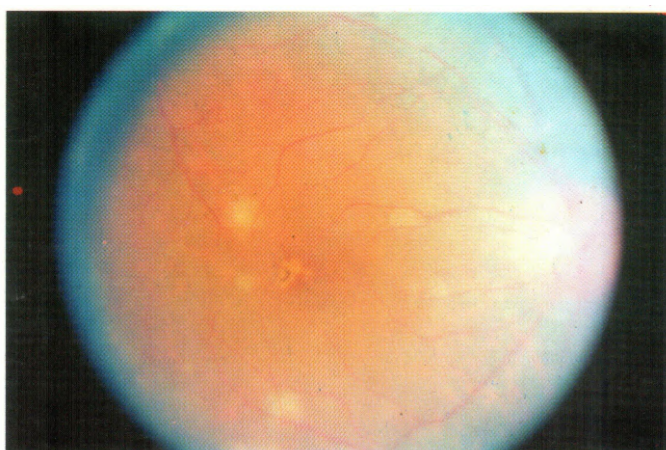


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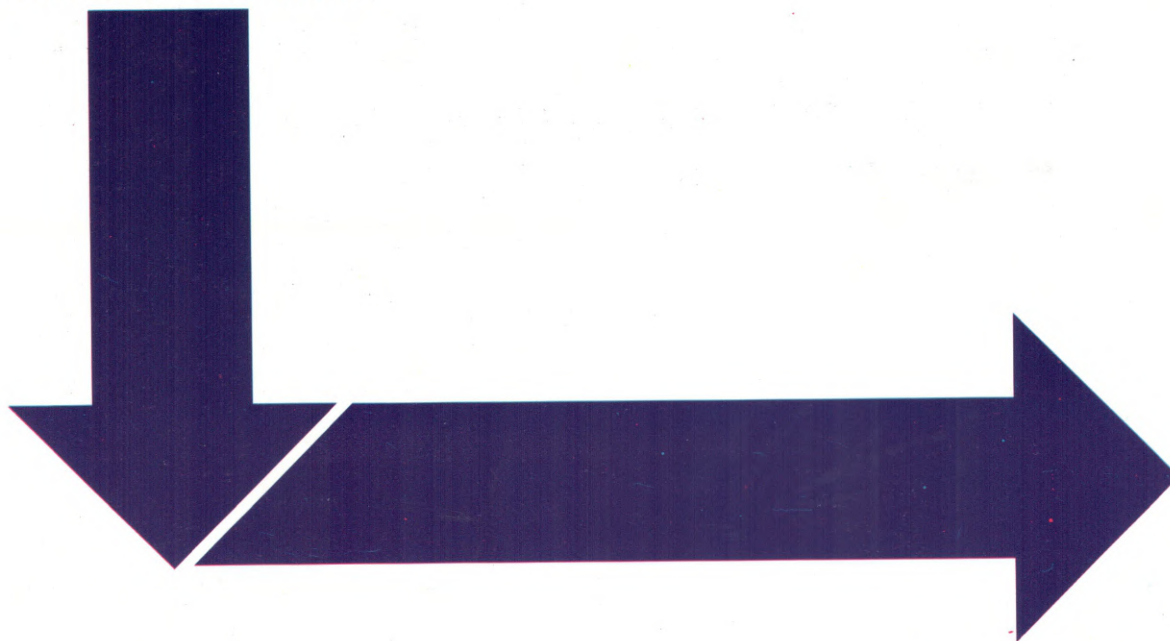


At Page 114, Figure-1: Choroidal Tubercles in Presumed Ocular Tuberculosis

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Abridged Prescribing Information

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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 of the iris. This change may not be noticeable for several months to years (see WARNINGS). Typically the 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.

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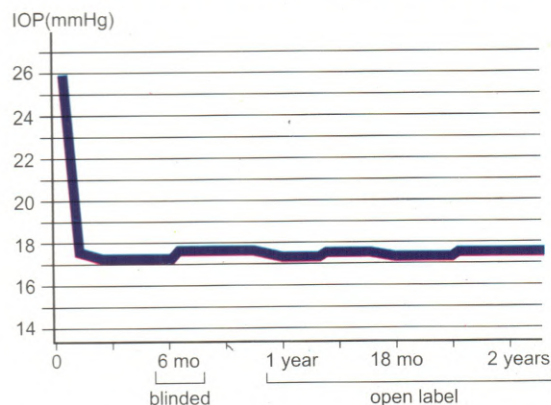
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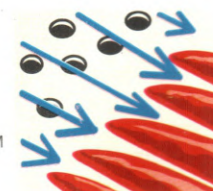


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EDITORIAL

Low Vision Aids

See also pages117-119

Ophthalmologists generally shy away from taking on the patients who are blind or severely visually impaired. This may be because of a lack of training in this field or the sense of inadequacy or utter failure in the face of problems that are humanly impossible to deal with. They should not really feel small since some such problems even require invocation of Divine Intervention for their solution: "And behold! thou didst make/Out of clay, the figure of a bird,/By my leave,/ And thou didst breath into it,/And it becometh a bird/By My leave,/And thou didst heal those/Born blind, and the lepers,/By My leave./And behold!thou didst/Bring forth the dead/By My leave"¹.

Our job is to help the needy as best as we can. This involves, of course, helping those with the commonly treatable problems like cataracts, trachoma and glaucoma, which are the three most common causes of blindness globally (38 million blind), responsible for 16 million, 6 million and 5 million blind, respectively². But we must also strive to help the additional 110 million people the world over with low vision and at risk of becoming blind².

According to the WHO, blindness is visual acuity (VA) of $< 3/60$ (0.05) or corresponding visual field loss in the better eye with best possible correction (visual impairment categories 3,4 and 5 in ICD-10) and low vision corresponds to visual acuity of $< 6/18$ (0.3) but equal to or better than $3/60$ (0.05) in the better eye with best possible correction (visual impairment categories 1 and 2 in ICD-10)^{2,3}. Thus huge numbers of populations in most countries that fall in the low vision category are amenable to help by most general ophthalmologists. In Pakistan, 2.5 million people blind in both eyes, 2.5 million blind in one eye and 5 million with low vision⁴ provide quite a challenge to us and need our compassion and help⁵. By far a majority of those with low vision can be helped easily only if they could have access to simple routine eye examination and refraction. But the problem is not solved as simply

as it appears. Providing a prescription to those who can ill-afford a pair of glasses is one thing (and you might think that dispensing a pair of glasses free of cost might take care of it-but think again,) yet making them wear it is quite another. Even in developed countries like Australia, with universal health care system and free eye care for all residents and subsidized provision of glasses to the poor, it was found in the Visual Impairment Project in Victoria⁶ that the 4th most common cause of blindness ($VA < 3/60$) was uncorrected refractive error, responsible for 8% of blindness, after age-related macular degeneration (AMD) 46%, glaucoma 17% and cataract 14%. Twenty-three percent of those with $< 6/60$ VA (legally blind in Australia) actually had undercorrected refractive error as the cause of their handicap, which was responsible for 27% of blindness at this level of VA, just behind AMD. 33% of those with low vision ($< 6/18$) in Australia were due to refractive error⁷. Undercorrected refractive error was found more commonly in the elderly, in those with underlying ocular disease and in those who had not had a recent eye examination. It was considered that a quarter of blindness and half the low vision could just be alleviated by providing a pair of glasses of the correct strength. Obviously, a large proportion of visual loss can be rectified with provision of as simple a device as an appropriate pair of glasses-the simplest form of low vision aid.

In Pakistan uncorrected refractive error is the 3rd commonest cause of blindness (11%) after cataracts (67%) and corneal opacities (13%)⁵. In a survey of the Schools for the Blind in Islamabad/Rawalpindi, Siddiqui et al found that 60% of children could be helped by Low Vision Aids (LVAs) and estimated that, of 10 million visually handicapped people in Pakistan, 0.5-1 million could be helped with LVAs⁵.

Besides the previously mentioned common causes of blindness and visual impairment, macular degeneration and diabetic retinopathy are

Besides the previously mentioned common causes of blindness and visual impairment, macular degeneration and diabetic retinopathy are increasingly emerging as such important causes. Patients with low vision have trouble with carrying out the mundane chores of daily living, keeping their jobs and participating in social activities. Hundreds of optical and non-optical aids are available but to have access to them **Knowledge** is quintessential. **Practice**, **Motivation** and the right **Attitude** are extremely important to achieve the fullest benefits from these.

Right type of lighting can enhance vision. Twice the amount of lighting is required at age 50 compared to that required at age 25 years. Both general overhead lighting (incandescent, fluorescent, halogen or chromalux that mimics natural sunlight), of adequate intensity, and task lighting as from floor-stand- or desk-type of lamps appropriately adjusted for reading and writing, may be manipulated for maximum benefit. Common sense tips to avoid glare from windows, floors or shiny papers need only be pointed out. (Common sense is a rare commodity, however!)

Low vision optical aids in the form of magnifiers for near tasks like reading or watching television are available. So are the ones for far distance like reading street signs or recognizing peoples' faces. Correct type of magnifiers with the correct strength may be chosen from hand-held, stand or pocket types. Some magnifiers look like glasses and some like miniature telescopes. They may be worn around the neck or attached to desk lamps or to the spectacle frames. Others have built-in lights for reading newspapers or magazines. All these require practice in their use and perseverance on the part of the patient as well as the fitter.

Non-optical LVAs include special editions of books and magazines with large letters, talking books, clocks and wrist watches, simple devices for threading needles and for keeping track of medications, bright colored or bumpy marks on telephone dials, type-writers or computer keyboards.

Close circuit televisions (CCTVs) are very useful devices for those with low vision. There are several types available. The free-standing units consist of a monitor on top of a flat platform. Reading material is placed on the platform which is moved to see (read) the material on the monitor. A portable CCTV can be plugged into any TV. A device like a computer mouse is rolled across the reading material to see it on the TV monitor. A truly portable CCTV uses a mouse-like device to project images not on TV screen but in a pair of goggles one wears.

Computer aids can help even non-computer users handle many non-computer tasks, e.g. one can scan into the computer a magazine article which the computer will then read aloud. Magnification programs which enlarge the text and images on the screen are available as standard fare in most computers for computer users in the presbyopic age and these can be modified for use by those afflicted by low vision.

As alluded to earlier, knowledge is power, and to apply this knowledge for those with poor vision can be gratifying. Perseverance on the part of the visually handicapped certainly can be rewarding both for the patient and the low vision services provider.

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Jehangir Durrani

Dysthyroid Orbitopathies

Qamar Farooq

Department of Ophthalmology, Rawalpindi General Hospital, Rawalpindi

ABSTRACT

Purpose: The study was designed to see the rates of various orbitopathies in thyrotoxicosis. NOSPECS classification system was followed.

Study Design: It was a multicentric simple cross-sectional study upon the new and old cases of thyrotoxicosis visiting randomly three different centers of twin cities (Rawalpindi and Islamabad) for diagnosis, treatment and follow-up, including all ages and both sexes.

Materials and Methods: Study population was 42 patients of thyrotoxicosis intersected at i) Eye department of Rawalpindi General Hospital (RGH), ii) Internal Medicine department of Pakistan Institute of Medical Sciences (PIMS), Islamabad and iii) Nuclear Medicine Oncology and Radiology Institute (NORI), Islamabad. Each patient underwent a complete ocular examination including slit-lamp examination, tonometry, funduscopy, color vision and measurement of proptosis by Hertel's exophthalmometer. NOSPECS classification was followed and every patient was categorized accordingly. Various signs of the disease were looked for and their rates calculated.

Results: In this study of 42 thyrotoxic patients from the three centers, 34 patients (81%) showed some sort of orbitopathy at the time of examination. Age range of the patients was 16 to 80 years with a mean of 36.88 years. Age distribution of the patients was bimodal showing higher numbers in 21 to 30 years and 41 to 50 years. Orbitopathy of low index was seen more commonly (67%) as compared to high index (14%). High index orbitopathy is more common in males and in older age groups. Of the various lid signs Kocher's, Dalrymple's, and von Graefe's were the most common. Proptosis of 3mm or more was encountered in 12% and diplopia from restrictive myopathy in 7% of the thyrotoxic patients. Optic nerve compression was present in 3 out of 42 (7%). Complete constellation of the disease was seen in 14%.

INTRODUCTION

Thyrotoxicosis is a systemic endocrine disorder wherein high serum T3 and T4, and suppressed TSH levels are present. It is mostly associated with Graves' disease¹ in which, in addition to other systemic features, orbitopathy is a marked feature. In Graves' orbitopathy (or thyroid associated orbitopathy as it is called) an autoimmune process underlies as suggested by the presence of various autoantibodies, e.g. antimicrosomal, antithyroglobulin and anti TSH-receptor antibodies². Orbital fibroblast is the target cell of these antibodies as it has been shown to possess a common autoantigen with TSH-receptor extracellular domain³. A supportive evidence to this comes from the study of Kahaly and co-workers which shows that orbital fibroblast of thyrotoxic patients is a stimulant to co-cultured lymphocytes leading to their marked proliferation as compared to the normal controls⁴. Tear protein profile of thyrotoxic patients has

been found to be abnormal, having higher levels of superoxide dismutase especially manganese superoxide dismutase^{5,6}. There is evidence of increased number of macrophages/mm², reduced number of HLA-DR-bearing cells and a decreased number of CD8+ T cells in orbital tissue of thyrotoxic patients as compared to normals⁷. Similarly, relative number of B-lymphocytes was found to be elevated in thyrotoxic patients in the study of Kazanavichius and co-workers⁸. All these findings show an underlying immunological process.

The primary site of involvement of orbital tissues in this inflammatory process is the endomysial fibroblast which being stimulated by the process starts producing excessive amounts of glycosaminoglycans, i.e. hyaluronic acid. Deposition of this hydrophilic ground substance causes fluid retention in the extracellular compartment of osmotic force. This increases the tissue tension,

which leads to soft tissue congestion, proptosis and optic nerve compression. With the resolution of inflammation hyaluronic acid production is replaced by collagen, thus causing contractures. This results in restrictive myopathy and lid retraction. As a result of sympathetic overactivity encountered in thyrotoxicosis, Muller's muscle hyperactivity also contributes to the lid retraction.

The study aimed at measuring the rates of various orbitopathies in known thyrotoxicosis cases, visiting randomly for their treatment, follow-up or laboratory diagnosis at Rawalpindi General Hospital (RGH), Pakistan Institute of Medical Science (PIMS), Islamabad and Nuclear Medicine, Oncology and Radiotherapy Institute (NORI), Islamabad.

The purpose of this study was to determine the rates of various orbitopathies in thyrotoxicosis patients at three centers, cross-sectionally and randomly, according to NOSPECS classification system. Similarly various lid signs described in the literature were looked for to see which ones were more common. This study also categorizes the orbitopathies into low and high indexes and their relative occurrences. Age- and sex-adjusted rates of overall orbitopathies and high index orbitopathies are also accounted for.

MATERIALS AND METHODS

Thyrotoxic patients of this study were collected from three places:

- i. **Eye department of RGH, Rawalpindi.** The patients referred from Medical and Surgical departments of the same hospital for ocular/orbital examination were also included, provided they fulfilled the criteria. Although there are no published data regarding the incidence of thyrotoxicosis at RGH, however, five thyrotoxic patients visit the hospital per month, on an average.
- ii. **Internal medicine department of PIMS, Islamabad.** The endocrinology unit of this hospital is a large consultation and treatment center for thyrotoxicosis and on an average seven thyrotoxic patients visit this hospital for treatment and follow-up in a month.
- iii. **NORI, Islamabad.** This is a diagnostic and radiotherapeutic center having a vast

catchment area for various disorders including thyrotoxicosis. On an average ten thyrotoxic patients, new and old, can be seen in this institute per month.

The study included new as well as old cases of thyrotoxicosis, which were on treatment or just visiting for follow-up. All age groups of both sexes were studied.

Exclusion Criteria

Patients having old contractures from physical, chemical, thermal or surgical trauma were excluded. Those having preexisting corneal opacities from traumatic/microbial ulcers as well as those having glaucomatous disc changes were also excluded from the study.

After having confirmed the diagnosis of thyrotoxicosis, every patient underwent ophthalmological examination according to the following protocol:

1. Chronology of the current disease which was measured from the time of appearance of the relevant symptoms of thyrotoxicosis.
2. History of ocular complaints like photophobia, lacrimation, redness, visual deterioration and diplopia, appearing within 18 months of thyrotoxicosis.
3. Visual acuity testing by Snellen's test types.
4. Colour vision testing.
5. Ocular movements
6. Following lid signs were specifically checked for: Kocher's, Dalrymple's, von Graefe's, Boston's, Griffith's, Mean's, Rosenbach's, Stellwag's, Joffroy's, Sainton's, Gifford's Enroth's and Grove's signs (Explanation of signs vide infra)
7. Direct and consensual pupillary light reflexes.
8. Direct and indirect ophthalmoscopy.
9. Slit-lamp examination including applanation tonometry by Goldmann tonometer and differential tonometry where restrictive myopathy was present.

10. Forced duction test if ocular movements showed restriction.
11. Automated perimetry in cases of optic nerve compression.
12. Exophthalmometry by Hertel's exophthalmometer.

Explanation of Various Lid Signs

- a. **Dalrymple's.** It is lid retraction in primary gaze.
- b. **Kocher's.** It is a staring and frightened appearance on far fixation.
- c. **von Graefe's.** It is the upper lid lag on downgaze.
- d. **Boston's.** It is jerky irregular movement of upper lid on downgaze.
- e. **Griffith's.** It is lower lid lag on upgaze.
- f. **Mean's.** It is globe lag on upgaze
- g. **Rosenbach's.** It is tremors of closed eyes.
- h. **Stellwag's.** It is infrequent blinking.
- i. **Joffroy's.** It is absence of forehead wrinkling on upgaze.
- j. **Sainton's.** It is delayed forehead wrinkling on upgaze.
- k. **Gifford's.** It is difficulty in everting upper lid.
- l. **Jellinek's.** It is increased pigmentation of lids.
- m. **Enroth's.** It is puffiness of lids.
- n. **Grove's.** It is increased resistance to the downpull of upper lid in full downgaze position.

The study included 42 thyrotoxic patients of all ages visiting the above mentioned centres. Every patient possessed necessary laboratory investigations for confirmation of thyrotoxicosis, of present or past origin.

After undergoing ophthalmological examination, every patient was awarded a class according to NOSPECS classification system, according to which:

- Those having no signs or symptoms of thyrotoxicosis were classed as N.
- Those showing only lid signs were assorted in class O.

- Those having soft tissue involvement as S.
- Those with proptosis of 3mm or more as P.
- Those complaining of diplopia as E.
- Those having findings of corneal exposure as C.
- Those with visual deterioration from optic nerve compression as V.
- And patients with multiple findings of different categories were named by uniting the symbols e.g. OS, OSP, SPEC, PEC, etc.

Class O and S were grouped as low index orbitopathy, while PECS and/or any combination of these last four classes were taken as high index orbitopathy because of the presence of potential visual threat.

RESULTS

Out of 42 thyrotoxic patients 34 (81%) were showing some sort of orbitopathy. Although females were seen more commonly than males both in thyrotoxicosis as well as orbitopathies, in age-and sex-adjusted rates male thyrotoxics were found to be more prone to show orbitopathies than females (males: 13 out of 15; females: 21 out of 27). No signs or symptoms were seen in 2 out of 15 males (13%), and 6 out of 27 females (22%). (Table-1).

Table-1: Sex-Specific Orbitopathy Rates in 42 Thyrotoxic Patients.

	Total	Orbitopathy		No Orbitopathy	
		No. of Patients	%	No. of patients	%
Thyrotoxics	42	34	81	8	19
Male	15	13	87	2	13
Female	27	21	78	6	22

Lid signs checked in 42 thyrotoxicosis patients were present in the following percentages:

Kocher's (60%), Dalrymple's (57%), von Graefe's (55%), Rosenbach's (36%), Enroth's (36%), Mean's (24%), Stellwag's (12%) Boston's (7%), Joffroy's (5%), Grove's (5%) and Griffith's (5%), (Table-2).

Table-2: Relative Percentages of Lid Signs in Thyrotoxicosis.

	No. of Patients	Percentage
Total thyrotoxics	42	100
Dalrymple	24	57
Kocher	25	60
von Graefe	23	55
Rosenbach	15	36
Boston	3	7
Means	10	24
Enroth	15	36
Stellwag	5	12
Joffroy	2	5
Grove	2	5
Griffith	2	5

Thus Kocher's, Dalrymple's and von Graefe's signs were relatively persistent in thyroid orbitopathy.

Soft tissue involvement was present in 15 out of 42 patients (36%).

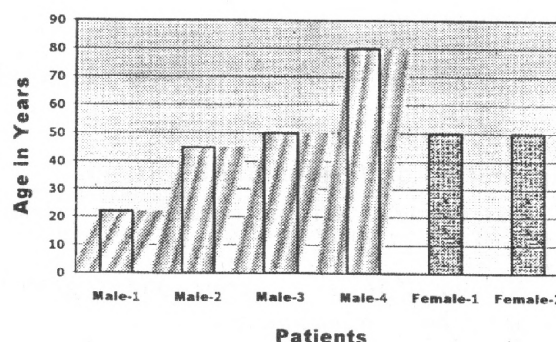
Proptosis was present in 5 out of 42 patients (12%) and was bilateral in 60% of the cases (3 out of 5).

Restriction of elevation was found in 3 out of 42 patients at the time of examination. Differential IOP in upgaze was found to be 6mmHg higher than that in the primary gaze and forced duction test was positive for down movement in these patients.

Slit-lamp examination revealed corneal stippling in 14% (6 out of 42), (Table-3).

Table-3: Rates of Components of NOSPECS.

	No. of Patients	Percentage
Total Thyrotoxics	42	100
N	7	17
O	33	79
S	15	36
P	5	12
E	3	7
C	6	14
S	3	7

Age Distribution Of High Index NOSPECS

Graph (Table-4)

Relative afferent pupillary defect and colour vision defect were present in 3 out of 42 (7%) patients and ophthalmoscopy revealed disc pallor consistent with optic nerve compression in these patients.

Of the 42 thyrotoxic patients 28 (67%) showed orbitopathy of low index only, which means presence of lid signs with or without soft tissue involvement.

Orbitopathy of high index (being PECS or any of its components) was present in 14% (6 out of 42). It was mostly in older age group, i.e. 45 years or above (5 out of 6) and males were more often affected than females in age- and sex-adjusted rates (Males: 4 out of 13; Females: 2 out of 21), 31% and 10%, respectively, (Table-4).

Complete constellation of the disease (SPECS) was seen in 6 out of 42 patients only (14%).

Considering the age brackets the following interesting observations were made (Table-5):

10-20 Years: A total of 3(7%) thyrotoxic patients fell in this age group and 2 out of them were having orbitopathy of low index.

21-30 years: 14 out of 42 belonged to this age group contributing a major proportion to the population of the study (33%). Most of them (78.5%) were having orbitopathy of low index.

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OSP News

OSP Research Foundation

CALL FOR RESEARCH PROPOSALS FOR GRANTS-IN-AID

Applications are invited by the OSP Research Foundation for financial grants for research projects in basic and clinical aspects, Corneal disease, glaucoma and Eales' disease being quite common in Pakistan are the suggested topics. Ocular complications of diabetes, retinitis pigmentosa and cataracts may be some other topics of research. The applicants are requested to submit, **in triplicate** a synopsis of the research plan, along with a description of the existing infrastructure and other resources to carry out the project, to:

Prof. Jehangir Durrani
Chairman, Technical Committee
OSP Research Foundation
Shaikh Zayed Hospital
Lahore-54600.

Intraocular Tuberculosis: "A Three-Year Study"

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ABSTRACT

Intraocular tuberculosis can have a varied presentation. The diagnosis may be difficult because intraocular tissues are not readily available for histopathology and culture. Moreover, it may or may not be associated with systemic tuberculosis. When intraocular disease coexists with systemic disease, the diagnosis of intraocular disease is greatly facilitated owing to clinical evidence. But when intraocular disease is not associated with clinically detectable systemic disease then it becomes a challenge for the ophthalmologist to establish a diagnosis of intraocular tuberculosis. A large number of investigations are available in this regard but most of them provide indirect evidence, and diagnosis of intraocular tuberculosis is often presumed. Some of these investigations are readily available in most hospitals, while others, such as intraocular biopsy, are performed only at specialized centers. The objectives of our study included evaluation of those investigative procedures which are readily available and to judge their efficacy in helping to establish a diagnosis of intraocular tuberculosis. Furthermore, the various clinical presentations of intraocular tuberculosis have also been reviewed. In a series of 105 patients with uveitis, 18 were presumed to have a tuberculous etiology. Out of these, 10 patients had choroidal tubercles and this was the commonest ocular feature in our study. Six patients had periphlebitis retinae, while two showed granulomatous anterior uveitis. Various investigations were used in support of the diagnosis, which provided indirect evidence of intraocular tuberculosis. Except for two, all patients responded well to therapy. In all cases the diagnosis was presumptive since we had no facility for taking an intraocular biopsy.

INTRODUCTION

Tuberculosis is still a common disease in the third world. In Pakistan it tends to occur early in life and figures as high as 68% and 71% have been reported in the 15-19 years age group with the overall infected population being 54% and 60%, respectively¹. The initial infection usually occurs in the lungs or alimentary tract although any organ may be involved, the eyes being no exception. Any part of the eyeball and adnexa may be involved but this study is limited to intraocular tuberculosis only.

Intraocular presentation of tuberculosis usually takes the form of uveitis or perivasculitis. Uveitis has a variety of causes and tuberculosis is one of them. In a country like Pakistan where tuberculosis is so prevalent, it should be high on the list of differential diagnosis, whenever a case of uveitis or perivasculitis is encountered. An important reason for this is that this is one of the few uveitis entities amenable to treatment by

specific medication. The mainstay of treatment in a large variety of uveitis entities are steroids. This fact makes the diagnosis of intraocular tuberculosis important as treatment with steroids alone may aggravate the disease if anti-TB drugs are not given concurrently. But the problem of diagnosis is a complex one because intraocular tissues are difficult to obtain for histopathology. Thus establishing the disease must be based upon indirect evidence plus clinical appearance on examination.

Pathology of Intraocular Tuberculosis

In the third world tuberculosis is a relatively common cause of ocular disease, in one series accounting for 30% of cases of uveitis². The decline in the incidence of systemic tuberculosis in the West resulted in reduced emphasis on the diagnosis of intraocular disease by ophthalmologists.

Intraocular tuberculosis occurs as a part of a post-primary infection. Clinically it can be due to

direct infection or due to indirect (hypersensitivity) mechanisms.

1. *Direct Infection*

"Direct" refers to the live organism causing ocular disease. The route of entry into the globe is thought to be the blood-borne spread from a tuberculous focus, diagnosed or occult, elsewhere in the body². An example of this would be choroidal tubercles which occur in miliary tuberculosis from hematogenous spread.

2. *Indirect Involvement*

The pathogenesis of indirect involvement is based on hypersensitivity and immunological mechanisms but they are not completely understood. Intraocular conditions included in this category are uveitis and retinal vasculitis. Retinal vasculitis has frequently been associated with tuberculosis owing to circumstantial evidence. However, it is still not known whether the retinal vasculitic lesions contain active bacilli or reflect a hypersensitivity response.

Clinical Features of Intraocular Tuberculosis

The intraocular presentation of tuberculosis can be in the following ways:

1. Uveitis
2. Retinal vasculitis
3. Uncommon presentations

1. *Uveitis*

Any part of the uveal tract may be involved though the choroid appears to be particularly predisposed to infection³. The disease may manifest in the form of an endogenous infection or a hypersensitivity response to tuberculoproteins.

a. *Infective Iridocyclitis*

The metastatic granulomatous type occurs in a miliary and a solitary form. In the miliary type there is a yellowish white nodule surrounded by numerous smaller satellites usually situated near the papillary or ciliary margin. This type of picture develops in severely debilitated patients with impaired immune system and massive dissemination of bacilli.

b. *Exudative Iridocyclitis*

This is probably allergic in nature⁴. It is a chronic and recurrent process with large mutton-fat keratic precipitates and occasionally minute nodules on the iris surface.

c. *Tuberculous Choroiditis*

The choroid has greater blood supply and more reticuloendothelial cells than other portions of the eye and thus has a greater chance of becoming infected. Choroidal tuberculosis may be the first and sometimes the only evidence of dissemination. Both eyes are often involved. Choroiditis can occur in the miliary and chronic forms of the disease. Miliary tubercles are formed in acute miliary tuberculosis and especially in tuberculous meningitis. Ophthalmoscopically they appear as round, pale yellow spots. Histologically they consist of caseating granulomas. Although they can be present in any part of the choroid, a predilection is seen for the area around the optic disc. The symptoms are principally visual defects due to the retinal lesions and clouding of the vitreous.

2. *Retinal Vasculitis*

This usually takes the form of periphlebitis retinae. It is most probably due to a hypersensitivity response of the retinal vessels to tuberculoproteins. Clinical presentation is in the form of repeated haemorrhages into the vitreous. The disease commonly affects young adults in the form of a retinal vasculitis which leads to vaso-obliteration, hypoxia, neovascularization, repeated bleeding and fibrous proliferation which may cause retinal detachment and secondary glaucoma.

3. *Uncommon Presentations of Intraocular Tuberculosis*

- a. Tuberculoma of the ciliary body⁵.
- b. Tuberculous panophthalmitis⁶.
- c. Choroidal tubercles following transplant of infected kidney⁷.
- d. Isolated choroidal granuloma⁸.

Table-1 is helpful in differential diagnosis of intraocular tuberculosis.

Table-1: Differential diagnosis of intraocular tuberculosis

Diseases presenting as retinal vasculitis	
Sarcoidosis	Behcet's disease
Syphilis	Pars planitis
Diseases presenting as anterior uveitis	
<i>Granulomatous</i>	
Sarcoidosis	Leprosy
Syphilis	Toxoplasmosis
Vogt - Koyanagi - Harada Syndrome	
<i>Nongranulomatous</i>	
Juvenile Chronic Arthritis	
Behcet's Disease	
Herpes Zoster	
Fuchs' Uveitis Syndrome	
Diseases presenting as posterior uveitis	
Presumed Ocular Histoplasmosis Syndrome	
Birdshot Retinochoroidopathy	
Acute Posterior Multifocal Placoid Pigment Epitheliopathy	
Punctate Inner Choroidopathy	
Choroidal Sarcoid	
Toxoplasmosis	
Multiple Evanescent White Dot Syndrome	
AIDS	

PATIENTS AND METHODS

The patients included in this study were those who reported sick at the departments of ophthalmology at C.M.H., Attock and C.M.H., Kharian over a three-year period, from 1993 to 1996. Since the Armed Forces consist of people from all parts of the country, therefore, patients of different ethnic groups and ages were available for the study. Most of the patients were those who presented with visual complaints primarily on an outpatient basis. Some of the patients were referred from other specialists either for visual symptoms or to exclude ocular involvement in established systemic tuberculosis. All patients were classified into one of the following groups:

1. Presumed intraocular tuberculosis with established systemic tuberculosis.
2. Presumed intraocular tuberculosis with indirect evidence of systemic tuberculosis.
3. Presumed intraocular tuberculosis with no evidence of tuberculosis elsewhere.

The patients who were investigated on an outpatient basis were advised to come for regular follow-ups. Those who failed to do so were excluded from the study.

Visual Acuity

Best-corrected visual acuity was recorded in every case, in each eye individually.

Slit-lamp Biomicroscopy

Anterior segment examination was carried out by means of a slit-lamp. Particular attention was paid to the inflammatory reaction in the anterior chamber (AC) and the presence of iris nodules.

Intraocular Pressure

The intraocular pressure (IOP) was measured by applanation in every case. Eyes showing elevated IOPs were also subjected to gonioscopic examination.

Ophthalmoscopy

Direct and indirect ophthalmoscopy were performed as a routine procedure with special emphasis on vitreous activity and inflammatory lesions in the fundus as a whole.

General and Systemic Examination

Special reference was made to the examination of the chest, lymph nodes, abdomen and the general health of the individual. Any circumstantial evidence during examination was given due weight.

Mantoux Test

This test was performed in every patient where intraocular tuberculosis was suspected. Initially the weakest strength, i.e., one tuberculin unit (T.U.) was used. In the case of a negative response, higher strength of tuberculin was used, i.e. >5 T.U. Interpretation of Mantoux test is different in different parts of the world. In the Western countries a dermal reaction even less than 10mm after 72 hours is considered significant⁹. In our study a dermal reaction not less than 15mm was considered significant when associated with uveitis. A reaction of more than 20mm was given special importance. Reactions between 10-15mm were interpreted with caution in association with clinical findings and results of other investigations. Also, in patients who had received BCG vaccine in the past, a positive skin test was interpreted with caution.

X-ray Chest

This was performed without exception in every individual who was included in the study and radiological findings were also carefully recorded as circumstantial evidence.

Blood Test

Complete blood picture and ESR were performed in each case. In cases of raised ESR it was looked into whether the rise was due to anemia or not. In some cases ELISA test for toxoplasmosis was also performed. VDRL was performed in suspected cases.

Tests for Acid Fast Bacilli

Microscopy and culture of tissues and body fluids were performed whenever they were required and as the situation dictated. These tests included the following:

1. Sputum for AFB
2. Gastric aspirates for AFB
3. Urine R/E and culture.
4. Faecal culture

Therapeutic Test

In a few patients in whom ocular findings were strongly suggestive of T.B. but with no evidence of systemic disease, a two-week trial of antituberculous drugs, i.e. isoniazid and rifampicin was given as an investigative procedure.

RESULTS

During the three-year period in which this study was carried out, a total of 105 patients with uveitis were recorded. Out of these only 18 were diagnosed as presumed intraocular tuberculosis with a fair degree of certainty according to the criteria which we had established. In the remaining cases a tuberculous aetiology could not be ascertained. Thus, 17.1% of the total uveitis cases seen were presumed to be tuberculous in origin. Although a limited number of uveitis cases were seen, our study shows that tuberculosis is not an uncommon cause in Pakistan. This is in contrast to a study carried out in the U.S.A. in which the overall incidence of uveitis from T.B. was 1.4% in a series of 10,542 patients with uveitis², while in a study carried out in India, 30% of uveitis cases were diagnosed to be of tuberculous origin¹⁰.

Among the 18 cases in our study, 14 were males between the ages of 20 and 65 years, while there were 4 females between the ages of 20 and 50 years.

Anterior Uveitis

2 out of 18 (11%) patients presented as anterior uveitis which was unilateral and both cases showed iris nodules. There was no detectable posterior segment involvement. Mantoux was strongly positive and chest X-ray showed healed calcified foci. AFB could not be isolated from the sputum.

Choroidal Tubercles

10 out of 18 cases (56%) presented with choroidal tubercles. In all 10 cases the lesions were bilateral. Nine out of ten cases showed definite findings in the chest with sputum being positive for AFB, while in one case the diagnosis of choroidal tubercles was made because of a very favourable response to a combination of isoniazid and rifampicin over a 3-week trial period. This particular case was a female aged 21 years in whom the only positive finding was a Mantoux test of 26mm after 72 hours with the weakest strength of tuberculin along with lesions resembling choroidal tubercles but no evidence of systemic disease. She had not received BCG vaccine. Choroidal tubercles in the absence of apparent systemic disease have been reported in the literature¹¹.

Periphlebitis Retinae

6 out of 18 (33%) cases presented as periphlebitis retinae and the lesions were bilateral in all these cases. Four of these cases showed a mild anterior uveitis, while the remaining two did not show any anterior segment signs. Three of the patients had bilateral macular edema, while in two cases only one eye was involved. In the sixth case there was a dense vitreous haemorrhage and no fundus details were visible. In 2 cases, chest X-ray showed apical consolidation and tubercle bacilli were cultured from their sputum. In the remaining 4 the diagnosis was suspected because of circumstantial evidence, i.e. an exaggerated response in Mantoux test and a high E.S.R.

All 18 cases showed a cellular vitreous infiltrate.

Response to Treatment

Out of 18 patients, 16 showed a satisfactory response to antituberculous treatment. However, 2 of these sixteen cases developed pigmentary scars in the macular area with significant deterioration of central vision. Two patients did not respond to treatment. They had periphlebitis retinae and did not benefit from laser photocoagulation. Ultimately they lost vision due to repeated vitreous haemorrhages, neovascular glaucoma and tractional retinal detachment.

DISCUSSION

The incidence of tuberculosis in the western world has declined. In the U.K 80,000 notifications were made in 1914 which reduced to 7,500 in 1982¹². But in the third world countries it is still widely prevalent and is a significant cause for morbidity and mortality. Since the disease has multiple presentations it may not present in its classical form to the physician or the ophthalmologist and it may not be included in the differential diagnosis of intraocular disease process.

Our study was an attempt to highlight the various modes of presentation of intraocular tuberculosis and the sequence which should be followed to establish a diagnosis. Our figures are not representative of national statistics, considering the small scale of the study, but it does show that a significant number of uveitis cases were presumed to be tuberculous in aetiology as compared to the western world studies, i.e. 17.1% in our study as compared to 1.4% in a USA study. In a similar study carried out in the Netherlands, tuberculosis accounted for 1.8% of cases with uveitis¹³. So although in the western world a reduced emphasis is given on such a diagnosis, ophthalmologists in Indo-Pak Subcontinent and other third world countries cannot ignore tuberculosis in the differential diagnosis of a case of uveitis.

The diagnosis of intraocular tuberculosis is usually presumptive. This is because in order to make a definitive diagnosis, one must isolate tubercle bacilli directly from the eye. This requires sophisticated equipment which was not available to us. Hence all the diagnoses made in our study were presumptive and based on circumstantial evidence.

The *commonest* presentation of intraocular tuberculosis encountered in our study was in the form of choroidal tubercles. This is in contrast to a study carried out in the UK in which the most

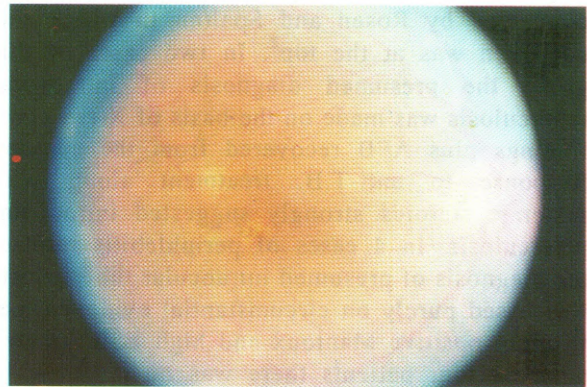


Fig-1: Choroidal tubercles. This patient, a man aged 60 years, presented with a visual acuity of 6/60 in his right eye. Vision improved to 6/6 uncorrected after 3 months on steroids and isoniazid + rifampicin.

common presenting lesion was retinal vasculitis. Except for one, in all our cases the choroidal tubercles were associated with some evidence of systemic involvement, e.g. X-ray findings etc, thus highlighting the fact that whenever a fundus lesion simulating choroidal tubercles is encountered, a chest radiograph must be taken which would support a presumptive diagnosis (Fig.1). In one case with choroidal tubercles there was no clinically detectable focus of systemic tuberculosis. Since there was indirect evidence in the form a high ESR and an exaggerated response to tuberculin, the patient was given a trial of anti-T.B. drugs. This step was both diagnostic as well as therapeutic. Here one may argue that in a country like Pakistan where tuberculosis is so prevalent, a large proportion of the population would have been subclinically exposed to tuberculoproteins, hence the validity of Mantoux test is doubtful. It must be noted that *it is not only the positivity of the Mantoux test which is important, but it is also important to note how*

exaggerated the response is, as a patient with a tuberculous focus in the body will give a strongly positive response¹⁴. Moreover, we must correlate different observations, such as presence of choroidal tubercles associated with strongly positive Mantoux, high ESR, no history of BCG vaccination in the past. Such a situation would justify a trial of anti-T.B. drugs and favourable response to this would almost confirm the diagnosis, although indirectly.

The *second most common mode of presentation* in our study was periphlebitis retinae, which is in contrast to the study conducted by Rosen and Spalton in which this condition was at the top². In two cases of this group the presumed diagnosis of intraocular tuberculosis was made on the basis of X-ray chest findings plus AFB recovered from the sputum. Response to anti-T.B. treatment along with systemic steroids strongly suggested intraocular tuberculosis. In 4 cases of periphlebitis retinae, the diagnosis of presumed intraocular tuberculosis was based purely on circumstantial evidence, i.e. strongly positive Mantoux and high ESR. In two of these four patients there was no response to treatment. Here it can be argued whether it was justified to label these cases as presumed intraocular tuberculosis. The periphlebitis could be of some other aetiology, perhaps sarcoidosis, although a strongly positive Mantoux and X-ray chest clear of lesions would probably go against sarcoidosis. The patients could have been showing reactivity to tuberculin simply because of living in a TB endemic society with repeated subclinical exposures to tuberculoproteins. Still another possibility is that the disease could have been resistant to the drug used, since in our study we did not change the regimen from case to case. Under such circumstances probably the only way to confirm the diagnosis would have been to take an intraocular biopsy and isolate AFB from the involved tissues. Despite all these pitfalls, in societies where tuberculosis is endemic, tuberculous aetiology should be suspected in the presence of marked retinal vasculitis associated with cellular vitreous infiltrate².

The *third most common presentation* of presumed intraocular tuberculosis in our study was an anterior uveitis. These patients presented with the typical appearance of granulomatous anterior uveitis. Although AFB could not be obtained from their sputum, they showed

radiological evidence of past infection in addition to a strongly positive Mantoux test. They responded very well to treatment. This again emphasizes the importance of associating circumstantial evidence with clinical signs of ocular disease.

It is also important to stress that intraocular tuberculosis may present in uncommon modes e.g. isolated granuloma of the ciliary body, isolated choroidal granuloma and endophthalmitis⁶. Hence one should have a high index of suspicion when on the lookout for intraocular tuberculosis. It is obviously important to exclude other causes of ocular inflammation at the same time while looking closely for evidence of systemic tuberculosis.

The presence of active or inactive tuberculous infection elsewhere in the body does not prove intraocular tuberculosis. Hence all cases in our study were "presumed" to have intraocular tuberculosis.

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Ophthalmic "Pastpourri"

Noguchia Granulosis

The Story of a Great Discovery that was Not to Be

WHEN the American Medical Association Section on Ophthalmology met in Washington, D.C., on Wednesday afternoon of May 18, 1927, the regular order of business was suspended. This unusual action was taken to allow Dr. Hideyo Noguchi of the Rockefeller Institute for Medical Research to address the section on his discovery in cases of trachoma of a microorganism with which he produced lesions in monkeys that resembled some types of human trachoma.

That Noguchi had isolated what he believed to be the inciting microorganism of trachoma in man and its equivalent, granular conjunctivitis in monkeys, was not a secret to many of the section members. Two days before, on May 16, he had made a public announcement of his discovery before the Section on Ophthalmology of the New York Academy of Medicine. Prior to this meeting Noguchi, seeking confirmation of his work by practicing ophthalmologists, had invited five of the most prominent to his Rockefeller Institute laboratory. There he showed them his inoculated monkeys. All agreed that judged by their clinical appearance, these animals had trachoma. Then followed an examination of sections of the inoculated monkeys, some showing scar-tissue formation. The men were then shown the microorganism he had isolated and named *Bacterium granulosis*. Noguchi had begun this phase of his work on trachoma only a year before at the instigation of Francis I. Proctor, M.D.

Jehangir Durrani
MD, FACS, FRC OPHTH

Synder C. Our Ophthalmic Heritage. Little, Brown and Company. Boston. 1967;p 117

CASE REPORT

Management of a Partially Sighted Patient with Low Vision Aids

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INTRODUCTION

With an increasing lifespan there is an increase in the requirements and demands for the partially sighted patients.

"A person with partial sightedness is one who has impairment of visual function even after treatment and/or standard refractive correction, and who has visual acuity of less than 6/18 to light perception, or a visual field of less than 10 degrees from the point of fixation but who uses, or is potentially able to use, vision for planning and/or execution of tasks¹.

Low Vision Aids, which are special optical devices, can help a person with severe visual impairment to make life comfortable. The use of these devices needs patient motivation, skill and determination. The following case report gives a brief idea about the management of visually handicapped patients by means of Low Vision Aids and shows how quality of life can be improved for a partially sighted person.

CASE REPORT

A 20-year-old college-going man was referred to low vision clinic of Al-Shifa Trust with the complaint of decreased visual acuity in both eyes for distance and near. His main problem was inability to read from blackboard and books.

OPHTHALMIC EXAMINATION

The patient had history of bilateral congenital cataracts. His right eye was operated on at the age of 1 year and the left eye at the age of 2 years. Secondary IOL was implanted in the right eye 15 years after cataract extraction.

Following were the findings on clinical examination:

VA OD 6/60 (-2.00/-1.50 x 180)
VA OS 6/36 (+10.00DS)
N.V. OD 3M (N-24) (At optimum distance-10 cm)
N.V. OS 2.5M (N-20) (At optimum distance-10 CM)

On cover test the patient was an alternating exotropia with right dominant eye along with dissociated vertical divergence (DVD). Jerk nystagmus was present in the left eye on right gaze, which reduced very much with distance optical correction. Extraocular movements were normal. On slit-lamp examination the patient had left updrawn pupil and a small membrane superotemporally in the right eye. On posterior segment examination the patient had bilateral vitreous degeneration. Optic discs and maculae were normal.

Concept of mono-vision was applied to improve the vision in this patient. The patient was advised aphakic correction (+10.00) and 4X Galilean telescope (spotting) for distance vision in the left eye. The visual acuity after aphakic correction in the left eye improved from 1/60 to 6/36. Adding 4X Galilean telescope improved the visual acuity to 6/9. In his right pseudophakic eye, he was advised +10.00 DS for near vision (0.8M/N6) at 10 cm. Now the patient uses +10.00 DS for both eyes. Left eye is used most of the time for distance and the telescope in the same eye provides further enhancement of distance vision when required (e.g reading blackboard, signboard etc), while the right pseudophakic eye is used for near vision. Cosmetically his glasses are acceptable. The latest follow-up at the end of six months is very encouraging and the patient is quite comfortable.

DISCUSSION

In many developed countries, low vision is a manageable condition to a great extent. In developing countries like Pakistan, it remains

neglected and easily overshadowed by high priority conditions like cataract and trachoma. Low vision is not just a medicosocial problem; it is also an economic issue in terms of lost productivity, especially when rehabilitation can be accomplished so inexpensively². The education, employment prospects, independence and quality of life of a person can be improved by enhancing vision with the help of low vision aids.

Congenital cataract is one of the leading causes of blindness in children, accounting for 15 to 20 % of students in schools for the blind³. Approximately one-third of congenital cataracts are inherited, one-third are associated with other disease syndromes and one-third are due to undetermined causes³. In Pakistan cataract is the commonest cause of severe visual impairment and blindness in children (27%). A study carried out at pediatric ophthalmology unit of Al-Shifa Trust Eye Hospital⁴ has found that heredity and trauma are the two most common factors for congenital cataract (20% and 19%, respectively). The intrauterine and perinatal causes each contributed 2%.

Congenital cataract surgery should be undertaken as soon as possible to minimize vision deprivation amblyopia, which is the commonest cause of poor vision in the majority of patients with congenital cataract⁵. There are several reasons for the development of amblyopia:

- Poor surgical techniques.
- Delayed surgery
- Delayed optical correction after surgery.

Cataract extraction is now being done on children as young as a few days old⁶. Hoyt suggests that in dense congenital cataract the surgical and optical correction should be completed by 4 months of age⁷. If one waits until 6 months of age 20/200 vision may be the best attainable. Equally important is the prompt optical correction of aphakia.

Most patients with congenital cataract will have low vision even after amblyopia therapy. Low Vision Aids can help them. These include:

- Optical Aids (stand magnifiers, hand-held magnifiers, high spherical additions, telescopes, etc).
- Nonoptical Aids (reading stands, lighting adaptation, P-caps, protective glasses, etc.)

- Electronic Aids (talking watches and calculators, easy readers, CCTV (closed circuit television), computers, OCR (optical character recognition) software, etc.

Optical devices (stand magnifiers, hand-held magnifiers, high spherical additions, telescopes, etc.) play a key role in enhancing the vision of these patients. Studies carried out in East Africa⁸, South America⁹, and West Africa¹⁰ indicate that approximately half of the children who have low vision show an improvement in distance and/or near vision with the help of Low Vision Aids.

Another system to help the patients with low vision is the concept of mono-vision, which so far has been mostly used in contact lens patients. It is the easiest and one of the most effective ways to improve vision. One eye is corrected for distance and the other eye for near vision¹¹. It has been used very rarely in low vision patients when SVI (Severe Visual Impairment) is equal in both eyes. In most of the patients with low vision, mono-vision concept is not applicable because of resulting high anisometropia and its associated problems.

This patient gave us a unique opportunity to use the concept of mono-vision in case of low vision because of preexisting anisometropia. The left aphakic eye was corrected with +10.00 DS and a telescope for distance vision, while the right pseudophakic eye was corrected with +10.00 DS for near vision. This made the patient utilize both his eyes for distance and near vision alternately without the need of changing from one to the other pair of glasses.

Key factors in mono-vision correction include patient's motivation, patient selection and his requirements. One way to motivate the patients as well as to screen them for successful mono-vision is called the demonstration technique¹². The patient is fitted with prescribed glasses in both of his eyes. He is then asked to focus on different objects, for distance and near. If he feels comfortable and is convinced, then the glasses are prescribed.

The preceding case report shows that correctly prescribed optical devices can be of significant benefit to the patients with low vision, especially the children. However, early

identification of children with congenital cataracts, followed by surgery in the hands of an experienced ophthalmologist and regular follow-up to manage refractive error and amblyopia should be an important and integral part of any prevention of blindness programme. In view of the above there is need for developing facilities for production of affordable LVD (low vision devices) using appropriate technology. Even the partially sighted have a right to see better.

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Ophthalmic "Pastpourri"

Noguchia Granulosis

Dr. Proctor's Concern About Trachoma in the U.S Indians

Versions of the story of Proctor and Noguchi read, in part, like some of the more breathless chapters of Sinclair Lewis' *Arrowsmith*. Francis I. Proctor, a Boston ophthalmologist, had retired to the southwest for reasons of family health. While there, he became deeply concerned with the trachoma problem of the Indians. Statistics he gathered showed that, of the 300,000 Indians in the United States, an estimated 30,000 had trachoma. Although staffed with a few dedicated doctors, the Bureau of Indian Affairs could do little; its total budget for all health needs of all the Indians was only \$500,000 a year.

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Synder C. Our Ophthalmic Heritage. Little, Brown and Company. Boston. 1967;p 117

Management of Involutional Entropion of the Lower Lid

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ABSTRACT

Purpose: To evaluate the efficacy of lower lid retractor plication in ensuring a permanent cure for involutional type of lower lid entropion.

Materials & Methods: This was a prospective study in a teaching hospital. One hundred sixty-four consecutive cases of involutional type of lower lid entropion with 84 males and 72 females (8 were bilateral) between the ages of 40-72 years were performed by a single surgeon (S.I.). They included 108 primary cases and 56 recurrent cases. All of them had lower lid retractor plication. The follow-up was between 6 months and 2 years.

Results: One hundred fifty-nine cases were fully corrected (97%). Five cases were overcorrected (3%). No recurrence was noted in any case.

Conclusion: Lower lid retractor plication is a simple surgical procedure which ensures a permanent cure in almost 100% of cases if performed carefully.

INTRODUCTION

Lower eyelid entropion is an eyelid malposition characterized by inversion of eyelid margin with secondary misdirection of eyelashes. If this is not treated early it can lead to severe ocular morbidity. It can vary in severity and in the early stages it may be intermittent; incipient entropion can be elicited by asking the patient to squeeze the eyelids tightly and look downward or by instilling a drop of Tetracaine into the eye which will precipitate entropion in patients who have a strong tendency. Also, in its early phase it may be misdiagnosed as simple trichiasis leading to inappropriate management. Trichiasis may, however, coexist.

Lower eyelid entropion is classified according to its aetiology into congenital, involutional, cicatricial and transient spastic types; involutional type being the commonest. This study discusses the management of the involutional type of lower lid entropion. Through the years there have been many surgical approaches to correct this type of entropion (Table-1), but they have attacked only one or two of the causative elements; these are stretching, atrophy or dehiscence of lower lid retractor complex, vertical mobility of the preseptal orbicularis muscle, atrophy of the tarsal plate and horizontal lid laxity (Table-2). As a result none of these procedures results in a 100% cure. We

describe a surgical technique which restores the normal structural integrity of the lower lid and results in a permanent cure.

Table-1: Historic entropion procedures

Anatomic Correction	Procedure
Vertical musculocutaneous shortening	Ziegler cautery
Horizontal lid tightening at lower tarsal border	Fox procedure
Barricading of orbicularis fibres	Weis and Jones procedures
Tightening of orbicularis fibres	Wheeler procedure
Repair/tightening of lower lid retractors	Jones procedure

Table-2: Mechanics of involutional entropion

Involved anatomical structure	Mechanism
Orbicularis muscle	Involution allows preseptal orbicularis to override pretarsal muscle.
Lower lid retractors	Laxity allows lower border of tarsal plate to rotate outwards.
Tarsal plate	Atrophy and loss of stiffness allows it to bend.
Horizontal lid laxity	Atrophy of orbicularis muscle, canthal tendons and tarsus; aggravated by relative enophthalmos due to orbital fat atrophy.

MATERIALS AND METHODS

For this study, patients were selected from the oculoplastic firm at a teaching hospital (Table-3). 164 consecutive cases (156 patients), 8 being bilateral, of involucional lower lid entropion were included. There were 108 primary cases and 56 recurrent cases who previously had Weis procedure in 24 cases, Wheeler in 14 cases, Fox pentagon in 7 and skin and muscle resection in 11 cases. No patients were included in the study with an element of horizontal lid laxity or cicatrization. The mean age of patients was 67.5 ± 7.4 yrs. (S.D.) with a range of 56-78 yrs.

Table-3: Patient assessment

1	Aetiology
2	Previous surgical treatment
3	Position of lower lids
4	Lower lid retraction
5	Horizontal lid laxity

All patients were managed uniformly by a lower lid retractor plication under infiltrative local anaesthesia. The surgery was performed by a single surgeon (SI). The patients were reviewed 1 week postoperatively and subsequently at 6 weeks, 6 months and 2 years postoperatively. The position of lower lid and any complications were recorded at each follow-up visit.

SURGICAL TECHNIQUE

The lower lid was infiltrated with 2 ml of 0.5% bupivacaine with 1:200,000 units of adrenaline mixed 50:50 with 2% lignocaine. A horizontal skin incision was made 5mm below the lash line extending from the lower punctum to the lateral canthus. Preseptal orbicularis muscle was separated from pretarsal orbicularis to expose the inferior edge of the tarsal plate. Next, the dissection was carried deep to the preseptal muscle to reach the inferior orbital septum which was divided to expose the lower lid retractor complex. It can be identified by the presence of orbital fat pad overlying it and if it is grasped with a pair of forceps and the patient is asked to look up, tension is felt in the complex. A 6/0 vicryl suture (double ended) was passed through the lower skin edge in the centre of the lid, through the retractor complex, through the lower border of the tarsal plate, and out through the

upper skin edge. This suture was tightened in a slipknot and its effect was noted on the lid margin which should be in apposition to the globe and should move normally in up and down gaze. If there was an undercorrection, the slipknot was untied and a proximal bite of the retractors was taken. However, if overcorrection was noted, a higher bite nearer to the tarsus was taken. Similarly, two sutures were applied medially and two laterally to the middle suture. The skin wound was closed with a few more interrupted vicryl sutures. A pressure dressing was applied for 24 hours. The patient was instructed to use an antibiotic ointment twice a day for 1 week. If any overcorrection was noted on the first postoperative visit, the vicryl sutures were removed at 1 week.

RESULTS

There were no perioperative complications. Only 87% of patients attended the 2-year follow-up visit and in them there was no recurrence (Table-4); the lower lid margin was normally apposed to the globe. Out of the remaining 13% who only attended the 6-month follow-ups, there was an overcorrection in 5 cases (3%); these were the cases in whom overcorrection was present on the first postoperative visit and had persisted.

Table-4: Results

	No.	Percentage
Fully corrected	159	97.0
Overcorrected	5	3.0
Recurrence	0	0.0
Total	164	100.0

DISCUSSION

In entropion, the lashes are directed towards the globe even though they themselves have a normal anatomical relationship with the eyelid margin. This also causes malpositioning of the Meibomian gland orifices and allows the eye to contact the keratinized epithelium of the lid margin. All these aspects of entropion cause progressive ocular irritation and resultant severe ocular morbidity in the form of punctate epitheliopathy, corneal abrasions, microbial keratitis and corneal scarring.

It is important to understand the pathogenesis and biomechanics of involucional entropion so as

to select a surgical technique that ensures a permanent cure. The underlying anatomic defects that have been implicated include an excessively vertically mobile preseptal orbicularis; these fibres bunch up and migrate superiorly forming a tight band of muscle tissue on the surface of the tarsus thus everting its lower border. Another important factor is laxity or disinsertion of the lower lid retractor complex which is responsible for the downward movement of the lower lid on downgaze. It consists of a sheet of fibrous tissue, which extends from the inferior rectus muscle sheath and runs forwards to the lower border of the tarsal plate accompanied by a few strips of smooth muscle in it, called the inferior tarsal muscle. The fibrous sheet is analogous to the aponeurosis of the levator muscle and the smooth muscle is analogous to the Muller's muscle. Laxity or disinsertion of this structure causes entropion in the same way as an aponeurotic weakness of the upper lid causes ptosis¹. The third factor implicated is atrophy of the tarsal plate which normally consists of dense fibrous tissue and forms the skeleton of the lids and stabilises the lid margin. As it atrophies, it bends under the influence of the other two forces already mentioned. In addition to these, involutional changes affecting the canthal tendons lead to a horizontal laxity of the lid which is aggravated by relative enophthalmos caused by atrophy of the orbital fat. Whether the lid turns in or out depends on other changes affecting the orbicularis muscle, the retractor complex and the tarsal plate.

A number of surgical techniques have been described to manage the involutional entropion of the lower lid (Table-1). These include vertical musculocutaneous shortening^{2,3}, horizontal tightening of lid at lower tarsal border⁴, barricading of orbicularis fibers^{5,6}, full-thickness resection of lid margin⁷. All these procedures correct only one or two factors responsible for the entropion; hence, recurrence occurs sooner or later. The best surgical technique would be the one which corrects all the causative factors (Table-2). The lower lid retractor plication⁸ is such a procedure, which corrects:

1. The overriding of orbicularis muscle by creating a scar tissue barrier between preseptal and pretarsal muscle fibres due to a transverse lid split.
2. The outward rotation of the lower border of

tarsal plate and inward bending of its upper border by tightening of the lower lid retractor complex and transferring its pull on the upper lid margin, thus everting it.

3. The bending of atrophic tarsal plate under the influence of the above-mentioned forces by transfer of pull of the retractor complex to its upper border.

Hence, the lower lid retractor plication offers a permanent cure for the involutional entropion as demonstrated by this study. However, if horizontal lid laxity is present, then a combined approach is necessary⁹⁻¹³, i.e. tucking of either the medial or lateral canthal tendon, whichever is lax, or both, in addition to the lower lid retractor plication. In this study, only those cases were included where no horizontal lid laxity was present. Schaefer et al⁹ have recommended in their study that if only laxity of the lower lid skin is present, then a base up skin triangle can be excised at the end of repair of the retractor complex to facilitate horizontal lid tightening. But if the lid is markedly lax, then a lateral canthal tuck should be included with this procedure. Rosser et al¹⁴ have shown in their study that lower lid retractor plication is the procedure of choice in ocular cicatricial pemphigoid as the conjunctiva is not touched in this technique. This study demonstrates that this procedure offers the best long-term results in a simple involutional entropion without horizontal lid laxity.

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Ophthalmic "Pastpourri"

Noguchia Granulosis

Dr. Proctor's Hunt for the "Microbe Hunter"

Proctor reasoned that the most efficient way to combat this disease was to remove the cause, but the cause of trachoma was unknown. Therefore, the cause must be found. To Proctor and to many others, the greatest "microbe hunter" in all the United States was Hideyo Noguchi, microbiologist of the Rockefeller Institute for Medical Research. Noguchi had worked on such problems as snake venom, spirochetes, tuberculosis, syphilis, poliomyelitis, rabies, Oroya fever yellow fever, and trachoma. Part of his reputation he had earned by virtue of his solid work; another part of it, romantically false, had been thrust on him by the hero-hungry public of the 1920's.

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Primary Trabeculectomy with Topical Application of Mitomycin-C in Primary Glaucoma

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ABSTRACT

The effects of topical application of mitomycin-C in primary trabeculectomy on postoperative control of intraocular pressure (IOP) in patients of primary glaucoma were studied in thirty eyes of fifteen patients, having an average age of thirty-six years. Trabeculectomy was performed with application of 0.2mg/ml and 0.4mg/ml concentration of mitomycin-C before formation of lamellar scleral flap under the conjunctivo-Tenon membrane. Changes in visual acuity (VA) and peroperative and postoperative complications were also studied

All patients were followed-up for upto twelve months. Average reduction in IOP was 14.04 mmHg. The overall success rate, i.e. postoperative IOP < 22mmHg without antiglaucoma therapy, was 96.66%. No significant changes in VA and visual fields were observed. There was no significant difference in success rates for postoperative control of IOP between the two concentrations of mitomycin-C (P value < 0.05). The incidence of hypotony and maculopathy was more, i.e. 12.5% with 0.4mg/ml compared with no maculopathy with 0.2mg/ml concentration, the difference being statistically insignificant (P value < 0.05).

The present study emphasizes the significance of use of topical mitomycin - C with primary TRAB in Pakistani patients who are relatively younger than the usual age of chronic glaucoma patients, recommending that all primary filtration procedures may be performed with 0.2mg/ml of mitomycin - C for three minutes in relatively young patients.

INTRODUCTION

Trabeculectomy is a standard filtration procedure by which intraocular pressure (IOP) is controlled adequately in most cases of glaucoma, but it has been observed that filtration surgery is less successful in certain groups of patients (High Risk Glaucoma Patients). In a variety of studies it has been concluded that relatively younger glaucoma patients may also be considered high risk patients¹⁻⁷.

The most common cause of failure of glaucoma surgery is fibrosis of the conjunctival bleb⁸. So the understanding of wound healing process and pharmacological methods modulating wound healing are the most notable advances in this field. While many agents such as corticosteroids and 5-fluorouracil have been employed for this purpose⁹⁻¹¹, mitomycin-C has been extensively evaluated in search of the most suitable method.

The purpose of this study was to observe the

effects of topical application of mitomycin-C in primary trabeculectomy (TRAB), on the postoperative control of IOP in relatively young patients of primary open-angle glaucoma (POAG) and chronic primary narrow-angle glaucoma (PNAG). Changes in the visual acuity (VA) and the incidence of intraoperative and postoperative complications of TRAB with topical application of mitomycin-C were also studied.

PATIENTS AND METHODS

After taking a detailed ophthalmic history including significant medical history, and performing a complete ophthalmologic examination including recording of visual acuity, applanation tonometry, anterior segment examination with slit-lamp, contact lens gonioscopy, ophthalmoscopy, central visual field analysis and provocative tests when required, thirty eyes of fifteen relatively young patients of POAG and chronic PNAG in whom TRAB was indicated either due to failure of medical therapy or poor compliance. Adequate control of diabetes and hypertension and

treatment of ischemic heart disease prior to surgery were confirmed.

A written consent was taken, explaining about the anesthesia, surgical procedure, and topical application of mitomycin-C intraoperatively.

Trabeculectomy was performed with limbal-based conjunctival flap, 8mm from the limbus and with peroperative application of mitomycin-C under the conjunctivo-Tenon membrane on the surface of the sclera before the formation of a scleral flap. The procedure was completed by excision of 2mm x 1.5mm trabecular tissue, peripheral iridectomy, and then suturing the scleral and conjunctivo-Tenon flaps. The lamellar scleral flap was sutured with five 10/0 interrupted sutures, Tenon with three 10/0 interrupted sutures and conjunctiva with continuous 10/0 sutures.

Postoperative medications included dexamethasone eye drops 4 times a day, chloramphenicol eye drops 4 times a day and atropine eye drops twice a day. These were continued for four to five weeks except for atropine eye drops which were usually discontinued after two weeks, depending upon the anterior chamber reaction during the postoperative period.

No suture lysis of the scleral flap with Argon Laser or surgically was performed, although conjunctival sutures were removed in almost all cases when required.

RESULTS AND OBSERVATIONS

Thirty eyes of 15 relatively young patients were studied. Average age of patients was 36 years with a range of 20 to 50 years. The patients were divided into:

- Group-1 POAG including juvenile type-18 eyes of 9 patients (Table-1).
- Group-2 PNAG including juvenile type-12 eyes of 6 patients (Table-2).

Follow-up time was 12 months in all cases.

Mean preoperative IOP for all eyes was 26.43mmHg (range = 11 to 48mmHg) and mean postoperative IOP was 13.3mmHg (range: 2 to 25mmHg), as measured on the last follow-up visit, the average reduction in IOP being 14.04mmHg.

Overall success rate, i.e. postoperative IOP $\leq$ 22mmHg without antiglaucoma therapy for six months after surgery, was 96.66%, i.e. only one patient had an

IOP of 25mmHg which was controlled with topical beta-blocker eye drops.

In the POAG group (Table-1) that also included juvenile POAG, 18 eyes of 9 patients were operated on. Female to male ratio was 1:8, and the age range was from 24 years to 50 years. Postoperative success rate was 100%. Ten out of 18 eyes were treated with 0.4mg/ml concentration of mitomycin - C for 3 minutes.

In the PNAG group (Table-2) 12 eyes of six patients were operated upon. Female to male ratio was 1:2. Age range was from 25 years to 50 years. All eyes underwent primary filtration procedure. Postoperative success rate, i.e., postoperative IOP $\leq$ 22mmHg without antiglaucoma therapy was 91.66%. Six out of 12 eyes were treated with 0.2mg/ml of mitomycin - C for 3 minutes, while the remaining 6 eyes were treated with 0.4mg/ml of mitomycin - C for 3 minutes.

Sixteen eyes (53.33%) of patients upto the age of 40 years were treated with 0.4mg/ml concentration of mitomycin - C for three minutes with 100% success rate for postoperative control of IOP. The concentration of 0.2mg/ml was used for three minutes in 14 eyes (46.66%) of patients between 41 to 50 years with a success rate of 93%.

VISUAL ACUITY

Preoperative VA (Table-3) in 73.33% of the patients was in the range of 6/12 to 6/6; 10% were in the range of 6/36 to 6/18 and the remaining were in the range of PL positive to 6/60, except for one patient who was NPL. This shows that 16.66% of the patients of glaucoma included in the study were already legally and irreversibly blind.

Postoperatively there was no significant decrease in VA in most of the cases. There was only one line decrease in VA in 2 patients (6.66%) which was due to progression of already present lens opacities. A gross deterioration of VA was observed in one patient, i.e., from 6/12 to HM which was due to postoperative hypotony-related problems of cataract formation, posterior synechiae, prolonged uveal reaction and shallow AC and maculopathy.

VISUAL FIELDS

In patients of POAG, 6 out of 18 patients (33.33%) had normal central fields, 5 patients (27.77%) had mild constriction of central visual fields affecting about 5 degrees and 5 patients (27.77%) had

Table-1: Primary open-angle glaucoma group.

Eyes	Age	Sex	Eye	Mito-C	VISUAL	ACUITY	IOP	
					Preoperative	Postoperative	Preoperative*	Postoperative#
1	40	M	R.E.	0.4mg/ml	6/6 P	6/6 P	20	16
2	40	M	L.E.	0.4mg/ml	6/9 P	6/9 P	26	22
3	30	M	R.E.	0.4mg/ml	HM	HM	20	16
4	30	M	L.E.	0.4mg/ml	6/6	6/6	20	09
5	24	M	R.E.	0.4mg/ml	NPL	NPL	42	09
6	24	M	L.E.	0.4mg/ml	6/60	5/60	22	12
7	50	M	L.E.	0.2mg/ml	6/6 P	6/9	14	12
8	50	M	R.E.	0.2mg/ml	6/9	6/9	14	14
9	45	F	L.E.	0.2mg/ml	6/12	6/12	27	12
10	45	F	R.E.	0.2mg/ml	6/12	6/12	20	12
11	25	M	L.E.	0.4mg/ml	6/9	6/9	26	02
12	25	M	R.E.	0.4mg/ml	6/6	6/6	24	09
13	48	M	R.E.	0.2mg/ml	6/12	6/12	23	07
14	48	M	L.E.	0.2mg/ml	6/9	6/9	22	08
15	42	M	R.E.	0.2mg/ml	6/36	6/36	45	16
16	42	M	L.E.	0.2mg/ml	6/12	6/12	42	14
17	25	M	R.E.	0.4mg/ml	6/18	6/18	25	14
18	25	M	L.E.	0.4mg/ml	HM	HM	26	19

*Preoperative IOP recorded with antiglaucoma treatment

#Postoperative IOP recorded without antiglaucoma treatment

Table-2: Chronic narrow-angle glaucoma group.

Eyes	Age	Sex	Eye	Mito-C	VISUAL	ACUITY	IOP	
					Preoperative	Postoperative	Preoperative*	Postoperative#
19	25	F	R.E.	0.4mg/ml	6/12	HM	40	04
20	25	F	L.E.	0.4mg/ml	6/9	6/9	32	06
21	45	F	L.E.	0.4mg/ml	6/9	6/12	22	10
22	45	F	R.E.	0.4mg/ml	FC	FC	14	20
23	50	M	L.E.	0.2mg/ml	6/12 P	6/12 P	11	12
24	50	M	R.E.	0.2mg/ml	6/12 P	6/12 P	13	10
25	41	M	L.E.	0.4mg/ml	6/36	6/36	23	17
26	41	M	R.E.	0.4mg/ml	6/6	6/6	22	14
27	50	F	R.E.	0.2mg/ml	6/9 P	6/9 P	48	05
28	50	F	L.E.	0.2mg/ml	6/6 P	6/6 P	32	05
29	45	F	L.E.	0.2mg/ml	6/9	6/9	38	20
30	45	F	R.E.	0.2mg/ml	6/9	6/9	40	25

*Preoperative IOP recorded with antiglaucoma treatment

#Postoperative IOP recorded without antiglaucoma treatment

Table-3: Visual acuity comparison (preoperative and postoperative).

Range of visual acuity	No. of Patients Preoperative	No. of Patients Postoperative
6/6-6/12	22	21
6/18-6/36	3	3
6/60-1/60	1	1
FC, HM, PL	3	4
NPL	1	1
TOTAL	30	30

Table-4: Incidence of complications of trabeculectomy with mitomycin-C in the present study.

Type of complication	No. of eyes	Percentage
Conjunctival wound gape	2	6.66
Wound leak with shallow AC	2	6.66
Surgery required	1	3.33
Choroidal detachment	2	6.66
Cataract formation	2	6.66
Hypotony-maculopathy	2	6.66
Postoperative uveitis	1	3.33
Hyphema	2	6.66
Vitreous loss	Nil	

grossly affected visual fields having only tubular vision or the superior part of visual field limited to central 5 degrees and other parts of the fields limited to 10 degrees from fixation. In 2 patients fields could not be recorded due to decreased VA.

In chronic PNAG group 9 out of 12 patients (75%) had a gross loss of central visual fields ranging from just tubular vision to the presence of visual fields upto 15 degrees in 2 quadrants only. No specific pattern of field defects was present. Only 2 patients (16.6%) had good visual fields having affection of peripheral 5 degrees.

Postoperatively there was no significant change in visual fields except in those patients in whom VA was grossly affected or when visual field could not be recorded.

COMPLICATIONS & THEIR INCIDENCE

The complications of TRAB with topical application of mitomycin - C (Table-4) in the present study were, conjunctival wound gapes in two patients (6.6%), wound leakage with shallow anterior chamber (AC), in 2 patients (6.66%; no surgical intervention required in one), choroidal detachment causing shallow

AC observed in two patients (6.66%) which was cured spontaneously, peroperative hyphema in 2 patients (6.66%), mild postoperative uveitis in one and ocular hypotony and its related complications in two patients.

Prolonged hypotony-induced maculopathy is one of the most serious complications of TRAB with topical application of mitomycin-C. Cases of hypotony, including those accompanied by shallow AC with or without wound leakage or choroidal effusion, were 5 in number. Two eyes of 1 patient had postoperative IOP of 5mm Hg without any decrease in VA and so were considered insignificant. In one of these 5 eyes hypotony improved over the next 6 weeks with gradual increase in IOP upto 10mmHg. Two eyes of another young lady developed hypotony during early postoperative period accompanied by shallow AC and choroidal effusion. She had preoperative bilateral maculopathy. No characteristic features of hypotony-maculopathy were detectable postoperatively in her left eye, while VA in the right eye gradually deteriorated, associated with mild uveitis and hypotony-related cataract formation, shallow AC along with choroidal detachment and probably maculopathy which could not be visualized due to cataract. Total number of patients developing hypotony-maculopathy were two (6.66%). Both were treated with 0.4mg/ml concentration of mitomycin-C for three minutes and none of the patients treated with 0.2mg/ml developed this serious complication.

DISCUSSION

The purpose of this study was to study the effects of primary trabeculectomy with topical application of mitomycin-C on the postoperative control of IOP in patients of POAG and chronic PNAG.

The results of the present study, i.e. success rate for postoperative control of IOP, are similar to the results of other authors including Kitazawa¹², Ramakrishna¹³, Shields¹⁴, Palmer¹⁵ and Mermoud¹⁶.

The success rate in POAG patients in the present study is comparable with the results reported by Kitazawa et al. They reported 100% success rate, i.e., postoperative IOP $\leq$ 22mmHg in 11 eyes of patients of POAG, undergoing primary TRAB with 0.2mg/ml concentration of mitomycin-C for five minutes¹². Ramakrishna et al reported 93.4% success rate using 0.4mg/ml concentration for five minutes¹³. They included 76 consecutive patients including all types of glaucoma patients in whom trabeculectomy was indicated, i.e. not necessarily high risk patients. Shields

Table-5: Hypotony-induced maculopathy in reported series of filtering surgery with mitomycin-C

	Chen et al	Palmer	Kitazawa et al	Skuta et al	Zacharia	Shields
Mitomycin-C concentration (mg/ml)	0.1-0.4	0.2	0.4 (0.2/0.5)	0.5	0.4	0.4
Exposure time in minutes	5	5	5	5	3.5 to 7	3-5
Delivery vehicle	Gelfoam (changed every minute)	Small surgical sponges	Absorbable sponge	Surgical sponges	Surgical sponge/Weck Cell sponge	Surgical sponge
Follow-up	1-8 Yrs	6-42 mos.	7-12 mos.	6-12 mos.	9-50 weeks	2-14 mos.
Hypotony-induced maculopathy* eyes(%)	2/45 [^] (4%)	1/33 (3%)	1/17 (6%)	1/20 (5%)	17/52 (32.7%)	6/59 (10%)

*Defined as 5mmHg or less with reduced visual acuity at last follow-up

[^]Both eyes received 0.4mg/ml.

et al titrated the duration of exposure of eyes to mitomycin-C according to the patient's risk factors for failure of filtration from excessive fibrosis. Patients with relatively no risk were treated for two minutes, while an additional minute was added for each risk factor, e.g. young age, black race, repeat surgery etc, up to a maximum of five minutes¹⁴. Similarly, Palmer reported 84% success rate using 0.2mg/ml concentration¹⁵ and Mermoud 83% success rate using 0.2mg/ml concentration¹⁶.

Complications of filtration surgery when it is combined with topical application of mitomycin-C (Table-4) include those which are observed with filtration surgery alone and those which are associated with application of mitomycin-C. Among the serious complications associated with TRAB with mitomycin-C, are hypotony and related maculopathy (due to different causes, e.g. overdrainage, choroidal effusion or detachment), prolonged uveitis and its resultant complications, rapid progression of already present lens opacities or development of cataract as toxicity of the drug, and corneal endothelial toxicity associated with intraocular penetration of mitomycin-C. Ocular hypotony-induced maculopathy is the most serious complication of glaucoma filtration surgery when combined with topical application of mitomycin-C. The reported frequency of this complication (Table-5) ranges from 3% to 6% in most of the clinical studies except one by Zacharia et al¹⁷ who reported 32.7%

incidence of hypotony (and related maculopathy). The incidence of hypotony-related maculopathy in the present study is similar to most of the reported studies, i.e., 6.66%. The lower incidence reported by Chen¹⁸, Palmer¹⁵, Kitazawa¹² and Skuta¹⁰ are probably because their studies were limited to the patients with high risk of failure of filtration procedure from excessive fibrosis. Slightly higher frequency of hypotony-maculopathy reported by Shields et al¹⁴ is probably because they chose to include all patients undergoing trabeculectomy to evaluate how individuals with different levels of risk of failure may respond and that's why the complications of ocular hypotony with maculopathy occurred in low risk patients treated for shorter duration and in no patients in high risk categories.

The higher incidence of hypotony-induced maculopathy reported by Zacharia et al¹⁷ was probably because of high concentration mitomycin-C used for longer duration of time especially on eyes undergoing first intraocular surgery. So it is evident that either using lower concentration of mitomycin-C (i.e. 0.2mg/ml) as reported by Palmer¹⁵ or by using it for shorter duration as done by Shields¹⁴ could decrease the incidence of hypotony-related maculopathy.

The mechanism by which mitomycin-C influences ocular tissues in filtration surgery is not fully understood. Tissue culture studies of rabbit's

subconjunctival fibroblasts by Yamamoto¹⁹ and Khaw²⁰ and of human subconjunctival fibroblasts by Jampel²² suggest that mitomycin-C has its effects primarily on cell proliferation. This cellular effect was dependent upon concentration and duration of application of the drug in rabbits¹⁹. Studying the effects of mitomycin-C on human Tenon's capsule fibroblast Jampel²² only examined the effects on proliferation of cells but not on fibroblast migration, collagen production, or local vasculature. A study of rabbit and human ocular tissues suggests that concentrations of intraoperatively administered mitomycin-C falls below the minimum effective levels within a few days²². This observation suggests that the drug may have an additional effect on the exposed ocular tissues such as changes in vasculature. Reduced vascularity of the bleb, observed in the early postoperative period after filtration with mitomycin-C may enhance other actions of the drug because it has been observed to be selectively toxic to hypoxic cells²³.

In the previously reported studies, the topical application of mitomycin-C with trabeculectomy varied either in its concentration (i.e. from 0.2mg/ml to 0.5mg/ml) or duration of application (i.e from 2 to 7 minutes). Other variations like the vehicle for delivery of drug or irrigation of tissues after application of mitomycin-C were not significant.

Concentration variation

In most of the studies, mitomycin-C was applied in variable concentrations. Chen et al used 0.2mg/ml in majority of their cases (32/45)¹⁸. Palmer used 0.2 mg/ml in his 33 patients¹⁵. Kitazawa used 0.4 mg/ml¹². Skuta et al used 0.5mg/ml¹⁰ and Shields used 0.4 mg/ml¹⁴. Yamamoto et al²⁴ in their study of titrating the dose of mitomycin-C demonstrated that 0.2mg/ml and 0.1mg/ml of mitomycin-C applied for 5 minutes at the time of trabeculectomy resulted in adequate control of IOP during postoperative follow-up period of 24 months. In the present study two concentrations of the drug, i.e. 0.2mg/ml (14/30 patients) and 0.4mg/ml (16/30 patients) were used so that the effect of different concentrations of mitomycin-C on postoperative control of IOP may be studied. The overall success rate was better with 0.4mg/ml concentration (100%) compared with 0.2mg/ml concentration (96.66%); however, this difference was statistically insignificant (P value<0.05). The incidence of hypotony-maculopathy was more, i.e. 12.5% (2 patients) with 0.4mg/ml concentration of the drug compared with no hypotony-maculopathy with 0.2mg/ml concentration of the drug, indicating that the incidence of this serious complication was considerably less with lesser

concentration, even though this difference in the incidence of maculopathy was still statistically insignificant (P value<0.05). The higher incidence of hypotony-induced maculopathy in low risk patients¹⁴ and with lower concentration, indicates that eyes undergoing primary filtration should be treated with 0.2mg/ml concentration for a period of no more than three minutes.

The present study emphasizes the significance of use of topical mitomycin-C with primary trabeculectomy procedures in Pakistani patients (darker race being a risk factor) who were relatively younger than the usual age of chronic glaucoma patients. There is no significant difference in success for postoperative control of IOP <21mmHg both when mitomycin-C was applied either in a concentration of 0.4mg/ml or 0.2mg/ml for 3 minutes. This suggests that all primary filtration procedures should be treated with 0.2mg/ml of mitomycin-C for 3 minutes.

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Ophthalmic "Pastpourri"

Noguchia Granulosis

Misunderstanding Lands Hideyo Noguchi in the U.S.

Much of Noguchi was made to order for the hero-scientist role. He was born in Japan in 1876 to an impoverished family; at the age of 2, one hand had been badly crippled by a severe burn. He had obtained his education through the great personal efforts and sacrifices of his mother and sister. He brought himself to the attention of Simon Flexner when that American was visiting Tokyo in 1899. Misunderstanding a causal comment Flexner made to him, Noguchi cut short his career in Japan and a few months later presented himself to Flexner in Philadelphia, ready to go to work for his "Professor". The surprised Flexner had no work for him, but he quickly arranged, through S. Weir Mitchell, for Noguchi to work on snake venoms. Noguchi proved his worth so well that he soon became an assistant to Flexner, and together they wrote several papers. When Flexner became director of the Rockefeller Institute he took Noguchi with him.

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Suggested Protocol for Diagnostic Ultrasound B-Scan

(from optic nerve to ora serrata)

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ABSTRACT

The objective of this paper is to develop greater interest and understanding in ultrasound B-Scan. Because of commercial reasons, in a city like Karachi, the so-called ultrasound centers are reporting for eyes without proper ophthalmic probes and without the knowledge of normal anatomy and pathology of the eye. To develop a three-dimensional picture, it is mandatory to correlate with clinical history, findings and pathology.

In this paper, a protocol is suggested for screening for pathology and for performing topographical scanning. Emphasis is on performing ultrasound following proper protocol and proper labelling of frozen photographs. Probe position and location should be labelled so that a person who is reviewing later would know what he is looking at.

INTRODUCTION

- "A" in the A-scan stands for amplitude and "B" in the B-scan stands for brightness.
- The term frequency means number of cycles per second. The frequency of 10 MHz is common for ophthalmic ultrasound probes.
- 2.5 MHz to 5 MHz is used for body scans.
- The higher the frequency of an ultrasound probe, the less deeply can its sound penetrate into tissues (Fig.1). It is important to realize that higher the frequency, the shorter the wavelength and, therefore, better the resolution¹.
- The transducer (probe) is the heart of the system. It is a piezoelectric crystal and converts electricity into sound waves and sound waves into electricity.
- The marker on the probe indicates the top of the display screen (Fig.2).
- The transducer inside the probe oscillates back and forth towards and away from this marker and generates a fan of sound waves which is appropriately called acoustic section or a slice.
- Gain is an electric amplification of sound wave signal that is received by the probe.

This amplification factor is called decibel (dB). When the gain is turned up, the echoes get taller and brighter; conversely they get shorter and dimmer when the gain is lower.

- Low gain has more resolution and less sensitivity (Fig.3).

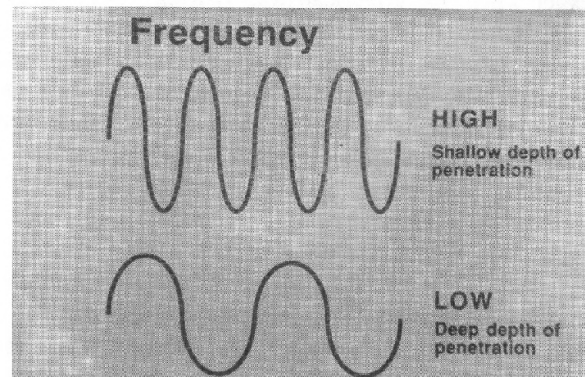


Fig-1: Effect of high and low frequency waves on the depth of penetration.

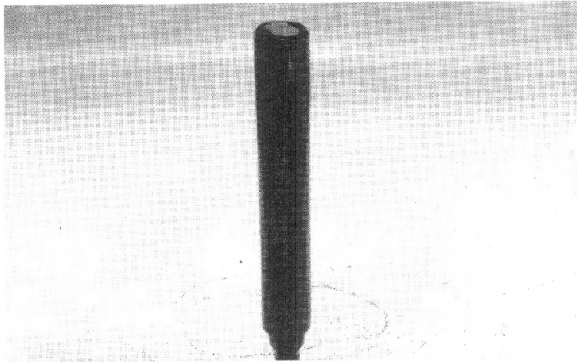


Fig-2: B-scan probe with its marker which indicates the top of display screen.

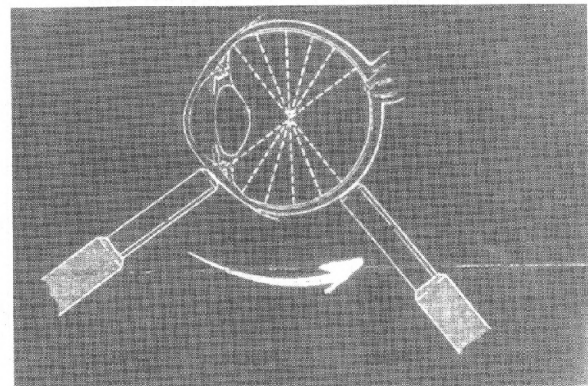


Fig-4: Movement of the probe from limbus to periphery (circumferential slice)

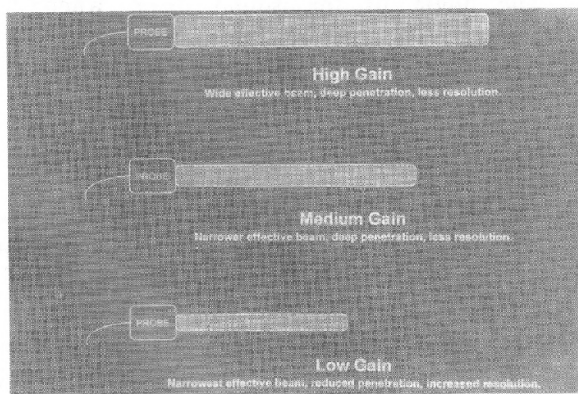


Fig-3: Effect of "gain" on penetration and resolution of the image.

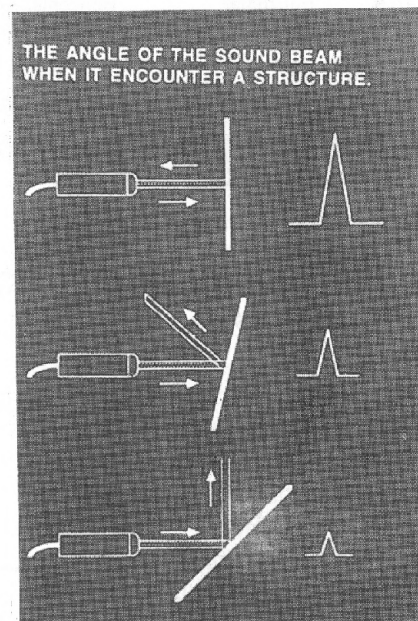


Fig-5: Effect of angle of sound beam influencing the height and brightness of echoes.

METHOD

Ultrasound probe can be placed directly on the lids or on the eyeball after putting local anaesthetic eye drops. Copious amounts of methylcellulose should be used. The probe should be moved slowly. One should take care of the probe orientation and should move the probe from the limbus to periphery² (Fig.4). Probe positions can

be described with reference to the clock hours on the eyeball. By convention, for horizontal transverse scan, orientation mark is directed towards the nose for both eyes. Therefore, the top of the scan on any horizontal transverse scan is the nasal retina and the bottom of the scan is the temporal retina¹. Wherever the probe is placed on the eye, the area being scanned lies opposite.

Suggested protocol for diagnostic U/S B-scan (From optic nerve to ora serrata)

A. Screening (Limbus to periphery)

- i. Transverse scans of four major quadrants at high sensitivity (High gain)

a. Transverse approach (Circumferential slice)

	Probe	Marker	For
Horizontal transverse	At 6:00	Towards nose	Superior retina
Vertical transverse	At temporal limbus	Vertically up	Nasal retina
Horizontal transverse	At 12:00	Towards nose	Inferior retina
Vertical transverse	At nasal limbus	Vertically up	Temporal retina

b. Axial approach (In primary gaze)

	Probe	For
Vertical axial	Up	Vertically A/P*
Horizontal axial	Horizontal	Horizontally A/P*

*antero-posterior

- ii. At low sensitivity (high resolution)
Repeat transverse and axial approach at low sensitivity (low gain).

B. Topographic B-scanning

After screening, suppose the lesion is at 10:30 in the right eye (RE) and we want to see its lateral extension.

	Probe	Marker	For
Appropriate transverse approach (Modified oblique approach) e.g. if the lesion is at 10:30 R.E. (Lateral Extension)	4:30	Supero-nasally	10:30

Now if we want to see the height of the lesion, i.e. anteroposterior (A.P.) extension, radial slice is taken like the spokes of a wheel.

	Probe	Marker	For
Longitudinal approach (radial slice) Radially perpendicular to transverse approach (A/P extent)	At limbus 4:30	Directed towards corneal centre	Height of lesion
Axial orientation for documentation (A/P slice)	On cornea	At 10:30	10:30 to 4:30

C. Evaluation of Macula

The basic probe positions are at nasal limbus or cornea. These positions cause perpendicular sound beams on macula.

	Probe	Marker	For
Horizontal axial	On cornea	Nasally	Macula
Vertical transverse	Nasal limbus	12 O'clock	Macula
Longitudinal	Nasal limbus	Centre of cornea	Macula
Vertical macula (axial)	On cornea	12 O'clock	Macula

- Clinical evaluation of macula is better made when not scanning through the lens.
- To evaluate macula for finer details, one can do scanning at high and low gains.

DISCUSSION

It is interesting to see that some have an innate grasp of three-dimensional objects viewed on two-dimensional planes and some have difficulty in building three-dimensional pictures. There are three factors which influence the height and brightness:

1. The angle of the sound beam when it encounters a structure (Fig.5).
2. The relative difference between the two tissues (Fig.6).
3. The size and shape of the interface between tissues (Fig.7).

For macular detachment low gain will give high resolution and for tractional detachment higher gain will allow better visualization of membranes which pull on the retina. There is no single setting of gain; it is specific for what you are looking for. Retinal detachment exhibits more tethered restrictions after movement than does the highly mobile posterior vitreous detachment³. Motility may be of prognostic value in attempted surgery particularly in the presumed vitreous haemorrhage⁴. Fresh haemorrhage is usually not visible in ultrasound, so also the thin retina^{1,2}. In pneumoretinopexy ultrasound is of no value¹. In eyes with silicone oil, size of the eye is increased ultrasonically and reliable A-scan biometry is not possible². In eyes with IOLs there are reverberations and axial scans are not possible. Foreign bodies give extra echoes and bad contact of probe with the eye will present artifacts⁵. One

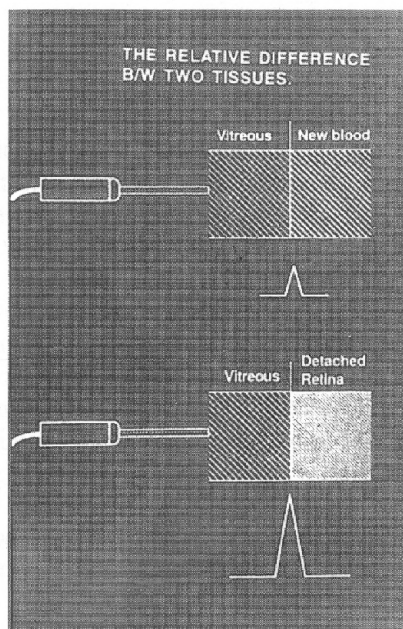


Fig-6: Effect of different tissues on the height and brightness of echoes.

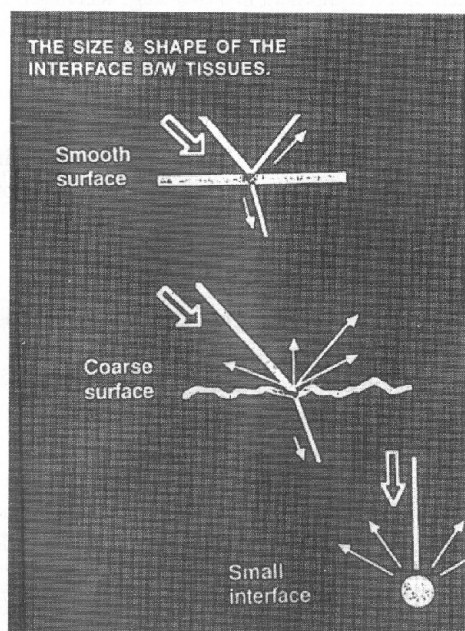


Fig-7: Effect of size and shape of the interface between the tissues on the height and brightness of echoes.

can differentiate between retinoschisis and tractional retinal detachment on ultrasound B-scan⁶. The presence of pathological condition of vitreous is easily detected with both B and A-scanning. Asteroid hyalosis is easily differentiated from other pathological conditions of the vitreous because of the high reflectivity noted on A-Scan⁷.

CONCLUSION

Intelligent use of contact ultrasound B-Scan is very informative. Haphazard movement of the probe on the eye means nothing. When one can see inside the eye with an ophthalmoscope, ultrasound is rarely needed. One should discourage unprofessional diagnostic ultrasound clinics where they do not know what they are looking for. Performance of real time B-scan by an ophthalmologist is the key to perfect ultrasonic diagnosis.

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Abstracts

Edited by Tahir Mahmood

Altering the pattern of panretinal photocoagulation: could the visual field for driving be preserved?

Davies N

Eye 1999; 13: 531-6

Panretinal photocoagulation (PRP) is the initial treatment of choice in proliferative diabetic retinopathy. The Diabetic Retinopathy Study (DRS) showed up to a 50% reduction of risk of severe visual loss. PRP itself has a well-known list of complications amongst which is the risk of constriction of peripheral visual field. The UK DVLC regulations require a visual acuity equal to or better than 3.125 inches at 67 feet and a binocular visual field of 120° in the horizontal meridian and no significant scotoma within 20° of fixation above and below the horizontal midline

The purpose of this study was to identify the area of retina required to provide the visual field for driving and to investigate whether the pattern of panretinal photocoagulation (PRP) for proliferative diabetic retinopathy could be altered to avoid treatment in this area whilst leaving the total number of burns constant.

A mathematical model of the emmetropic eye was used to calculate retinal dimensions corresponding to different angles of visual field. These were used to define retinal regions that correspond to the UK DVLC visual field criteria and regions that lie outside this area. Further calculation estimated the number of laser burns applied within these regions for both 500 µm and 200 µm diameter spot sizes and various burn spacings.

Modeling of the number of burns applied in the normal pattern of PRP agreed with the number required to control proliferative retinopathy. Reducing burn spacing or extending treatment up to the ora serrata allowed application of sufficient burns to control the disease without encroaching on areas of the retina that provide the driving field.

The authors concluded that it was theoretically possible to alter the pattern of PRP to avoid treatment in retinal areas concerned with the driving visual field whilst leaving the total number of burns constant. This suggested that a clinical trial of such a pattern PRP could be performed to assess adequate control of proliferative retinopathy along with preservation of the visual field required for driving.

Corneal biopsy with tissue micro-homogenisation for isolation of organisms in bacterial keratitis

Diamond J, Leeming J, Coombs G, Pearman J, Sharma A, Illingworth C, Crawford G, Easty D

Eye 1999; 13: 545-9

Bacterial corneal ulcers represent an important cause of visual loss in patients of all ages. They arise as a consequence of contact lens wear, trauma, adnexal disease, topical steroid use, severe debilitation or ocular surface disorders and cause visual loss as a result of corneal scarring, perforation or endophthalmitis

The purpose of this study was to evaluate a novel two-stage technique to increase yield of bacteria isolated from infected corneal ulcers.

The authors designed a new blade to remove friable material from infected corneal ulcers. The new blade was used in combination with standard tissue micro-homogenisation equipment in a two-stage technique intended to distribute biopsy samples evenly between relevant agar plates. Patients with presumed bacterial corneal ulcers underwent sequential corneal sampling using the new two-stage technique and a scalpel blade, used without micro-homogenisation (the order of sampling was varied between the two groups). Bacterial isolation rates were compared using the chi-squared test.

Twenty-four patients with presumed bacterial corneal ulcers were studied. The overall positive bacterial isolation rate was 88% with identical bacterial isolation rates for the new two-stage technique and the scalpel blade (71%). The new technique isolated bacteria from three ulcers that had initially been 'sterile' when sampled with a scalpel blade. Polymicrobial infections were identified in two ulcers with the new blade where only a single organism had been identified using the scalpel blade (not significantly different).

The authors concluded that the new two-stage technique showed promise for improving bacterial isolation rates from presumed-bacterial corneal ulcers.

Human aqueous and vitreous humour levels of ciprofloxacin following oral and topical administration

Cekic O, Batman C, Yasar O, Basci NE, Bozkurt A, Kayaalp SO
Eye 1999;13: 555-8

Ciprofloxacin is a synthetic fluoroquinolone antibacterial active against a broad spectrum of Gram-positive and Gram-negative ocular pathogens. It has proved to be a powerful topical antimicrobial for use as a single agent for treating keratitis and conjunctivitis. Ciprofloxacin has also been suggested as a possible agent for prophylactic use in cases of endophthalmitis.

The purpose of this study was to assess the aqueous humour ciprofloxacin concentrations following oral and topical administration of ciprofloxacin in patients with non-inflamed cornea and intact crystalline lens, and to compare the concentrations of the drug given by either route.

In this prospective study, 34 patients undergoing pars plana vitrectomy for various ocular pathologies were divided into two groups. Eighteen patients received 2 drops of 0.3% ophthalmic solution of ciprofloxacin every 30 min for 3 h and then every 60 min for the next 3 h, and 16 patients received a single oral dose of 1000 mg ciprofloxacin 6 h before surgery. The aqueous and vitreous humour samples were simultaneously harvested after oral or topical administration during pars plana vitrectomy to assess penetration of the drug. These samples were assayed for ciprofloxacin concentrations by using high performance liquid chromatography.

The aqueous and vitreous humour levels of ciprofloxacin were 0.59 ± 0.06 µg/ml (mean $\pm$ SEM) and 0.64 ± 0.06 µg/ml after oral and 0.44 ± 0.07 µg/ml and 0.22 ± 0.04 µg/ml after topical ciprofloxacin administration, respectively. Aqueous humour levels were not statistically significantly different following oral and topical administration ($p = 0.069$). However, the vitreous level of the drug after oral administration was significantly higher than that after topical administration ($p < 0.001$).

The authors concluded that ocular bioavailability of ciprofloxacin in aqueous humour following oral and topical administration is found to be similar when the drug was applied as described above. Penetration of ciprofloxacin into vitreous humour was less than that into aqueous humour after topical administration.

The results of adjustable suture technique in paediatric strabismus surgery
Chan TKJ, Rosenbaum AL, Hall L
Eye 1999;13,567-70

The adjustable suture technique (AST) in strabismus surgery was first described by Jampolsky in 1970. It allows the surgeon the opportunity to adjust the desired position of alignment within 24 h after surgery while the patient is alert.

The advantages of this technique are particularly great in patients who have restrictive or parietic strabismus, as well as in cases of reoperation, thyroid eye disease, blowout fractures, strabismus following retinal detachment surgery or combined horizontal and vertical strabismus problems, in which conventional surgery is more likely to be unpredictable.

Adjustable suture technique (AST) has been shown to be an effective treatment method in adult strabismus. The application of AST is not well studied in children due to potential poor cooperation during adjustment and the concern that the adjustment process cannot be completed. In this study the authors evaluated the efficacy and safety of this technique in a preselected group of children between 7 and 15 years of age.

A retrospective review of 89 consecutive children undergoing AST was completed to assess: (1) the ability to perform and complete adjustment in children; (2) the frequency of need to perform adjustment; and (3) accuracy of surgical alignment. In this study only patients with horizontal rectus muscle surgery were included.

All children successfully completed the AST on the first post-operative day. Of the 89 patients, 24 (27%) required further adjustment by the AST. The mean follow-up period was 13.1 months. Fifty-three patients (60%) had previous strabismus surgery (range 1 to 5 operations). Sixty-six (74%) patients achieved successful alignment. Complications included slipped muscles in 1 case and difficulty in recession of the lateral rectus muscle in 1 patient.

The authors concluded that twenty-seven per cent of the patients required post-operative adjustment. The AST achieved an overall 74% successful alignment. Application of the AST was recommended to be considered in children with horizontal deviations over age 7 years, especially in the reoperations of esotropia.

Transscleral diode laser in the treatment of retinopathy of prematurity
Davis AR, Jackson H, Trew D, McHugh JDA, Aclimandos WA
Eye 1999;13,571-6

Retinopathy of prematurity (ROP) is a leading cause of childhood blindness in industrialized countries, and the standard treatment for threshold disease (defined as stage III + disease involving five contiguous or eight cumulative clock-hours in zone 1 or 2) is transscleral cryotherapy to the avascular retina anterior to the ridge. The multicentre North American Cryotherapy for Retinopathy of Prematurity study has reported the long-term safety and efficacy of cryotherapy

in preventing blindness in these babies, incidence of blindness being reduced from 48% to 31.5%. Guidelines for the screening and treatment have been developed by the Royal College of Ophthalmologists. Cryotherapy treatment is associated with significant ocular inflammation, choroidal damage and breakdown of the blood-retinal barrier. Currently, diode laser photocoagulation is largely delivered using the indirect ophthalmoscope (LIO).

The purpose of this study was to assess the outcome of contact transscleral diode laser (TSDL) in the treatment of threshold retinopathy of prematurity (ROP).

TSDL was performed in 14 eyes of 8 babies who presented to the paediatric ophthalmic service at King's College Hospital between 1996 and 1997 with threshold ROP (median post-conceptual age 26+1 weeks, median birth weight 835 g) by a single surgeon. Follow-up ranged from 9 to 41 weeks (median 21 weeks).

In 11 eyes (79%) regression of ROP occurred after a single laser treatment with a good anatomical outcome. In 3 eyes (21%) there was an unfavorable response with the development of traction retinal detachment. These included both eyes of one baby who rapidly progressed to stage IV ROP. One other eye developed a fibrotic band a few months after treatment. No significant complications of laser treatment were observed.

In the authors' opinion initial results indicate that TSDL photocoagulation is an effective and technically straightforward alternative to cryotherapy in the treatment of ROP.

Acute angle closure glaucoma: an evaluation of a protocol for acute treatment

Choong YF, Irfan S, Menage MJ
Eye 1999;13:613-6

Acute angle closure glaucoma (AACG) is a common ophthalmic emergency, which requires early recognition followed by appropriate treatment to minimize visual loss. The urgent necessity to lower intraocular pressure is well known. This is normally achieved using medical therapy such as miotics, carbonic anhydrase inhibitors, beta blockers and osmotic diuretics. This is followed by definitive treatment such as a Nd:YAG laser peripheral iridotomy (PI) or in some cases filtration surgery. It is a condition commonly presenting out of normal working hours and often is initially managed by the least experienced members of the medical team.

Acute angle closure glaucoma treatment protocol observed by the authors in this study was:

Stage I:

Immediate:

500 mg acetazolamide by slow intravenous injection.

500 mg acetazolamide orally stat.

Carteolol 1% eye drops b.d. if no contraindications.

Predsol 0.5% eye drops q.i.d.

Analgesics and antiemetics as indicated.

Patient to lie supine for one hour.

After one hour:

Pilocarpine 4%, 3 drops stat and then q.i.d.(affected eye only)

Stage II:

After a further 30 minutes:

Recheck IOP. If not reduced:

50% glycerol 1g/kg orally (caution in diabetes) and limited fluid intake for maximum effect (at 30-60 minutes lasting for five hours).

If vomiting and oral agents useless than 20% mannitol 1-2 g/kg intravenously over 45 minutes.

Patient to lie supine for one hour.

Stage III:

After a further one hour:

Recheck intraocular pressure. If not reduced:

20% mannitol 1-2 g/kg intravenously if not already given.

Refer to senior colleagues.

The purpose of this study was to report the use of authors' protocol for the treatment of acute angle closure glaucoma (AACG) and document its effectiveness.

The records of 63 consecutive patients were reviewed which were treated according to the protocol over three and a half years. At presentation the mean intraocular pressure (IOP) in the affected eye was 56 mmHg. The visual acuity was 6/60 or worse in 68% of patients. The mean duration to achieve adequate IOP control was 3 h (range 1-7h) and 44% of the patients achieved this without the use of osmotic diuretics. None of the fellow eyes developed AACG prior to peripheral iridotomy. No further medical or surgical treatment was needed in 44%. Further topical treatment alone and surgical treatment were needed in 21% and 35% respectively. Following adequate IOP control, 76% had a visual acuity of 6/24 or better. All who had a final visual acuity of 6/60 or worse had significant non-glaucomatous pathology. At 6 months follow-up, 67% were treatment free and 65% had a normal optic disc.

In the authors' opinion this study demonstrated that their treatment protocol provided comprehensive and explicit guidance on the emergency treatment of AACG. This resulted in rapid IOP control following presentation and eventual favorable outcome in most cases.

Primary vitrectomy for pseudophakic and aphakic retinal detachments

Newman DK, Burton RL

Eye 1999;13: 635-9

Scleral buckling procedures for pseudophakic and aphakic retinal detachments may be compromised by poor visualisation of the peripheral retina. This can result from anterior or posterior capsular opacification, cortical lens remnants, reflexes from the intraocular lens surface, refraction at the intraocular lens rim, and inadequate pupillary dilation. Impaired visualisation of the peripheral retina may be responsible for scleral buckling procedures having a lower primary retinal reattachment rate in pseudophakic and aphakic eye than in phakic eyes.

The purpose of this study was to evaluate the results of primary vitrectomy for the treatment of pseudophakic and aphakic retinal detachments. Primary vitrectomy may enable better identification of retinal breaks than scleral buckling procedures.

This prospective study was performed of primary vitrectomy for the treatment of 25 consecutive cases of pseudophakic and aphakic retinal detachment.

The primary retinal reattachment rate was 84% (21 eyes). Surgical failure resulted from new/missed retinal breaks (2 eyes) and proliferative vitreoretinopathy (2 eyes). The final retinal reattachment rate with further surgery was 96% (24 eyes). There were 7 macula-on detachments which all retained their presenting visual acuity. A visual acuity of 6/18 or better was achieved by 56% of the 18 macula-off detachments. Visualization of the peripheral retina was impaired in 17 eyes and procedures to improve visualisation were performed in 7 eyes. Retinal breaks were detected in 16 eyes at surgery that had not been identified pre-operatively. Raised intraocular pressure was the most common complication, affecting 10 eyes in the early post-operative period.

The authors concluded that primary vitrectomy offered certain advantages in the treatment of pseudophakic and aphakic retinal detachments. In the authors' opinion a controlled study was required to determine whether primary vitrectomy achieves a better outcome than scleral buckling procedures for these retinal detachments.

Comparison of sub-Tenon's anesthesia by different delivery techniques in cataract surgery

Tokuda Y, Onda K, Yoshitomi F, Inouye J, Amano S, Oshika T

Eye 1999;13: 640-2

The efficacy of sub-Tenon's anaesthesia has been well

documented in cataract surgery, vitreoretinal surgery, retinal photocoagulation, trabeculectomy and strabismus surgery. Several delivery techniques of sub-Tenon's anaesthesia have been reported, including injection of anaesthetic into the sub-Tenon's space after making a conjunctival incision, injection of anesthetic into the posterior sub-Tenon's space (retrobulbar space) after making a conjunctival incision and injection of anaesthetic into the intra-Tenon's space (subconjunctival space) without making a conjunctival incision. The difference in the analgesic effects of these methods, however, has never been investigated

The purpose of this study was to compare the analgesic effects of three different delivery techniques of sub-Tenon's anesthesia in cataract surgery by assessing patients' response to the visceral stimulus.

This prospective, randomized study was conducted on 345 eyes of 345 patients undergoing phacoemulsification and posterior chamber intraocular lens implantation. They received anaesthetic infiltration into the sub-Tenon's space through a conjunctival incision (115 eyes), infiltration into the posterior sub-Tenon's space (retrobulbar space) through a conjunctival incision (114 eyes), or injection into the intra-Tenon's space (subconjunctival space) without making a conjunctival incision (116 eyes). Pain scores were recorded when the anterior chamber was irrigated with an acetylcholine chloride solution to achieve miosis after lens implantation.

There were no significant differences in pain scores among the three groups (chi-squared test of homogeneity, $p = 0.814$). Approximately 10-20% of patients reported slight to severe pain at the time of acetylcholine administration.

The authors concluded that the three anaesthetic delivery methods of sub-Tenon's anaesthesia possess similar and reasonable analgesic effects in cataract surgery, but may not block visceral stimuli completely.

Ophthalmologists with conjunctivitis: are they fit to work?

Webber SK, Blair DGS, Elkington AR, Canning CR

Eye 1999;13: 650-2

Conjunctivitis is often viewed by ophthalmologists as a trivial condition. However, for some patients it is extremely uncomfortable and it can cause significant visual morbidity; it is also often highly contagious. When ophthalmologists have conjunctivitis they face a dilemma: Should they stay off work so minimizing the risk of spreading the infection to their colleagues and patients? This may cause difficulties within the department, including the need to reschedule

appointments and operations, or to find another ophthalmologist to take on the work. Alternatively, the ophthalmologist could continue to work but risk spreading the infection to other people who, in turn, will suffer discomfort, pain and perhaps reduced vision. Often ophthalmologists feel they should absent themselves from work but feel guilty about the extra workload shifted onto their colleagues. Ophthalmologists may feel they should not be at home unless they are unwell.

The purpose of this study was to establish current opinion as to whether ophthalmologists with conjunctivitis were fit to work.

One hundred and sixty ophthalmology units in the United Kingdom were sent a postal survey inquiring about work practices when an ophthalmologist contracted conjunctivitis.

One hundred and five replies were received. Twenty-nine per cent of respondents said the ophthalmologist should stay off work while 7% said he or she should continue as usual. There was no concordance as to whether viral or bacterial conjunctivitis posed a greater problem. There was evidence that ophthalmologists had been implicated in the spread of epidemics of viral conjunctivitis but also reports of ophthalmologists who had continued to work with no reported spread of infection.

In view of the lack of consensus the authors were unable to recommend evidence-based clinical guidelines, but suggested that use of modern diagnostic laboratory techniques may help in making the decision as to whether to continue at work or not.

Ophthalmic "Pastpourri"

Noguchia Granulosis

Noguchi's Working Tempo

Investigation after investigation, often two and three at a time were undertaken by Noguchi. Whenever possible, he insisted on working by himself; team-work and collaborators were not to his liking. There seemed to be no end to his energy, to his brilliance to his scientific insight. Paper after paper, 34 on yellow fever alone, came from his pen. Other workers in the field did not always agree with his conclusions, perhaps because they were not always able to duplicate his results. As for his laboratory methods, one commentator had said: "He was rarely a slave to procedure".

Jehangir Durrani
MD, FACS, FRC OPHTH

Snyder C. Our Ophthalmic Heritage. Little, Brown and Company. Boston. 1967;p 118

Letters to the Editor

Dear Editor,

The paper in PJO Vol.15 No. 4, 1999, "Phacoendophthalmitis" is highly controversial. The authors had treated 78 eyes in six months. This study does not show whether 78 complications in six months were referred from outside or were from Abbasi Shaheed Hospital. These are alarmingly high rates of complications, since cataract surgery has become very safe now. I think instead of relying on oral steroids one should improve surgical skills to avoid such complications. Now surgery has been so advanced that after hydrodissection one can clean up even the last lens fiber.

This study does not show as to what happened peroperatively, e.g. how many cases had posterior capsule rupture and how many of them showed vitreous? Phacoendophthalmitis was due only to lens matter or the latter amalgamated with vitreous? How many developed cystoid macular edema? In this study the authors have not mentioned the IOP of 78 eyes after these complications. I would strongly disagree that all these cases were phacoendophthalmitis. I think that some of these cases simply had raised IOP, which caused corneal edema. The authors write about the amalgam of lens matter and vitreous; it is not desirable to have this happen in 78 eyes at the turn of the millennium in a teaching institute. Authors believe that oral steroids are wonderful drugs. Even the drug like viagra is not a wonderful drug. The word wonderful is unscientific and is inappropriately quoted.

Dr Shahid Wahab
Assistant Professor
Dow Medical College
Karachi.

Author's Reply

Dear Sir,

With due respect, it would be kind of you to print in the JOURNAL answers to the questions put to me by Dr. Shahid Wahab, in the sequence asked.

1. The patients were operated on at Abbasi Shaheed Hospital, Karachi (Refer to Patients and Methods).

2. Phacoendophthalmitis is different from infectious endophthalmitis. It is a reaction (iritis) to the lens proteins.
3. Surgical skills are continuously being improved. Excellence is what we aim for, but perfection is not human. All the lens matter can only be removed by removing the lens as in intracapsular extraction.
4. Peroperative complications are given under Patients and Methods. Seven had posterior capsular rupture.
5. Phacoendophthalmitis from lens matter or amalgam with vitreous is discussed under Introduction.
6. Cystoid Macular Oedema in iritis settles down with treatment, which is well documented. Refer to Visual Acuity under Patients and Methods.
7. IOP was checked. Phacoendophthalmitis is not the only complication which one sees after cataract surgery. Phacoendophthalmitis was the specifically looked for complication and thus the only one mentioned; other complications were not the topic of the paper. They were treated appropriately.
8. Postoperative raised IOP usually settles down in 5 to 6 days and by that time corneal oedema resolves. But the lens matter, cells and flare are seen with phacoendophthalmitis to persist beyond that time.
9. In a Teaching Institute people are learning and being taught. The learning curve does not come down. New students keep on coming.
10. The rates shown would be very high in ECCE if no steroids were used after surgery. It would be very interesting if someone dares to go for a study with only antibiotics postoperatively. I would not suggest it since it will be harmful to the patients.

We do believe that oral steroids are wonderful drugs. Seeing is believing. (AIN-UL-YAQEEN)-Al-Quran.

11. For some people viagra is a wonderful drug. No wonder it is in demand. Bertrand Russell was once asked, "Will you die for your writing"? He replied, "I may be wrong". Ten

years down the road I would ask the young surgeon if he is in need for this drug.

Arshad Shaikh
Assistant Professor
Karachi Medical and Dental College &
Abbasi Shaheed Hospital
Karachi.

My Dear Prof. Durrani,

You have invited the views of the readers regarding the teaching of Ophthalmology in 4th year instead of final year. I have read the excerpts of Prof. Raja Mumtaz with great dismay. I fully endorse the views of our Baba-i-Ophthalmology. In fact, the matter was put on the agenda of PMDC Council, and it was artfully and schematically bulldozed by the stalwarts and some members, averse to Ophthalmology, of PMDC, in the presence of Yawning Ophthalmic members of the Council. This is the story in a nutshell.

Prof. Zia-ul-Islam (from NWPF), has tried his best to reopen the matter for discussion without any fruitful results. The matter has also been undertaken half-heartedly by the concerned quarters. We urgently need to form a special committee, to make efforts to bring back Ophthalmology to final year. The atmosphere is very congenial with the incoming of Prof. Hayat Zafar as President of PMDC, and I suggest to let Prof. Zia ul Islam be the head of this committee as he is already on this job.

With my personal regards.

Yours sincerely,
Prof. Dr. M. Yasin Khan Durrani
President Elect.

Dear Editor,

Primary open-angle glaucoma (POAG) is one of the known causes of irreversible blindness. Being silent and symptomless it often has caused considerable visual damage before the patient presents. Often one medication controls the problem but some patients need additive medications.

In four of my patients (7 eyes), all males, 28-60 years of age, despite Betaxolol / Timolol 0.5% BD, the IOP failed to come down to a desirable level (15-22 mmHg) even after 6-8 weeks. Addition of Xalatan 0.005% once daily brought IOP from a range of 21-29mmHg to 14-20mmHg. They have been under my observation for the last 3 to 8½ mos. Serial visual fields have shown satisfactory response. But more than 60% of my patients are complaining of intolerably high price of glaucoma medications. The above-quoted patients are already showing irregular compliance because of financial reasons and may be headed for disaster and blindness.

I seek advice from your readers on how to solve such problems as a private consultant. If I advise glaucoma surgery there is a chance of failure or of well known complications like early cataract formation requiring further surgery. I feel that medically controlled POAG is a viable option (vs surgery), but for the financial reasons. Could we have some sort of fund set up to provide medications free or on subsidized rates for deserving patients?

Sincerely,

Prof. M. Afzal Sheikh

News and Events

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For further information contact:

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For further information contact:

Dr. Keiki R. Mehta / Dr. Kirit K. Modi, Organizing
Chairmen
Sea Side, 147, Shahid Bhagat Singh Road (Near
Colaba Bus Station), Mumbai-400 005, India.

Tel: 215 1303 / 215 0082
Fax: (91) 22-215 0433
e-mail: keiki_mehta@yahoo.com

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Saturday, 7th to Monday, 9th October 2000.

Contact Address:

Secretary
Ophthalmological Society of Pakistan
(Hyderabad Branch)
Liaquat Medical College Eye Hospital
Journalist's Colony, Hyderabad-71000

Telephone: 92-221-612090, 611676
Fax: 92-221-780748, 640598
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**at Al-Hamra Art Council,
Lahore, Pakistan**

Friday, 24th to Sunday, 26th November 2000

Contact Address:

Prof. Hamid Mahmood Butt
Allama Iqbal Medical College &
Jinnah Hospital
Lahore, Pakistan

Phone: 92 (042) 5162588
E-mail: hamidbut@wol.net.pk

**24TH ALL PAKISTAN
OPHTHALMOLOGICAL CONGRESS
OPHTHALMOLOGICAL SOCIETY
OF PAKISTAN**

February 22nd to 24th, 2001
at Pearl Continental Hotel,
Peshawar - (PAKISTAN)

"24th All Pakistan Ophthalmological Congress" will be held in Peshawar in February 2001, under the auspices of the Ophthalmological Society of Pakistan. More than 500 delegates are expected to attend the congress from Pakistan and the rest of the world. The theme for the congress is "Vision 2001", which denotes the importance of new millennium in the advancement of visual sciences.

Peshawar is located in the northwest of Pakistan. It is the fourth largest city of Pakistan and is the capital of North-West Frontier Province (NWFP), the land of the brave Pukhtoons and gateway to the Subcontinent of Indo-Pakistan. It lies at the feet of the historical Khyber Pass, which joins it to Afghanistan and Central Asia. It has a history as old as the human civilization, and has been the center of several great civilizations of the past. The weather at the end of February is usually quite pleasant, the temperature ranging between 15-20 degrees centigrade.

For further details and registration:

Contact:

Dr Nasir Saeed, Secretary Organizing Committee
Department of Ophthalmology
Khyber Institute of Ophthalmic Medical Sciences
Hayatabad Medical Complex, Peshawar, Pakistan

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 Al-Shifa Trust
 Jhelum Rd
 Rawalpindi
Tele: (051) 523480-4 Ext 383/384
Fax: (051) 523487
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Web site: http://www.alshifa.eyeg.org.pk

**COMMUNITY EYE HEALTH
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Diploma in Community Eye Health - 6 months
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Certificate in Community Eye Health - 3 months
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Certificate in Planning for Eye Care - 3 months
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Short Courses - 1-4 weeks (ongoing)

Enquiries: *Courses Promotion Officer,*
Internation Centre for Eye Health,
 11-43 Bath Street, London, EC1V9EL, U.K.

Fax: +44 (0) 207 608 6950
e-mail: j.hoskin@ucl.ac.uk

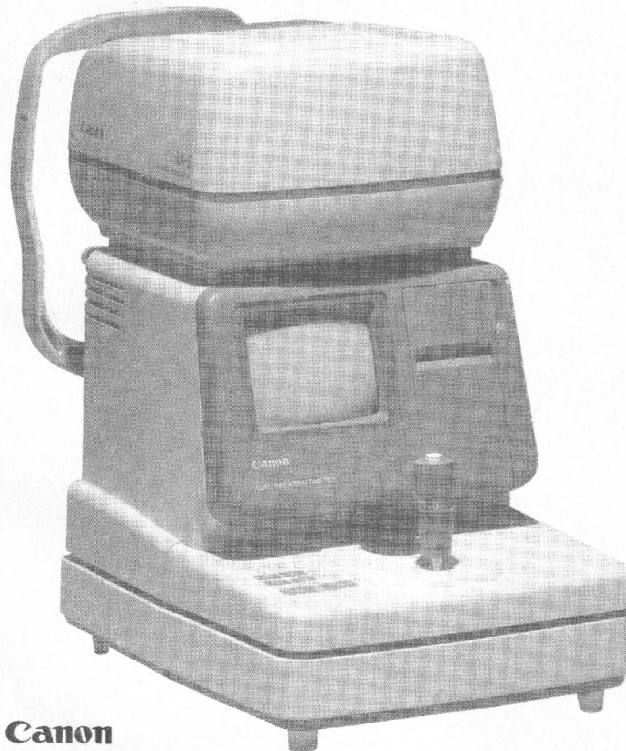
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Ghana:	Dec. 2000	Colombia:	April 2001
		Pakistan:	Apr. 2001

Letters of enquiry should be sent to:
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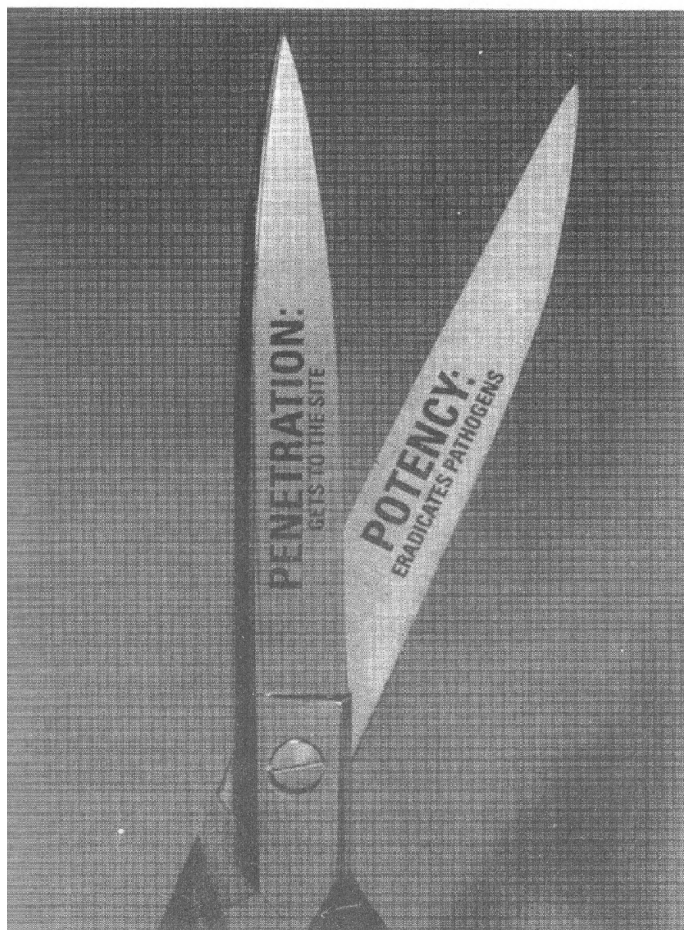
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1. Data on file, Alcon Laboratories, Inc.
2. Sabbagh I.B. Survey finds infused antibiotics help prevent infection. *Ophthalmology Times*. July 15, 1998:20.

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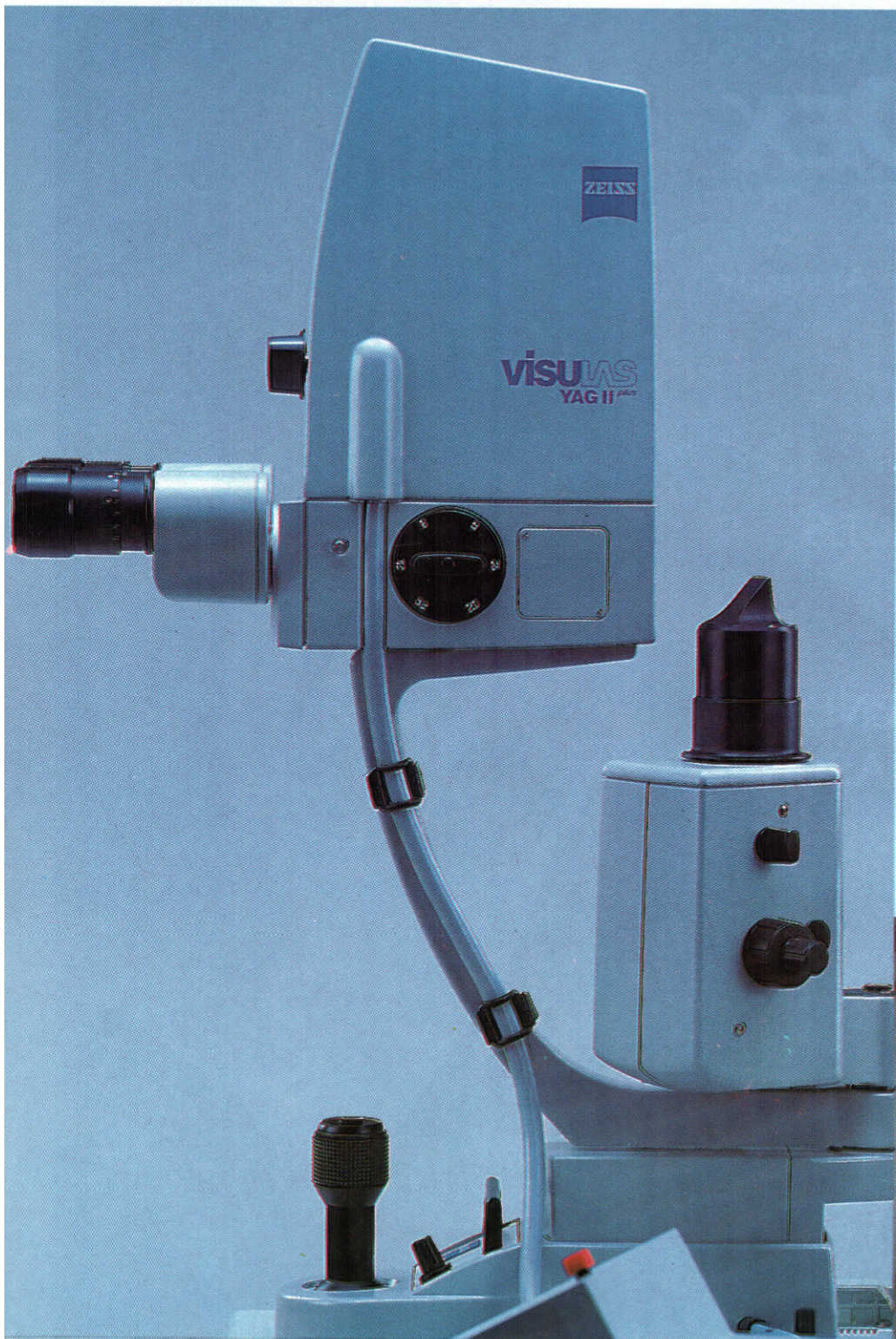


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