

PAKISTAN JOURNAL OF OPHTHALMOLOGY

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At Page 6, Figure-3a: Pre-op: Prosis 3mm, Levator Function 4mm

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EDITORIAL

Glaucoma: A Major Challenge to Ophthalmologists in 21st Century

INTRODUCTION

Glaucoma is now considered to be the 2nd major cause of global blindness. It is estimated that over 66 million people are affected and over 6 million are blinded in both eyes by the disease. 50% of the affected population in developed countries is not aware of their illness; in developing countries the situation is much worse.

Unlike cataract blindness where effective and safe surgical treatment is available, Glaucoma is a much more complex issue. Despite major breakthroughs in the understanding of pathological processes, in the field of diagnosis and treatment, we are still faraway from satisfactory long term management of glaucoma.

In the 21st century more efforts will need to be made in the field of epidemiology. The ethnic distribution of primary open and close angle glaucoma will have to be explored further. Major efforts will need to be made to identify more risk factors for both primary open angle and primary close angle glaucoma.

On the pathogenesis side, we have developed better understanding in the causation of structural damage to the optic nerve head and retinal nerve fibre layers through mechanical pressure and or neurological and ischaemic factors. However a lot more work is needed in this area in order to identify factors responsible for making the optic nerve head susceptible to structural and functional damage and ways and means to protect it from such damage.

The management of glaucoma will continue to be a major challenge to ophthalmologists in the

new century. Early detection and early referral through primary health care services or through mass screening is still not possible in many countries. Even if patient present to the ophthalmologist, the correct diagnosis in early stages of glaucoma is still major dilemma. Effort will therefore have to be made to identify ways and means of simple and effective diagnostic methods for early and correct diagnosis.

Very recently more and more medical options are available to the ophthalmologists for effective management of their glaucoma patients. Some of the new anti glaucoma drugs are fairly safe, effective, offering convenient dosage, which leads to improved compliance and thus help in preventing glaucoma blindness. However, the availability and the cost of such drugs to all the affected population globally is still a dream.

A number of breakthroughs have also been made in surgical management of glaucoma. More efficient, effective and safer procedures and becoming available to some of the privileged classes in developed world. Many such procedures are technically very complex and therefore, may not be adopted globally for universal usage.

In view of such complexities involved in early detection, referral, diagnosis and management, many countries/regions are now coming up with guidelines for management of glaucoma in their own country settings.

The European Glaucoma Society summarized the goal of glaucoma treatment as follows:

Preservation of Visual Function, adequate to the individual needs with minimum or no side effects, for the expected life time of the patient,

without any disruption of his/her normal activities, at a sustainable cost. All countries will have to develop strategies to achieve this noble goal for their target populations.

Keeping in view these complex issues related to glaucoma, the Ophthalmological Society of Pakistan has taken a pro action and encouraged the constitution of a sub group of interested and dedicated ophthalmologists in the form of glaucoma interest group. The group has been assigned the task of preparing national guidelines for management of glaucoma in Pakistan. The group has also been given the task to interact with similar interest groups or societies regionally and globally to achieve its desire objectives.

The group has been working on the task with the full support of Pharmaceutical industry and it is hoped that it will come forward with the national guidelines in the next six to seven months. The guidelines will have to address the major issue of creating awareness among the people and training of primary health care personnel in order to improve early detection and referral. The group will also have to come forward with concrete proposal for conducting nation wide multi-centric epidemiological, basic and operational research in the field of glaucoma. It is strongly hoped that these measures will lay a sound foundation for building nation wide glaucoma services as part of comprehensive eye care and will thus pave way for control of blindness from glaucoma in 21st century.

Prof. Muhammad Daud Khan

Levator Resection: A Feasible Option in Congenital Ptosis with Poor Levator Function

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ABSTRACT

26 patients of congenital ptosis were operated upon. 15(58%) were male and 11(42%) female with an average age of 10 years. The ptosis was moderate (3mm) in 6(23%) and severe (>4mm) in 20(77%) patients. The levator palpebrae superioris (LPS) function was 4mm in 12(46%), 3mm in 6(23%) and <2mm in 8(31%) patients. The LPS resection was minimum (14 – 17mm) in 3(11%), moderate (18-22mm) in 14(54%) and maximal (>23mm) in 9(35%) patients. 17(65%) patients had a good (within 1mm of normal) results, 7(27%) had a fair (within 2mm of normal) result while 2(8%) had an under-correction of more than 2mm which required a frontalis sling procedure. Levator resection is a feasible option and gives good results in patients of congenital ptosis with poor levator function.

INTRODUCTION

Ptosis or drooping of upper eyelid is due to dystrophy of the levator palpebrae superioris (LPS) muscle¹. There are diverse opinions regarding management of ptosis when the levator function is poor i.e. 4mm or less excursion of the upper eyelid. This study is an attempt to emphasize that simple levator resection is a feasible option in patients with poor levator function.

PATIENTS AND METHODS

Complete ocular examination was done. visual acuity, ocular muscle balance and ocular movements were checked. The amount of ptosis was recorded using the Marginal Reflex Distance (MRD), normal being 2.5mm, this being the difference between the center of the upper eye-lid margin and the corneal reflection in primary position of gaze. LPS function was assessed by noting the excursion of the upper eye-lid from extreme downgaze to extreme upgaze, by holding a transparent rule in front and pressing on the area above the eye brow to prevent frontalis over action. Bells phenomenon and Marcus-Gunn jaw winking phenomena were also checked. Applanation tonometry, retinoscopy and dilated fundus examination was carried out.

General anesthesia was employed in all patients. The upper eyelid skin crease was marked and a 4/0 black silk suture was applied 3mm 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 then held within the scissors ends and guided along the track made by the 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 tarsal side of ptosis clamp, 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 on the anterior surface of LPS aponeurosis beyond the lower edge of the orbital septum till the orbital fat pad was identified. The lid was then everted and a skin-crease incision given along the upper border of tarsus through skin-orbicularis lamina. The anterior surface of tarsus was exposed in its upper half for future suture placement. The LPS aponeurosis is then transferred to the skin side through this route by releasing and then reapplying the ptosis clamp. The conjunctiva is now sutured to the upper border of tarsal plate with 6/0 vicryl suture. The LPS aponeurosis is now anchored to the junction of upper one third and lower two third of anterior tarsus with a 5/0 double-armed ethibond suture. Lid level is now checked after tightening this suture and should cover the upper 2mm of cornea. Any necessary adjustment is carried out.

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 eye brow with a tape to avoid the problem of exposure in the early post operative 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 5th postoperative day. Follow-up was at two weeks, four weeks, three months, six months and every year.

RESULTS

The study is spread over a ten year period from 1990 to 2000. 26 patients of congenital ptosis were operated upon. 15(58%) were male and 11(42%) female with an average age of 10 years. The ptosis was moderate (3mm) in 6(23%) and severe (>4mm) in 20(77%) patients (Table-1). The LPS function was 4mm in 12(46%), 3mm in 6(23%) and <2mm in 8(31%) patients (Table-2). The LPS resection was minimum (14 – 17mm) in 3(11%), moderate (18-22mm) in 14(54%) and maximal (>23mm) in 9(35%) patients (Table-3).

17(65%) patients had a good (with 1mm of normal) result, 7(27%) had fair (with 2mm of normal) result while 2(8%) had an under-correction of more than 2mm which required a frontalis sling procedure (Table-4). Following range from 1 month to 2 years with a mean of 6 months.

Table-1: Amount of ptosis

	Number	Percentage
Mild (2 mm)	Nil	-
Moderate (3 mm)	6	23.0
Severe (4 mm)	20	77.0
Total	26	100.0

Table-2: Levator palpebrae superioris function (mm)

Function (mm)	Number	Percentage
4 mm	12	46.0
3 mm	6	23.0
> 2 mm	8	31.0
Total	26	100.0

Table-3: Levator palpebrae superioris resection (mm)

	Number	Percentage
Minimum (14-17 mm)	3	11.0
Moderate (18-22 mm)	14	54.0
Maximal (> 23 mm)	9	35.0
Total	26	100.0

Table-4: Postoperative results

	Number	Percentage
Good (within 1mm of normal)	3	11.0
Fair (within 2mm of normal)	14	54.0
Undercorrection	9	35.0
Total	26	100.0

One overcorrection (released) included in good overall results.

DISCUSSION

LPS is the main elevator of the upper eyelid¹⁻³. The muscle origin is from the tendinous ring



Fig-1a. Pre-op: Ptosis 8mm, levator function 2mm.



Fig-2a. Pre-op: Ptosis 6mm, levator function 3mm.



Fig-1b. Post-op: fair result after 22mm levator resection.



Fig-2b. Post-op: fair result after 24mm levator resection.

at the apex of the orbit and as it processes forward, it splits into two lamina. The anterior lamina is inserted into the pretarsal skin and the posterior lamina is inserted on the anterior surface of upper tarsal plate in its upper third. The Muller's muscle also originates from the under surface of the posterior lamina to insert into the superior border of upper tarsal plate³.

Levator function is measured by noting the upper lid excursion from extreme down gaze to extreme up gaze taking care to eliminate frontalis overaction^{1,2}. It is said to vary from 13-16mm^{1,4}; poor levator function is attributed to be less than 4mm², while some mention it to be 5mm⁴.



Fig-3a. Pre-op: Ptosis 3mm, levator function 4mm.



Fig-4a. Pre-op: ptosis 6mm, levator function 4mm.



Fig-3b. Post-op: good result after 22mm levator resection.



Fig-4b. Post-op: good result after 25mm levator resection.

In the combined approach, transconjunctival isolation gives us ease, assurance and speed of levator aponeurosis isolation while the transcutaneous route gives advantages of posterior exposure and opportunity to create future lid crease^{6,7}.

Frontalis sling is considered to be the procedure of choice if levator function is poor^{1,2}. However, the flattening of supra-tarsal contour is a major compromise^{1,2}. Levator resection is considered to be a practical and feasible option even if the levator function is poor.

All patients were operated upon under general anesthesia. The type of anesthesia does not seem to effect the operative results⁹. Due to the younger age group, general anesthesia is the preferred mode. Also the lid level is adjusted on the table to cover the upper 2mm of the cornea and the results are maintained post-operatively⁸. The amount of levator resection varied from minimum (14-17mm) in 3(11%), moderate (18-22mm) in 14 (54%) and maximal (>23mm) in 9(35%) patients. The decision was based on the desired adjustment on the table as mentioned previously. The amount of levator resection has to

be tailored to the individual patient. Only 2(7%) patients required a frontalis sling procedure as their levator aponeurosis was so rarified that it could not maintain the lid lift.

CONCLUSION

Levator resection is a practical and feasible option in patients with poor levator function and gives good cosmetic result.

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Role of Mitomycin-C in Prevention of Pterygium Recurrence

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ABSTRACT

Prevalence of pterygium is quite high in Pakistan. Its pathogenesis is not well defined. Exposure to dust, dryness, wind and the sun are possible causative factors. Progressive pterygium may obstruct the visual axis and also become cosmetically unacceptable to the patient. Surgical excision of an established pterygium relieves the symptoms but has a high recurrence rate of between 30% and 70% in 1-4 months time. Intraoperative application of a single 0.02% dose of mitomycin-C for 2 minutes after pterygium excision reduces the recurrence rate. In our study, 202 patients harbouring 259 pterygia were included, 106 in the control group (Gp-C) and 111 in the mitomycin-C-treated group (Gp-M). One hundred fifty-nine (78.72%) were males and 43 (21.28%) were females. The male to female ratio was 3.69:1. Patients ranged between 17-77 years of age, the average age being 33.7 years. Two hundred thirty-four (90.34%) were primary pterygia while 25 (9.66%) were recurrent in nature. Two hundred seventeen (83.78%) pterygia were operated upon using the bare sclera technique, however, only 111 (51.15%) received a single intraoperative application of mitomycin-C as an adjunctive therapy. Follow-up was conducted for 3-17 months, with an average follow-up of 10.3 months. No recurrence occurred in Gp-M, while 17 (16.04%) recurrences occurred within 4 months of surgery, in Gp-C.

INTRODUCTION

Pterygium is a degenerative condition of the subconjunctival tissues. It is a fibrovascular connective tissue overgrowth located in the horizontal meridian of the interpalpebral fissure, extending from the conjunctiva and crossing the limbus with its apex on the cornea^{1,2}. It has a broad body on the epibulbar area, a blunt head on the cornea, an intervening area called the neck, and the cap, a grey zone which precedes the head³. Once developed, a pterygium leads to ocular congestion, photophobia, tearing, foreign body sensation, progressive astigmatism, diplopia, restriction of extraocular movements and visual deterioration. It becomes a stigma being cosmetically unacceptable to both the patient and the family⁴.

Pterygium is common in the tropics and in Australia⁵. In Pakistan, the prevalence of pterygium is quite high because the masses are daily exposed to dust, dryness, wind and the Sun. Troops in the armed forces have a greater than average exposure to these elements. Surgical resection is accepted as the only way of eliminating an established pterygium⁴, but a high recurrence rate of 30-70%⁶⁻⁸ has led to exploration

of various additional treatment modalities for prevention of pterygium recurrence.

We conducted a study to find out the frequency of pterygium in the local population with special reference to armed forces personnel and to determine the role of single application of mitomycin-C in preventing the recurrence of pterygium.

MATERIALS AND METHODS

This prospective study was conducted in the department of Ophthalmology, Combined Military Hospital, Lahore, from June 97 to October 98. Patients included in the study were picked up from the outpatient unit of the department. Serving and retired officers, serving and retired soldiers, serving and retired entitled civilians, their families, parents and referrals from peripheral military hospitals were considered. Furthermore, patients presenting in the outpatient unit for other ocular ailments and harbouring pterygia as well, were also considered for inclusion in the study. Selection and exclusion criteria (Table 1) were strictly followed.

Each individual included in the study underwent a complete ophthalmic examination. A

brief history of each case was taken with special emphasis on exposure to the elements mentioned above. Visual acuity, both pre- and post-operative, was recorded. Special attention was given to any astigmatic errors. Torch and slit-lamp examination of each case was carried out to determine the size and morphology of the pterygium. Screening for diabetes mellitus and hypertension was done in each case.

On a random and non-selective basis, the patients were then placed into two groups, namely group-C (Control group) and group-M (Mitomycin group). Informed consent for use of mitomycin-C as an adjunctive therapy was obtained from each patient in group-M prior to surgery. Group-C underwent excision of the pterygia only, using the bare-sclera technique. Group-M, in addition to surgery, received a single application of mitomycin-C on the operating table, immediately after surgery. The first postoperative examination was carried out 72 hours after surgery. Thereafter, they were seen daily for the next 4-5 days. Patients were reviewed weekly for 2-3 weeks, fortnightly for 2 months, then monthly for 3 months, and finally quarterly for 6-12 months. During the follow-up, special attention was paid to the operation site, the mitomycin-C application site and any complications or recurrence. Photographs were taken for record where required or permitted by the patient. Various data were collected, frequency of pterygium and other relevant statistics calculated, and the results of the study compared with other studies of a similar nature, both local as well as international.

METHODOLOGY OF THE OPERATIVE PROCEDURE

After careful selection of the patients, each case was put on topical corticosteroid drops for a period of 2-4 weeks as an outdoor case, in order to decongest the pterygium. Surgery was performed only when the pterygium was decongested. All the patients were called for surgery on the very morning of the operation, with no overnight premedication. Premedication included topical antibiotics, steroids and 1% amethocaine in the conjunctival sac, for half an hour, prior to surgery. Each patient was meticulously prepared for surgery, by scrubbing of the area with antiseptic lotion, draping the eye with sterile cellophane sheet (Opsite) and using sterile linen sheets to cover the face and body. The lids were opened by using a light-weight lid speculum.

One-fifth ml of 2% lidocaine with 1:100,000 epinephrine was injected into the pterygium, after grasping and lifting its neck with a toothed forceps. Under an operating microscope, the pterygium was grasped with toothed forceps, and a superficial keratectomy performed with a no. 15 Bard-Parker blade, commencing some 0.5 mm in front of the pterygium head, till the limbus was reached. The conjunctiva was undermined and the body of the pterygium dissected from both the overlying conjunctiva and the Tenon's capsule, with a spring scissors. Once completely freed, the pterygium was excised by means of the scissors. The exposed sclera was scraped free of all episcleral tissue with a no. 15 Bard-Parker blade. Any bleeding points were managed with light bipolar cautery.

In Pakistan, mitomycin-C is available under the name of Mitomycin-C Kyowa, of Kyowa Hakko Kogyo Co. Ltd., Japan, in a 10-vial packing of 2 mg/ml (potency) vials. One-fifth mg of mitomycin-C crystals was dissolved in 10 ml of saline, thus, giving a 0.02% solution. One-fifth mg/ml (0.02%) mitomycin was used intraoperatively, on the bare sclera, as a single application. The size of the micro sponges used for soakage and application of mitomycin-C was 3 mm(L) x 2 mm(W) x 1 mm(H). The sponge, after being tailored to the above specifications, was soaked in the mitomycin-C solution for 30 seconds, and thereafter, applied to the bare sclera, approximately 2 mm from the limbus, in the plane of the pterygium, for 2 minutes. Special care was taken to prevent any soakage / spillover of the solution onto the conjunctiva and cornea. On removal of the sponge after 2 minutes, the exposed scleral area was copiously irrigated with 50-100 ml of BSS / saline, in order to wash away any excess mitomycin-C left behind. The area was then dried, using separate micro sponges for the exposed sclera on the one hand and the conjunctiva/cornea on the other. The free conjunctival edges were approximated and stitched with interrupted 8/0 silk sutures, leaving a 3-4 mm strip of sclera, adjacent to the limbus, bare. Topical antibiotics, steroids and mydriatics were instilled and the eye padded.

First postoperative examination was done 72 hours after surgery. The pad was removed and slit-lamp biomicroscopy of the operated eye performed to assess the state of the conjunctiva, bare sclera and cornea. The cornea was stained with fluorescein to assess the degree of corneal re-

epithelialization. Padding of the eye was continued till such a time that there was no corneal staining. No topical steroids were instilled for this period. Thereafter, topical antibiotics, steroids and NSAIDS were copiously used till the inflammation subsided. During the first week, patients were reviewed daily. Weekly review was done for the next 2-3 weeks, fortnightly review for 2 months, monthly review for 3 months, and finally, quarterly review for 6-12 months was carried out.

RESULTS

FREQUENCY

The total number of patients reporting in the outpatient unit of the department, between June 1997 and October 1998 was 18764. Of these, 482 were found to harbour pterygia. Thus, the frequency of pterygium in our population is 2.57% (Table 2).

DEMOGRAPHY

In our study, 202 individuals were included, harbouring 259 pterygia; 106 in Gp-C and 111 in Gp-M respectively. One hundred fifty-nine (78.72%) were males and 43 (21.28%) were females. Male: female ratio was 3.69:1.

AGE

Ages of patients ranged between 17-77 years. Majority of the patients; 103 (50.99%) presented between ages 21 and 30 years, the average age being 33.7 years.

CLINICAL FEATURES

A fleshy mass on the eyeball in 183 (90.59%) and recurrent irritation in 175 (86.63%) were the main presenting features. The bulk of the patients were outdoor workers, i.e. 174 (86.13%), with a history of exposure to UV rays.

BILATERALITY

One hundred sixty-four (81.18%) had a single pterygium, 37 (18.32%) were bilateral. One (0.49%) case showed multiple pterygia in the same eye.

SITE

Two hundred eight (80.30%) pterygia were

nasal, 48 (18.52%) temporal and 3 (1.15%) atypical.

STAGE

Two hundred eleven (81.47%) pterygia were progressive, while 48 (18.53%) were atrophic in nature.

RECURRENT PTERYGIA

Two hundred thirty-four (90.34%) were primary; 25 (9.66%) were recurrent in nature, having been operated upon 1-4 times in the past.

ASSOCIATED SIGNS

In 220 (84.94%) cases, pterygia were well developed, while 39 (15.05%) barely involved the cornea.

None of the eyes harbouring pterygia had a pingueculum, though pingueculae were present in 34 (16.83%) fellow eyes.

One hundred eighty-six (92.07%) patients had astigmatism against-the-rule in the eye harbouring the pterygium.

GROUPS

Two hundred seventeen (83.78%) pterygia were operated upon using the bare sclera technique, however, only 111 (51.15%) received a single intraoperative application of mitomycin-C as adjunctive therapy.

FOLLOW UP

Follow-up was conducted for 3-17 months, with an average follow-up of 10.3 months. No recurrence occurred in Gp-M, while 17 (16.04%) recurrences occurred in

Gp-C, all within 4 months of surgery.

COMPLICATIONS

Granuloma formation; 2 (1.80%) of Gp-M, Conjunctival cyst formation; 3 (2.83%) of Gp-C and 1 (0.90%) of Gp-M, and Chronic corneal ulcer; 1 (0.94%) of Gp-C.

All were successfully managed. No major vision-threatening complication took place.

Table 1: Selection and Exclusion criteria.

	Selection	Exclusion
Age	17 years or more	Less than 17 years
Pterygium head on cornea	More than 1 mm	1 mm or less
Systemic diseases (diabetes, hypertension)	Absent	Present

Table 2: Frequency of pterygium in our normal population.

	Cases	Pterygia	Percentage
Army	15823	379	2.40%
Civilians	2941	103	3.50%
Total	18764	482	2.57%

Table 3: Comparison- Mode of Mitomycin-C application.

Study	Mode of Application	Complications
OWN	Single , Intraoperative	Nil/111
Mahar (1996)	Topical drops	2/64

Table 4: Comparison – Control of pterygium recurrence with single application of 0.02% Mitomycin-C.

Study	Cases	Recurrences
Own	111	Nil (0%)
Heiligenhaus	18	Nil (0%)
Frucht-Pery	49	2 (4%)
Mastropasqua	45	6 (13.33%)

Table 5: Comparison- Incidence of pterygium recurrence.

Name of study	No. of cases	Group-M	Group-C
Own	217	Nil/111 (0%)	17/106 (16.03%)
Frucht-Pery	81	2/49 (4%)	15/32 (46.8%)
Cano-Parra	66	1/30 (3.33%)	14/36 (38.8%)
Mahar (1993)	32	Nil/17 (0%)	9/15 (60%)
Heiligenhaus	18	Nil/18 (0%)	—
Helal	156	11/156 (7.05%)	—
Mastropasqua	45	6 (13.33%)	16 (35.6%)
Mahar (1996)	64	5/64 (7.81%)	—

Table 6: Own Study – Complications.

Complication	Gp-M	Gp-C
Granuloma formation	2	Nil
Conjunctival cyst	1	3
Chronic corneal ulcer	Nil	1

Table 7: Comparison of complications.

Study	Cases	Complications	
		Gp-M	Gp-C
Own	217	3/111	4/106
Mahar	64	2	—
Helal (1996)	156	11	—
Frucht-Pery	81	2/32	1/49
Heiligenhaus	18	18	—
Mastropasqua	45	7	—

DISCUSSION

Mitomycin-C, an antibiotic-neoplastic agent, is a non cell-specific alkylating agent, having antiproliferative effects on the cells that show an increased rate of mitosis, by inhibiting DNA synthesis. Studies by Mahar, Frucht-Pery, Canno-Parra, Heiligenhaus, Helal and Mastropasqua⁹⁻¹⁴ have reported beneficial effects of mitomycin-C when used topically as an adjunctive treatment after surgical excision of pterygium, in the prevention of pterygium recurrence, both in the primary and recurrent pterygia. No optimal dosage has been established so far. Use of the drug is still on experimental basis.

Our study was safe as compared to the studies conducted with topical mitomycin-C drops because of better control on the amount of mitomycin-C exposure. Application of mitomycin-C was objectively controlled and had a much higher patient compliance. Results of our study, when compared with studies of Mahar (Table 3), in which he used topical mitomycin-C drops of two different strengths, showed that a single, intraoperative application of mitomycin-C is a much safer means for delivery of the drug, as it leads to far less drug-related complications. In our study, there were no drug-related complications with 0.02% mitomycin-C, co-relating positively with the results of other studies where the same strength of the drug was used^{4,9-11,14-16} (Table 4). A single dose intraoperative regimen is more convenient for the patient, who does not need to repeatedly apply topical drops, and treatment is relatively cost-effective.

In our study, the frequency of pterygium is 2.57%, which may be a little on the higher side. It may be so as the majority of the subjects in the study were either serving soldiers or their parents, belonging to the rural areas. They belong to the high-risk group of our population, who work outdoors most of the day and are exposed to the elements.

Our study showed a 100% success rate in prevention of pterygium recurrence following application of 0.02% mitomycin-C. On the other hand, 16.03% cases of the control group showed recurrences. No significant difference is seen when compared with studies conducted by Heiligenhaus, Frucht-Pery, Mastropasqua, Mahar, Helal and Cano-Parra^{9,11,14-16} (Table 5). No major vision-threatening complication took place in

either group (Table 6). Hence, again there was no significant deviation from the type and number of complications seen in other studies of a similar nature^{4,10,11,15,16} (Table 7).

CONCLUSION

The use of mitomycin-C to prevent pterygium recurrence is still under trial, both for single intraoperative application and topical drops. Good results have been achieved by a single intraoperative application and with minimal postoperative complications. Intraoperative application of a single dose of 0.02% mitomycin-C for 2 minutes reduces the recurrence rate after pterygium excision, appears to be safe and is technically simple. However, keeping in view the potential hazards / complications of mitomycin-C, extreme caution should be taken when it is used and the lowest possible concentration be applied for the shortest possible duration. Furthermore, additional studies are required to determine a safe optimal dosage and to assess the long-term complications of mitomycin-C.

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Experience in Management of Intraocular Foreign Bodies, Surgical Techniques Problems and Determinants of Outcome

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ABSTRACT

Purpose: To evaluate the usefulness of vitrectomy as a means of removal of intra ocular foreign bodies and treat their associated complications.

Method: 25 patients with Intraocular Foreign Body (IOFB) demonstrable on the basis of X Ray or B Scan Ultrasound underwent vitrectomy for removal of the intraocular foreign body. Most of the patients had silicone oil fill, encirclement with 2.5 mm band, cryo around the site of impaction of IOFB and argon laser to the retina. Where possible the Silicone Oil was removed and an intra Ocular Lens Implant placed if a cataract was present.

Results: It was possible to remove IOFB in 19 out of 25 patients. One patient had a double perforation. On the last follow up the Visual acuity was 6/12 or better in eight patients and less than 6/60 in six patients. Two patients developed a rhegmatogenous retinal detachment, one of which could not be repaired despite two further attempts.

Conclusion: Vitrectomy is an effective means of removal of IOFB. Persistent Uveitis, the site of impaction, site of entry and entry site breaks can be significant impediments to visual recovery.

INTRODUCTION

Intraocular foreign bodies traumatize the eye at the time of injury due to their mass and kinetic energy. Later on progressive damage may occur due to the toxicity of the foreign body (siderosis) or the ocular response to trauma. It is therefore necessary to remove the Intraocular Foreign Body and also modify the fibro proliferative response in the eye. The traditional method of removal of IOFBs has been to use a magnet. However some foreign bodies are non-magnetic, deeply impacted or have become encapsulated and are therefore resistant to removal by a magnet.

Magnet extraction alone does not clear the visual axis, repair any coexisting retinal detachment or prevent later tractional retinal detachments¹. We employed vitrectomy techniques for removal of foreign bodies. The technique had to be modified for our local environment.

METHODS

25 patients, all of them male with a mean age of 22 years (range 10-42 years) underwent vitrectomy for removal of IOFB from September 1998 to December 1999. All patients had a foreign body demonstrable in the eye on X-ray or B scan. In most patients a previous attempt had been made to remove the IOFB with a magnet. The surgical plan consisted of Pars Plana Vitrectomy, Lensectomy or Lens aspiration where there was a lens opacity, external tamponade with a 2.5 mm band or a tire, silicone oil injection where the IOFB was impacted in the retina (Table-1). If the crystalline lens had to be removed a capsular rim was left behind and an inferior peripheral iridectomy was carried out. As the facility for Endo laser was not available on site photo-coagulation was applied to the retina around the site of impaction of the IOFB and 360° around the retina in a separate sitting. Later the Silicone Oil

Table-1: Procedures carried out

Cataract extraction	Silicone oil used	IOL	Method of extraction of IOFB	2.5mm encircling band	Tyre	Comments
Yes, capsule removed	Yes	AC	Forceps Magnet	N	Yes	Stormy, intractable rise in IOP after insertion of AC IOL
Yes	Yes	No	Nylon loop	Yes		Multiple scars on the cornea from a glass IOFB
Yes	Yes	PC	Forceps	Yes	No	ROO and IOL implantation in separate sittings
No	Yes	No	Abandoned	No	No	ROO through pars plana
Yes	Yes		Forceps	Yes	N	Developed a stitch abscess, lost to follow-up
No	Yes	No	Magnet	No	Yes	
Yes	Yes	No	Forceps	Yes	No	Entry site break
No	Yes	PC	Magnet	Yes	No	Early lens opacity progressed, cataract extraction at the time of ROO
No	Yes	PC	Forceps Magnet	Yes	No	Early lens opacity progressed, CE at the time of ROO, no laser, retinal detachment developed
No	Yes	No	Forceps Magnet	No	No	
No	Yes	No	FB not located	No	No	Early ROO
No	Yes		Forceps	Yes	No	Posterior subcapsular cataract after ROO
Yes	Yes	PC	FB could not be removed	No	No	No siderosis

Cont....

Cataract extraction	Silicone oil used	IOL	Method of extraction of IOFB	2.5mm encircling band	Tyre	Comments
Yes	Yes	No	Forceps	Yes	No	Hypotony, inferior tractional retinal detachment, oil keratopathy
No	No	No	Vitreous cutter	No	No	Entry site break causing a retinal detachment. Treated with cryopneumopexy
Yes	Yes	Yes	Forceps	Yes	No	Accidental inferior retinotomy and cataract formation
Yes	Yes	PC	Forceps	Yes	No	Fibrin on the IOL needed Yag
Yes	Yes	No	Forceps	Yes	No	Giant tear created while removing FB
	Yes		Forceps	No	No	
Yes	Yes	No	Forceps	No	Yes, superior	Fire arm injury with superior cornea tissue loss. Retinal detachment, settled spontaneously
No	No	No	Not removed	Yes	No	Double perforation, FB not retrieved
Yes	No	PC	Forceps	No	No	FB removed, no oil, then IOL implanted after one week
No	Yes	PC	Not removed	Yes	No	Elevated fold along the tract of FB, FB not removed - through fear of submacular haemorrhage
No	Yes	No	No FB could be retrieved	Yes	No	Open entrysite under the medial rectus, falciform fold lifted

PC Posterior chamber
 AC Anterior chamber
 IOL Intraocular lens
 IOP Intraocular pressure
 ROO Removal of oil
 CE Cataract extraction

Table-2: Ocular status at the time of primary surgery

Preoperative VA	VA at last follow-up	Cornea involvement	Cataract	Vit. Haem	Site of impaction
1/60	PL	Superior cornea	Yes	Yes	7 O' clock pre-equatorial
PR	1/60	Multiple corneal	Yes	Yes	Vitreous
1/60	6/6	Scar below the	Yes	No	5 O' clock, mid peripheral
PR	Lost to follow-up	Yes	Yes	No	Nasal retina, 9 O'clock
HM	6/6	No	No	Yes	6:30 O'clock
PR	6/6 with +10DS	Central opacity	Yes	Yes	3 O'clock pre equatorial
HM	6/9	No	Yes	Yes	Nasal retina, 9 O'clock
HM	PL	No	Yes	Yes	
1/60	1/60	Superior cornea	No	Yes	5 O' Clock, post equatorial
1/60	6/36	No	No	Yes	3 DD nasal to the disc
HM	6/60	No	No	Yes	Temporal retina
1/60	6/12	8	N	Yes	Temporal, 8 O' Clock
PR	6/24 with +10 DS	N	No	Yes	Infero temporal
6/24	6/6	No	No	No	Vitreous
HM	4/36	Central opacity	Yes	Yes	5 O'Clock, post equatorial
PR	3/60	No	Yes	Yes	10 O'Clock

Preoperative VA	VA at last follow-up	Cornea	Cataract	Vit. Haem	Site of impaction
1/60	HM	No	No	Yes	5 O' Clock, post equatorial
PR	Lost to follow-up	No		Yes	Temporal to the disc
PR	6/18	Yes, superior	Yes	Yes	Superior retina
HM	6/60	No	No	Yes	Double perforation, exit at the inferior arcade
PR	6/6	Yes	Yes	Yes	Inferior, 6 O' Clock
6/36	6/12	No	No	Yes	2 DD temporal to the fovea
6/6	6/12	No	No	Inferior	Nasal, under the medial rectus

Table-3: Entry site breaks and subsequent visual outcome

Cataract	Nature of FB	Band	Tyre	VA after ROO	VA after IOL implantation
Yes	Iron	Yes	No	6/6 with correction	
Yes	Iron	Yes	No	1/60	HM
No	Multiple small, Iron	No	No	No oil	6/9, No CE
No	Iron	Yes	No	PL	
Yes	Iron	-	Yes, superiorly	6/18	

ROO Removal of oil

was removed and an Intra Ocular lens implanted where possible (Table-1).

Table-4: Causes of poor visual outcome

Comments	Visual acuity
Bullous keratopathy	PL
Multiple corneal scars,	CF
Papillomacular bundle impacted	CF
Stormy glaucoma after ROO, RD	PL
Siderosis, presented one	CF
Stormy glaucoma after ROO, RD	HM

RD = Retinal Detachment
ROO = Removal of Oil

Table-5: Changes in visual acuity after vitrectomy

Pre-op visual acuity	Visual acuity at last follow-up	Lines of change in visual status
1/60	PL	-2
PR	CF	2
1/60	6/6	7
1/60	CF	0
PR	Lost to follow-up	
HM	6/6	8
PR	6/6	9
HM	6/9	7
HM	PL	-1
1/60	1/60	0
1/60	6/36	2
HM	6/60	2
1/60	6/12	5
PR	6/24	5
6/24	6/6	4
HM	4/36	2
PR	3/60	2
6/24	6/9	3
1/60	HM	-1
PR	Lost to follow-up	6
PR	6/8	
HM	6/60	2
PR	6/6	9
6/36	6/12	3
6/6	6/12	-2

Mean improvement in visual acuity = 3.3 line, range from -2 to 9.

RESULTS

Vitrectomy for removal of IOFB was performed on 25 patients, all male, with the mean age of 22.4 years (range 10 to 44 years). IOFB could be retrieved in 19 out of 25 patients (Table-1). In one patient there was a double perforation with posterior exit site. In two patients the IOFB could not be retrieved because it either sat on the papillo-macular bundle or was very close to the macula. In two patients the IOFB could not be located and in one patient it would not come out despite considerable traction.

In 11 out of 25 the site of entry was corneal, in three of these the central cornea was involved. 12 out of 25 patients had a cataract changes of the lens and 20 had a vitreous haemorrhage (Table-1). IOFBs were removed with foreign body forceps in 12 patients, with a magnet in two patients, with both in three patients and a nylon loop in one patient and vitrectomy cutter in one patient (Table-1). IOFB was made of metal in 24 patients and glass in one patient.

In five patients breaks developed at sites other than the site of impaction of the IOFB. They were present immediately posterior to the entry sites (entry site breaks) (Table-3).

In 10 patients the visual acuity was 6/12 or better. In six patients it was CF (1/60) or less. The causes of poor visual outcome are given in Table-4. They are corneal decompensation in one patient, retinal detachment in one patient, injury to the macula in one patient and advanced siderosis in one patient and raised IOP due to persistent severe uveitis in two patients.

Three patients out of 25 (12%) developed a retinal detachment post operatively, all three due to an entry site break. The retina was successfully attached in two of these patients.

Four patients lost a mean of 1.5 lines of Snellens visual acuity. There was a mean gain of 3.3 lines of Snellens visual acuity (Table-5).

DISCUSSION

Intra ocular foreign bodies (IOFB) pose a unique threat to the eye. They cause mechanical damage due to a penetrating injury, which may damage the cornea, the crystalline lens and the

retina. If the disc, the macula or the papillo macular bundle are impacted at the time of injury then the outcome is expected to be poor. Later on ferrous foreign bodies may cause siderosis².

Ideally IOFB removal, internal tamponade, chorio-retinal reaction with laser or cryo and where needed intraocular lens implantation should be carried out in single sitting³⁻⁵. However our resources were limited and the technique had to be modified to fit the environment.

We found that lens opacities were present, tended to be progressive. Therefore it was best to remove the crystalline lens and leave a capsular rim behind. Invariably synchiae would form between the capsular rim and the Iris. Capsule also provided a scaffold for deposition of fibrin leading to closure of the inferior peripheral iridectomy. However we found that in all cases where an attempt was made the synchiae were dissectible and a posterior chamber lens could be implanted.

There was only a partial posterior vitreous detachment present in all cases despite the long interval between injury and surgery. The hyaloid face tended to organize and elevate a retinal fold close to the site of impaction of IOFB. It was often difficult if not impossible to dissect the retina away from the hyaloid face, leading to iatrogenic retinal breaks in some instances. Antero posterior traction folds led to giant retinal tear formation in one eye when the IOFB was removed.

With time the IOFB tended to encapsulate and even the foreign bodies present on the surface of the retina developed sufficient adhesion to cause a break when an attempt was made to remove them. Time significantly added to the surgical difficulty. Contrary to the popular belief we found that IOFBs that had been present in the retina for sometime, always required internal tamponade and fresh cryo or photo coagulation.

In view of these observations we decided that internal tamponade with silicone oil was useful for medium term. It helped in closure of the breaks and allowed photo-coagulation soon after surgery.

Almost all IOFBs that we found were present below the horizontal midline. This is perhaps a

reflection of the loss of velocity of the IOFB, once it had penetrated the external ocular coats.

20% (5 out of 25) patients had breaks posterior to the vitreous base. In one patient the break developed while the IOFB was being removed extended through more than 120°. He later developed uveitis associated with raised IOP and had a poor visual outcome despite an attached retina. In two patients the entry site breaks were treated by internal tamponade with oil and encircling band. In one cryo-retino-pneumopexy was successfully employed. In one patient the break was only discovered after removal of oil and cataract extraction. He had poor outcome despite multiple surgeries.

Frequent breaks are expected, as the IOFBs tend to be ragged and drag on the vitreous base when they are removed. Fibro-proliferative response to trauma also results in vitreous bands that run in antero-posterior and tangential directions and if not completely relieved before removal of IOFB may cause an anterior break.

We found that it was prudent to employ encirclement as a preventive measure in addition to examination of the entry sites prior to closure. However entry site breaks only posed a serious problem where a cataract was present simultaneously and prevented early adequate treatment.

Three patients out of 25 (12%) developed a retinal detachment due to an entry site break.

This compares with upto 30% detachment rate reported in the literature⁶. The relatively low incidence of retinal detachment in this series is perhaps a reflection of the extraordinary measures we took to avoid a retinal detachment.

Six patients had very poor outcome (Table-4). The causes were corneal oedema due to multiple corneal injuries in one patient, retinal detachment due to an entry site break in one patient, macular injury by the IOFB in one patient and advanced siderosis in one patient. Raised IOP due to persistent severe uveitis was encountered in a number of patients and was the principal cause of visual loss in two patients. We find that in eyes that have had multiple surgical or non-surgical events, persistent and severe uveitis posed a serious threat to sight.

Overall most patients had a substantial

improvement in vision after vitrectomy (Table-5). Of the 23 patients available for follow-up four lost an average of 1.5 line in visual acuity. However overall there was a mean gain in visual acuity of 3.3 lines with a maximum gain of 9 lines. This is a powerful indicator of the usefulness of vitrectomy for removal of IOFB.

We felt that delay in vitrectomy for removal of IOFB led to a substantial increase in surgical difficulty and should be avoided where possible. An X-ray on first presentation to the primary care physician would certainly lead to early referrals.

CONCLUSION

Vitrectomy for removal of IOFB is a effective means for removal of all types of IOFBs. However delay in presentation leads to substantial difficulty. The site of impaction of the IOFB and post operative inflammation are significant hurdles to full visual rehabilitation.

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Silicone Lid Sling-in Permanent Facial Palsies:

(A Physio-Anatomic Help For Preventing Exposure Keratopathy)

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ABSTRACT

To evaluate the efficacy of silicone sling procedures in our local settings to correct exposure problem associated with permanent facial palsy while at the same time providing anatomically well settled and physiologically active eyelid.

Settings: Institute of Ophthalmology, King Edward Medical College and Mayo Hospital, Lahore. Nishtar Medical College, Multan.

Methods: A silicone band is passed in front of the tarsal plate suborbicularis in a circular fashion. It is supported by medial palpebral ligament medially and orbital wall laterally. Its tension is adjusted to provide a spring like action to close the lids while opening is provided by the levator palpebrae superioris muscle stretching the sling at the same time.

Results: Good lid closure with concomitant correction of lower lid ectropion was achieved in majority of cases. Cosmetic results were excellent. Near to normal upper lid movements were restored.

Conclusion: The method provides a useful and satisfactory way of providing mobile and cosmetically acceptable eyelids while at the same time preventing problems of exposure keratopathy.

INTRODUCTION

Permanent facial palsies (Table-1) due to loss of facial nerve in accidents or tumour removal results in exposure keratopathy. This includes corneal ulceration and infection, leading in many cases to endophthalmitis and loss of eyeball. Lower lid sagging results in ectropion and epiphora occurs due to lack of tear drainage (Table-2). Procedures like tarsorrhaphy provide a functionally and cosmetically unacceptable solution to the problem. Vision is also hampered at the same time. Other procedures discussed later on provide less acceptable results¹ (Table-3).

Silicone lid slings provide cosmetically and physiologically acceptable solution to exposure while at the same time movements of the lid are restored. Lower lid ectropion is also corrected.

PATIENTS AND TECHNIQUES

All patients in which large portion of facial nerve was damaged or removed accidentally or cut

with the removal of tumors were included in this study. These included patients with parotid tumours and acoustic neuromas². Patient only with paralysis of upper lid were excluded. Only those patients were included where neurological examination showed no possibility of facial nerve recovery (Table-4).

A silicone band 2mm wide and 40 mm long was used (Fig.1). Two holes were drilled in lateral orbital wall. The band was passed through the lower osteotomy hole and crossed over to the upper lid. Using a Wright's needle the band was passed under the orbicularis muscle in front of the tarsal plate to the medial canthus. The band was attached by non absorbable sutures to the front of tarsal plate at two places through stab incisions. The medial palpebral ligament was then exposed by a horizontal incision in the skin. Two lamellae anterior and posterior of the ligament were defined and band passed vertically between the two down to the lower lid. Here it was again threaded under the orbicularis muscle in front of

the tarsal plate to the lateral canthus. The band was passed out of the orbit through upper osteostomy and tied with the other end using a sleeve outside the orbital wall. Then it was buried under the fascia and the skin.

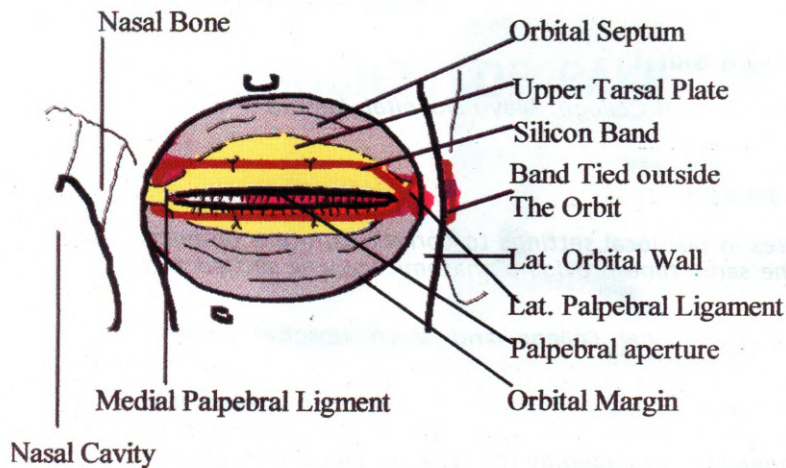


Fig.1: The basic plan for band passage

The tension in the band was adjusted next day to provide enough tension for adequate closure of the lid while it was left lax enough to allow for proper opening of the eye. All the patients remained on systemic antibiotic for seven days. They were all encouraged to start moving their lids from postoperative day. All the patients were monitored for excessive tension in lids, undue exposure of the cornea and epiphora. They were followed-up at intervals of one week, two weeks, six weeks and six months.

RESULTS

Of the seven patients operated six had highly acceptable cosmetic and functional results. One had a tight lid probably due to associated adhesion due to trauma. The band had to be tightened in all patients two weeks after surgery except in one after six months.

Exposure of band by necrosis of overlying skin occurred in one patient (Table-5). This was treated by covering with fascia lata graft and mobilizing skin flap over it. We personally feel that band is better tied on inner side of osteotomy to prevent this complication.

Lower lid elevation was achieved in all patients³. There was lid lag in one patient corrected by loosening the band. Upper lid movement following the pupil were cosmetically acceptable in all patients. Epiphora was reduced in five patients. Corneal exposure was present in none of the patients. There was high patients satisfaction rate.

Table-1: Causes of permanent facial palsy

- | |
|---|
| 1. Supra nuclear palsy |
| 2. Cerebello pontine angle tumors |
| 3. Geniculate ganglionitis (Ramsey Hunt Syndrome) |
| 4. Bells palsy |
| 5. Traumatic facial palsy |
| • Mastoidectomy |
| • Facial trauma |
| • Parotid gland tumor removal |

Table 2: Problems associated with facial palsy

- | |
|-------------------------|
| 1. Incomplete blinking |
| 2. Lagophthalmos |
| 3. Watery eyes |
| 4. Exposure keratopathy |
| • Conjunctivitis |
| • Corneal opacities |
| • Ulceration |
| • Infection |
| • Endophthalmitis |

Table 3: Treatments available for permanent facial palsy

- | |
|---------------------|
| 1. Tarsorrhaphy |
| 2. Canthoplasty |
| 3. Gold weights |
| 4. Temporalis sling |
| 5. Silicon sling |

Table 4: Causes of facial palsies in the study

	No. of cases
Cerebello pontine angle tumors	1
Mastoidectomy	2
Facial trauma	2
Parotid gland tumor removal	1
Congenital	1

Table 5: Postoperative complications

	No. of cases	Percentage
Tight band	1	14
Loose band (needing tightening)	6	86
Band exposure	1	14
Lid lag	1	14
Sagging of lower lid	Nil	—
Corneal exposure	Nil	—

DISCUSSION

Complete facial paralysis secondary to facial nerve injury creates a condition of exposure keratitis and ectropion which can lead to grave consequences if not treated. Dry eye, corneal ulcer, perforation and endophthalmitis can all occur.

Different procedures have been tried to alleviate this problem.

Tarsorrhaphy provides a cosmetically and functionally poor solution. It limits vision and provides poor corneal protection and this makes it less than an ideal procedure.

Gold weights⁴ implanted in upper eyelid do not solve the problem of lower lid ectropion and exposure keratopathy. This procedure is therefore confined to cases of upper lid paresis only. Moreover, problem of gold weight extrusion remains.

Temporal muscle transfer sling⁶ has been used in different centers with the idea of providing a dynamic upper lid. The idea is to use temporalis muscle for upper lid closure. The large bulk of temporalis makes it cosmetically less acceptable. Each time the jaws are clenched, the eyes close. The upper lid also does not follow the movement of the eye ball.

Silicone sling provides a superior alternative both cosmetically as well as functionally to the above mentioned procedures. The levator palpebral superioris muscle opens the eyelid while at the same time stretching the sling (Fig.2). On relaxation of the muscle the stretched silicon sling spring back to close the eye lid (Fig.3). On upgaze

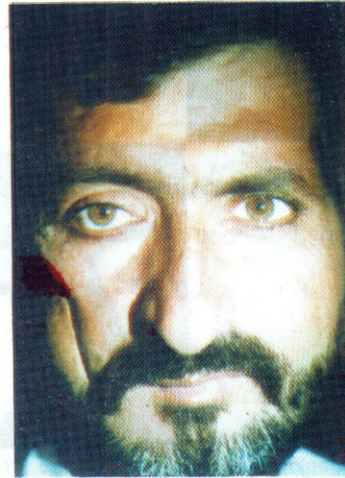


Fig.2: Patient opening the right eye by levator pull



Fig.3: Patient closing his right eye by spring action of silicon band.

and downgaze the upper lid margin follows the upper pupillary margin (Fig.4 & 5). This is excellent for cosmesis as well as from functional point of view. During all these maneuvers lower lid is held in place by lower loop of the sling. This corrects the ectropion and hence the epiphora.

This method has advantage of providing an opportunity for adjustment of sling tension to match levator strength and action according to the patient's needs.



Fig.4&5: In upgaze and downgaze note the right lid margin following the upper pupillary margin.

Different materials have been used as a sling including steel wire springs⁷.

We feel that silicon band provides a more inert material. Postoperatively the band is enclosed in a fibrous capsule and this makes cheese wiring less likely.

It has also been suggested that band be tied under the preseptal orbicularis muscle. But the chances of cutting through of the sutures are enhanced.

In cases where adequate lid closure is not obtained additional procedures can be added to the basic procedure. These includes tying gold weight to the band in upper lid⁸. Alternatively levator muscle can be weakened to reduce resistance to lid closure⁹.

With all the adjustments a high patients satisfaction rate is achievable.

CONCLUSION

The method has been used for the first time in the country with encouraging results. With a bit of modifications mentioned above it can be a very useful way of providing physiological and anatomic function to the lid in patients of permanent facial palsy, thereby preventing devastating complications. This method has the beauty of being able to be used in combination with other methods also, thereby providing a lot of lability.

The methods opens exciting avenues in prevention of exposure keratopathy.

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An Audit of 81 Cases of Trabeculectomies in Primary Glaucoma in NWFP

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ABSTRACT

To evaluate the short and long term complications of trabeculectomy in our population, we carried out a project on trabeculectomy. Eighty-one trabeculectomy operations were performed between June, 1997 and February 1999. They were performed on patients with primary glaucomas of various types. The patients age ranged between 16 years and 80 years. Each patient underwent complete preoperative ocular and systemic examination with special reference to visual acuity, intraocular pressure, lens opacities, optic nerve head, visual field and gonioscopy. Classical trabeculectomy technique was adopted in each case. 46 eyes (56.8%) were available for one year follow-up. Trabeculectomy was able to control intraocular pressure below 21mmHg in 42 eyes (91.3%). The most common short-term complications were shallow anterior chamber in 19.7%, of which flat anterior chamber was present in (6.1%), hyphema in 14.8%, choroidal detachment in 6.1% and ciliary block glaucoma in 2.5%. The long-term complications constituted accelerated cataract formation in 13.0%, visual field loss progression in 15.2% and progression of optic disc cupping in 15.2%. Trabeculectomy, thus seems to be associated with short and long-term complications but if managed properly has no long-term deleterious effect on visual acuity in majority of cases. It controls intraocular pressure in over 90% of adult patients with primary glaucoma

INTRODUCTION

Trabeculectomy today is the most common filtering operation performed for the control of glaucoma around the world. The operation was first introduced by Cains¹ and later modified by Watson². It is a partial thickness scleral flap operation, which essentially works by means of a fistula formation from the anterior chamber to subconjunctival space³.

Trabeculectomy is fraught with various complications for the simple reason that the surgery is designed to interrupt the integrity of the globe. The globe is left in a non-physiologic state, often with hypotony, which can result in early and late complications. The early complications include changes in refraction, hyphema, shallow anterior chamber, flat anterior chamber, choroidal detachment and ciliary block glaucoma⁴. The long-term complications constitute accelerated cataract formation, progression of visual field loss and optic disc cupping and endophthalmitis⁵. All these complications are rare as compared to full thickness operations⁶.

To evaluate the short and long-term complications of trabeculectomy in our population, we conducted a study on trabeculectomy to see its

effectiveness on the intraocular pressure control and final visual outcome.

PATIENTS AND METHODS

In the period from June, 1997 to February 1999. Eighty-one trabeculectomy operations were performed in the Department of Ophthalmology, Lady Reading Hospital, Peshawar. All the patients above 16 years were recruited for the study. Among them 43 eyes of females and 38 eyes of males underwent trabeculectomy (Table 1 & 2).

Table-1: Cases submitted for trabeculectomy

Total no. of patients	61
Total no. of eyes operated	81
No. of eyes completed one year follow-up	46
Age of patients	16 to 80 years
Average age	43 years
Male to female ratio	1:1.13

Trabeculectomy was performed for primary glaucomas of various types. Forty-six eyes were available for follow-up at the end of one year (Table-3).

All patients underwent complete ocular and

systemic examination with respect to visual acuity, intraocular pressure, optic disc assessment and visual fields. Lenticular opacities were assessed and gonioscopy was performed on all patients. Shaffer grading system was adopted to grade the anterior chamber angle into grade 0 to IV.

Table-2: Age and sex wise distribution

Age (in years)	Female	Male	Total
16-20	-	-	-
21-30	05	05	10
31-40	20	10	30
41-50	15	17	32
51-60	03	02	05
61-70	-	02	02
71-80	-	02	02
Total	43	38	81

Table-3: Indications for trabeculectomy

Type of glaucoma	*1	*2	%
Primary open angle glaucoma	35	20	57.14
Primary chronic angle closure glaucoma	18	10	55.55
Primary acute angle closure glaucoma	28	16	57.14
Total	81	46	56.79

*1 Number of eyes operated

*2 Number of eyes available for follow-up

Each patient for trabeculectomy was admitted one to three days prior to operation. Diabetes, hypertension and other systemic diseases were brought under control if present. No anti-glaucoma medications were given on the day of operation and postoperatively unless there was an indication.

All operations were performed by classical trabeculectomy technique. These were performed under local anaesthesia, consisting of fornix-based conjunctival flap without tenectomy. Then a 4mm x 4mm half to two-third thickness scleral flap was dissected, followed by resection of 3mm x 1mm block of trabecular tissue and a peripheral iridectomy. The scleral as well as conjunctival flaps were sutured with 8/0 virgin silk. Three sutures were applied to the scleral flap, 2 at the corners and 1 posteriorly. Subconjunctival gentamycin and betamethasone was given at the end of operation. All patients received

postoperative dexamethasone, neomycin and polymyxin B-sulphate combination at 06 hours interval.

A daily inspection and dressing was routine for first 3-5 days. The patient was discharged on 3rd to 5th postoperative day if trabeculectomy was successful and there were no complications. The patient was then seen after 10 days and then after one month. After that follow-up was at 3rd month, 6th month, 9th month and 12th month. At each visit particular attention was given to visual acuity, filtration bleb, intraocular pressure, optic nerve head and other associated complications.

The shallowness or flatness of anterior chamber was assessed by Van Herick technique estimating angle width from anterior chamber depth at the periphery, the anterior chamber being flat when there was absent peripheral anterior chamber. Visual fields were performed at the end of one year of follow-up.

RESULTS

Eighty-one eyes underwent trabeculectomy for various types of primary glaucomas. In bilateral cases one eye was operated at a time. If the first eye was found to be free of complications only then the second eye was operated.

Intraocular Pressure

Intraocular pressure below 21mmHg without medication was in 42 eyes (91.3%) after one year. Intraocular pressure between 15 and 20mmHg was achieved in 6 eyes, between 10 and 15mmHg in 28 eyes, between 05 and 10mmHg in 6 eyes and below 05mmHg in 2 eyes. In the remaining 4 eyes (8.7%) intraocular pressure was above 21mmHg, ultimately requiring revision of filtration surgery within two months after primary surgery to bring intraocular pressure under control. Late failures were not encountered (Fig.1).

Short Term Complications

Short-term complications were frequent. Of 81 operated eyes, small hyphema occurred in 12 eyes (14.8%), shallow anterior chamber in 16 eyes (19.7%) of which flat anterior chamber was present in 5 eyes (6.1%). Among the causes of shallow anterior chamber wound leak occurred in 5 eyes (6.1%) and excessive filtration in 6 eyes (7.4%), while in eyes with flat anterior chamber wound leak associated with choroidal detachment was the main cause in all 5 eyes (6.1%). Ciliary block glaucoma was seen in 2 eyes (2.5%) (Fig.2).

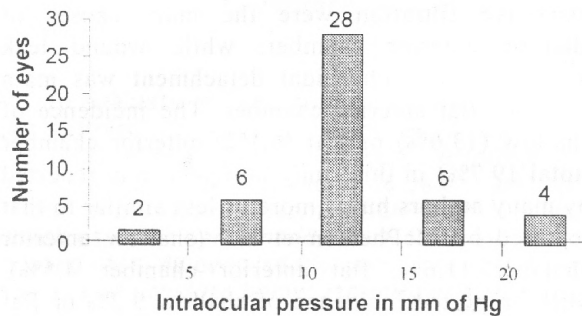
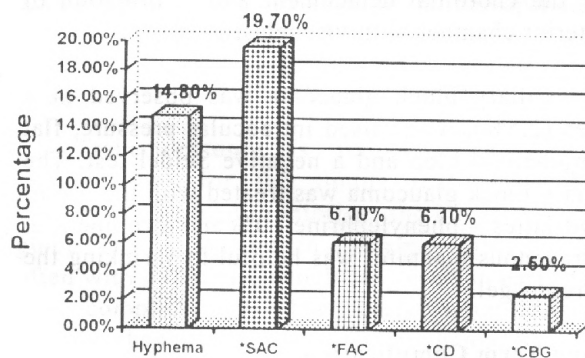


Fig.1: Intraocular pressure following trabeculectomy



- SAC = Shallow anterior chamber
 FAC = Flat anterior chamber
 CD = Choroidal detachment
 CBG = Ciliary block glaucoma

Fig.2: Short-term complications in primary glaucoma.

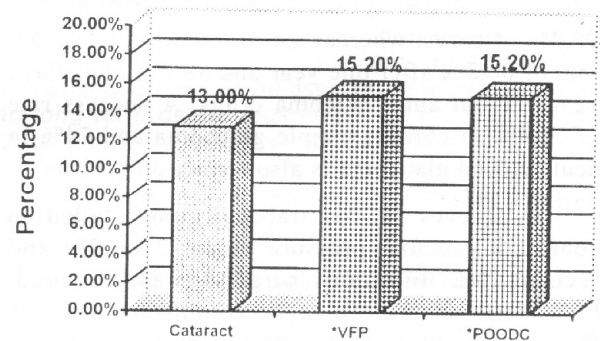
Long Term Complications

Visual acuity: An unaccountable fall in visual acuity of two to four Snellen lines occurred in 6 eyes (13.0%), inspite of good control of intraocular pressure. Cataractous changes were

observed in all these eyes (13.0%). In 2 eyes (4.3%) lens opacities were marked and in the remaining eyes (8.7%), they were slight.

Visual fields: Visual fields remained stable in the majority of the eyes. In 7 eyes (15.2%) there was further progression in the visual field loss.

Optic Disc Assessment: In 7 eyes (15.2%) there was further increase in the optic disc cupping as compared to baseline (Fig.3).



VFP = Visual field progression

PODC = Progression of optic disc cupping

Fig.3: Long-term complications in primary glaucoma

DISCUSSION

Standard trabeculectomy technique without wound modulating agents was performed on 81 eyes for primary glaucomas of various types. These patients were followed for a period of one year from the time of their surgery. At each visit short and long-term complications were assessed. Patients were especially checked for visual acuity, intraocular pressure, depth of anterior chamber, lenticular opacities, optic disc and visual fields.

Intraocular Pressure: In patients with primary adult glaucoma, the intraocular pressure was maintained below 21mmHg in 42 eyes (91.3%). This was achieved without the addition of anti-glaucoma drugs at the end of one year (Fig.4).

These results are comparable to Thomy and Bhar⁷ where intraocular pressure below 20mmHg without medication was attained in

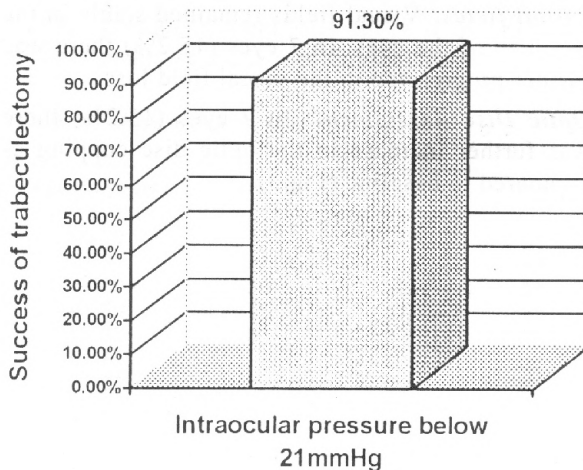


Fig.4: Success of trabeculectomy in primary glaucoma.

95.4% of cases, whereas Zaidi⁸ reported a success rate of 80.7% after one year and 88.9% after three year without anti-glaucoma drugs. A success rate of 73.4% in chronic simple glaucoma and 74% in acute closed glaucoma is also reported by Mills⁹.

In 4 eyes (8.7%) trabeculectomy failed to control intraocular pressure below 21mmHg and revision of filtration surgery was required. Fibroblasts are known to be responsible for this failure. Fibroblast activation can be prevented by following basic principles of surgery like minimal trauma, careful hemostasis and least amount of tissue destruction. At present wound modulating agents like Mitomycin-C¹⁰ are available to prevent postoperative scarring at the filtration site.

Short Term Complications

Among the short-term complications hyphema was seen in 14.8%. In all eyes hyphema was small, occupying less than one-fifth of the anterior chamber. All caases resolved within five days of operation. Secondary hyphema did not occur and intraocular pressure remained normal. The incidence of postoperative hyphema is about 15.9% to 53%^{11,12,8} in trabeculectomies done for primary glaucomas. It can occur at the time of surgery or within first three to five postoperative days. Ridgway¹¹ reported a 15.9% incidence of hyphema following trabeculectomy for chronic simple glaucoma, Portney¹² 30% and Zaidi⁸ 53% but all three included all types of hyphemas in their calculation. Persistent hyphema is uncommon.

Flat or shallow anterior chamber is a common complication of trabeculectomy in which the outflow of aqueous through the sclerostomy exceeds aqueous production. In the majority of cases the anterior chamber reforms spontaneously. Those that fail to respond result in peripheral anterior synechiae formation, corneal damage and cataract formation¹³. In our study shallow anterior chamber was seen in 19.7%, of which flat anterior chamber constituted 6.1%. Wound leak and excessive filtration were the main causes of shallow anterior chamber, while wound leak associated with choroidal detachment was main cause of flat anterior chamber. The incidence of shallow (13.6%) or flat (6.1%) anterior chamber (total 19.7%) in this study is higher than reported by many authors but is more or less similar to that reported by McPherson et al¹⁴ (shallow anterior chamber 11.6%, flat anterior chamber 4.5%). Mills⁹ reported incidence of shallow 9.2% or flat 3.9% anterior chamber (total 13.1%). However it is surprisingly less than reported for classical fistulizing procedures. The wound leak in our study was treated by applying a pressure dressing for 24 to 48 hours. Once or twice the leaks required surgical intervention. The excessive filtration responded to cycloplegics and pressure dressing for 24 hours. In cases of choroidal detachment the eye was soft with a positive Seidel test. All cases responded to pressure dressing except one eye which required incision drainage for the choroidal detachment and reformation of anterior chamber with viscoelastic.

Ciliary block glaucoma was observed in 2 eyes (2.5%), with raised intraocular pressure, flat conjunctival bleb and a negative Seidel test. The ciliary block glaucoma was treated with the use of mydriatics – phenylephrine 10% and atropine 2%. Intravenous mannitol was helpful in shrinking the vitreous gel.

Long Term Complications

Cataract: Cataract formation is a known complication of trabeculectomy. The incidence of cataract after classic fistulizing procedures have been reported between 35% to 40%^{15,16}. However, the incidence of cataract formation following trabeculectomy is between 8.7% to 35.6%^{6,11,17}. The incidence of cataract in our study causing a decrease in visual acuity of more than two Snellen lines is 13%. This is higher as compared to Ridgway¹¹ who reported 8.7% incidence of cataract after trabeculectomy in chronic simple

glaucoma; Lamping, Bellows and Hutchinson⁶ reported an incidence of 21% and D'Emro et al¹⁷ 35.6%. As stated by the latter authors this may be an acceleration of pre-existing lens opacities or opacification. In our study 19.7% had shallow to flat anterior chamber. This shallowing of anterior chamber may disturb lens metabolism sufficiently for opacification to occur. In addition direct trauma to the lens at the time of surgery cannot be excluded as a causative factor.

Visual Field Loss and Optic Disc Cupping: The reduction of intraocular pressure by trabeculectomy does not necessarily protect the eye from further visual field loss. Surgery, however, may reduce the rate of visual field loss. There appears to be susceptibility of the severely cupped disc to nerve fibre loss even at normal intraocular pressure¹⁸. Visual field in our study remained stable in majority of cases. In 15.2% there was progression of visual field loss. This visual field loss corresponded to the increase in the optic disc cupping.

Trabeculectomy, thus appears to be associated with short and long-term complications as reported by other studies but with a slightly higher incidence of shallow to flat anterior chamber in our study. These, if managed properly, have no long-term effect on visual acuity in majority of cases. It controls intraocular pressure in over 90% of adult primary glaucomas.

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Primary Chronic Angle Closure-Glaucoma in Pakistan

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ABSTRACT

Purpose: To determine the proportion of primary chronic angle-closure glaucoma (P.C.A.C.G.) among patients presenting with features of a chronic primary glaucoma.

Setting: A District Headquarter Hospital in the suburbs of Karachi.

Patients and Methods: Data of the patients presenting with features of chronic glaucoma, having no evidence of secondary glaucoma or a history or evidence of a previous acute or sub-acute attack, who attended the Hospital during January 1992 to December 1993, were analyzed retrospectively.

Results: 103 patients fulfilled the criteria set for the diagnosis of primary chronic glaucoma. 57 (55.3%) patients were of P.C.A.C.G., while 46 (44.7%) were of primary open angle glaucoma (P.O.A.G.). The mean intraocular pressure was 24.6 mm Hg in P.O.A.G. group and 30.8 mm Hg in P.C.A.C.G. group. 22 (38.5%) out of the 57 patients of P.C.A.C.G. were previously diagnosed as glaucomatous, but only two (3.5%) had correct specific diagnosis. 18 (31.5%) patients of P.C.A.C.G. had unilateral involvement. Two patients in the P.C.A.C.G. group had uniformly dilated pupil in one eye, the iris and pupil being otherwise normal. One of these eyes had circumferential corneal edema limited to the periphery.

Conclusion: P.C.A.C.G. is common in Pakistani population, but it is often misdiagnosed as P.O.A.G.

INTRODUCTION

Primary chronic angle closure glaucoma (P.C.A.C.G.) can develop in any of the several ways, i.e. after an acute attack of glaucoma, following intermittent sub acute attacks, or as such without ever developing acute or sub acute stages. The last type is the topic of this study.

Angle closure glaucoma is usually considered to occur in significant proportions only in races with mongoloid features e.g. Chinese¹⁻⁴ Mongol⁵ and Vietnamese⁶. The highest incidence being recorded in Eskimos⁷. The disease was thought to occur rarely in European races^{4,8,9}. However some recent studies indicate that it is much more common in Europeans than previously thought¹⁰⁻¹². It is considered that the people of South East Asia (Indo-Pakistan subcontinent) have been studied little to establish specific diagnosis¹. A report from Pakistan, however, indicates a high incidence of angle closure glaucoma¹³. Similarly some recent reports indicate a significant proportion of this condition among people of Indian origin^{14,15}.

In the light of these recent findings the author presents a re-analysis of the data that were collected to support an earlier study¹⁶ about primary open angle glaucoma (P.O.A.G.). The data however could not be sent for publication at that time.

PATIENTS AND METHODS

Initial Screening for Chronic Glaucoma

Patients 30 years of age or older who attended the Out Patient Department of Sindh Government Hospital Sudaabad Karachi during the period between 1st January 1992 to 31st December 1993, with any complaint, underwent optic disc examination with direct ophthalmo-scope and intraocular pressure (I.O.P.) measurement with Schiotz tonometer. The suspects i.e. those having I.O.P. above 21 mmHg and/or suspicious optic discs were selected for more thorough evaluation including detailed history. As many as patients were screened this way as the circumstances allowed.

Detailed Evaluation of Selected Patients

This included detailed history and, where applicable, analysis of documentary record of prior examination and treatment. Slit lamp examination, gonioscopy with a Goldmann three-mirror lens, tonometry with Goldmann applanation tonometer and optic disc evaluation with contact lens after pupillary dilatation was done. Pilocarpine 2% eye drops were instilled after the examination in patients with a susceptible angle, and they were asked to stay at the hospital until reversal of mydriasis was achieved.

Computerized visual field analysis was ordered only in doubtful cases, as an automated perimeter was not available in the Hospital.

Glaucoma was defined as I.O.P. more than 21 mmHg.

Optic disc changes characteristic of chronic glaucoma i.e. difference of cup/disc ratio of more than 0.2 between the two eyes, vertically oval cup, notch in the neuroretinal rim, optic disc hemorrhage, characteristic para papillary atrophy¹⁷ were noted.

Presence of characteristic visual field defects were also recorded among patients in whom visual field analysis was done.

Angle-closure was defined as the presence of an occludable angle according to Shaffer grading along with at least part of the angle closed by peripheral anterior synechiae (P.A.S.)⁹.

Patients with a history suggesting an acute or sub acute attack of angle closure in the past, and those with features of secondary glaucoma were excluded from the study.

RESULTS

A total of 103 patients fulfilled the criteria set for the primary chronic glaucoma. Out of these, 46 cases (44.7%) were of primary open angle glaucoma (P.O.A.G.), and 57 (55.3%) were P.C.A.C.G. (Table-1).

In the P.C.A.C.G. group, 54.4% (31 cases) were females, and 45.6% (26 cases) were males, while in the P.O.A.G. group 52% (24 cases) were males and 48% (22 cases) were females. (Table-2).

Out of the total 57 cases of P.C.A.C.G. 35 (61.4%) were previously undiagnosed. 22 cases (38.6%) were previously diagnosed as glaucoma. In 15 cases (26.3%) either no specific diagnosis regarding the type of glaucoma had been made or no documentary record of such a diagnosis could be obtained. Specific diagnosis had been mentioned in 7 cases (12.2%), but incorrect diagnosis of P.O.A.G. was made in 5 cases (8.8% of the total) and only two patients were correctly diagnosed as suffering from P.C.A.C.G. (Table-3).

Table-1: Types of primary chronic glaucoma

Type	Number	Percentage
*P.O.A.G.	46	44.7
**P.C.A.C.G.	57	55.3
Total	103	100.00

*Primary open angle glaucoma

**Primary chronic angle-closure glaucoma

Table-2: Sex distribution

Sex	Primary chronic angle-closure glaucoma (n=57)		Primary open angle glaucoma (n=46)	
	Number	%	Number	%
Male	26	45.6	24	52.0
Female	31	54.4	22	48.0

Table-3: Prior diagnosis of primary chronic-angle closure glaucoma patients.

Status of prior diagnosis	Number	Percentage of total
Undiagnosed	35	61.4
Diagnosed	22	38.6
Diagnosed as glaucoma but unspecified*	15	26.3
Specific diagnosis	07	12.2
As P.C.A.C.G.	02	3.5
As P.O.A.G.	05	8.8

*or no documentary record of specific diagnosis could be obtained

The mean base line intraocular pressure was 24.6 mmHg in the P.O.A.G. group (range 22 mmHg to 35 mmHg), while that in the P.C.A.C.G. group it was 30.8 mmHg (range 22 mmHg to 45 mmHg) (Table-4).

Table-4: Mean base line intraocular pressure

Type of glaucoma	Mean IOP (mmHg)	Range (mmHg)
P.O.A.G (89 eyes of 46 patients)	24.6	22-35
P.C.A.C.G (105 eyes of 57 patients)	30.8	22-55

18 patients (31.6%) of the P.C.A.C.G. group had only one eye involved while 6 patients (13%) of the P.O.A.G. group had unilateral involvement. (Table-5).

Table-5: Unilateral involvement

Type of glaucoma	Number	Percentage
P.C.A.C.G. (n=57)	18	31.6
P.O.A.G. (n=46)	6	13.0

Anisocoria was present in 2 patients, the abnormally large pupil being round and regular, without any features of ischemic atrophy of the iris, and one of these eyes had circumferential corneal edema in the periphery. Both these eyes had 360 degree P.A.S. formation (Table-6).

Table-6: Abnormal anterior segment findings

Clinical feature	Number
Anisocoria	18
Corneal edema (limited to the periphery)	6

DISCUSSION

The chronic form of primary angle-closure glaucoma is being diagnosed more frequently than before. For instance, in 1964 Lowe found this condition in only 7% of all the angle-closure glaucoma cases he studied in the European population of Australia, and gave it the name of "Creeping Angle Glaucoma"⁸, whereas in the year 2000 a study from Europe show that about 55% of all cases of angle-closure glaucoma were of chronic type¹⁰.

The differentiation of the two types of primary chronic glaucoma i.e. the P.C.A.C.G. to

and P.O.A.G. is important for several reasons. First, the treatment strategy is different. A peripheral iridectomy, laser iridotomy, or goniosynechialysis can be helpful in many cases of P.C.A.C.G.⁴ instead of trabeculectomy, which is a more traumatic procedure. Furthermore, laser iridotomy/peripheral iridectomy can be useful in prevention of glaucoma development in the fellow eye¹⁸. Secondly, screening for angle-closure glaucoma can be more simple than that for P.O.A.G. i.e. by van Herick method of angle estimation limbal depth¹⁹, although even this is not considered to be realistic for mass screening in developing countries¹⁵.

This study is different from most other studies on the subject of angle-closure glaucoma in that it is primarily concerned with the chronic form of this condition, and its proportion is determined among both forms of primary chronic glaucoma i.e. P.O.A.G. and P.C.A.C.G, hence a comparison with other studies was not straightforward. Table-7 shows the comparison of the relative proportions of P.O.A.G. and P.C.A.C.G. found in this study and those in two other recent studies^{10,11,20}. Since this comparison was not made as such in the studies concerned, it was determined after calculating the sum total of all the cases of P.O.A.G. and the chronic cases of primary angle-closure glaucoma in these studies.

Table-7: Relative proportion of open angle and angle-closure among primary chronic glaucoma in different studies

Study	P.O.A.G %	P.C.A.C.G %	Total %
The Egna-Neumarkt glaucoma study ^{10,11}	80	20	100.00
The Andhra Pradesh eye disease study	73	27	100.00
Present study (Rizvi SA)	44.79	55.30	100.00

The relative proportion of P.C.A.C.G. is greater in this study (Table-7) than that found in other studies on people of non-mongoloid origin available to the author. It is possible that the results would have been different if criteria for angle closure glaucoma employed in other studies^{2,5,15,21} were used instead of those in this study i.e. presence of any P.A.S. in a glaucomatous eye with occludable angle

regardless of its extent, a criterion previously described⁹ and used recently also¹⁰. This, incidentally, highlights the need for standardization of definition of P.C.A.C.G. Two other factors that could have influenced the results were the dependence, in most of the cases, on appearance of optic disc, and an I.O.P. above 21 mmHg as a must, to diagnose glaucoma. Both these factors, however, are likely to affect the number of cases of primary chronic glaucoma altogether, not just P.C.A.C.G.

In contrast to other studies^{10,15} the proportion of previously diagnosed patients was relatively high (Table-3). This could be because the present study is a convenience sampling of patients who visited the hospital, many of whom may have wanted a second opinion or could not afford private treatment. The fact that only two of the previously diagnosed patients of P.C.A.C.G. were diagnosed as such highlights the importance of meticulous gonioscopy as a routine in the work-up of every glaucoma patient. It should be stressed that gonioscopy is not an easy skill to master and every trainee requires individual supervision and guidance through out the training period.

The higher incidence of unilateral involvement in P.C.A.C.G. (Table-5) is in agreement with the other studies², but the higher female involvement, although present (Table-2) is not as pronounced^{10,14,15}.

Some interesting clinical features were noted among patients of P.C.A.C.G. For instance, two patients had a dilated pupil on the side of 360 degree P.A.S. formation (Table-6). This could not be due to ischemic atrophy because there was no history of an acute attack and the dilated pupil was regular and uniform, without any evidence of iris atrophy. The finding could be due to the iris being pulled equally in all meridians toward the angle by the progressive PAS formation. Similarly there was peripheral circumferential corneal edema in one of these eyes which could have been due to the irido-corneal touch damaging the endothelium, the synechiae being extended too anteriorly. Unfortunately photographs of these clinical findings could not be taken. Moreover, the mean initial I.O.P. in the eyes with P.C.A.C.G. was higher than those with P.O.A.G. (Table-2). The author was unable to find a similar comparison in any recent study. The finding however implies

that P.C.A.C.G. could be more rapidly blinding than P.O.A.G.. The author also had an impression that the optic disc in the P.C.A.C.G. group were relatively more deeply cupped for a given cup/disc ratio, but this could not be quantitatively determined because of the non availability of a quantitative optic nerve head analyzer,

In conclusion, P.C.A.C.G. appears to be quite common in our population but is often misdiagnosed as P.O.A.G. because of the typical clinical presentation. Much efforts are needed to understand the epidemiology, pathogenesis, clinical characteristics, methods for mass screening, and especially the treatment strategies best suited for this form of glaucoma.

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Abstracts

Edited by Tahir Mahmood

Long-term Effect of Nd: YAG Laser Posterior Capsulotomy on Intraocular Pressure

Ge J, Wand M, Chiang R, Paranhos A, Shields MB

Arch Ophthalmol 2000; 118: 1334-7

Short-term increases in intraocular pressure (IOP) after an Nd-YAG laser posterior capsulotomy are well documented.

The purpose of this retrospective study was to study the long-term effect of Nd: YAG capsulotomy on intraocular pressure (IOP) of capsulotomy treated eyes with untreated fellow eyes of patients with bilateral pseudophakia.

The authors reviewed the records of patients with bilateral pseudophakia who received Nd:YAG capsulotomy in only 1 eye. Using the Wilcoxon rank sum test, the authors compared the mean change in IOP in eyes before and after capsulotomy with that of the noncapsulotomy eyes at corresponding time intervals. Using multiple regression tests, the authors analyzed the factors significantly associated with postcapsulotomy long-term IOP increase.

The study included 100 patients who were followed up for a median of 1.5 years after capsulotomy. The mean $\pm$ SD age of the study group was 76 ± 7 years, and 37 patients had glaucoma. The changes in IOP in the eyes treated with capsulotomy were significantly higher than those in noncapsulotomy eyes at each time interval following capsulotomy. The long-term IOP increase was significantly associated with the IOP increase measured 1 hour after the capsulotomy ($P=.001$). Patients with glaucoma were more likely to require long-term additional glaucoma medication than were nonglaucoma patients to require initial glaucoma therapy after the capsulotomy ($p=.002$).

After Nd:YAG capsulotomy, long-term IOP is often elevated above precapsulotomy baselines,

especially in glaucoma patients or patients who experience a significant IOP increase within hours after the capsulotomy.

Postoperative Application of Mitomycin for Trabeculectomies

Mietz H, Jacobi PC, Krieglstein GK

Arch Ophthalmol 2000; 118: 1341-8

Persistent hypotony is a phenomenon frequently associated with the use of mitomycin to enhance the outcome of trabeculectomies. This is true for both cases of complicated glaucoma and situations in which mitomycin are used for primary procedures. An increased outflow of aqueous humor through the filtering site and a toxic effect of mitomycin on the ciliary body epithelium may be important contributing factors for persistent hypotony. So far, it seems impossible to predict which cases have a higher risk for hypotony, making hypotony impossible to prevent. Factors associated with the application of mitomycin and the amount of mitomycin delivered to the eye include the concentration of mitomycin used, the amount of solution placed on the sponge, the material of the sponge, the duration of application, and whether the sponge is replaced during application.

The purpose of this study was to reduce the rate of hypotony by using a lower concentration of mitomycin and applying the mitomycin only topically to the filtering bleb following surgery.

In this study patients were enrolled on a consecutive basis and prospectively followed up. Standardized trabeculectomies were performed and mitomycin was applied postoperatively for three consecutive days following surgery (group 1). For comparison, data from previous studies were used for control eyes with intraoperative mitomycin application (group 2) and no mitomycin application (group 3). Preoperative and postoperative data, complications, and the need for further surgical procedures were evaluated.

The study group (group 1) was consisted of 22 cases. The mean follow-up was 13.4 and 13.5 months for groups 1 and 2, respectively. Average intraocular pressure values decreased from 33.6 and 31.0 mm Hg ($P=.32$; t test) to 16.0 and 12.5 mm Hg in the 2 groups ($p=.03$; t test). The average number of medications decreased from 2.5 and 2.5 to 0.6 and 0.4 ($p=.35$; t test) in groups 1 and 2, respectively, at the last visit. Hypotony lasting for more than 3 months occurred only in eyes with intraoperative mitomycin application (14/22). Choroidal detachment (3/22) and hypotony maculopathy (2/22) also were only noted in eyes from group 2. In group 3, success rates were much lower.

In authors opinion this is the first clinical study, to evaluate the efficacy of new technique of mitomycin application. The authors concluded from the results of the study that the postoperative application of mitomycin following trabeculectomy is associated with a lower risk of severe and long-standing hypotony. This technique may be promising in eyes at low risk for failure.

Frequency of the Common Canaliculus A Radiological Study

Yazici B, Yazici Z

Arch Ophthalmol 2000; 118: 1381-5

Tears enter the lacrimal sac through the canaliculi. The upper and lower canaliculi join to form a single common canaliculus (CC) 2 to 5 mm long, which opens into the lateral wall of the lacrimal sac. It is usually supposed that about 90% of the population has a CC and that in the remaining 10% the upper and lower canaliculi enter the sac separately.

In authors opinion there is no quantitative study supporting this assumption.

In this study the authors investigated the frequency of the CC and other anatomical types connecting the upper and lower canaliculi to the lacrimal sac.

In this study the authors presumed that there might be 3 different types of anatomical connections between the lacrimal sac and the canaliculi. The authors reviewed digital subtraction macrodacryocystograms obtained from 281 patients with obstructive epiphora and those of 247 patients were included in this study. These

patients were grouped according to the anatomical types.

Dacryocystographies were performed on 153 patients unilaterally and 94 bilaterally. The authors observed a CC in 321 (94.1%) of 341 lacrimal drainage systems. In 13 lacrimal drainage systems (3.8%), the CC was absent, but the upper and lower canaliculi joined at the wall of the lacrimal sac. In only 7 lacrimal drainage systems (2.0%) did the upper and lower canaliculi enter the sac separately. In 2 patients with bilateral dacryocystograms, a CC was seen on one side but not on the other side.

The authors concluded the study with the remarks that the frequency of separate drainage of the upper and lower canaliculi into the lacrimal sac is only 2.0% and the CC might not be present bilaterally in all individuals.

Episcleritis and Scleritis: Clinical Features and Treatment Results

Jabs DA, Mudun A, Dunn JP, Marsh MJ

AM J Ophthal 2000; 130: 469-76

Scleral inflammatory disease consists of episcleritis, a more superficial inflammation, and scleritis, a deeper and more destructive inflammation. Previous studies have suggested that scleritis more often associated with systemic autoimmune diseases. Ocular complications often occur with scleritis and include keratitis, uveitis and glaucoma with anterior disease and exudative detachments or other posterior segment complications with posterior scleritis. The distinction between episcleritis and scleritis has therapeutic import, because episcleritis often may respond to topical anti-inflammatory agents, such as topical corticosteroids, whereas scleritis typically requires systemic medications, such as oral non steroidal anti-inflammatory drugs, oral corticosteroids, or in some cases immunosuppressive drugs. Because episcleritis and scleritis are uncommon disorders, there are a limited number of large series documenting clinical experience with these disorder.

The purpose of this retrospective study was to evaluate the clinical experience with scleral inflammation particularly the treatment required to control the disease and the consequences of such treatment at a tertiary care eye center.

The authors reviewed the charts of one hundred thirty-four patients with scleral

inflammation over a 12-year period. Thirty-seven patients had episcleritis, and 97 patients had scleritis. Ocular complications occurred in only 13.5% of patients with episcleritis but in 58.8% of patients with scleritis ($P < .0001$). No patient with episcleritis has a decrease in visual acuity, whereas 15.9% of patients with scleritis did. Only 16.7% of patients with episcleritis required more than topical corticosteroids for treatment, and these patients required oral nonsteroidal anti-inflammatory drugs. Conversely, 30.4% of patients with scleritis required nonsteroidal anti-inflammatory drugs, 31.9% oral prednisone, and 26.1% systemic immunosuppressive drugs ($P < .0001$). Necrotizing scleritis and posterior scleritis more often were associated with ocular complications, occurring in 91.7% and 85.7%, respectively, than were diffuse anterior scleritis and nodular anterior scleritis ($P = .020$). Patients with necrotizing scleritis and posterior scleritis were more likely to be treated with oral corticosteroids or immunosuppressive drugs (90% and 100%, respectively) than were patients with diffuse anterior scleritis and nodular anterior scleritis (56.4% and 21.4%, respectively, $P = .002$).

The authors concluded with remarks that scleritis is a severe ocular inflammation, often associated with ocular complications, and nearly always treated with systemic medications. Nearly 60% of these patients will need oral corticosteroids or immunosuppressive drugs to control the disease.

Ultrasound Biomicroscopy of the Anterior Segment After congenital Cataract Surgery
Nishijima K, Takahashi K, Yamakawa R
AM J Ophthalmol 2000; 130: 483-9

Glaucoma is well recognized as a complication after congenital cataract surgery and the incidence of pupillary block glaucoma soon after surgery decreased as the surgical technique with vitreous cutting instrumentation was improved. However, the incidence of other types of glaucoma, for example, open-angle glaucoma, as a late complication long after surgery remains high. Moreover, knowledge is incomplete as to the mechanism of such a complication and how frequently patients should be followed up after surgery. The incidence of glaucoma and the time elapsed between the surgery and the diagnosis of glaucoma varies in different reports. Glaucoma may occur because of abnormalities in the

structure of the eye with congenital cataract. For example, an anomaly of the structure of the anterior segment is sometimes observed when gonioscopy is performed.

The purpose of this study was to evaluate the structure of the anterior segment after congenital cataract surgery with ultrasound biomicroscopy and investigate its relationship to glaucoma.

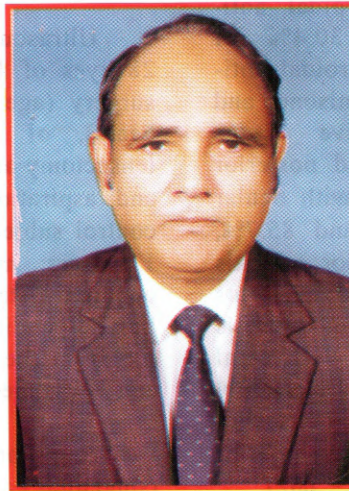
Ultrasound biomicroscopy was performed on 28 eyes of 15 patients after congenital cataract surgery (age range, 8-27 years; mean, 13.1 ± 1.1 years), of which 26 eyes had pars plana lensectomy and two eyes had phacoemulsification and aspiration, and on 21 eyes of 11 phakic control subjects who were healthy (age range, 6-17 years; mean, 11.5 ± 1.1 years). The angle-opening distance at 500 μm was measured on a line perpendicular to the trabecular meshwork 500 μm from the scleral spur, and the trabecular-iris angle was measured.

Angle-opening distance at 500 μm in the congenital cataract group ranged from 174 to 920 μm (mean, $424 \pm 28 \mu\text{m}$), and in the control group it ranged from 260 to 1,119 μm (mean, $643 \pm 57 \mu\text{m}$), a difference that was significantly different ($P = .0004$, Student *t* test). The trabecular-iris angle in the congenital cataract group ranged from 30.4 to 66.9 degrees (mean, 41.9 ± 1.6 degrees) and in the control group ranged from 32.1 to 69.8 degrees (mean, 44.9 ± 2.5 degrees), a difference that was not significantly different ($P = .28$, Student *t* test). This means that there is a tendency for high insertion of the iris in the congenital cataract group, and intraocular pressure was elevated after surgery (including glaucoma and ocular hypertension) in 10 (47.6%) of 21 eyes with high insertion. The pars plicata after congenital cataract surgery was significantly flatter than that of control subjects ($P = .0057$, Student *t* test).

The authors concluded with remarks that ultrasound biomicroscopy is a useful method for evaluating the anterior segment of eyes with congenital cataract, and complications after cataract surgery can be caused by disorganization of the anterior segment. Patients with abnormalities of the anterior segment should be followed up closely for the development of glaucoma.

Awardee of Novel Christy Year 2000 OSP Presidential Gold Medal

Dr. Haseeb Alam



In view of the outstanding services rendered to the Ophthalmological Society of Pakistan and the visually impaired population of this country, the OSP Gold Medal Award Committee has unanimously decided to confer the Novel Christy Presidential Gold Medal Award on a distinguished member of OSP who was born on 20th March, 1934. He obtained his Medical Degree from University of Karachi in 1960 and obtained Diploma in Ophthalmology from London University in 1968 and FICS from USA in 1985.

He served as Ophthalmologist in Pakistan till 1966. He then went to United Kingdom where he studied and worked from 1968 till September 1975. He then moved to Bahrain and served that country as a Consultant Ophthalmologist.

He came back to Pakistan in 1975 and joined as consultant ophthalmologist in a Social Security Hospital till 1993. Since 1993 he is working as an Associate Professor in a private medical college. He has to his credit 9 scientific publications published in various national and international journals. He has been regular attendee of almost all national conferences held under the auspices

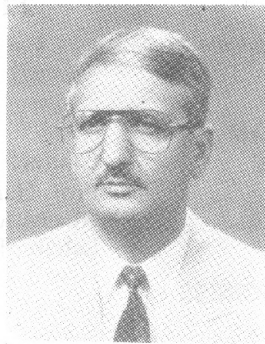
OSP for the past 25 years. He has also attended 5 international congresses held in different parts of the world under the auspices of various supranational organizations.

The awardee of the year 2000 OSP Novel Christy Gold Medal Presidential Award has been a very active member of OSP. In fact he is the author of the first constitution of OSP. He has also served OSP as the Central Secretary for more than two decades. He served as a President of the Karachi branch of OSP from 1992 to 1994. He is also a very active member of Pakistan Medical Association and served this organization as a Senior Vice President from 1994 till 1997. Both the National Society and the Karachi branch has acknowledged his services in 1999 by awarding him Shields of Honor.

In appreciation of his distinguished services to Ophthalmological Society of Pakistan and the people of Pakistan, the Chairman and Members of OSP Gold Medal Committee take great pleasure in conferring the Novel Christy Year 2000 Presidential Gold Medal Award on this Gentleman.

Awardee of Ramazan Ali Syed Gold Medal Award for Year 2000

Prof. Shad Muhammad



In view of the outstanding services rendered to the Ophthalmological Society of Pakistan the visually impaired population of this country, the OSP gold Medal Award Committee has unanimously decided to confer the Ramazan Ali Syed Year 2000 gold Medal Award on a distinguished member of OSP who was born on 15th September, 1947 in a remote corner of Pakistan. He obtained his Medical Degree in 1971, Diploma in Ophthalmology from London University in 1976 and FRCS from Royal College of Surgeons, Glasgow in 1982. The Royal College of Ophthalmologists, UK conferred on him FRCOphth in 1989.

He worked in various capacities in Pakistan till 1973. From October 1973 till August 1982. He studied and worked in various capacities in various parts of United Kingdom. In 1982 he came back to Pakistan and has been a member of Teaching Faculty in various medical college of the country, Currently he is serving as a Professor of Ophthalmology in a Postgraduate Medical Institute.

This distinguished ophthalmologist has to his credit 21 scientific papers published in various national and international journals of ophthalmology. He has been a regular attendee of

almost all national and regional OSP meetings where he has presented more than 31 scientific papers. He has also been regularly attending international congresses held in various parts of the world under the auspices of various supranational organizations.

He is a great social worker and has to his credit 16 outreach activities in various remote parts of Pakistan, where he and his team has performed surgery in most challenging conditions on a large number of highly deserving patients. He has served OSP in various capacities including Secretary General and President of a Regional Branch. He has also played pivotal role in organizing various OSP national congresses. This distinguished ophthalmologist has also served ophthalmology in the capacity of a Vice President of a Regional Eye bank Society and also as a Technical Director of a National NGO working for the welfare of visually impaired people.

In appreciation of his distinguished services to Ophthalmological Society of Pakistan and the people of Pakistan, the Chairman and members of OSP Gold Medal Committee take great pleasure in conferring the Ramazan Ali Syed Year 2000 Presidential Gold Medal Award on this distinguished ophthalmologist.

News and Events

6TH INTERNATIONAL CONGRESS OF THE PAN ARAB

1-5 March 2001

Contact:

Council of Ophthalmology
Specialty Clinics Building, 3rd floor
Maamari Street, Near AUH
Beirut, Lebanon.

XIII CONGRESS OF THE EUROPEAN SOCIETY OF OPHTHALMOLOGY

3-7 June 2001
Istanbul, Turkey

OXFORD OPHTHALMOLOGICAL CONGRESS

1-4 July 2001
Oxford, UK

QUEEN VICTORIA HOSPITAL, CORNEA & OCUPLASTICS COURSE

19-20 July 2001
East Grinstead, UK

XIXTH ESCRS CONGRESS

1-5 September 2001
Amsterdam, Netherlands

III MODERN CATARACT AND REFRACTIVE SURGERY INTERNATIONAL SYMPOSIUM

19-22 September 2001
Bystrica, Slovakia

CURRENT CONCEPTS IN OPHTHALMOLOGY 9TH ANNUAL CONGRESS OF OPHTHALMOLOGICAL

6-8 October

Ophthalmological Society of Pakistan
Hyderabad Zone
Pakistan.

AMERICAN ACADEMY OF OPHTHALMOLOGY

11-15 November
New Orleans, USA

KAROPHTH-2001 CORNEA KARACHI OPHTHALMIC ANNUAL SYMPOSIUM ON CORNEA

Ophthalmological Society of Pakistan
Karachi, Pakistan

22nd LAHORE OPHTHALMO 2001

21-23 Dec. 2001
Al-Hamra Art Centre
Lahore, Pakistan

Contact Address:

Prof. Hamid Mahmood Butt
Allama Iqbal Medical College & Jinnah Hospital
Lahore, Pakistan. Phone: 92 (042) 5162588
E-mail: hamidbut@wol.net.pk

COMMUNITY EYE HEALTH

The *Journal of Community Eye Health* is published four times a year.
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Institute of Ophthalmology
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VIDEOS

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Details are available from the Examination Office,
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 Tel: 00 44 (0) 171 935 0702 (extensions 24, 25, 26)
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References:

1. Data on file, Alcon Laboratories, Inc.
2. Sabbagh LB. Survey finds infused antibiotics help prevent infection. *Ophthalmology Times*. July 15, 1998:20

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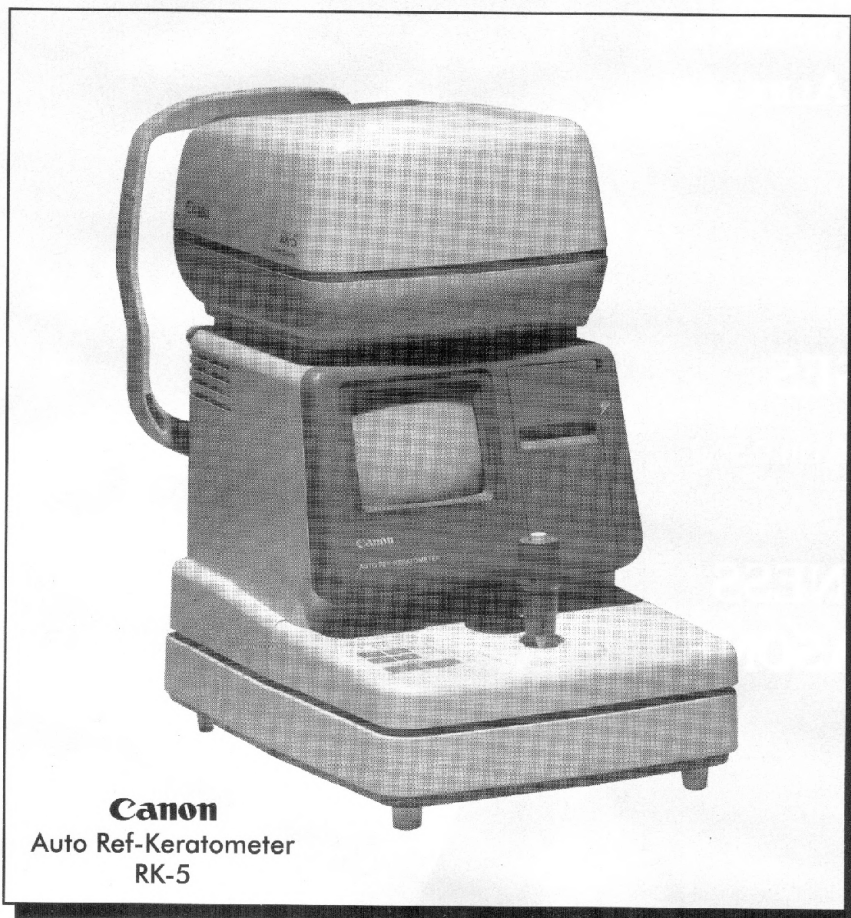
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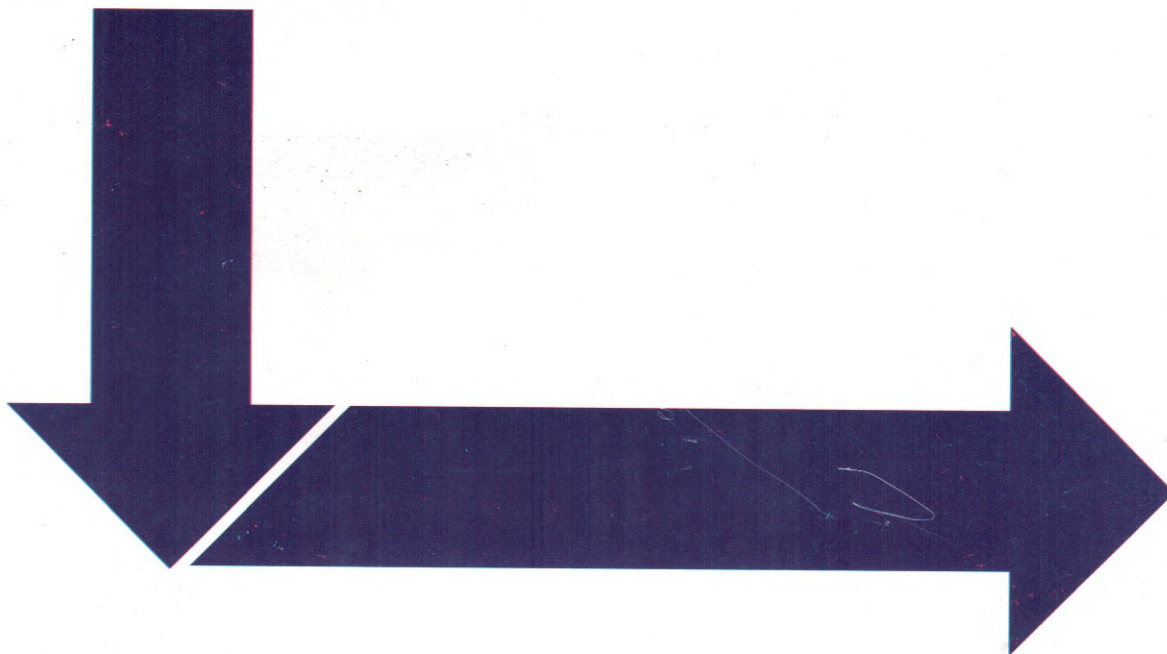
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Abridged Prescribing Information

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latanoprost

INDICATION AND USAGE XALATAN is indicated for the reduction of elevated intraocular pressure in patients with open-angle glaucoma and ocular hypertension who are intolerant of other intraocular pressure lowering medications or insufficiently responsive (failed to achieve target IOP determined after multiple measurement over time) to another intraocular pressure lowering medication. **CONTRAINDICATIONS**

Known hypersensitivity to latanoprost, benzalkonium chloride or any other ingredients in this product. **WARNINGS** XALATAN may gradually change eye color, increasing the amount of brown pigment in the iris by increasing the number of melanosomes (pigment granules) in melanocytes. The change in iris color occurs slowly and may not be noticeable for several months to years. Patients should be informed of the possibility of iris color change. Patients who are expected to receive treatment in only one eye should be informed about the potential for increased brown pigmentation in the treated eye and thus, heterochromia between the eyes. The increased pigmentation may be permanent. **PRECAUTIONS:** Patients may slowly develop increased brown pigmentation around the pupil spreads concentrically towards the periphery in affected eyes, but the entire iris or parts of it may also become more brownish. Until more information about increased brown pigmentation is available, patients should be examined regularly and, depending on the clinical situation, treatment may be stopped if increased pigmentation ensues. XALATAN should not be administered while wearing contact lenses. Patients should be instructed to avoid allowing the tip of the dispensing container to contact the eye or surrounding structure because this could cause the tip to become contaminated by common bacteria known to cause ocular infections.

Patients also should be advised that if they develop an intercurrent ocular condition (e.g., trauma, or infection) or have ocular surgery, they should immediately seek their physician's advice concerning the continued use of the multidose container they had been using. Patients should be advised that if they develop any ocular reactions, particularly conjunctivitis and lid reactions, they should immediately seek their physician's advice. If more than one topical ophthalmic drug is being used, the drugs should be administered at least five (5) minutes apart. **ADVERSE REACTIONS** The ocular adverse events and ocular signs and symptoms reported in 5 to 15% of the patients on XALATAN in the 6 month, multi-center, double-masked, active-controlled trials were blurred vision, burning and stinging, conjunctival hyperemia, foreign body sensation, itching, increased pigmentation of the iris and punctate epithelial keratopathy. Local conjunctival hyperemia was observed; however, less than 1% of the XALATAN treated patients required discontinuation of therapy because of intolerance to conjunctival hyperemia. **DOSAGE AND ADMINISTRATION** The recommended dosage is one drop (1.5 µg) in affected eye(s) once daily in the evening. The dosage of XALATAN should not exceed once daily since it has been shown that more frequent administration may decrease the intraocular pressure lowering effect. Reduction of the intraocular pressure starts approximately 3 to 4 hours after administration and the maximum effect is reached after 8 to 12 hours. XALATAN may be used concomitantly with other topical ophthalmic drug products to lower intraocular pressure. If more than one topical ophthalmic drug is being used, the drugs should be administered at least five (5) minutes apart. **HOW SUPPLIED** XALATANTM (latanoprost solution) Sterile Ophthalmic Solution is a clear, isotonic, buffered, preserved colorless solution supplied in plastic ophthalmic dispenser bottles with a dropper tip and tamper evident overcap. Each bottle contain 2.5ml latanoprost (0.005%) (50UG/ML). **Storage:** Protect from light. Store unopened bottle under refrigeration at 2° to 8°C (36° to 46°F). Once opened the container may be stored at room temperature up to 25°C (77° F) for 6 weeks.

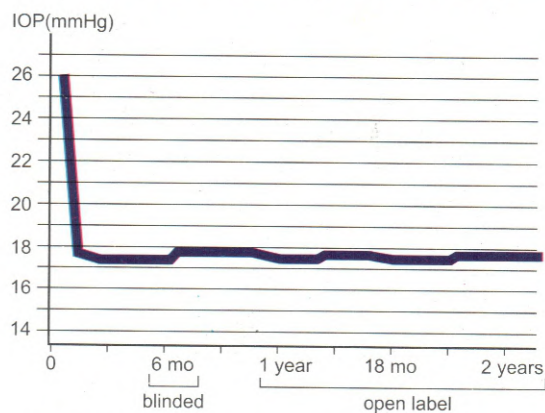
Further information is available upon request.

1. Data on file, Hedman K, Alm A. Presented at the ICO/June 1998; Amsterdam, The Netherlands. 2. Watson PG, Ophthalmology, 1998;105:82-87. 3. Bucci M, J Glaucoma, 1999;8:24-30. 4. Emmerich K-H, Graefes Arch Clin Exp Ophthalmol. *Indication: Reduction of intraocular pressure in patients with open-angle glaucoma and ocular hypertension. PX 11294.00



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June 2000

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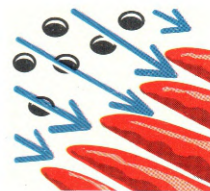


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