluorodecaline (D-K-line) in twenty-five eyes suffering from complicated retinal detachment. We report our experience in these patients.

PATIENTS AND METHODS

Patients for the study were selected from our outpatient department (Eye OPD) at the Civil Hospital, Karachi. The study was carried out from May 1994 to October 1996. Patients referred from other centres were also included. The inclusion criteria for the study were retinal detachment complicated by PVR grade C, giant retinal tear, traumatic RD, failed RD surgery and RD complicated by vitreous hemorrhage (Tables 1-3). The exclusion criteria were retinal detachment with no or mild PVR, RD with a tear less than 90° having mobile posterior flap, fresh RD with or without macular involvement and Eales' disease.

All patients were admitted in the eye ward. A detailed history was obtained on a printed proforma. All patients were examined preoperatively, peroperatively and postoperatively as discussed later.

Best-corrected vision was recorded. Anterior segment was examined with slit-lamp with special emphasis on the signs of previous ocular surgery, condition of the cornea, pupil and lens. Posterior segment was examined by indirect ophthalmoscope using an indentor, and 90D and triple-mirror. The

Table 1: Demographic data (24 patients)

Age	NO. & (%) of patients	SEX Male	SEX Female	EYE Right	EYE Left
> 40 years	14 (58%)	17 (71%)	7 (29%)	18 (72%)	7 (28%)
< 40 years	10 (41.6%)				

Table 2: Associated ocular findings (25 eyes)

Phakic	Pseudophakic	Aphakic	Myopic	Traumatic
15 eyes (60%)	5 eyes (20%)	*ICCE 4 (16%) **ECCE 1 (4%)	8 eyes (32%) Highly myopic 2 eyes (8%)	6 eyes (24%) Blunt 4 (16%) Penetrating 2 (8%)

*ICCE = Intracapsular cataract extraction **ECCE = Extracapsular cataract extraction

Table 3: Ocular findings (25 eyes)

Retinal detachment	*PVR	Giant Tear	Vitreous hemorrhage	Vision
Total RD 19 eyes (76%) Subtotal RD 6 eyes (24%)	20 eyes (80%) Ranging from Grade C_P-C_A	8 eyes (32%) 6 eyes were Complicated by PVR (24%)	4 eyes (16%)	CF 2 eyes (8%) HM 9 eyes (36%) PL 14 eyes (56%)

*PVR = Proliferative vitreoretinopathy

Table 4: Intraoperative complications (25 eyes)

Complications	Number	Percentage
Limited peripheral R.D*.	4	16
Oil in the anterior chamber	4	16
Retinal incarceration	1	4
Iatrogenic tear	3	12
Retinal hemorrhage	2	8
Vitreous hemorrhage	3	12
**PFCL in subretinal space	1	4

* R.D = Retinal detachment **PFCL = Perfluorocarbon liquid
All these complications were noted in 6 particular eyes (24%)

Table 5: Postoperative complications (25 eyes)

Complications	Number	Percentage
Recurrent retinal detachment due to PVR	6	24
Increased IOP	10	40
Transient	9	36
Uncontrolled	1	4
Residual PFCL droplets	4	16
Keratopathy	1	4
Hypotony	2	8
Macular pucker	1	4

Table 6: Success rate (25 eyes).

	Number	Percentage
Anatomical success		
Completely attached	10	40
Partially attached (Central retina flat)	6	24
Total	**16**	**64**
Functional success		
Improved	11	44
Unchanged	12	48
Decreased	2	8
Total	**25**	**100**

Table 7: Postoperative best-corrected visual acuities (25 eyes)

Visual Acuities	Number	Percentage
6/24	1	4
6/60	2	8
1/60 - 3/60	8	32
CF	2	8
HM	7	28
PL	5	20
Total	**25**	**100**

Table 8: Pre and postoperative best-corrected visual results (25 eyes).

Visual acuities	Preoperative		Postoperative	
	No.	%	No.	%
PL	14	56	5	20
HM	9	36	7	28
CF	2	8	2	8
1/60			4	16
2/60			3	12
3/60			1	4
6/60			2	8
6/24			1	4
Total	**25**	**100**	**25**	**100**

extent of retinal detachment was noted, PVR was graded according to the new classification of PVR proposed by the Retina Society in 1991 (Robert Machemer)[7]. The detachment was drawn on a fundus drawing chart showing details of RD, PVR and retinal tears. The color codes were used as described by Kanski (1995)[2]. Intraocular pressure was taken by applanation tonometer and B scan and gonioscopy were done where required.

Baseline investigations were done in all patients and fitness for general anesthesia (G.A.) was obtained. All patients were operated on under G.A. and informed written consent was taken. Every patient was apprised of the procedure and the visual prognosis preoperatively. In addition to the material used for conventional surgery, vitreous cutter (Storz), PFCL (D-K-Line), silicone oil and SF_6 were made available in every case.

In the operation theatre the Zeiss operating microscope, vitrectomy unit, cryotherapy and contact lenses for peroperative use were also available. Intraocular forceps, microscissors and Charles back-flush flute needle were used in some selected cases.

OPERATIVE PROCEDURE

After the patient was anesthetized, indirect ophthalmoscopy was done in all patients to re-evaluate the extent of RD, PVR and retinal tears that could not be visualized in uncooperative patients even with indentation preoperatively.

Three-hundred-sixty degrees (360°) peritomy was done and all four recti were isolated. In cases where scleral buckling had already been done, revision or just an adjustment was made only when considered necessary. Standard three-port pars plana vitrectomy was performed. Scleral ports were made 4mm from the limbus in phakic and 3.5mm in aphakic eyes. Revision of prior vitrectomy was made when the vitreous base had not been fully removed previously. Total lensectomy was done in 15 patients (60%) and in five patients (20%) introcular lenses and posterior capsules were left in place.

In cases of retinal detachment complicated by PVR, initially core vitrectomy was done. A cut was given in the epiretinal membrane near the optic disc. The edge of the incised membrane was picked up by a forceps and then PFCL was injected slowly by a 20-guage needle, 1mm above the disc. The tip of the needle was kept within the centre of the bubble to prevent dispersion of the bubble. The PFCL bubble[4] aided in opening the funnel and flattening the retina and helped to define the areas of traction clearly[3]. Then vitrectomy continued peripherally and anteriorly removing all traction. In eyes with anterior PVR, the PFCL bubble facilitated anterior vitrectomy by immobilizing the posterior retina and pulling the peripheral retina posteriorly providing better membrane visibility. In cases of retinal detachment with giant retinal tears[1], the bubble of heavy liquid filled the eye in posteroanterior direction, thus unfolding the rolled over posterior flap of the tear. In cases of RD complicated by vitreous hemorrhage[4], PFCL was injected into retrohyaloid space. The PFCL bubble pushed the retina posteriorly while blood was isolated anteriorly and then this blood was safely cleared with vitreous cutter.

In all cases subretinal fluid was drained internally through the preexisting peripheral tear. After complete peeling of the epiretinal membranes and removal of anteriorly located PVR, PFCL was exchanged with saline usually twice to remove any residual PFCL. In 19 patients (76%) saline was exchanged with silicone oil (5700 C_S) and used as internal tamponade. The quantity of silicone oil used varied from 3.50cc to 7cc with the average being 4cc. In these patients peripheral iridectomy at 6°Clock (Ando's iridectomy)[8] was done. In six patients (24%) a 20% mixture of sulphur hexafluoride (SF_6) 0.5cc to 1.5cc was injected as internal tamponade. Minimum cryopexy was done using indirect ophthalmoscope. Explants were tied with 5/0 ethibond, while scleral ports and peritomy were closed with 6/0 vicryl.

At the end of the procedure the fundus of every patient was examined with indirect ophthalmoscope to see whether the retina was flat and to check disc perfusion. Subconjunctival injection of 20mg genticyn and 2mg dexamethasone was given. Injection genticyn 80mg I/V in adults and 20mg I/V in children was given when considered necessary. Patients with SF_6 were kept in a position according to the location of the tear. When IOP was raised, 500mg acetazolamide (two tablets of diamox 250mg) was given stat after the patient resumed oral diet, and then one tablet six hourly. All patients were kept nil orally till bowel sounds were heard. The first dressing was done after 24 hours. Visual acuity, IOP and state of the retina were noted during the first week every day. All patients were given topical antibiotics and steroids. Systemic antibiotics were given in some cases where it was necessary. The patients were followed-up in outpatient department weekly for one month, bimonthly or monthly for 6 months. The total follow-up period ranged from 2 years to 1 month (mean 7 months). Attention was directed to postoperative inflammation, IOP, state of the retina, signs of recurrence of PVR, presence of any residual PFCL droplet, silicone oil emulsification and leakage into the A.C.

RESULTS

At the end of the procedure, the retina was attached in all patients. During the operation a few problems were noted and managed according to the standard methods[3-6,8,9]. These complications are shown in Table-4.

Six eyes (24%) (Table-5) out of 25 developed PVR with recurrent retinal detachment. In four eyes (16%) a few residual droplets of PFCL were noted postoperatively floating in the vitreous cavity and in the anterior chamber. These droplets did not cause any visual problem or damage to the eye up to the last follow-up. In only one patient with silicone oil residual PFCL droplets were mixed with emulsified oil and later both were removed. Raised intraocular pressure was noted in 10 eyes (40%). In 6 patients with SF_6 raised IOP was controlled with medication. In 3 eyes rise in IOP was temporary and no treatment was required. In one patient with silicone oil IOP was uncontrolled with medication. Therefore, silicone oil

had to be removed. Two eyes developed hypotony and one patient developed macular pucker that was noted after six months of follow-up.

Anatomical success (Table-6) with total retina attached was obtained in 10 eyes (40%). Retina was partially attached in 6 eyes (24%). Functional success was seen in 11 eyes (44%). Most of the patients (Table-7 & 8) had best corrected visual acuities of 6/60 or less. Only one patient had best-corrected vision of 6/24.

DISCUSSION

Because of the unique physical and chemical properties of PFCLs, they are being used in complicated retinal detachment surgery with good success rate. Many vitreoretinal surgeons have been using these liquids as intraoperative hydrokinetic tool in the management of complicated RD. To take advantage of these liquids we selected 25 eyes of 24 patients with complicated retinal detachments. We used perfluorodecaline (D-K-Line) to manage these cases.

Intraoperatively PFCL proved a good fluid to inject and to remove easily with 20 gauge needle[4]. SRF drained internally from preexisting peripheral retinal hole obviating the need for posterior retinotomy (Stanley - 1989)[4]. Heavy liquid greatly facilitated peeling of the membrane by fixing the posterior retina back to the RPE. Perfluorodecaline was very effective in unfolding the folded flap of the giant retinal tear (GRT) (Kreiger 1992)[1]. PFCL was very effective in removing the anterior PVR but some difficulty was faced in pseudophakic patients in visualizing the peripheral retina. Same problem was faced by Kreiger (1992)[1] who managed it by capsulotomy. Intraoperatively, some problems (Table-4) were encountered but we managed them according to the standard methods except the retinal hemorrhage[3-6,8,9]. We did not use retinotomy for relaxing the stiff retina but this effect was successfully obtained by high scleral buckle in our cases. Six eyes (24%) out of 25 required additional surgery due to PVR with recurrent RD. This complication in our series is comparable to the results of other investigators[4-6]. In a series reported by Blinder (1991)[5] PVR with redetachment occurred in 12% of cases and the same investigator (1992)[6] in another series reported that PVR with redetachment occurred in 25% of the cases. Chang et al (1989)[4] managed 14 patients with traumatic RD reporting that PVR with recurrent detachment was present in 42% of their cases. It has also been demonstrated that anterior PVR was more common and severe in traumatic RD. In our series the higher incidence of recurrent PVR and redetachment is probably because of previous multiple ocular surgeries done at other centres, various varieties of complicated cases being included, particularly traumatic RD, unavailability of endophotocoagulation that probably might have led to reopening of the tear later on and perhaps because of missed or overlooked peripheral tears. Another cause may be the delayed referral in these cases. Silicone oil was removed in 4 eyes (16%) due to emulsification, uncontrolled IOP and keratopathy. These complications were attributed to silicone oil and not to the use of PFCL. Raised IOP was also noted in patients with SF_6 but was controlled with medications or settled without any treatment.

The visual results have been encouraging in cases of complicated retinal detachment managed by using PFCL intraoperatively. For the purpose of analysis we divided the visual results in anatomic and functional success rate categories. Anatomical success was defined as reattachment posterior to the scleral buckle and IOP of 5mm or more for at least 6 months of follow-up[1,4,10], the functional success has been defined as visual acuity of 1/60 or better[6,10].

The overall anatomical success rate was 64% in 16 eyes out of which 10 eyes had completely attached retina and 6 eyes had central retina attached. The overall functional success rate was 44% (11 eyes) and 14 eyes (56%) were considered functionally failed. These anatomical and functional results are comparable to those seen at other centres. In a series of 11 patients with giant retinal tears, managed with PFCL, Kreiger (1992)[1] achieved 100% anatomical and 81% functional success rates. In the management of 14 traumatic retinal detachments Chang and colleagues (1989)[4] reported 73% anatomical and 51% functional success rates. Blinder (1991)[6] reported 15 cases of complicated RD managed with PFCL. Anatomical success rate was 100% and functional success was obtained in 47%. In our series the anatomic success rate (16 eyes, 64%) is fairly reasonable and is thus comparable to those of other centres. On the other hand the functional success rate (11 eyes, 44%) is lower than from other centres. This considerable difference in functional success is multifactorial. We think that many factors have contributed in this low functional success rates. for example a large group of the patients had marked loss of vision (i.e PL) in our series (14 eyes, 56%), long standing complicated RD, improper previous ocular surgeries, unavailability of endophotocoagulation, intractable hypotony, mostly older age and low I.Q. of the patients. In addition, some patients having good vision in one eye were not happy with the visual

outcome of the operated eye. Because of these factors we think that any postoperative improvement in the vision as compared to the preoperative visual acuity, is our functional success.

CONCLUSION

Our study shows that there is a very large gap between patients and general physicians and between general ophthalmologists and vitreoretinal surgeons. Because of illiteracy, patients do not understand and realize the nature and the outcome of the complicated RD. Delay in referral of these patients by the general physicians and general ophthalmologists and also undue delay on the part of the patients in seeking help are factors that contribute to the chronicity and severity of the disorder. Vitreoretinal surgery is a very expensive, time- consuming and yet less rewarding procedure. It requires team work and a joint venture to make it affordable, less expensive and professionally rewarding.

We need more cooperation from our society, concerned authorities and associations to help the needy patients at public hospitals. Patients should be educated and made to realize their problems, nature and aftermath of vitreoretinal surgery. Though vitreoretinal surgery is expensive, time- consuming, back-breaking and a thankless job, even so we need more ophthalmologists to take part in the services to humanity and in caring for the needy patients.

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No Injection, No Stitch, No Pad Cataract Surgery Technique

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ABSTRACT

One thousand (1000) eyes with cataracts were operated on under topical anaesthesia through a 2.8mm temporal clear corneal incision and phacoemulsification with foldable intraocular lens implantation. In all cases only plate haptic foldable posterior chamber intraocular lenses were used through the injector system. Preoperative cases of astigmatism were not considered in this study. No peribulbar or pinpoint anaesthesia was given nor any stitch applied during the operation. The patients walked out of the operation theatre without a pad.

On the first postoperative day, out of the thousand eyes operated on, 560 eyes (56%) had 6/9 visual acuity (unaided) and 480 eyes (48%) improved to 6/6 with pinhole.

The visual acuity (aided) was found to be 6/6 in 560 eyes (56%) after one week and in 760 eyes (76%) after one month.

Astigmatism was found to be in the range of 0.5-1.0 diopter in 440 eyes (44%) after one week and in 520 eyes (52%) after one month. The shift in astigmatism ranged from 0 to 0.25 D in 720 eyes (72%).

INTRODUCTION

The new technique of no injection, no paid, no stitch cataract surgery involves phacoemulsification under topical anaesthesia which saves the patients from going through the torture of peribulbar or retrobulbar injection. The operation involves a clear corneal temporal incision which has the advantage of avoiding the superior rectus catch, thereby bringing down the incidence of postoperative red eye and pain.

The main aim is to keep the eye white and clear even at the end of surgery. The end process involves implantation of foldable PC IOL followed by stromal hydration of the cornea near the incision, as a result of which sutures are avoided. The shift in astigmatism is thus reduced to the minimum.

PATIENTS AND METHODS

All patients were first subjected to the routine preoperative investigations. They were given a preoperative betadine eye wash on the day before surgery. On the day of the surgery, the eye to be operated upon was dilated and topical anaesthetic eye drops (xylocaine - 4%) were instilled three times at an interval of 15 minutes.

On the operation table, the patient was draped well and advised to look straight up at the source of light. The surgeon then made a side-port entry at 1 O'clock position for the right eye and 11 O' clock position for the left eye and Viscon (methylcellulose) was injected (Fig 1). A clear corneal temporal incision (2.8mm) was made with a diamond knife at 9 O' clock position for the right eye and 3 O' clock position for the left eye (Fig 2). It was extended horizontally for 1.5mm into the corneal layers and then dipped down so as to produce a clear corneal valve. During this process the conjunctiva was not touched with any instrument. The eye was held steady by introducing the straight end of the titanium nuclear rotator instrument into the side-port incision. This had the advantage of preventing any subconjunctival haemorrhage that is usually seen if a conjunctival forceps is used.

The capsulorhexis was then performed with a bent-tipped 26G needle by raising a triangular flap and then extending it in a controlled fashion to produce a circular rhexis of about 5 to 6mm diameter (Fig-3). This was followed by hydrodissection. Hydrodelamination was avoided. The phaco probe was introduced through the incision and a phaco chopper through the side- port entry into the anterior chamber. The nucleus was cracked into 4 pieces (Fig-4) by embedding the phaco probe into the middle of the nucleus and chopping it with a chopper held in the left hand. Each pie-shaped cracked piece was chopped further and aspirated using high vacuum.

The phaco probe was replaced by the irrigation/aspiration probe and irrigation/aspiration of the cortical matter was done. The anterior capsule was also well polished (Fig-5).

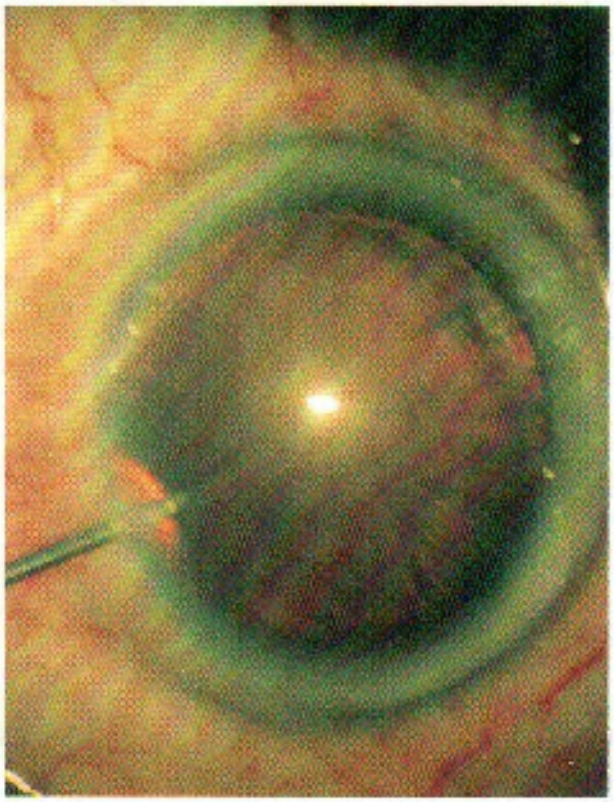

Fig-1:
injection of methylcellulose into the eye

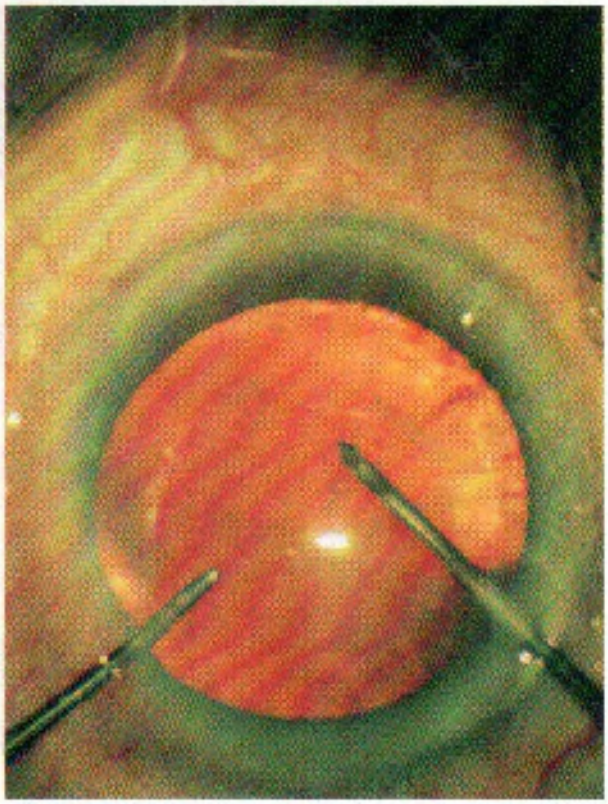

Fig-3:
Rhexis started

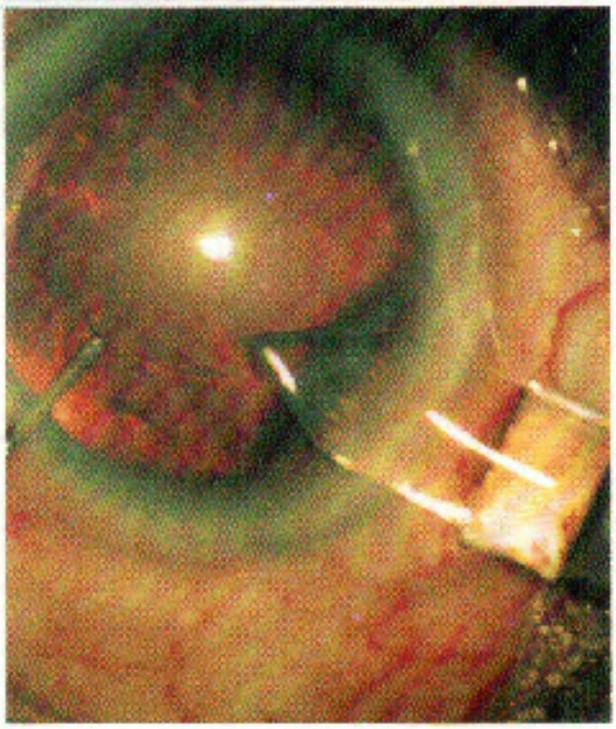

Fig-2:
Clear corneal incision being created

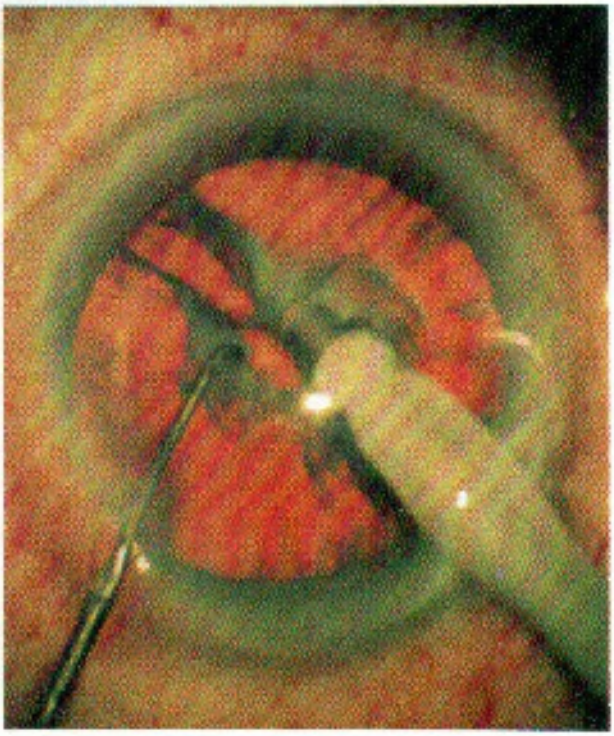

Fig-4:
Phaco Chop

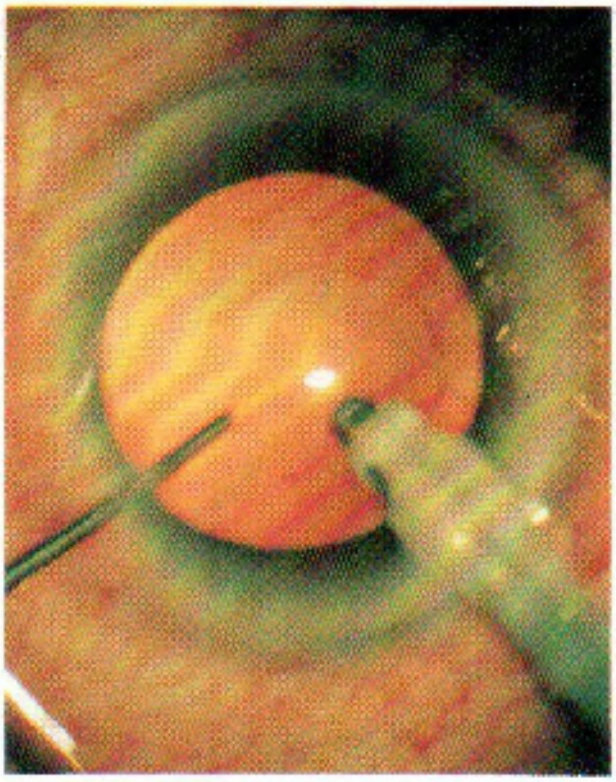

Fig-5:
Irrigation/aspiration being done.
Note the rhexis margins

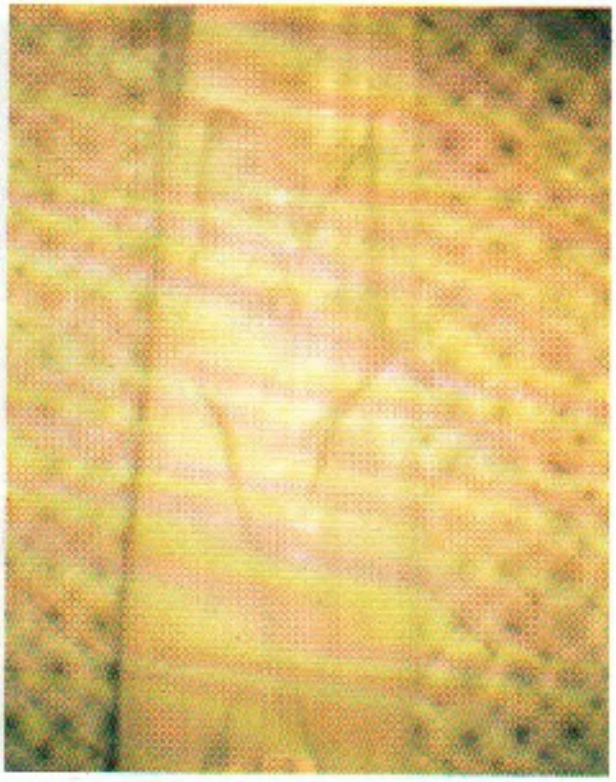

Fig-7:
Plate haptic foldable IOL with large fenestrations, being loaded into the cartridge

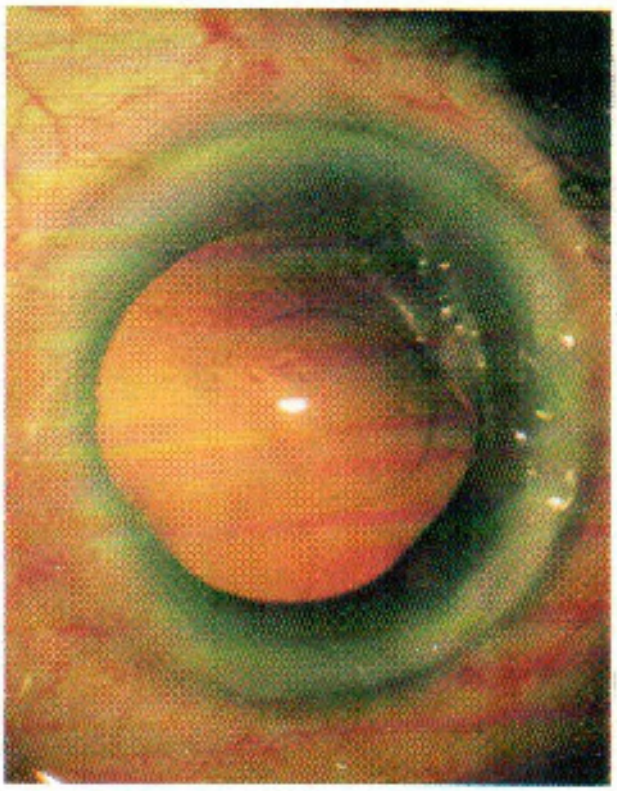

Fig-6:
Methylcellulose distends the bag

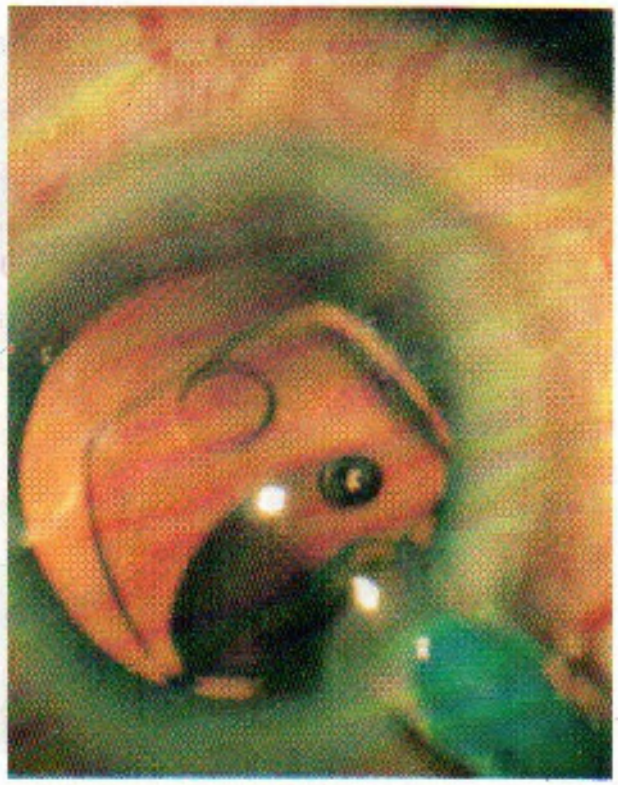

Fig-8:
Foldable IOL being implanted

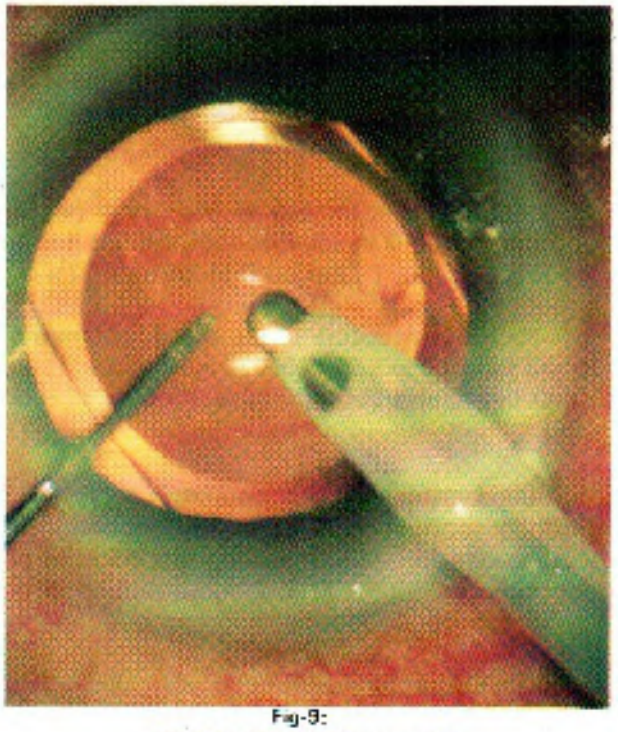

Fig-9:
Methylcellulose being removed

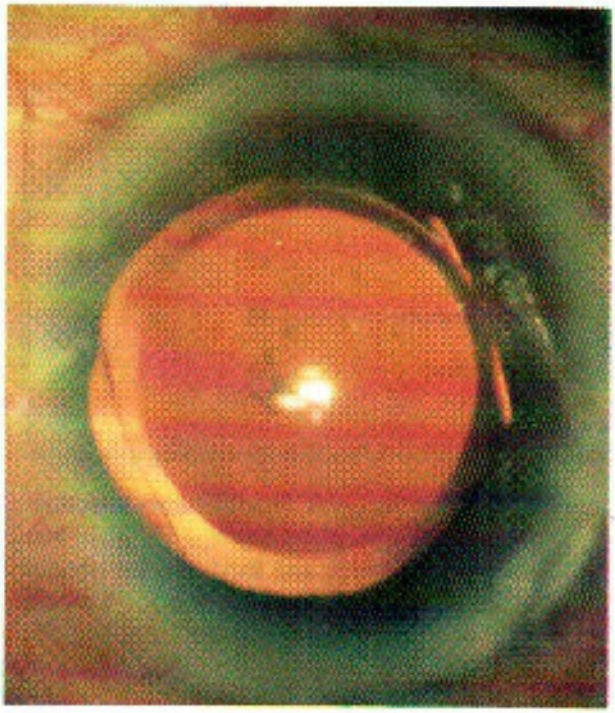

Fig-10:
Case completed with foldable IOL in the bag

Table 1: Postoperative visual acuity.

Visual acuity	First postoperative day				One week		One month	
	Unaided		With pinhole		Aided		Aided	
	No.	%	No.	%	No.	%	No.	%
6/6	80	8	480	48	560	56	760	76
6/9	560	56	440	44	440	44	240	24
6/12-6/24	240	24	80	8	0	0	0	0
6/36 6/60	120	12	0	0	0	0	0	0

Table 2: Astigmatism after one week and after one month. Shift in astigmatism is also indicated.

Range of Diff. in cylinder (in dioptres)	Astigmatism after one week		Astigmatism after one month		Shift in astigmatism	
	No. of eyes	%	No eyes	%	No. of eyes	%
0.00 0.25	160	16	160	16	720	72
0.50-1.00	440	44	520	52	240	24
1.25-2.00	400	40	320	32	40	4

Table 3: Complications.

Complications	No of eyes	%
- Pain	80	8.0
- Redness	112	11.2
- Extension of capsulorhexis	40	4.0
- Posterior capsular opacities	25	2.5
- Fibrin reaction	27	2.7
- Dialysis	4	0.4

The capsular bag was then filled with methyl-cellulose (Fig-6). The plate haptic PC IOL was loaded on to the cartridge and fixed into the injector (Fig-7). This was then introduced into the capsular bag and the lens injected slowly (Fig-8). All methylcellulose was removed by the irrigation/ aspiration probe (Fig-9).

At the site of the incision, stromal hydration was done into the corneal stroma, which acted as a good valve and no sutures were required (Fig-10). Subconjunctival garamycin and decadron were avoided. All patients were allowed to go home immediately after surgery, without a pad, and advised to use corticosteroid and antibiotic eye drops.

The visual acuity was recorded on the first postoperative day and repeated at the end of one week and one month and the shift in astigmatism was noted.

RESULTS

The results of the surgery are shown in Tables 1 and 2. The postoperative visual acuities are compared at the end of one week and one month (Table-1). The immediate postoperative (unaided) visual acuity was found to be 6/6 in 80 eyes (8%) and 6/9 in 560 eyes (56%). It ranged from 6/12 to 6/24 in 240 eyes (24%) and 6/36 to 6/60 in 120 eyes (12%).

The visual acuity with pinhole was found to be 6/6 in 480 eyes (48%) and 6/9 in 440 eyes (44%). It ranged from 6/12 to 6/24 in 80 eyes (8%).

The (aided) visual acuity at the end of one week was found to be 6/6 in 560 eyes (56%) and 6/9 in 440 eyes (44%).

The (aided) visual acuity at the end of one month was found to be 6/6 in 760 eyes (76%) and 6/9 in 240 eyes (24%).

The range of astigmatism at the end of one week and one month are compared in Table-2. Astigmatism at the end of one week ranged from 0.0 to 0.25 D in 160 eyes (16%), 0.5 to 1.0 D in 440 eyes (44%), 1.25 to 2.0 D in 400 eyes (40%).

Astigmatism at the end of one month ranged from 0.0 to 0.25 D in 160 eyes (16%), 0.5 to 1.0 D in 520 eyes (52%), 1.25 to 2.0 D in 320 eyes (32%).

Shift in astigmatism at the end of one month ranged from 0.0 to 0.25 D in 720 eyes (72%), 0.5 to 1.0 D in 240 eyes (24%), 1.25 to 2.0 D in 40 eyes (4%).

The complications are mentioned in Table-3. Eighty patients complained of pain on the first postoperative day. In 40 eyes there was extension of capsulorhexis.

DISCUSSION

This type of surgery has proved to be of great advantage since the patient does not have to go through the torture of peribulbar injection. The eye at the end of surgery is white and quiet so that it is difficult to distinguish the operated from the nonoperated eye at a cursory glance.

The whole procedure of admission, operation and discharge takes hardly two hours, at the end of which the patient is comfortably back home. Change in astigmatism is also minimal. Polishing of the anterior capsule reduced the chances of postoperative posterior capsular opacities.

The disadvantage of the procedure is that it requires a highly skilled surgeon who will be able to manage any complications arising during surgery. The whole procedure should not go beyond 15 minutes, as the anaesthetic effect will wear off.

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Ophthalmic "Pastpourri"

Keratoplasty
The First Succesful Human Allograft

Inspired by Sellerbeck and von Hippel, on December 7, 1905, Dr. Eduard Zirm enucleated an eye that had had failed attempts at removal of intraocular magnetic foreign body. It was immediately immersed in normal slaine solution at body temperature. In the meantime, a patient with both corneas entirely opaque from unslaked lime except for the extreme periphery above at the limbus, was put thoroughly under chloroform. His right eye was selected for the first procedure. The first step was the formation of a conjunctivial bridge below. With the von Hippel trephine a disc, 5mm in diameter, was removed from the peripheral portion of the cornea of the enucleated eye of the donor. With the same trephine a disc of exactly the same size was removed from the recipient's leukomatous cornea. The donor cornea was put carefully in place, the bridge of conjunctiva drawn across it and sutured over.

With the left eye, Zirm altered his procedure somewhat. This time the donor tissue was taken from the center of the cornea. It was placed on gauze squeezed out of warm salt solution and kept moist and warm in a stream of aqueous vapor. The trephine was then used on the host cornea. The donor disc was put in place; it fitted perfectly, both as to size and thickness. Care had been taken to touch it with no instrument from the beginning to the end of the operation. Zirm inserted two sutures in the conjunctiva, making a St. Andrew's cross of thread over the center of the graft.

A week later the graft in each eye was clear. With the left eye the patient could count fingers. However, the graft in the right eye began to give trouble and had to be removed. Five weeks after the operation with his left eye he could count fingers quite readily at 3.5 meters. Ten weeks after the operation, with focal illumination, a faint haze could be seen, but part of the pupil margin was actually visible. Fifteen weeks after the operation he was released from the hospital. The graft was clear and looked black against the gray cloudy opaque cornea.

Zirm had succeeded where all before him had failed, and thus became the first surgeon to achieve a successful human corneal allograft.

Excerpted from: Alois Glogar, Karl Brauer, and Eduard Konrad Zirm. In: Our Ophthalmic Heritage by Charles Snyder. Little, Brown and Company, Boston. 1967; pp 107-8.

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Intraocular Level of Antibiotics in Bacterial Endophthalmitis and the Timing of Repeat Injection

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ABSTRACT

Purpose: *To determine the antibiotic levels attained in aqueous and vitreous following intravitreal therapy for endophthalmitis and assess the timing and dose for reinjection.*
Method: *Antibiotic levels were measured by fluorescence polarization immunoassay in eleven patients following intravitreal injection of 2mg of vanomycin in ten patients and 1mg in one patient.*
Results: *24 to 72 hours after intravitreal injection of vancomycin 1-2mg, aqueous levels ranged from 8.4 to 170mg/L and vitreous levels were 38.65-220mg/L.*
Conclusion: *Aqueous and vitreous vancomycin levels were well within the therapeutic range, sometimes at retinotoxic level. Since the earliest sample was at 24 hours, it is likely that "retinotoxic" levels are reached using standard dosing. In all cases suprathreshold level of vancomycin was available in the vitreous at the time of assay. I, therefore, feel that the injection should be repeated, if necessary, 72 hours after the first injection and at a lower dose than 2mg.*

INTRODUCTION

Endophthalmitis is a serious complication of intraocular surgery. The use of intravitreal antibiotic injection has improved the prognosis but the doses selected are empirical and have been extrapolated from animal studies[1]. We report on the results of aqueous and vitreous antibiotic assay and discuss it in further management of endophthalmitis.

METHODS

Eleven patients with a diagnosis of endophthalmitis were examined. They presented with history of pain, photophobia and reduction in visual acuity after cataract extraction. On examination they had a hypopyon or severe anterior chamber reaction and vitritis. A clinical diagnosis of endophthalmitis was made in all cases.

All cases had diagnostic aqueous and vitreous taps and were treated with intravitreal vancomycin. 4 received intravitreal amikacin and six received intravitreal ceftazidime. Aqueous and vitreous samples for assay were taken at the time of reinjection. Aqueous and vitreous taps were performed under local anaesthesia. With the patient under the operating microscope, a 27 gauge needle on a 1 ml syringe was used to aspirate 0.1ml of aqueous through a temporal corneal paracentesis. Then another 1 ml syringe was used to aspirate 0.1 ml of vitreous through the pars plana i.e. 3 mm behind the limbus. 2 mg in 0.1 ml of vancomycin and 2.25 mg of ceftazidime or 0.4 mg of amikacin in 0.1 ml were then injected through the same site into the mid-vitreous cavity. The specimens were sent for culture, sensitivity and antibiotic assay by fluorescence polarization immunoassay (TDX. Abbott Laboratories). As the sample size was very small, i.e 0.1-0.2 ml, the specimen was first diluted to increase the volume to carry out the assay. Sufficient volume was not available for assay in all cases.

In all cases the antibiotics and their doses were chosen by the on-call surgical team. The decision to reinject was made on clinical grounds.

All patients had intact posterior capsules and all except three were pseudophakic.

RESULTS

In four patients the sample was taken at 48 hours (two days) after the first injection; in five it was taken 72 hours after the first injection. In one patient it was taken approximately 96 hours after the first injection and in another after 24 hours.

Patient details are summarized in Table-1. Patient 1 underwent an uncomplicated extracapsular cataract extraction with posterior chamber lens implantation and presented three days later with pain and reduced vision. Her aqueous vancomycin level

was 8.2mg/L, and vitreous vancomycin level was 92.3mg/L 24 hours after injection of 1mg of vancomycin. She did not receive amikacin. Her therapy was supplemented with 1mg of intravitreal cephalexin and 20mg of subconjunctival vancomycin. Her final visual acuity was 6/18.

Patient 2 presented with the acuity of C.F. and received 2mg of vanomycin and 1000μgm (1mg) of amikacin. The vancomycin level was 90mg/L in the aqueous and 96mg/L in the vitreous. The assay was conducted 48 hours after the first intravitreal injection. Her final visual acuity was 6/9 with correction.

Patient 3 presented with acuity of H.M. and had pain and hypopyon. She received 2 injections of 2mg of vanomycin at 0 and 48 hours before assay at 96 hours. The aqueous level was 51mg/L. She was immunocompromised due to Chronic Lymphatic Leukemia. Her final visual acuity was 6/9 with correction.

Patient 4, who was a diabetic, received 2mg of vancomycin and 400μgm of amikacin. At assay 48 hours later the aqueous vancomycin level was 52mg/L. He had presented with the visual acuity of 6/60 and his final visual acuity was 6/9.

Patient 5 presented with the visual acuity of 6/60 and received 2mg of vanomycin and 400μgm of amikacin. At assay 48 hours later the aqueous Vanomycin level was 97 mg/L in the vitreous . His final visual acuity was 6/9.

Patient 6 complained of pain and reduced vision seven days after uncomplicated cataract extraction with lens implantation. 2mg of vancomycin and 2mg of ceftazidime were injected after vitreous sampling which grew coagulase negative staph. At 48 hours the vitreous vancomycin level was 55.6 mg/L.

Patient 7 underwent uncomplicated cataract extraction without lens implantation. Upon diagnosis of endophthalmitis 2mg of vancomycin and 2mg of ceftazidime were injected. 72 hours after injection the aqueous level of vancomycin was 170 mg/L and vitreous level was 220 mg/L. Her current visual acuity is 6/18 with correction.

Patient 8, who had advanced disc cupping and a functioning bleb, underwent an uncomplicated cataract extraction with lens implantation. 2mg of vancomycin and 2.25mg of ceftazidime were injected when endophthalmitis was strongly suspected. At 72 hours the aqueous vancomycin level was 30mg/L and the vitreous vancomycin level was 105 mg/L.

Patient 9 had uncomplicated extracapsular cataract extraction with lens implantation. 2mg of vancomycin only were injected. At 48 hours the aqueous vancomycin level 41.65 mg/L and the vitreous level was 160mg/L. Her current visual acuity is 6/24.

Patient 10 underwent uncomplicated cataract extraction with lens implantation. He presented late with PL vision only. 2mg of vancomycin and 2mg of ceftazidime were injected. The vitreous vancomycin level at 72 hours was 38.65ml/L.

Patient 11 was on haemodialysis when he underwent uncomplicated extracapsular cataract extraction with lens implantation. 2mg of vancomycin and 2mg of ceftazidime were injected when he was diagnosed as having endophthalmitis. Eikenella corrodens were grown from the vitreous. The vitreous vancomycin level was 80.7mg/L.

DISCUSSION

The Endophthalmitis Vitrectomy Study has shown that intravitreal injection is the preferred method of treating endophthalmitis in eyes with acuity better than LP on presentation[2]. Shaarawy et al[3] have shown that "a single injection of intravitreal antimicrobial agent may be insufficient to cure some cases of endophthalmitis". Therefore, there are patients who can benefit from a repeat antibiotic injection, preferably chosen on the basis of sensitivities, particularly where there is poor clinical response. However, the dose and timing of repeat injection remains a subject for discussion. Repeat injections can be retinotoxic due to high vitreous levels[4]. A vitreous level of 100mg/L of vancomycin[5,6] has been shown to be retinotoxic in experimental rabbits. Toxic levels for the human eye have been inferred from animal experiments.

Organisms adhere to polymethylmethacrylate (PMMA) lens implants during surgery[7]. The bactericidal activity of antibiotics may be reduced for PMMA adherent organisms[8,9]. The bactericidal concentration of vancomycin for Staphylococcus epidermidis (ATCC 35983) adherent to PMMA discs derived from orthopaedic cement[9] is increased from 8 to 32mg/L. The surface of an implant may, therefore, harbour viable bacteria in the presence of what are normally regarded as adequate antibiotic levels. Therefore, it is imperative that suprathreshold levels of the correct antibiotic are achieved in the vitreous and the aqueous but that they are held below the retinotoxic level.

It would appear that a sustained level of vancomycin above 32mg/L is required to eradicate infection but it should be lower than 100mg/L whenever possible. In all patients where data were available, the vitreous vancomycin level was suprathreshold (Table-2).

Table 1: Summary of patient data.

Patient number	Age	Operation	Organism	Visual acuity on presentation	Final visual acuity	Sub conj. injections	Systemic disease	Other features	Other antibiotic
1	76	Phaco+IOL*	alpha Haemolytic strep	PL	6/9	Vancomycin 20mg			No
2	70	ECCE+IOL**	Coagulase negative Staph.	CF	6/9				Amikacin
3	80	ECCE+IOL	Strep. Pneumonia	4/60	6/9		Chronic lymphatic leukaemia	Assay 48 hrs after second injection of vancomycin	Amikacin
4	86	ECCE+IOL	None	6/60	6/9	Vancomycin 20mg	Diabetes mellitus		Amikacin
5	59	Phaco+IOL	Coagulase negative Satph.	PL	6/9				Amikacin
6	60	ECCE+IOL	Coagulase negative Satph.	HM	CF			Assay and re-injection 48 hours after injection	Ceftazidime
7	55	ECCE only	None	HM	6/18			Assay and re-injection 72 hours after injection	Ceftazidime
8	65	ECCE only	None	HM	CF		Advanced POAG*	Assay and re-injection 72 hours after injection	Ceftazidime
9	55	ECCE + IOL	None	HM	6/24			Assay and re-injection 48 hours after injection	None
10	65	ECCE + IOL	None	PL	PL			Assay and re-injection 72 hours after injection	Ceftazidime
11	65	ECCE + IOL	Eikenella corrodens	PL	PL			Assay and re-injection 72 hours after injection	Ceftazidime

*Phacoemulsification + Intraocular lens implantation

**Extracapsular cataract extraction + Intraocular lens implantation

*Primary open-angle glaucoma.

Table 2: Vancomycin levels in aqueous and vitreous after intravitreal injection.

Patient number	*DAY	Sampling	Dose of intravitreal vancomycin	Aqueous vancomycin level	Vitreous vancomycin level
1	0		1 mg		
	1	**Assay	2 mg	8.2 mg/L	92.3 mg/L
2	0		2 mg		
	2	Assay	2 mg	90 mg/L	96 mg/L
3	0		2 mg		
	2		2 mg		
	4	Assay	2 mg	51 mg/L	
4	0		2 mg		
	2	Assay	2 mg	52 mg/L	
5	0		2 mg		
	2	Assay	2 mg	97 mg/L	
6	0		2 mg		
	3	Assay	2 mg	NA	55.6 mg/L
7	0		2 mg		
	3	Assay	2 mg	170 mg/L	220 mg/L
8	0		2 mg		
	3	Assay	2 mg	30 mg/L	105 mg/L
9	0		2 mg		
	2	Assay	2 mg	41.65 mg/L	160.5 mg/L
10	0		2 mg		
	3	Assay	2 mg	NA	38.65mg/L
11	0		2 mg		
	3	Assay	2 mg	NA	80.7 mg/L

*Time of any surgical intervention

**Assay = Time of sampling for assay

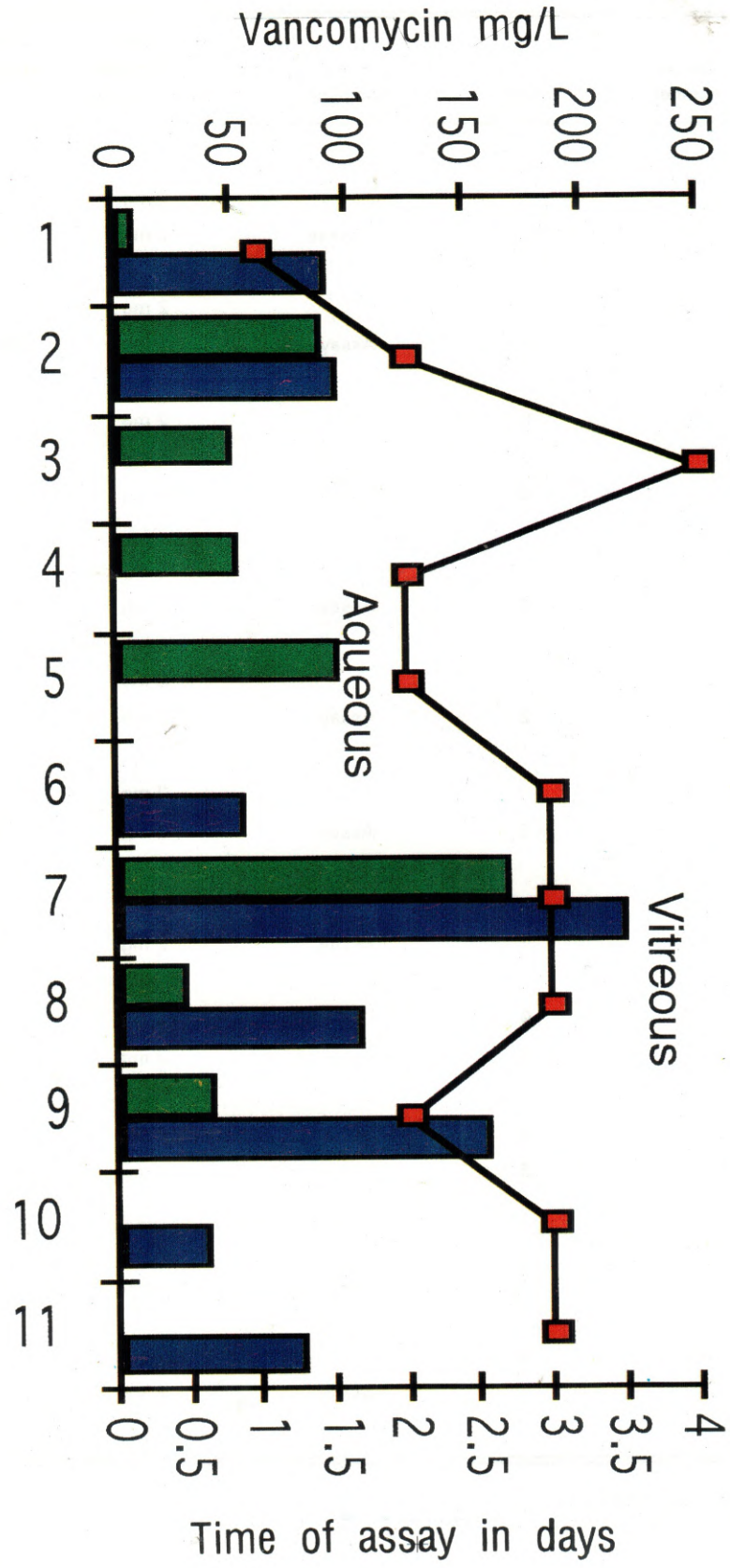

Fig-1: Aqueous and vitreous levels of vancomycin after initial intravitreal injection

In three patients (7, 8 and 9), the vitreous vancomycin level was above the presumed retinotoxic level i.e., 100mg/L. In patients 7 and 9 the level was especially high (220mg/L and 160.5mg/L). This may indicate one of three things: a) anomalies in diffusion within the eye. Vancomycin is a relatively large molecule that diffuses slowly and does not leave the eye very readily, b) error in reconstitution of the antibiotic and c) error in dilution at the time of assay.

We chose to use 2mg in 0.1ml as it has been shown to be safe in animal models[10].

An important unanswered question is whether intraocular antibiotic level is predictable after intravitreal injection. In our study we found variation in aqueous and vitreous levels at 48 hours and at 72 hours (Table-2 and Figure-1).

Ocular factors such as the volume and location of the bolus and physical state of the vitreous, the status of lens and capsule in the pseudophakic eye, the physical character of the injected molecule and the site from where the sample is taken may explain the differences observed.

Retinal toxicity of intravitreal antibiotics is of concern as gentamicin and amikacin have been reported to cause macular infarction. The vitreous level of vancomycin of 220 mg/L at 48 hours in case 7 and of 160mg/L in case 9 (Table-2) were above the presumed retinotoxic level for vancomycin[5] and must have been even higher at an earlier time following the injection. These patients are in their early postoperative phase but their visual acuity has improved to 6/18 and 6/24, respectively. It appears that eyes are highly tolerant of vancomycin as the repetition of injection would have led to an even higher level.

CONCLUSION

Antibiotic levels assayed are sufficient to eradicate the organisms isolated even in the presence of prosthetic material. Aqueous and vitreous levels are variable following intravitreal injection. Assay of aqueous and vitreous, where possible, will provide a future guide to the selection and timing of antibiotic dosage. In most of our patients high levels of vancomycin and amikacin were well tolerated. According to the data available from this study it appears that sufficient intraocular antibiotic is available at 72 hours. So the injection need not be repeated until 72 hours after the first injection and its dose should not exceed 1mg.

ACKNOWLEDGEMENTS

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Case Report

Colloid Cyst of the Third Ventricle Presenting As Papilledema

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INTRODUCTION

Colloid cysts of the third ventricle occur generally (though not exclusively)[1] in young adults. They constitute about 2% of all intracranial neoplasms. The nature and origin of these lesions have been the subject of considerable controversy. They may be more of malformations than neoplasms and of either ependymal or paraphyseal (choroid plexus) origin. The lesion is invariably located in the third ventricle anteriorly. These tumours can intermittently obstruct the flow of CSF through the foramen of Monro.

CASE REPORT

A twenty-nine-year-old man presented to the Eye Department with the complaints of headache, transient obscuration of vision, nausea and vomiting, off and on for the last two-and-a-half-years. He had no past history of any major illness or accidental or surgical trauma. On examination the visual acuity was 6/9p and 6/12, right and left eye, respectively. There was no significant refractive error. Visual fields were almost normal. Anterior segment was normal. Posterior segment examination showed bilateral marked swollen discs (Fig-1). Intraocular pressure was 16mm Hg right and left.

INVESTIGATIONS

All routine investigations including blood complete with ESR, urine R/E, blood urea and sugar and x-ray chest were normal.

X-ray skull (Lateral View) showed minimal enlargement of pituitary fossa with erosion of inner cortex of posterior clinoids (Fig-2).

C.T. scan showed dilated lateral ventricles and a hyperdense enhancing, rounded, small lesion in the anterior part of the third ventricle (Fig-3 & 4).

MANAGEMENT

The case was referred to the neurosurgeon, who performed a ventriculoperitoneal shunt communicating the lateral ventricles with the periotoneal cavity. Within a week there was marked improvement in the patient's symptoms as well as a slow and gradual improvement in the visual acuity and appearance of the optic discs.

DISCUSSION

Colloid cyst of the third ventricle is a neurosurgical problem but it may present first to the ophthalmologist. The lesion accounts for about 2% of all intracranial neoplasms. Other third ventricular lesions mimicking colloid cysts include xanthogranulomas[2], cysticercal cysts[3], and cysts of the septum pellucidum intermittently obstructing the foramina of Monro[4]. The various treatment modalities include complete removal of the cyst by transcortical transventricular and transcallosal transventricular approaches[5,6], reducing the size of the cyst by means of coagulation and suction of the colloid material via endoscopic transformen approach[7]. Because of the high morbidity and mortality rate of the above procedures, our patient was provided symptomatic relief by a ventriculoperitoneal shunt communicating the lateral ventricle with the peritoneal cavity.

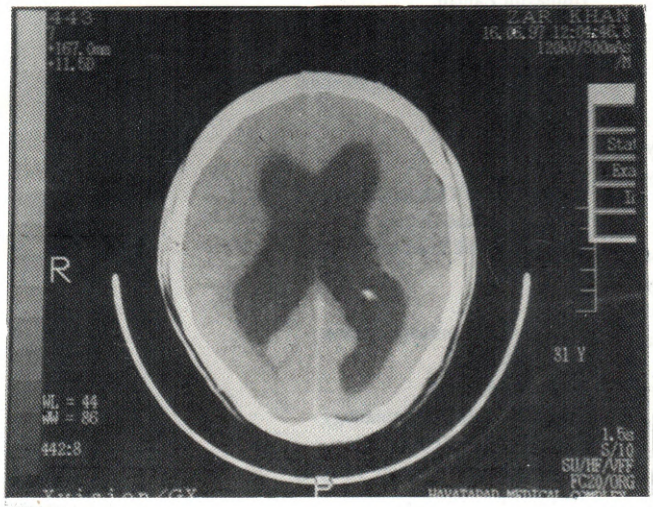

Fig-1
Papilledema in a patient with colloid cyst of the third ventricle

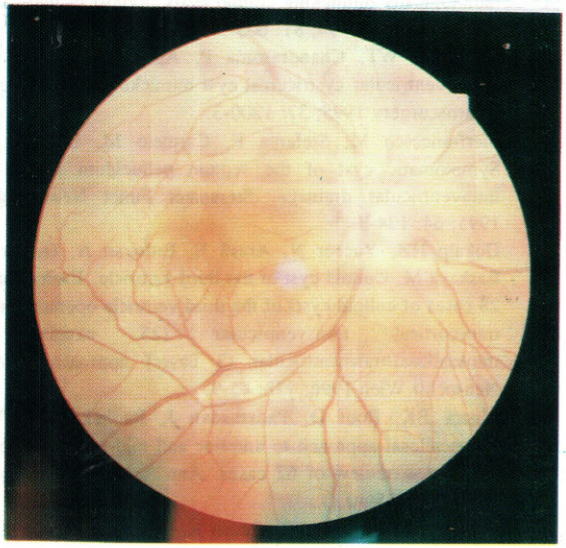

Fig-3
CT Scan of the patient with dilated lateral ventricles

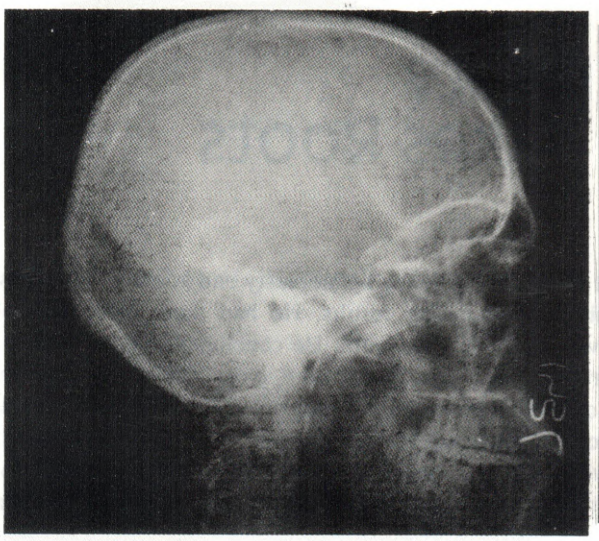

Fig-2
X-ray skull (Lateral view) showing minimal enlargement of pituitary fossa with erosion of posterior clinoid process

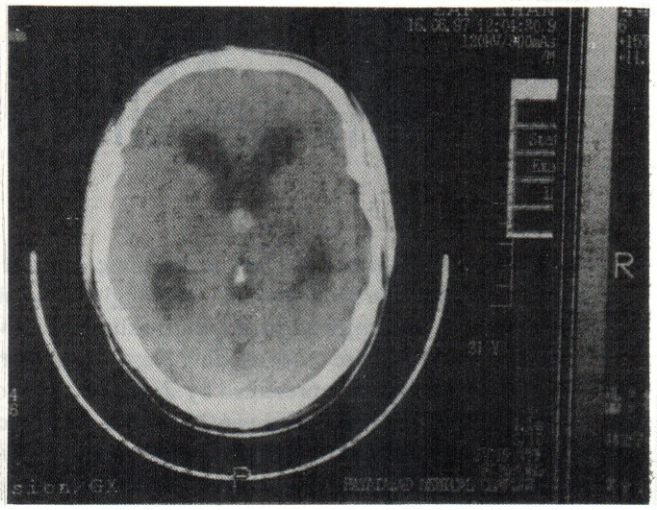

Fig-4
CT-scan showing hyperdense lesion in the anterior part of the 3rd ventricle

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Ophthalmic "Pastpourri"

Keratoplasty
The Seedling Takes Roots

Zirm also demonstrated his case at the clinic of Ernst Fuchs. Fuchs knew keratoplasty and knew it well, knew the hazards of the operation and the seemingly inevitable disappointing results. He had done more than 50 keratoplasties. All had enjoyed permanent healing; none was optically successful. He concluded that keratoplasty was indicated only for those cases needing plastic surgical repair. Fuchs' young associate, Josef Meller, examined the patient. Everything was as represented by Zirm. The eye could even be examined with the ophthalmoscope and the disc carefully inspected. Vision was 6/36 with a stenopaic disc, and with convex glasses (16 to 20 D) the patient could read J4, with difficulty. This was one year and one week after the operation. Zirm with his patient proved, and proved before the high court of Vienna ophthalmology, that keratoplasty could know optical as well as surgical success.

Excerpted from: Alois Glogar, Karl Brauer, and Eduard Konrad Zirm. In: Our Ophthalmic Heritage by Charles Snyder. Little, Brown and Company, Boston. 1967; p 108.

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Case Reports

Bowen's Disease

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ABSTRACT

Two cases of Bowen's disease of the limbal area, treated with surgical excision, have been followed for a period of two to two-and-a-half years. No recurrence occurred in both cases during the period of study. Following are the observations:

1. *No association with other malignancies was seen in contrast to previous studies.*
2. *Both cases were under the age of twenty years.*
3. *No association with arsenic exposure was found contradicting older studies.*

On the basis of present results we recommend excisional biopsy of raised limbal lesions, unresponsive to topical medications including steroids, in all age groups.

INTRODUCTION

Bowen's disease of the conjunctiva is a persistent, progressive and raised lesion not responding to topical medications, including steroids. Pathologically, it is carcinoma in situ. Most important histopathological finding of this lesion is an intact basement membrane of the conjunctival epithelium. When not treated in time the condition may become invasive.

CASE REPORTS

Case-1: A 19-year-old male presented in January 1994 with slowly growing painless limbal mass on the right eye over the previous 12 months. He received topical steroids and decongestant drops for over 8 months, with no relief. On examination a 10mmsq mushroom-shaped mass was seen attached at 2 O'clock limbus through a stalk (Fig-1). No history of trauma or surgery pointed to a spontaneous nature of the disease. The patient was a known case of cardiac valve disease. No other abnormality was found on systemic examination. Excisional biopsy was performed under local anesthesia (Fig-2, photograph taken after one week). Histopathology confirmed the diagnosis of Bowen's disease. No evidence of previous arsenic exposure was found by any route. The patient was followed-up till June 1996 with no recurrence and no other abnormal finding except cardiac disease.

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Case-2: An 18-year-old female presented in June 1994 with painless slowly enlarging limbal mass on the left eye for over 13 months. She received topical medications including steroids for over 10 months with no relief. On examination a 10mmsq mushroom-shaped mass was attached at 8 O'clock position of the limbus by way of a stalk. No history of trauma or surgery pointed to the spontaneous nature of the lesion. Excisional biopsy was performed under local anesthesia. Histopathology confirmed it as Bowen's disease. There was no evidence of previous arsenic exposure by any route. Follow-up of the patient till June 1996 showed no recurrence and no other abnormal systemic finding.

DISCUSSION

Bowen's disease of the conjunctiva is not a rare entity. However, there is paucity of clinical studies in this field in Pakistan. We have described two cases of Bowen's disease of the conjunctiva in young patients. No association of Bowen's disease with arsenic exposure in our patients favours recent studies[1-5] and contradicts the older studies[6-9]. We have selected excisional biopsy as the treatment of choice rather than one of the other options, i.e., electrocautery, cryotherapy, topical cytotoxic agents and radiotherapy. Destruction of the lesion by adequate freezing or cauterization is effective but unpredictable. Topical cytotoxic medications such as 5-Fluorouracil are effective but have their own hazards. Radiotherapy, if selected as treatment option, has to be in full tumour doses which is likely to cause radionecrosis and scarring.

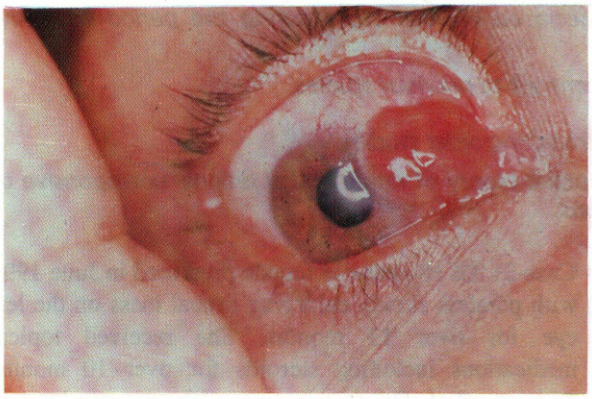

Fig-1:
Painless limbal mass on the right eye of a 19-year-old male (Case-1)

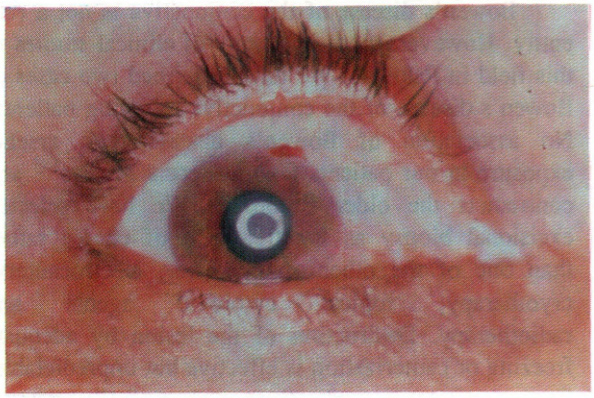

Fig-2
Painless limbal mass on the left eye of an 1-year-old female (Case-2)

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Diabetes-related Blindness: A Cause for Concern

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ABSTRACT

A retrospective study of 1247 patients attending the diabetic clinic of Al Shifa Trust Eye Hospital and Pakistan Institute of Ophthalmology was done to study important aspects in diabetic care in Pakistan. The results were as follows:

The age group attending the clinic ranged between 28 and 73 years. 17.88% (223) were on insulin therapy, 66.88%(834) were on oral hypoglycemics and, 4.49%(56) were on no treatment. This excludes patients who were diagnosed as diabetics for the first time in the hospital, amounting to 10.74%(134).

The duration of diabetes ranged from 6 months to 28 years. The visual acuity on presentation ranged from perception of light to 6/6 with 25.7%(320) having severe visual handicap with a vision between less than 3/60 and 6/60.

The prevalence of diabetic retinopathy was 56.9%(710). The diabetic control was poor in the majority of cases, 72%(897) as confirmed by the abnormal blood glucose and glycated Hb A1c levels. Patients' knowledge of the disease was poor, about 78%(972), with only about 19.7%(246) making routine blood checks. 19%(237) of the patients had had their fundi examined in the past and only 12%(150) of the patients had had laser treatment done elsewhere.

26.8%(334) of the patients had associated high blood pressure.
9.14%(114) had a history of ischemic heart disease and 0.40%(5) had diabetic nephropathy and were on renal dialysis when seen in the clinic. 14.4%(179) had abnormal lipid profiles.

Diabetes mellitus is now considered an important cause of preventable blindness in Pakistan. Preventive steps need to be taken now so as to prevent it from reaching epidemic proportions. The status of diabetic care and ways and means to improve it are discussed.

INTRODUCTION

Diabetes mellitus is fast becoming a global problem. While the developing countries are still trying to get rid of the problem of communicable diseases which still take a considerable toll, non-communicable diseases like cancer, arterial disease and diabetes are posing even a bigger threat in the form of manpower and economic loss.

According to the WHO estimates the prevalence of diabetes mellitus based on population studies varies from less than 1% to over 25% of the world population[1]. Each year it consumes enormous quantities of health care budgets and brings miseries of gross disability and premature death to many of its victims. The commonest specific complication in all forms of diabetes is retinopathy, the incidence of which is governed almost entirely by the duration of clinical diabetes. It is well known that the incidence of noninsulin-dependent diabetes mellitus increases with age. So, as the average age increases so does the incidence of diabetes-related blindness. It is estimated that less than 5% of the patients (mostly of the noninsulin-dependent Group) have retinopathy at the time of diagnosis. The prevalence rises to 40 to 50% after 10 years of overt diabetes and after 20 years more than 90% of the patients have some retinal abnormality. A diabetic is 10 to 20 times more likely to go blind than a non diabetic.

Diabetes mellitus is the major systemic cause of blindness in the Western world. In the United Kingdom diabetic eye disease results in approximately 1000 blind registrations per year. In total, 2% of the diabetic population is blind (8,000-10,000 persons in the United kingdom) which account for 7-8% of all blind registrations. Indeed diabetes is the commonest cause of blindness in the 30-60-year age group[2,3].

Although no definite figures exist for Pakistan, the prevalence of diabetes mellitus, according to various studies, is around 5% over the age of 30 years. A similar figure exists for impaired glucose intolerance.

There are an estimated 6 million diabetics in Pakistan. 2.5 to .3 million are said to have eye complications.

Prevalence rates for other countries of the region using various criteria are somewhat similar, e.g the prevalence rate in the urban Saudi Arabian population

is 4.95%, while in the rural area it is 4.3%. In Oman the prevalence rate above the age of 20 years is 10%, the highest in the region, while in Egypt it is was found to be 4.3%.

This hospital-based study highlights some important ignored aspects of diabetic care in Pakistan and focuses on the magnitude and the variety of problems that health system of the country is facing and the measures which need to be taken if this emerging cause of blindness is to be controlled.

PATIENTS AND METHODS

This study was done at the Diabetic Clinic of Al Shifa Trust Eye Hospital, Rawalpindi. It is a tertiary care 250-bed eye hospital affiliated with the Pakistan Institute of Ophthalmology. It serves the population of about 20 million people in the Northern area of Punjab the Azad Jammu and Kashmir and the Northern areas of Pakistan. The Institute is also the WHO collaboration centre for the prevention and control of blindness in the region.

It also receives referrals from other parts of Pakistan. The diabetic clinic is part of the retina clinic and is held twice a week. The daily outpatient load of the hospital is about 500 patients and it is the main referral area for the diabetic clinic.

A complete history is taken of all patients with a special reference to the type and duration of diabetes, the degree of diabetic control, method of glucose testing, qualification of the treating/referring doctor (general practitioner or medical specialist), past eye examination and past eye treatments. This is followed by a complete eye examination, including funduscopy after dilatation with cyclopentolate 1% or tropicamide 1%. Phenylepherine 10% is used when there is no history of hypertension. Fundus fluorescein angiography is advised in patients undergoing laser treatment. A fluorescein angiogram is especially done in patients with macular edema before laser treatment. Routine laboratory tests done on every patient include blood sugar (random), glycated hemoglobin levels, lipid profiles, urea and creatinine. A fasting blood sugar is done when the results are borderline. Blood pressure is checked on all patients attending the clinic. In this study we have tried to use the terminology and clinical classification of diabetic retinopathy established by the Early Treatment Diabetic Retinopathy Study Research Group ETDRS[4]. A special mention has been made of the maculopathy as it was seen to be an important cause of decreased visual acuity in this study. A total of 1247 patients were included in the study. Patients with dense mature cataracts and vascular occlusions were excluded.

RESULTS

The age group of patients attending the diabetic clinic ranged between 28 and 73 years. 834(66.88%) of the patients were noninsulin-dependent diabetics and were on some form of oral treatment. 223(17.88%) of the patients were insulin- dependent. This included patients with adult onset diabetes who were on insulin because of poor control. 56(4.49%) of the patients were not taking any treatment because of poor socioeconomic conditions. 134(10.74%) of the patients were diagnosed as diabetics for the first time in the clinic.

The visual acuity was in the range of PL to 6/6. 136(10.9%) of the patients had a corrected visual acuity of less than 3/60 in both eyes and were considered blind according to the International Classification of Diseases. 184(14.8%) of the patients had a corrected visual acuity between 3/60 and 6/60 in both eyes and had severe visual impairment according to the International Classification of Diseases. 357(28.6%) of the patients had corrected visual acuity in both eyes of between 6/60 and 6/18. 570(45.7%) of the patients had a corrected vision of better than 6/18.

Table 1: Prevalence & Causes of bilateral blindness in Pakistan.

	Percentage
Prevalence of blindness in Pakistan	**1.78**
Cataract-related blindness	66.7
Corneal-opacities-related-blindness	12.6
Refractive errors, including aphakia	11.4
Glaucoma	3.9
Others	5.4

The prevalence of diabetic retinopathy in the study was 56.9%(710). 96(7.69%) had advanced diabetic eye disease comprising tractional detachments with and without vitreous haemorrhages in both eyes and no treatment could be offered. 112(8.98%) had proliferative retinopathy with neovascularization of the disc or elsewhere in the retina. Preretinal and vitreous haemorrhages were an important feature.

221(17.72%) had maculopathy alone. Clinically, a combination of both focal and diffuse leakage was

seen. 134(10.7%) had moderate to severe non-proliferative diabetic retinopathy with cotton-wool spots, intraretinal haemorrhages, venous beading and intraretinal microvascular changes (IRMA) being prominent. 147(11.78%) had mild to moderate retinopathy comprising mild to moderate intraretinal haemorrhages and hard exudates. A mixed picture was frequently observed.

Diabetic control was poor in the majority of patients (72%), as evidenced by medical history and random blood sugar levels of more than 180mg% on more than one occasion and haemoglobin A1c levels of more than 12%. Patients' knowledge of the disease was poor in 78%(972) of the cases. Only 19.7% (246) of the patients claimed to have routine blood sugar checks. The rest were having them checked occasionally and were not particular about it. The exact duration of diabetes could not be ascertained from the history. 19% (237) of the patients had their fundi examined in the past and only 12%(150) had had laser treatment done.

335(26.9%) of the patients had associated hypertension. 114(9.14%) of the patients gave history of ischemic heart disease. 5(0.40%) of the patients were on renal dialysis when seen in the diabetic clinic.

179 (14.35%) of the patients had abnormal lipid profiles on routine testing. Only 137(11%) of the patients were under the care of general practitioners and this is evident by the fact that only 4% of the patients were referred by general practitioners.

None of the patients in this study was referred by an optician.

DISCUSSION

Industrialization in the last century has altered the balance of major diseases. A century epidemics of infectious diseases were the main cause of mortality, but presently the main causes of ill health and mortality include cancer, arterial diseases and diabetes. There are many causes of diabetes including endocrine diseases, liver diseases or drugs, but the commonest causes include insulin-dependent diabetes mellitus (IDDM) or type-1 and noninsulin-dependent diabetes mellitus (NIDDM) or type-2.

Diabetes mellitus has become a major international health problem affecting possibly 60 million people the world over. In the Western world it has become the commonest cause of blindness during working life, the second commonest cause of renal failure and a major risk factor for leg amputations. On an average diabetes reduces the life expectancy by a decade due largely to macrovascular diseases.

Pakistan is a developing country with a population of 130 million. Like other developing countries health and education are the two important sectors which need attention and improvement.

Until a few years ago the main stress in Pakistan was on the prevention of blindness due to cataracts as it was thought to be the most important cause of blindness in the country and this was evidenced by the fact the in 1980 the first committee to fight blindness was named the National Eye Camp Planning Committee. As is obvious from its name all activities were focused to clear the backlog of cataract-related blindness in the country.

In 1987-90 a survey jointly sponsored by the Ministry of Health and the World Health Organization (WHO) was conducted nationally to determine the causes, prevalence and distribution of blindness in the country. The results were important as they revealed many other causes of blindness, in addition to cataracts; diabetes-related blindness being one of them. (Chart A). A serious note was taken and the name of the Committee was changed to the National committee for the Prevention of Blindness. Perhaps the problem of diabetes-related blindness was underestimated as it is now becoming an important cause of blindness in the country.

Increase in population, poor health standards and low literacy rate are the key factors which help a disease process in becoming more prevalent in a country. Multiple factors, like a rise in the population of Pakistan which stands at more than 130 million and projected to be 150 million at the turn of the century ago with a growth rate of 3.1%, a health budget of less than 2% and a literacy rate of about 35%, one of the lowest in the world, provide an ideal environment for a disease process like diabetes, to become more prevalent.

In order to understand the core of the problem and before discussing the future strategies, it is important to understand the referral system in a country like Pakistan.

There are three basic referral systems in the country. The Primary Health Care centres - which include the rural health centres and the basic health

units where the main care takers are the community health workers, paramedical staff with various grades of training and the doctors working in the rural centres. As evidenced by experience, this referral system has not been utilized to its capacity. One reason is the lack of funding for the system. The second reason being a lack of training and, above all, lack of interest on behalf of the staff in these health care centres.

The Secondary Health Care Centres comprise the district headquarter hospitals (DHQs) where all important specialties are represented together with a supporting staff of paramedics, nurses and doctors. This system at present seems to be underutilized and underfunded as far as the provision of prevention oriented care is concerned.

The Tertiary Care Centres are the final referral centres. Presently 25 in number, they provide tertiary care in the country. Reasonably well-funded by the government, yet they are over-burdened due to the unfiltered referrals.

Important links between all three referral steps are the general practitioners (GPs), but as it will become clear from the ensuing discussion this important link also is not being utilized properly.

Highlighting the salient features of the study, about 4.5% of the patients were not on any medication because they either could not afford it or did not believe in the Western medicine. Many of them were using herbal medicines prescribed by Hakims. It is interesting to note that all patients taking such medicines had high blood sugar levels and high Hb A1c levels.

It is said that illiteracy plays an important role and ignorance a major role in the spread of a disease. Patients' knowledge about the disease was poor in 78% of the cases. This is evident by the fact that only 19.7% of the patients tested their blood sugar levels regularly with the help of a glucometer.

The majority of patients were from urban and suburban areas. It is a well-recognized fact that diabetic care needs a team of physicians, dieticians, nephrologist, ophthalmologist, diabetologist and a vascular surgeon, in addition to a well-developed referral system comprising general practitioners, optometrists and primary health care workers. While this may be true of the developed countries this important link between different specialties is lacking in the developing countries.

Regarding the role of GPs, it was noted that many patients had been under the treatment of GPs at some stage of the disease, but only 4% in this study were referred by GPs.

To understand the present working of GPs and in what way they were sharing their responsibilities in diabetic care, we did a knowledge, attitude and practice study (unpublished data) on 64 general practitioners in the city of Rawalpindi and the capital city of Islamabad. Both the cities have a total population of about 5 million. The results of the study were rather disturbing:

64%(41) of the GPs were routinely checking the blood sugar levels on their patients. None of them was asking for glycated Hb A1c levels.

40.6(26) of the GPs claimed to know how to perform ophthalmoscopy and all of them were examining the fundi without dilating the pupils.

73.4%(47) knew about the stages of diabetic retinopathy but none of them knew the stage at which the patient should be referred for ophthalmologist's opinion.

This proves that with the present state of affairs this group of health care providers can not be relied upon for proper referral of diabetics.

As mentioned before, 237(19%) of the patients had their fundi examined in the past and only 150(12%) had previous laser treatment done. In many cases the treatment given was totally insufficient which brings up another point for discussion and that is of training in the proper use of lasers.

In the majority of tertiary care centres the main stress is on general ophthalmology, with no centre in the country imparting training in posterior segment disorders specifically.

Taking advantage of the lack of laser facilities in government hospitals, many general ophthalmologists have acquired lasers in private capacity. With no previous training in treating posterior segment disorders the general ophthalmologists are doing more damage than good.

It is well known that a definite number of population with eye problems will first present to the opticians. Studies have proved that opticians/optometrists, after formal training, can

become useful screeners of many eye ailments including diabetes related problems[5,6]. In Pakistan this important screening method has not been utilized so far.

There are no established institutes for the formal training of optometrists. Most of the opticians have family businesses and are trained only in dispensing glasses. This is proven by the fact that none of the patients was referred by an optician.

136(10.9%) of the patients had a final vision of less than 3/60 and 184 (14.8%) of the patients a vision between 3/60 and 6/60. For practical purposes 320(25.7%) of the total patients were blind and no medical or surgical treatment could be offered. Although the prevalence of diabetic retinopathy varies between 24% and 70% in various hospital-based studies, the prevalence of diabetic retinopathy in this study was almost 57%.

The four cardinal principles of screening for human diseases were well defined in a public health paper from the World Health Organization (WHO) in 1968[7].

Firstly, the condition should be an important health problem with a recognizable latent or presymptomatic stage.

Secondly, a suitable and reliable screening test should be available which is acceptable to the health care professionals and to the public.

Thirdly, treatment for patients with recognized disease should be effective and agreed upon universally.

Fourthly, the costs of early diagnosis and treatment should be in balance with the total expenditure on health care.

All these principles are applicable to a disease like diabetes mellitus. Detection and treatment of diabetes-related problems particularly eye problems at an early stage are of immense importance for a country like Pakistan, where the health budget is already less than that needed and where advanced surgical treatment is not freely available to the public and, frankly speaking is out of reach of the common man and where problems like cataract-related blindness still top the list when it comes to funding.

To detect and treat diabetes-related eye problems is a challenge in which all the health caretakers like the GPs, the ophthalmologists, the opticians, will have to play their roles. An important negative point in the scenario is the absence in the country of diabetologists whose only responsibility is confined to diabetic care. A major question being asked at the moment is as to who can be a useful screener. Perhaps the ophthalmologists with their background of training; but the thing to note is that there are only about 1500 qualified registered ophthalmologists in the country for a population of 130 million, and with most of them practising in the cities, screening will be a formidable task for them. The bulk of the population in the Western countries has ready access to the optometrists and can utilize their facilities without prior medical referral. Vision testing is free in some countries and studies have proved that optometrists can play an important part in screening for retinopathy if formal training is imparted to them. To achieve this in Pakistan, where no infrastructure exists for this specialty, might take some time.

So, the important question being asked is who should be involved in patient screening in this given setup. The answer truly is that the responsibility for screening ultimately lies with the general practitioners and the doctors in the primary care centres. It is highly probable that these two categories of doctors in the present circumstances will never be able to provide more than a very small fraction of the screening service, but this is a chance the health authorities will have to take. Unlike the developed countries where most of the diabetics will be followed-up in the diabetic clinics, in developing countries most of the diabetics will be followed-up by the general practitioners and this may call for more formal training in ophthalmology for them, in other words, going back to the basics is what is needed.

The prevalence of diabetes mellitus in Pakistan is quoted to be around 5%, but there is need for more controlled epidemiological studies based on WHO criteria to assess the exact prevalence of the disease. As mentioned earlier, the main stress so far has been on cataract-related blindness and it may be a novel idea to utilize the cataract screening programme in Pakistan for the screening of diabetes as well. Such integrated approach may be particularly useful in countries experiencing epidemiological transition. As 70% of the population of Pakistan lives in rural areas, this screening method may give us some idea of the prevalence of diabetes mellitus in large part of the country.

An important factor in the treatment of any disease is the patient follow-up. This has emerged as

one of the major obstacles in patient care in Pakistan. Only 41% of the patients kept their appointments for more than 6 months in this study. As a large proportion of patients will not be attending the clinics, it is imperative for the clinicians to change the treating strategies, e.g. offering laser treatment at a much earlier stage than as laid down in various studies.

Contrary to the past beliefs, diabetes mellitus in adults should now be recognized as a grave threat to the public health of a developing country like Pakistan. Important steps in this regard need to be taken in order to prevent economic and manpower losses.

RECOMMENDATIONS

This study has brought to light several important aspects which need to be considered for diabetic care, not only in Pakistan but also in countries sharing a similar health system.

1. Diabetes-related blindness should be considered as an important preventable cause of blindness in Pakistan.
2. The exact cause of the increase is not known, but several factors will have to be considered, e.g. inappropriate diet with a possible high content of fat and refined carbohydrates, the changing life patterns with a trend towards industrialization, or the changing environment. An important factor in our society could be the interfamily marriages which could make a person prone to develop diabetes at some stage.
3. There is need for more controlled epidemiological studies in the country to find the exact prevalence of diabetes. Separate funding in this regard is necessary.
4. The referral system of the country needs to be reviewed.
5. There is need for more tertiary care centres in the country with upgradation of facilities in the existing ones.
6. There is need for diabetic clinics at the secondary and tertiary care centres.
7. Refresher training courses for general practitioners should be considered, with stress on prevention, diagnosis and proper referral of various eyes diseases including diabetes.
8. Certified training courses for opticians should be considered with particular stress on ophthalmoscopy and detection of common eye ailments.
9. There is need for more ophthalmic practitioners in the country. The present number is utterly insufficient for providing proper ophthalmic care to the community.
10. Community health education should be a regular feature in which the media can play an important part.
11. There is definite need to increase the health budget of the country.
12. No preventive programme can succeed without active participation of the community and with the present literacy rate it will be highly improbable for any community health programme to succeed. More funding will have to be provided for education if the health care system is to improve.

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Abstracts

Edited by Ajmal Nisar

Aspirin Therapy in Nonarteritic Anterior Ischemic Optic Neuropathy.

Beck RW, Hayreh SS, Podhajsky PA, Tan E-S, Moke PS.
Am J Ophthalmol 1997; 123: 212-7.

The purpose of this study was to determine the benefit of aspirin in reducing the risk of nonarteritic anterior ischemic optic neuropathy in the fellow eye following its occurrence in the first eye.

A retrospective cohort study was conducted on 431 patients, 153 of whom were and 278 of whom were not prescribed aspirin following the development of unilateral nonarteritic anterior ischemic optic neuropathy.

The 2-year cumulative probability of nonarteritic anterior ischemic optic neuropathy in the fellow eye was 7% in the aspirin group and 15% in the no-aspirin group, and 5-year cumulative probabilities were 17% and 20%, respectively. Compared with the no-aspirin group, the rate ratio for nonarteritic anterior ischemic optic neuropathy in the fellow eye in the aspirin-user group was 0.43 (95% confidence interval, 0.19 to 0.92) over the first 2 years and 0.68 (95% confidence interval, 0.36 to 1.26) over the 5-year period. The overall calculated 5-year risk was 19%; however, if none of the patients with incomplete follow-up developed nonarteritic anterior ischemic optic neuropathy in the fellow eye, then the 5-year risk would be about 12%.

In conclusion, the 5- year risk of nonarteritic anterior ischemic optic neuropathy occurring in the second eye is far lower than that reported by previous studies. The authors suggest a possible short-term but little or no long-term benefit to aspirin in reducing the risk of nonarteritic anterior ischemic optic neuropathy in the fellow eye. However, this finding must be viewed with caution because this study was not conducted prospectively with a controlled protocol.

Secondary Intraocular Lens Implantation After Cataract Surgery in Children

Biglan AW, Cheng KP, Davis JS, Gerontis CC
Am J Ophthalmol 1997; 123: 224-34

The purpose of this study was to report results of secondary intraocular lens implantation after cataract surgery in children.

The authors reviewed clinical records for a 5-year period of patients who had cataract surgery in childhood and received a secondary intraocular lens implant. The authors studied indications for secondary intraocular lens placement; surgical procedures for intraocular lens implantation; preoperative and postoperative visual acuity, refractive error, and binocular status; and complications of the procedure.

A secondary intraocular lens was placed in 28 eyes of 25 patients who had cataract surgery in childhood. In 20 eyes, the lenses were placed in the ciliary sulcus. The other eight eyes had insufficient capsular support for an intraocular lens; in two, the intraocular lens was placed in the anterior chamber and, in six, in the posterior chamber with suture fixation to the sclera. Twenty of 28 eyes (71%) had measurable improvement in visual acuity; only one eye had a decrease in visual acuity of 2 lines. Fifteen patients (54%) had a final refraction within 1.50 diopters of the fellow eye; 21 (75%) were within 3.00 diopters. During follow-up, two eyes developed glaucoma. One had transient pressure elevation; one required two filtration procedures. Three patients required Nd:YAG capsulotomy. Six patients demonstrated Worth fusion at distance and near; three demonstrated 200 seconds of arc or better stereo visual acuity.

In conclusion, secondary placement of an intraocular lens in the posterior chamber appears to be a safe, effective alternative for correction of aphakia in the contact lens-or spectacles-intolerant child or young adult.

Famciclovir for the Treatment of Acute Retinal Necrosis (ARN) Syndrome

Fiqueroa MS, Garabito I, Gutierrez C,Fortun J
Am J Ophthalmol 1997; 123: 255-7

The purpose of this study was to document a case of acute retinal necrosis syndrome in an immunocompetent patient who was successfully treated with famciclovir after unsuccessful treatment with acyclovir.

After diagnosing acute retinal necrosis syndrome in the patient's left eye, the authors treated him with 13 mg/kg/24 hours of intravenous acyclovir in three daily doses for 14 days followed by 800 mg of

acyclovir five times per day orally. New areas of retinitis developed within the posterior pole despite treatment with the maximum dosage of acyclovir; thus, the authors used a new antiviral agent, famciclovir.

When the authors administered 500 mg of famciclovir orally every 8 hours for 3 months, the retinitis regressed within month, leaving atrophic granular pigmented scars.

In conclusion, Famciclovir can effectively treat acute retinal necrosis syndrome in immunocompetent patients.

Clinical Assessment of Long-term Safety and Efficacy of a Widely Implanted Silicone Intraocular Lens Material

Steinert RF, Giamporcaro JE, Tasso VA
Am J Ophthalmol 1997; 123: 17-27

The purpose of this study was to summarize the long-term safety and efficacy, in a large series of patients, of intraocular lenses made from a second-generation silicone material (AMO SLM-2/UV) widely used as an intraocular lens material.

This was a prospective study of adult patients who received posterior chamber intraocular lenses with an optic composed of a high-index-of-refraction, ultraviolet light absorbing silicone (AMO SLM-2/UV). In 501 patients, clinical data through 3 years postoperative are presented. Postoperative measurements included spectacle-corrected visual acuity, occurrence of postoperative sight-threatening or lens- related complications, and adverse reactions. Results were compared with the standards established by the US Food and Drug Administration (FDA) for polymethylmethacrylate lenses.

At 1 year, 95.2% (496/521) of all patients in group I achieved corrected visual acuity of 20/40 or better. This compared well with the standard reported for polymethylmethacrylate lenses (88%, 2,521/2,864). At 3 years, 94.3% (347/368) of best-case patients achieved corrected visual acuity of 20/40 or better. The rate of sight-threatening complications reported at the final postoperative examination at 3 years was 2.0% (10/501). The rate of Nd:YAG capsulotomy was 27.5% (138/501) through 3 years.

In conclusion, lenses made of the SLM-2/UV silicone material demonstrated safe and effective performance through long-term follow-up at a level equal to or better than established standards for polymethylmethacrylate lenses.

Secondary Posterior Chamber Intraocular Lens Implantation in Pediatric Patients

DeVaro JM, Buckley EG, Awner S, Seaber J
Am J Ophthalmol 1997; 123: 24-30

The purpose of this study was to report results of secondary posterior chamber intraocular lens (IOL) implantation in previously aphakic pediatric patients.

In 19 pediatric patients, 19 aphakic eyes (11 after infantile and eight after traumatic cataract surgery) received secondary sulcus fixated posterior chamber IOL implants.

Visual acuity of 20/40 or better was achieved with IOL implantation and overrefraction in three of 11 infantile (27%) and six of eight traumatic cataract patients (mean follow-ups, 18.1 months [range, 8-29 months] and 18.0 months [range, 6 to 28 months]), respectively. Eighteen of 19 patients (95%) demonstrated postoperative vision equal to or better than preoperative levels; 15 of 19 patient (79%) showed improved vision after IOL implantation. The mean $\pm$ SD difference between actual and predicted postoperative refraction at 1 month was -0.97 $\pm$ 0.96 diopter. Average refractive error at last examination was -0.40 $\pm$ 2.43 diopters. Amblyopia therapy was performed in 14 patients. One IOL required repositioning 8 months postoperatively. Strabismus was present in 14 patients before and 13 patients after IOL implantation, requiring surgery in four patients.

In conclusion, secondary IOL implantation can be performed successfully in carefully selected pediatric patients. Visual acuity results are better in eyes with a history of traumatic cataract and are influenced by patient compliance. The short-term risks of the procedure appear no greater than those of primary IOL implantation, and complications resemble those seen in adults.

Trabeculectomy With Intraoperative 5-Fluorouracil Vs Mitomycin C

Singh K, Egbert PR, Byrd S, Budenz DL, Williams AS, Decker JH, Dadzie P
Am J Ophthalmol 1997; 123:48-53

The purpose of this study was to compare the effectiveness of intraoperative 5-fluorouracil (5-FU) and mitomycin C used adjunctively with trabeculectomy in a black West African population.

Eighty-five consecutive eyes of 85 black patients undergoing primary trabeculectomy for open-angle glaucoma were prospectively randomly assigned to receive either 5-FU (50 mg/ml for 5 minutes) or

mitomycin C (0.5mg/ml for 3 1/2 minutes) intraoperatively by soaked sponge.

Of the 81 eyes with at least a 3-month postoperative follow-up, 41 of 44 (93.2%) in the mitomycin C group and 27 of 37 (73.0%) in the 5-FU group had a final intraocular pressure of less than 21mm Hg (P=.01). Twenty-eight of 44 eyes (63.6%) in the mitomycin C group and 18 of 37 (51.4%) in the 5-FU group had a final intraocular pressure of less than 15 mm Hg (P= 0.26). Mean postoperative intraocular pressure was 13.7 mm Hg in the mitomycin C group and 16.3 mm Hg in the 5-FU group (P=0.05). There were no differences between the two groups in mean age, preoperative intraocular pressure, postoperative visual acuity, and complications. Mean follow-up was 10.0 ± 4.41 months (range, 4 to 19 months).

The authors conclude that the adjunctive use of mitomycin C with trabeculectomy was equally safe and more efficacious compared to 5-FU in this West African population. Use of mitomycin C in this study was not associated with a statistically significantly greater proportion of patients achieving low intraocular pressure (less than 15 mm Hg) compared to 5-FU.

The Association of HLA-DR15 and Intermediate Uveitis

Tang WM, Pulido JS, Eckels DD, Han DP, Mieler WF, Pierce K
AM J Ophthalmol 1997; 123: 70-5

The purpose of this study was to evaluate the association between human leukocyte antigen (HLA-DR15) specificity and intermediate uveitis.

Eighteen patients diagnosed with intermediate uveitis underwent HLA-DR15 serotyping. Additionally, DNA-based phenotyping for a specific HLA-DR15 allele was performed in four patients. The clinical features of HLA-DR15-positive intermediate uveitis were compared with those of HLA-DR15-negative intermediate uveitis.

Thirteen of 18 patients (72%) were positive for HLA-DR15 the frequency of the HLA-DR15 specificity in intermediate uveitis patients was significantly higher than in the control subjects (relative risk, 6.36; P < .001). Each of four patients tested carried the specific allele, DRß1 1501, which has been associated with multiple sclerosis. In the HLA-DR15-positive group were four patients (31%) with coexisting multiple sclerosis or optic neuritis, one patient with coexisting narcolepsy, and three patients (23%) with a family history of multiple sclerosis. Retinal periphlebitis, especially if bilateral, was a frequent ophthalmoscopic finding in HLA-DR15-positive intermediate uveitis.

In conclusion, this study identified a significant association between intermediate uveitis and the HLA-DR15 specificity. Patients who are HLA-DR15-positive and have intermediate uveitis may have systemic findings of another HLA-DR15-related disorder. Intermediate uveitis may belong to a constellation of HLA-DR15-related disorders, which includes multiple sclerosis, optic neuritis, and narcolepsy.

White Dot Fovea

Yokotsuka K-I, Kishi S, Shimizu K
Am J Ophthalmol 1997; 123: 76-83

The purpose of this study was to describe a newly identified clinical entity tentatively named white dot fovea.

The authors examined by scanning laser ophthalmoscopy 58 eyes of 30 patients (mean age, 64 years) who had white dots in the fovea (anatomically defined as the foveola) simulating macular hole. In addition, the retinal surfaces of 30 autopsy eyes from donors aged 70 years or older were observed by scanning electron microscopy.

White dot fovea was bilateral in 28 of 30 patients (93%). It was characterized by the presence of numerous white dots on the foveal surface distributed either diffusely or along the foveal margin, forming a gray ring. There was no subjective symptom or visual disturbance. The condition was best seen by a scanning laser ophthalmoscope using argon blue laser as the light source. The white dots numbered from 100 to 300 per eye. Each dot was approximately 5 um in diameter. Scanning electron microscopy showed foveal granules simulating the white dots in five of 30 autopsy eyes (17%). The granules had multiple protrusions with cilia-like structures resembling glial cells. This glia-like structure seemed to be a counterpart of clinically observed white dot fovea.

The authors conclude that white dot fovea is a new, frequent, and apparently innocuous clinical entity. It merits due attention in the differential diagnosis of macular holes.

Peribulbar Corticosteroid Injection: Vitreal and Serum Concentrations After Dexamethasone Disodium Phosphate Injection
Weijtens O, Van Der Sluijs FA, Schoemaker RC, Lentjes EGWM, Cohen AF, Romijn FPHTM, Van Merus JC
Am J Ophthalmol 1997; 123: 358-63

The purpose was to study the dexamethasone level reached in human vitreous after a peribulbar injection of 5mg of dexamethasone disodium phosphate and to assess its systemic uptake.

In a prospective study, 61 eyes of 61 patients scheduled for vitrectomy received a single peribulbar injection of 5mg of dexamethasone disodium phosphate at varied intervals before surgery. At the start of vitrectomy, an undiluted vitreous sample was taken. In 22 patients, multiple serum samples were collected. Dexamethasone concentrations were measured by radioimmunoassay. The physiologic cortisol concentration was determined in the vitreous of 12 eyes of 12 patients who did not receive dexamethasone.

An average dexamethasone peak concentration of approximately 13 ng/ml was reached in vitreous 6-7 hours after peribulbar injection. In serum the average peak concentration was approximately 60 ng/ml 20-30 minutes after peribulbar injection. The average physiologic cortisol concentration in vitreous was 5.1 ng/ml.

It was concluded that after a peribulbar injection of 5 mg of dexamethasone disodium phosphate, an average intravitreal dexamethasone concentration is reached with a 75 times greater anti-inflammatory potency than physiologically present cortisol. Dexamethasone concentration in serum, however, is several times higher. Peribulbar injection is not just a local treatment but results in serum levels comparable to those achieved by a high oral dose.

Abnormal Expression of the p53 Tumor Suppressor Gene in the Conjunctiva of Patients With Pterygium
Tan DTH, Lim ASM, Goh H-S, Smith DR
Am J Ophthalmol 1997; 123: 404-5

The purpose of this study was to determine whether pterygium was a disorder of abnormal growth by examining the expression of the p53 gene in the conjunctiva of patients with pterygium.

Immunostaining for abnormal expression of p53 was performed using mouse monoclonal antibody to human p53, pAb 240, on six eyes with primary pterygium and two eyes with recurrent pterygium.

In three of the eight eyes with pterygium, specimens were positive for abnormal expression in the epithelium of the pterygium and in the superior bulbar conjunctiva.

In conclusion, abnormal p53 expression in the epithelium of primary and recurrent pterygium specimens suggests that pterygium is a growth disorder rather than a degeneration.

Is Myopia Related to Amplitude of Accommodation?
Fong DS
Am J Ophthalmol 1997; 123: 416-8.

The purpose of this study was to report the association between amplitude of accommodation and refractive error.

Refractive error and amplitudes of accommodation were measured in 1,148 eyes of 696 patients as part of the Early Treatment Diabetic Retinopathy Study.

Eyes with myopia, defined as those with a refractive error of -0.75 diopter or more, have lower accommodative amplitudes (P=.005). After multivariate logistic regression analysis adjusting for age, occupation, and white race, lower amplitudes of accommodation remained associated with myopia (P=.03).

In conclusion, eyes with lower amplitudes of accommodation must use more of their accommodative reserve for near work. Myopia may be an adaptation that develops in eyes with reduced accommodative amplitudes.

Mechanisms of Inflammatory Response in Sympathetic Ophthalmia and VKH Syndrome
Rao NA
Eye (117) 11, 213-6

Although the inciting events in the pathogenesis of sympathetic ophthalmia and Vogt-Koyanagi-Harada (VKH) syndrome are different, these two forms of bilateral granulomatous uveitis share several clinical, histopathological and immunohistochemical features, including their association with HLA types and in their in vitro T-cell response to retinal antigens. These clinical and immunopathological features indicate that there is an underlying T-cell-mediated autoimmunity to uveal/retinal antigens in the development of these

forms of uveitis. Both forms exhibit preservation of the choriocapillaris and retina despite extensive inflammatory cell infiltration in the choroid. Recent experimental studies suggest that this preservation of choriocapillaris could be the result of anti-inflammatory products secreted by the retinal pigment epithelium, including transforming growth factor-beta and a novel protein called retinal pigment epithelial protective protein that is known to suppress the phagocyte generation of superoxide. Such suppression of the oxidant release in the choroidal inflammation could help protect the uvea from necrotic change and preserve the choriocapillaris from inflammatory cell infiltration.

New Therapeutic Options in Uveitis

Lightman S

Eye 1997; 11: 222-6

Most patients with sight-threatening posterior uveitis eventually end up on systemic medication to control their disease. Although the more aggressive approach to the use of these drugs does offer the patient a better chance of significant visual improvement at least in the short term, this is often associated with severe systemic side-effects in both the young and older patient. Cyclosporin has become a very useful second-line agent as a steroid sparer in those patients who can tolerate it. However, it is not suitable for or effective in everyone and the other currently available drugs are often of limited effectivity or associated with major systemic sequelae. This paper summarizes the therapeutic approaches currently being examined to define whether they have a role in the better management of these patients in the future. Particularly exciting is the potential for sustained intraocular drug delivery so that adequate drug levels are achieved inside the eye without the necessity for systemic administration.

Retinal Changes Associated With Tamoxifen Treatment For Breast Cancer

Tang R, Shields J, Schiffman J, Li H, Locher D, Hampton J, Prager T, Pardo G

Eye 1997; 11: 295-7

This study was undertaken to estimate the incidence of retinal changes and determine the prevalence of ocular toxicity associated with tamoxifen treatment in a breast cancer population.

The study was based on a population cross-sectional survey, including 290 patients taking tamoxifen from 6 months to 12 years; 274 patients were analysed. The main outcome measures were the incidence of retinal changes and visual impairment.

The incidence of retinal changes was 0.9% (3 of 274 patients). All 3 patients were asymptomatic. The length of tamoxifen treatment ranged from 39 months to 120 months in the affected patients, with cumulative tamoxifen doses ranging from 23.7g to 73g.

Retinopathy in patients receiving low doses of tamoxifen is rare and, in this study, did not result in changes in visual acuity. The authors found no retinopathy in patients receiving tamoxifen within the first 3 years of treatment or in patients receiving a total tamoxifen dosage of less than 23.7g. Although retinopathy can occur in a tamoxifen-treated population, its low incidence and an associated good prognosis for vision does not merit special screening for this problem.

Clinical Diagnosis of Ocular Sarcoidosis

Stavrou P, Linton S, Young DW, Murray PI.

Eye 1997; 11: 365-70

The purpose of this study was to assess the value of raised serum angiotensin converting enzyme (ACE) levels in making a clinical diagnosis of ocular sarcoidosis in patients with intraocular inflammation, compatible with sarcoidosis, in whom tissue biopsy is either not practical or not possible.

The ocular manifestations and clinical course of 22 patients with intraocular inflammation compatible with sarcoidosis and elevated ACE level (including II patients with abnormal chest radiograph) were compared with those of a group of 18 patients with intraocular inflammation due to biopsy-proven sarcoidosis. The mean follow-up ($\pm$ SD) was 4.5 ± 3.4 years in the presumed ocular sarcoidosis group and 7.8 ± 5.3 years in the biopsy-proven sarcoidosis group.

There was no difference in sex, race and age distribution between the two groups. No statistically significant difference could be found between the ocular manifestations seen in each group. The most common finding was retinal vasculitis with panuveitis, seen in 86.4% of the presumed ocular sarcoidosis group and in 83.3% of the biopsy-proven sarcoidosis group.

In conclusion, these results suggest that intraocular inflammation compatible with sarcoidosis in conjunction with raised ACE levels would be accordant with a diagnosis of sarcoidosis in patients in whom histological diagnosis is either not practical or not possible.

Surgical Treatment of Supranuclear and Internuclear and Ocular Motility Disorders

Buckley SA, Elston JS

Eye 1997; 11: 377-80

Patients with supranuclear and internuclear ocular motility disorders may have nystagmus and oscillopsia, or need to adopt an abnormal head posture to either fixate or maintain binocularity. Many have a cosmetically unsatisfactory appearance. In addition, because of lesions involving ocular motor nuclei or nerve fascicles, double vision is also a common problem. The usual management of these patients is symptomatic with occlusion or prisms. The authors report on 11 patients who underwent extraocular muscle surgery with the aim of reducing symptoms and restoring or improving binocular single vision. Three patients had bilateral internuclear ophthalmoplegia with exotropia, 3 had dorsal midbrain syndrome, 2 had residual upgaze palsies after cerebral vascular accidents, 2 had oculopalatal myoclonus and one skew deviation. After surgery, symptoms, visual function and cosmesis improved in nearly all patients. The authors recommend that surgery should be considered more readily in the rehabilitation of these patients.

Clear Cornea Sutureless Phacoemulsification and Astigmatic Decay After Two Years

Percival P, Beare N

Eye 1997; 11: 381-4

The purpose of this study was to determine whether clear cornea temporal sutureless sections led to astigmatic decay over a 2-year period.

The difference between (a) preoperative keratometric cylinder and keratometric cylinder at final follow-up, and (b) spectacle cylinder at 1 month postoperation and final follow-up, was calculated for 43 eyes.

The mean difference in keratometric cylinder between pre-operation and final follow-up was 0.12 D with the rule (WTR) or against the wound. The range was from 0.7 D WTR to 0.4 D against the rule (ATR). Eithy-two per cent of eyes did not change by more than 0.3 D. The mean change in spectacle prescription between 1 month postoperation and final follow-up was 0.05 D ATR, range 0.5 D WTR to 1.0 D ATR. At final follow-up 93% of eyes were seeing 20/40 or better unaided.

It was concluded that a carefully constructed temporal wound can remain astigmatically neutral.

The Maintenance of Peroperative Mydriasis in Phacoemulsification with Topical Diclofenac Sodium

Antcliff RJ, Trew DR

Eye 1997; 11: 389-91

The purpose of this study was to determine whether the use of topical diclofenac sodium (diclofenac) preoperatively improved the maintenance of peroperative mydriasis, in conjunction with irrigating solutions containing adrenaline.

Sixty-four consecutive patients undergoing phacoemulsification were randomized to receive either diclofenac or no diclofenac in conjunction with cyclopentolate 1% and phenylephrine 10% preoperatively. They subsequently underwent routine phacoemulsification by one consultant surgeon. Irrigating solutions of balanced salt solution contained adrenaline $1:10^6$. Pupil diameters were measured pre-sclerostomy, post-phacoemulsification, post-irrigation/aspiration and on day 1 postoperatively. These were then compared by Student's *t*-test.

The two groups were statistically similar in age and sex. The mean pre-sclerostomy pupillary diameters were 8.1 mm in both groups. The mean post-phacoemulsification diameters were 7.6 mm in those receiving diclofenac and 7.2mm in those not ($p=0.03$). The mean diameters after infusion/aspiration were 7.7mm in those receiving diclofenac and 7.1 mm in those not ($p=0.008$). The mean pupillary diameters on day 1 were 5.3mm in those receiving diclofenac and 4.6 mm in those not ($p=0.003$).

It was concluded that diclofenac improved the maintenance of per-operative mydriasis, in the presence of irrigating solutions containing adrenaline.

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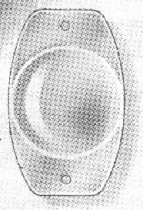

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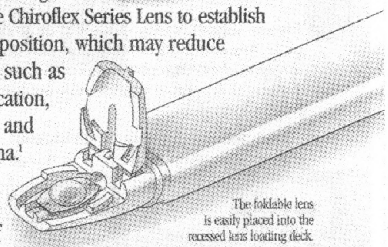

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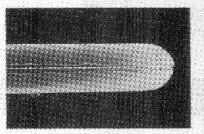

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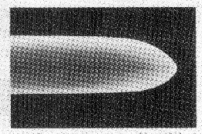

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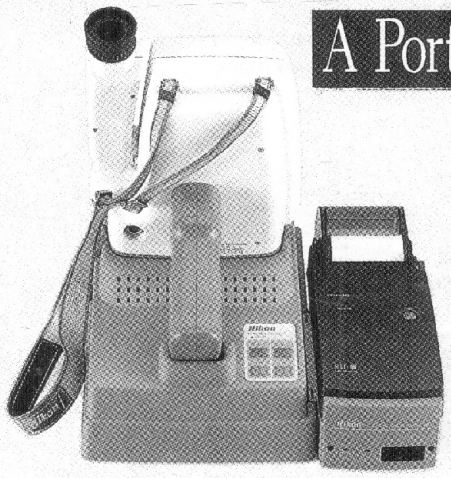

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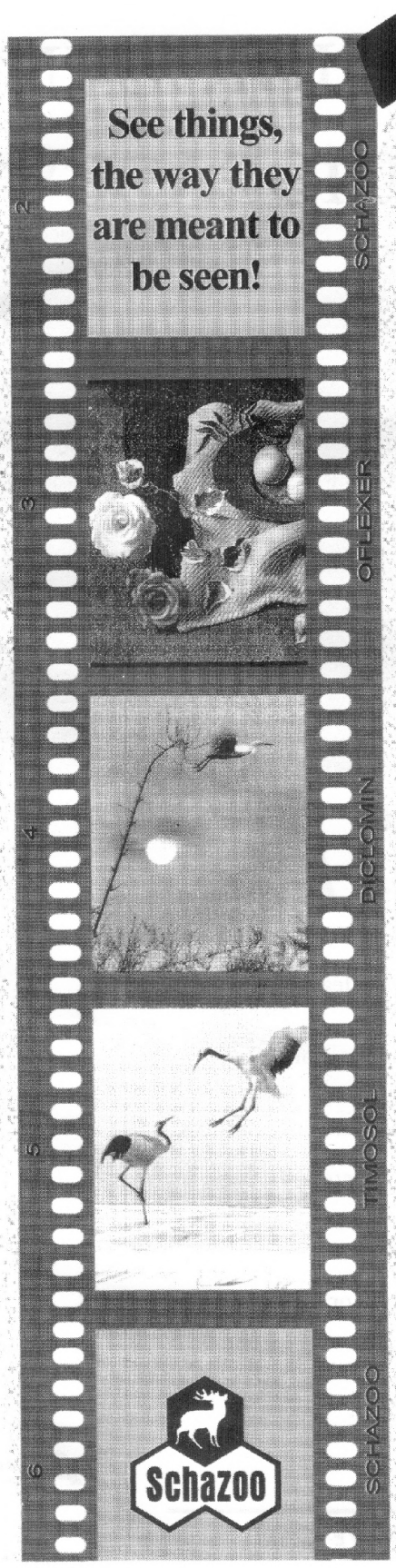

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1- (PDR Ophthalmology 1995).
2- (SO: Br-J-Ophthalmol 1991 Nov; 75(11): 675-9).
3- (SO: Yen-Ko-Hsueh-Pao 1994 Dec; 10(4): 251-3).
4- (SO: Br-J-Ophthalmol 1995 Jun; 79(6): 606-9).
5- (SO: J-Cataract-Refract-surg 1995 May; 21(3): 309-12).
6- (SO: J-Fr-Ophthalmol 1992; 15(1): 5-8).
7- (SO: Refract-Corneal-Surg 1993 Nov-Dec; 9(6): 425-36).
8- (SO: Insight 1993 Apr-Jul; 18(3-4): 10).
9- (Comparsion between timolol & hydrunolol, showing percentage of withdrawals. M.Ober et. al., Br. J. Opthal., 1985-69,593).
10 & 11- (APHS, Drug information 92, page #1705)

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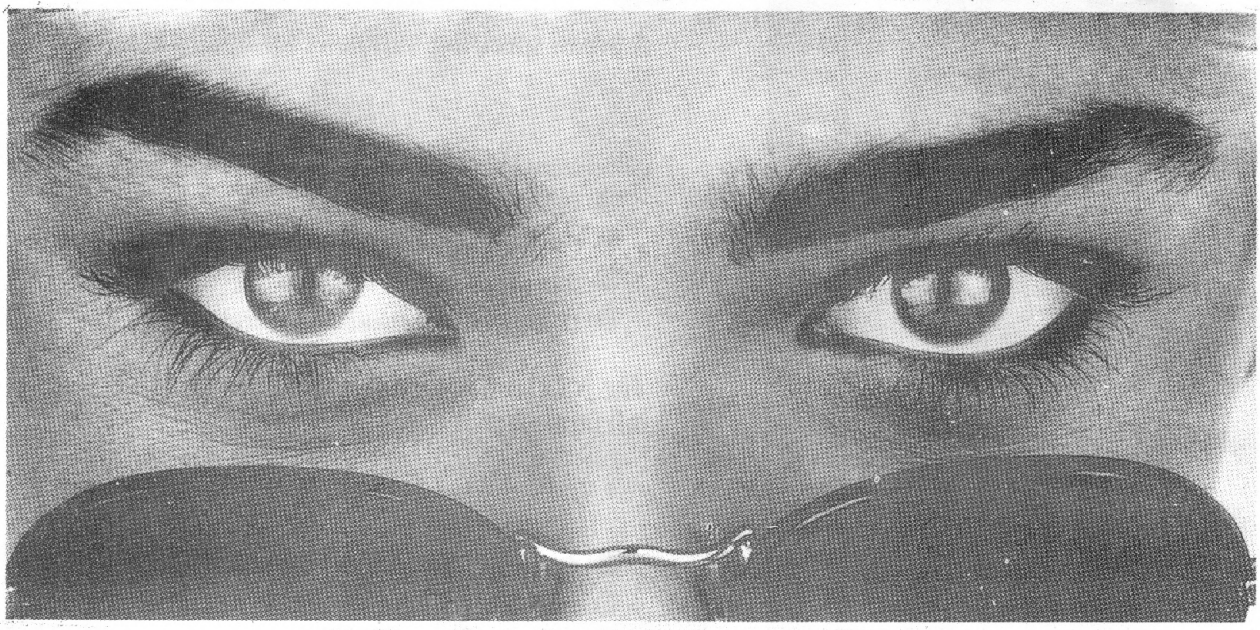

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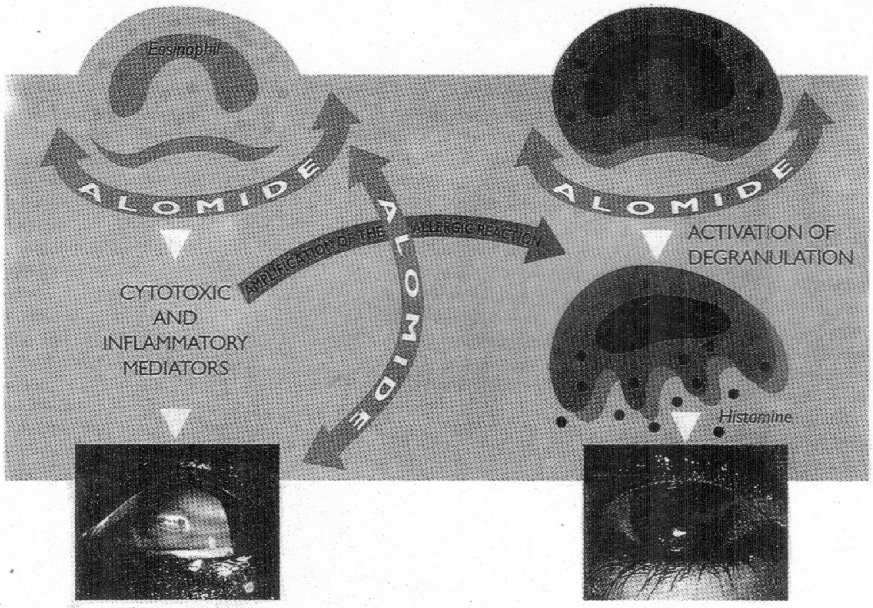

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