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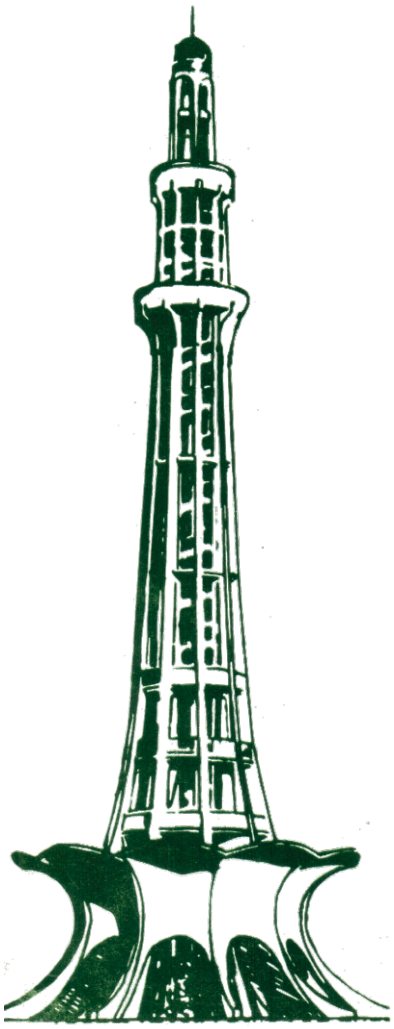

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In This Issue

Complete Contents on the Next Page

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Editorial

Say: Are the blind and the seeing man equal, or are the darkness and the light equal?
- The Holy Qur'an 13:16

Ophthalmic Public Health Education in Pakistan

Khalid J. Awan, F.P.A.M.S.

Health education has existed in one or another form since the ancient times. Instructions to improve the physical health were given to the masses either by religious leaders in the form of practices of spiritual significance, such as washing of hands before eating by Prophet Muhammad (SAW), or by political leaders as laws to maintain a strong army, such as the legal requirements by Lycurgus for athletic activity among the Spartans. However, the formal public health education as we know it today began in the early part of this century.

The idea of forcing people to adopt clean habits for better health cannot be employed anymore, and it is necessary to change public's convictions about health. This became apparent to health officials as early as 1875, when the Maryland State Board of Health declared: "...it is that the most thoughtful among practical reformers of the present day base their hopes of sanitary progress on the education of the masses as the real groundwork of national health. The people...must be interested systematically in the general results of sanitary progress, and become more intimately acquainted with the social and material causes by which it is impeded."[1]

The formal foundation of health education in the United States was laid in 1914, when the first Bureau of Health Education was established in the New York City Health Department. Five years later, the field got its specialty name of Health Education at a conference that was called by the Child Health Organization of America (CHOA). At the same conference the CHOA announced a fellowship in health education. The founders of CHOA, a pediatrician named L. Emmet Holt and a nurse named Sally L. Jean strongly held the belief that promotion of health education and nutrition would accomplish much more in the health of children than the process of diagnosis and therapy of existing diseases.[2] Within three years of the above conference enough people showed interest in health education that the American Public Health Association established a separate specialty section for it.

Soon the academic recognition followed with development of specialized graduate curriculum by Clair E. Turner at the Massachusetts Institute of Technology (MIT). At that time, general notion existed that the main goal of health education was the prevention of certain clear-cut diseases as diphtheria, tuberculosis, infant mortality, etc. Hence, the main emphasis was on efforts to get people to carry out certain actions. It was thought, as Hochbaum[3] points out, that failure of people to carry these out was "due primarily if not totally to ignorance, and...therefore the mission of health education was first and foremost to remove such ignorance. Once done, it was assumed, the desired actions would be taken as a matter of course." It is obvious that a similar ignorance of health related matters is currently prevailing in Pakistan. Therefore, it would benefit if our public health officials and educators familiarize themselves with history of health education in America.

The field of public health education has virtually exploded with a mushrooming phenomenon in the United States. In the early 40's, there were about 44 health educators in employment in 13 state and local health departments. In 1990, the survey showed their number to be 25,000. It is projected that by year 2000 their number would increase to 37,000. That is a thousand fold increase in a little over 50 years.[4]

The public health education has further become subdivided into two subspecialty groups, the School Health Educators and the Community Health Educators. At times, it must be remembered, there arises a counterproductive competition among the school health educators and the educators themselves, and between the community officials and the community health educators. This aspect of public health education probably is not yet a matter of concern. We first need to have an effective health education programme. The first step would be to carry out a complete survey of the existing health education programmes and the number of health educators in employment. To learn how many school health educators and how many community health educators will be needed in Pakistan at a national level, a well chalked out programme should first be implemented in a selected trial region of the country.

No segment of the society can ever be free from health needs. Hence, health education is needed at homes, schools, streets, industry, public recreational areas, etc. From the ophthalmologic health care point of view, the preschool and school-age children and their parents, industrial settings, and community activities are perhaps more critical than other areas as a matter of priority. Not that other areas are not in need of ophthalmic public health education.

An editorial in the *Journal* can provide comments with greater confidence only in regard to the ophthalmic health education in Pakistan. Even then it is not possible to be comprehensive, and, hence, specific situations are presented to make the point.

Ophthalmic health education may be considered in three stages: preventive, consisting of actions that can

be taken to avert visual loss, or to improve the visual function; intermediate, through which an established disease can be diagnosed at its early stages with consequently better therapeutic outcome; and therapeutic, through which persons who suffer from illnesses may be made to understand how to administer the prescribed treatment more effectively.

The foremost example of an eye disorder that falls under the category of preventive health education is amblyopia in preschool or school-age children. Amblyopia may easily escape diagnosis, unless there is a very obvious deviation in alignment of the eyes because of which a parent or a teacher can take the patient to a doctor. Unfortunately, most parents and teachers are unaware of this effect of the crossing of eyes on the development of sight. Many children, however, may develop amblyopia without any crossing of the eyes. In the United States, all preschoolers and school-age children are given examination by the school health educator, usually a nurse, and those found to have any visual or alignment defect immediately referred to an ophthalmologist.

Late presentation of retinoblastoma represents problems related to intermediate health education in Pakistan. In a recent paper, Kundi, Khan, and Mohammad[5] have found that in our country the patients with retinoblastoma are brought so late to an eye doctor that no treatment can be effective. They report a mortatlity rate of 88.46%, a situation that has not changed in the last ten years. On the other hand, the cure rate in the Western countries is nearly 90%,[6] an exact opposite of the situation in Pakistan. The major factor in this discrepancy is not the type of treatment, as the same treatment is available in Pakistan as in the Western countries. The reason for the horrible prognosis of retinoblastoma in Pakistan is the ignorance of the parents about the early signs of the disease and the effectiveness of the early treatment. It will be very helpful if a trial programme of public health education about retinoblastoma is set up in the North West Frontier Province of Pakistan, where the incidence of retinoblastoma is highest in Pakistan.

Diabetic retinopathy and glaucoma are good examples to illustrate therapeutic ophthalmic health education. Most Pakistani patients with diabetes mellitus do not keep good control of their blood sugar, and do not realize that diabetes may lead to serious damage to the retina and kidneys. The patients with glaucoma in our country go blind mostly due to a non-compliance with the prescribed treatment. Ophthalmic health educators should spread information that stresses the importance of a full compliance with prescribed treatment of these illnesses and the dire consequences of not doing so.

Recently, a dreadful report appeared on an unusual cause of monocular, and rarely bilateral, blindness in children in Pakistan.[7] In this report, the authors collected 50 cases of preschoolers or school-agers who had lost an eye due to perforation of the globe by the needle of a discarded disposable syringe. The children had picked up the discarded syringes from the street and used them as play waterguns. This particular report demonstrates that health education is not just for the lay people, the professionals who discard potentially harmful items also need it. Eye trauma is perhaps one of the most difficult ophthalmic entities to get a good outcome, even in the advanced countries. Hence, we need to place even more emphasis on the preventive measures against ocular trauma in Pakistan, including that from sports and industrial situation.

Well-planned education programme for each of these blinding entities must be developed by joint efforts of the Ophthalmological Society of Pakistan, experts in each field, the government health agencies, representatives from communication media, and the community leaders. It is a great deal easier to prepare an effective plan for a specific situation than a blanket programme. Each plan should then be implemented with the help of central and local governments, the regional experts, and the communications media in the area. In country like ours, where illiteracy rate is very high, television can be of great help in achieving the expected results of these plans. Each plan should be tried in a specified target region. The experience gained from the individual programs can help in the formulation of national and blanket plans. It is important that all segments of the community, schools, private organizations, businesses, hospitals, unions, industries, communications media, religious organizations, and the government agencies contribute toward the successful application of the final plans in their localities.

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Camera Clinicals

In this section of THE JOURNAL, *photographic documentation of an interesting and challenging observation is persented to the readers. They should make their diagnosis from the given information, and compare their conclusions with the exposition given on page 32.* -Editor.

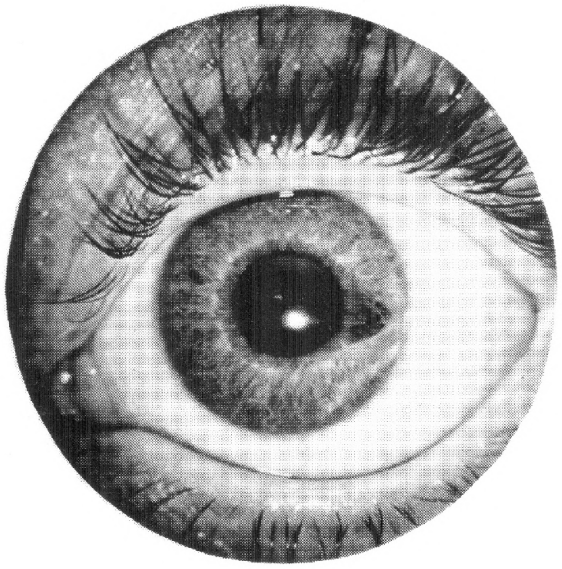

Figure 1

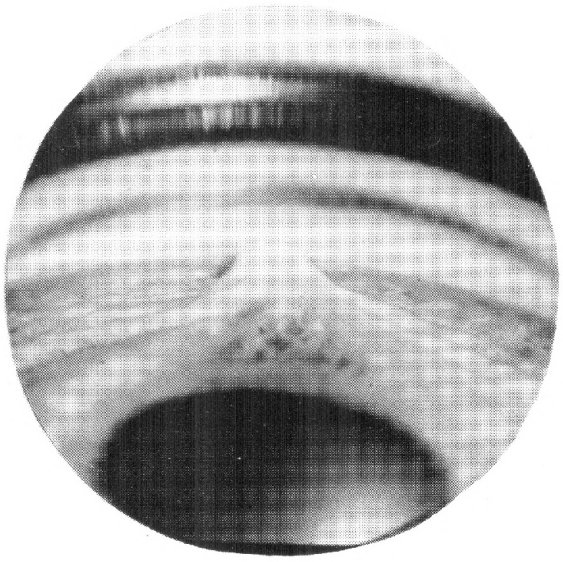

Figure 2

Figures 1 and 2: A 19-year-old woman complained of redness and burning of her right eye. On eye examination, her visual acuity was 20/20 (6/6) without glasses in each eye. The clinical findings supported the diagnosis of acute conjunctivitis of the right eye, which responded to treatment with antibiotic-corticosteroid combination drops. The right was otherwise normal on slit lamp, ophthalmoscopic and gonioscopic examinations. The left eye was also normal except that on external examination the iris appeared abnormal and was pulled toward periphery at 3 o'clock position without any distortion of the pupil (Figure 1). On gonioscopic examination the interesting finding shown in Figure 2 was present. The intraocular pressure was 17 mm Hg with applanation tonometry in each eye.

The patient gave no history of past ocular inflammation or trauma. She or any other family member had never noticed anything abnormal about either of her eyes. The only interesting family ophthalmologic history was that her father had glaucoma and her grandmother had cataracts. The patient herself had enjoyed good health and had been found healthy during a recent general medical examination.

(Figure 1)

Segmental Iridogoniodysgenesis Without Glaucoma or Other Abnormalities

ABSTRACT: A 21-year-old woman had left iridogoniodysgenesis without any other associated ocular or systemic abnormalities. A thick band of anterior iris stroma extended forward and formed an adhesion with Schwalbe's ring across the anterior chamber angle at 3 o'clock position in the left eye. Each eye had 20/20 (6/6) visual acuity without glasses. There was no distortion of pupil, or any associated glaucoma. (Pakistan Journal of Ophthalmology 7:32-33, April, 1991.) Reprint requests to Khalid J. Awan, FPAMS, 1921 Park Avenue, SW, Norton, VA 24273, USA.

Iridogoniodysgenesis is one of the congenital anterior chamber malformations which at various times have been described under the group-terms of "mesodermal dysgenesis of the iris and cornea,"[1] "mesodermal dysgenesis of the anterior chamber,"[2] "mesocctodermal dysgenesis,"[3] and "anterior chamber cleavage syndrome."[4] These anomalies may occur with an autosomal dominant heredity pattern[2,5] or as sporadic cases.[6]

According to the affected structures and the extensiveness of involvement, Waring, Rodrigues, and Laibson[5] formulated a stepladder classification and divided them into three groups of (1) peripheral (prominent Schwalbe's ring, iris strands to Schwalbe's ring and hypoplasia of the anterior iris stroma), (2) central (central posterior corneal defect, central iridocorneal adehesions, and corneolenticular approximation), (3) combined peripheral and central anomalies.[4] Awan[6] divided the syndrome complex into the following six clinical pictures: "Posterior embryotoxon" (prominent Schwalbe's ring); "Axenfeld's anomaly" (prominent Schwalbe's ring with attached iris processes); "Rieger's anomaly" (Axenfled's anomaly with iris hypoplasia); "Peters' anomaly" (deep central corneal opacity and anterior polar lenticular opacity, with or without iridocorneal or iridolenticular strands); "Peters-Rieger's Syndrome" (a combination of Peters' anomaly and Rieger's anomaly with or without posterior embryotoxon); and "sclercornea."

The combination of iris hypoplasia and iris stromal strands adherent to a non-prominent Schwalbe's ring has been called "iridogoniodysgenesis" by some authors.[2,4,7] Iridogoniodysgenesis is associated with glaucoma in a high percentage of cases. Nearly half of the patients may also have megalocornea, corectopia, and an indistinct limbus.[8] In another report, two brothers with iridogoniodysgenesis also developed early cataracts.[7] They, however, had no glaucoma. Awan[6] reported association of hypoplasia of the optic nerve, dysversion of the optic disc, and ectopia of the macula. Other anomalies of the posterior segment that have been recorded include retinal dysplasia, persistent hyperplastic primary vitreous, microphthalmos, and coloboma of the lens.[6]

Several systemic abnormalities have also been reported in patients suffering from "Peters-Rieger's Syndrome" or "anterior chamber cleavage syndrome."[2,5,6] The most well-recognized of these are dental (oligodontia or anodontia) and skeletal (maxillary hypoplasia, facial asymmetry, dysplasias of the skull, extremities, and spine, etc.) anomalies.

The patient reported here is interesting in that she had no ocular or systemic abnormalities that are usually associated with iridogoniodysgenesis. It cannot be, however, categorically said that glaucoma will not develop the affected eye in the future, as it is known that glaucoma may appear later in life in some cases.[5]

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Presumed Cutaneous Ocular Anthrax with Signs of Orbital Cellulitis

Zia Mohammad, F.C.P.S.(P)

ABSTRACT: We saw eight patients, four male and four female, ranging from 10- to 40-year in age, who had unilateral redness, itching, and marked swelling of the eyelids and periorbital area. The edema also extended to the entire face, the opposite eye, the forehead, and the postauricular region. All patients had severe constitutional symptoms and intense headache. The inflammation extended posteriorly into the orbit, with restriction of globe motility to a varying degree in all patients and signs of optic disc involvement in some of them, mimicking a cavernous sinus thrombosis.

These patients recovered only when heavy doses of intravenous penicillin (2.4 million units daily in continuous drip), alongwith oral ibuprofen 400 mg t.i.d., were added to their management. The swelling gradually subsided over a period of several days with formation of a black eschar on the involved area of the affected eyelid. Weeks later, the eschar fell off, leaving behind a badly scarred eyelid with severe ectropion which needed extensive plastic repair.

Although cultures in our laboratory did not confirm it, we strongly suspect these to be the cases of cutaneous anthrax of the eyelid. Further study is in progress to learn the source of *Bacillus anthracis* in the area to which these patients belong. (Pakistan Journal of Ophthalmology 7:33-35, April, 1992.)

Orbital cellulitis is a purulent inflammation of fibrofatty tissues of the orbit, which though uncommon is potentially sight, and even life, threatening. Before the advent of antibiotics, a significant percentage of patients died and of those who survived a large number was left either blind or with impaired vision.[1,2] The prompt and wide-spread use of antibiotics in modern times has made orbital cellulitis a relatively uncommon disease. Nonetheless, it still is regarded an ocular emergency that is a threat to both sight and life of a patient.[3,4] Hence, any condition that even remotely resembles orbital cellulitis must receive prompt and serious attention.

Duke-Elder and MacFaul[4] state that orbital cellulitis due to *Bacillus anthracis* infection is "exceedingly rare" and usually develops secondarily from a pustule of anthrax on nose, lip, chin, or forehead.[4] However, the eyelid cutaneous anthrax is not as rare. Last year (1990), we came across an unusual flurry of cases of what at least on the surface resembled orbital cellulitis, but appeared to primarily involve the eyelids in young persons. Because of the clinical features, history, reponse to heavy intravenous penicillin, and the outcome, we strongly believe that these were cases of anthrax of the eyelid. The purpose of this report is to communicate our experience with this unusual problem to our colleagues at home and abroad.

From the Department of Ophthalmology, Lady Reading Hospital, Postgraduate Medical Institute, Peshawar, Pakistan.

Reprint requests to Dr. Zia Mohammad, F.C.P.S.(P), P.O. Box 81, Mardan, Pakistan.

* Presented at the XIII Congress of the Asia-Pacific Academy of Ophthalmology, May 12-17, 1991, Kyoto, Japan.

Materials and Methods

Last year (1990), eight patients, with an average age of 20 years (range 10 to 40 years), with severe inflammation and swelling of the periorbital and orbital tissues visited in a row the Department of Ophthalmology, Lady Reading Hospital, Postgraduate Medical Institute, Peshawar. A marked edema of the face, opposite eye, forehead and mastoid region accompanied this eyelid and periorbital inflammation (Figure 1). All patients appeared quite toxic with marked constitutional symptoms, complained of severe headache, and six of them had a history of a furuncle in the upper half of the face and one had sinusitis. All of them were admitted to the hospital with a diagnosis of orbital cellulitis. Each patient received full systemic and ophthalmic evaluation. Bacteriological culture with swabs from the eyelid lesions and from the skin peripheral to the orbital region were taken.

These patients were placed on heavy doses of intravenous antibiotics (cefazolin and tobramycin) and oral non-steroidal anti-inflammatory agent (ibuprofen, 400 mg t.i.d.). Anticoagulants were used in first four cases, but on account of finding no special advantage of doing so, they were not used in the subsequent three cases. Because no improvement occurred from the use of antibiotics mentioned above, heavy doses of penicillin (2.4 million units per day in a continuous drip) were added to the management of all patients.

Results

The eye examination showed no abnormality of the uninvolved eye, except for edema of the eyelids. In

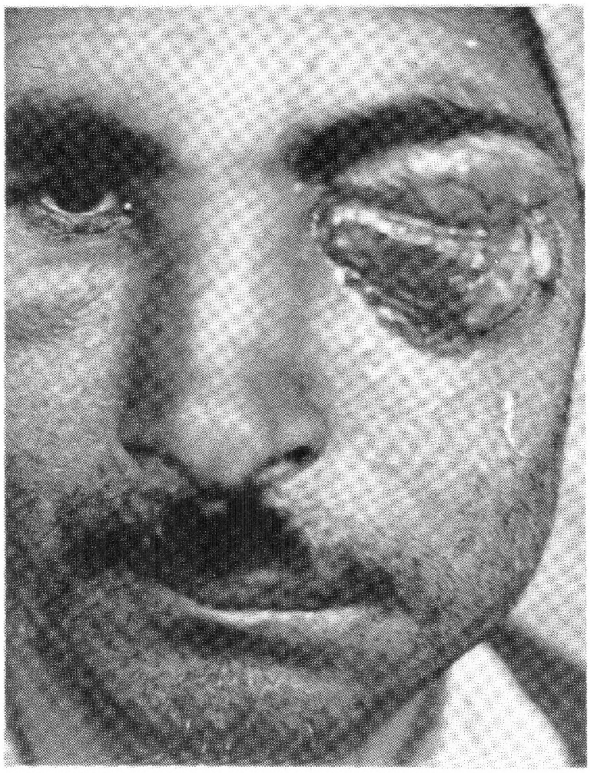

Figure 1 (Mohammad): Left eye. Note the severe inflammation and swelling of the eyelids and periorbital area. The edema is extending to therest of face and other eye.

the involved eye full evaluation of ophthalmic features was precluded by severe edema. However, all of the patients had severe edema of the preseptal and postseptal tissues, with restriction of the mobility of globe from a minimum to almost a frozen eyeball. The loss of orbital fissure did not permit the patient to have diplopia. In the involved eye, the eyelid showed induration and redness which was accompanied by excoriation and water exudation. Although no reaction was present in the anterior chamber, the optic disc appeared hyperemic in some patients and in a couple of them showed frank minimal papilledema. Extreme prostration allowed no cooperation from the patients for further ocular evaluation.

Our cultures showed growth of *Staphylococcus aureus* from the peripheral skin areas in only four of the patients, probabaly as a result of contamination or superinfection. We could not get any growth in cultures taken directly from the eyelid lesions.

None of the patients showed any improvement until the penicillin was added to the therapeutic regimen. Within 24 hours of institution of penicillin the constitutional symptoms started improving, and in another 24 hours the edema began to subside.

After several days the edema of the orbital and periorbital tissues was gone, and the eyelid lesion became covered with a characteristic charbon slough or black eschar (Figure 2). In about two weeks the black eschar spontaneously fell off, leaving behind a badly

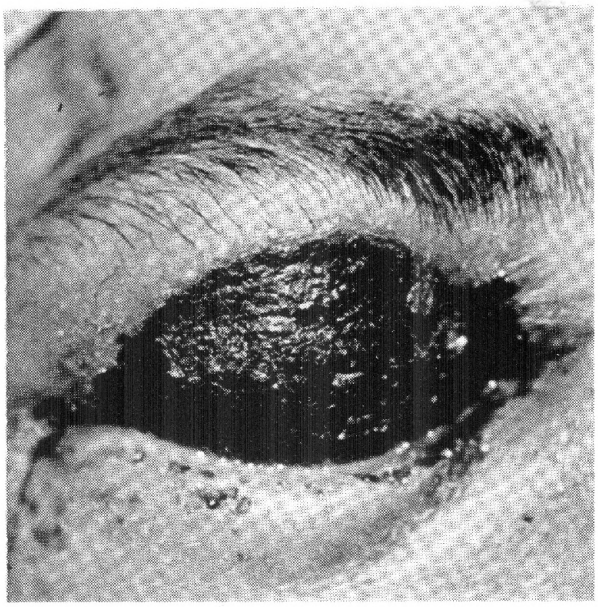

Figure 2 (Mohammad): Upper eyelid anthrax at its resolution stage. There is a characteristic black eschar of charbon with well-defined margins. It spontaneously fell off, leaving behind a severely ectropic eyelid.

scarred eyelid with a severe cicatricial ectropion. The ectropion required in some patients, and will require in others, complex plastic procedure for its repair. Fortunately none of the patients lost more than a Snellen's line of visual acuity. Despite the lack of a bacteriologic confirmation, we diagnosed these cases as those of ocular anthrax with eyelid and orbital involvement.

Discussion

In a very recent report, Yorston and Foster[5] diagnosed eyelid anthrax in almost half of their patients purely on the basis of clinical findings and without the help of any bacterial culture studies. They supported the diagnosis of anthrax by "the presence of characteristic scarring and history of severe swelling and black eschar formation prior to the development of ectropion." We could not get bacteriologic confirmation in our cases, which is not unexpected in view of the fact that sophistication in laboratories of our country leaves much to be required. However, everyone of our eight patients not only thoroughly fulfilled the above criteria of anthrax diagnosis, but each of them also met the therapeutic test of failing to respond to initial broad spectrum antibiotic therapy until penicillin was added. The growth of *S. aureus* in our four patients was from the skin areas that were away from the area of direct involvement. Moreover, infection with *S. aureus* would have shown favorable response to initial therapy with combination of cephalosporin and tobramycin. We are totally convinced that all of the cases reported here were those of cutaneous ocular anthrax.

We have not yet determined the source of *B. anthracis* infection in our patients. A study is underway

to examine the circumstances and the livestock in the area of the Northwest Frontier Province (NWFP) to which these patients belong.

It is thought that *B. anthracis* infection in man occurs from contact with infected live stock (goat, sheep, cattle, etc.), from using animal products that are contaminated by spores of the organism (wool, skin, etc.), or from eating infected meat. Insects, such as flies. mosquitoes, etc. may also carry infection from infected animals to man.[5] We feel that in our area anthrax might be a vector borne disease.

In the Western literature, eyelid involvement in anthrax is regarded as "uncommon,"[6] and orbital invasion "exceedingly rare,"[4] and ocular anthrax receives very little attention in ophthalmic textbooks. Even the latest 715-page *Infections of the Eye* devotes only 12 lines in a column to its discussion and management.[7] Although rare in the U.S.A. and Europe, anthrax is a common infection in Africa, Middle East, India, etc.,[4,5] Our experience has shown that eyelid involvement and orbital cellulitis due to *B. anthracis* infection is not uncommon in our country.

Bacillus anthracis is a Gram-positive, sporeforming, aerobic, zoonotic organism which appears chains of non-motile rods, and is notoriously long-lasting, unperishable even at temperatures of over 100°C or on drying. Its infectivity may last for as long as a quarter of a century. Hence, it is very important that we conduct further studies to delineate regional prevalence of anthrax and formulate proper measures for its prevention and eradication.

Finally, eyelid anthrax must be differentiated from periorbital necrotising fasciitis, an extremely rare ischemic necrosis of subcutaneous tissues and fascia due to an overwhelming infection with β – *Streptococcus hemolyticus*.[8] In the eyelid, the disease usually affects the preseptal structures, causing an alarmingly rapid and severe tissue destruction without formation of black eschar.

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*

Ophthalmic 'Pastpourri"

Bacillus anthracis, a Test Agent for Aqueous Circulation

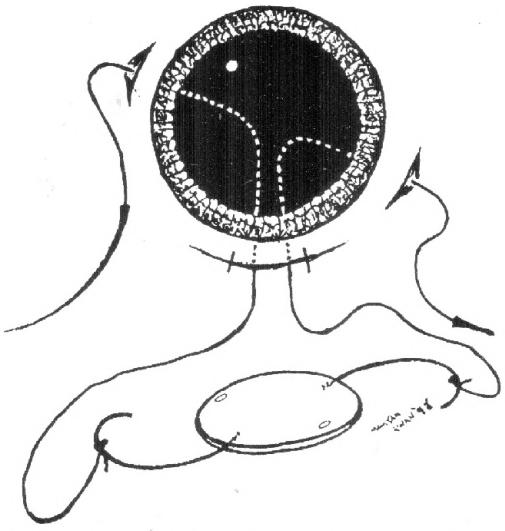
"I have made four experiments of this kind, with results as follows: When a few drops of an aqueous suspension of anthrax spores are injected into the anterior chamber of a rabbit, an abundant growth of the bacillus can generally be seen with the naked eye in the course of 24 hours...A microscopic examination shows...the periphery of the anterior chamber and Fontana's spaces are filled with bacilli...my last experiment, from which I was able to get much thinner sections, plainly showed the bacilli passing in multitudes from Fontana's spaces directly into the blood vessels. In most points the anthrax experiments form simply, a confirmation of the results obtained with India-ink."

- H. Gifford, **1890**
121-17192

Fixation of Posterior Chamber IOL in Aphakic Eye

While visiting Pakistan last December, I was asked by a young ophthalmologist during a discussion on the secondary intraocular lens implantation about my own technique of implanting posterior chamber intraocular lens in an aphakic eye. Because the intracapsular cataract extraction is still the quickest and the most practical technique to meet the needs of cataract patients in Pakistan, there is a large population of patients with surgical aphakia in our country. As the costs of implant surgery go down and more surgeons become available to perform this operation, many of these patients may seek secondary intraocular lens implantation. Therefore, I thought it would be more productive to describe my method of secondary posterior chamber intraocular implantation in a Letter to the Editor in THE JOURNAL. A more detailed study of this method is under way, and I intend to present, *Insha Allah*, its results at the next annual meeting of the Ophthalmological Society of Pakistan at Peshawar.

TECHNIQUE: Following the usual preoperative steps, anesthesia, and preliminary instrumentation, I dissect the conjunctiva and make two 3 mm paralimbal incisions in the superficial half the thickness of sclera 0.75 mm behind the posterior limit of the surgical limbus, at 2 and 8 o'clock positions (in the right eye) or at 10 and 4 o'clock positions (in the left eye). The split sclera is then undermined to make a small pocket or pouch in it. A 10-O prolene suture is passed from the outside to the inside of globe from under the outer flap of this pouch. The long needle passes parallel to the iris plane. This suture is pulled out through a wound in the limbus at the opposite side.



Similarly, another suture is passed from within the walls of other scleral pouch, as is illustrated here in the accompanying Figure. These sutures are tied to the respective haptics of the implant, and as they are pulled out the implant is gently positioned in the sulcus behind the iris. The prolene sutures are then tied, in such a way that the knot remains buried within the pouch under its outer wall. This technique is simple and eliminates all risk of later exposure of the scleral suture with subsequent irritation or infection. There is no need to make any scleral flaps, or placing of sutures blindly from inside of the eye.

-Muhammad Humayun, F.P.A.M.S.
Halifax, Nova Scotia, Canada

A Correction

Due to the printer's misunderstanding of cropping marks, the wrong portion of the photomicrograph was printed in Figure 3 on page 9 of the last issue of THE JOURNAL with article titled "Higher Incidence of Eyelid Squamous Cell Carcinoma in Comparison to Basal Cell Carcinoma" by FM Halepota, AH Soomro, and SM Shaikh. The correct Figure 3 is being reproduced below with its original legend. We regret this error. *-Editor*.

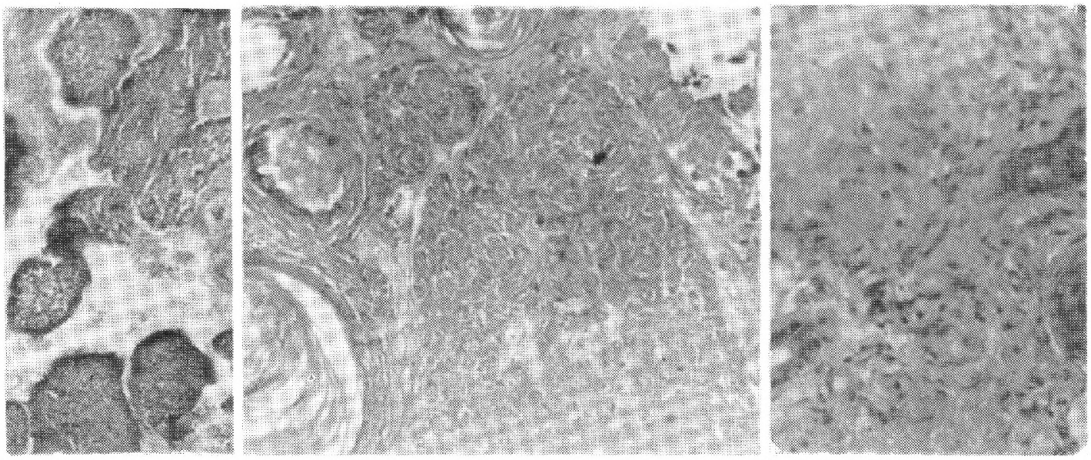


Figure 3 (Halepota, Soomro and Shaikh): Histopathologic section of Figure 2 lesion. Note typical sheets of squamous epithelial cells, hyperchromatism, and keratoepithelial pearls.

Rare Occurrence of Ocular Toxocariasis in Pakistan

M. Afzal Bodla, M.S.

ABSTRACT: Ocular toxocariasis is very rarely reported in Pakistan. A 4-year-old Pakistani boy presented with left esotropia and leukokoria. The left eye had a concave white, vascular retrolental mass at 6 o'clock near the ora serrata with a fibrous band extending through the vitreous to the posterior pole. We made the diagnosis of presumed ocular toxocariasis on the basis of clinical features, eosinophila (4%), a positive history of contact with puppies, elevated antibody titers to A and B blood groups, and exclusion of other disorders. (Pakistan Journal of Ophthalmology 7:37-39, April, 1991.)

Ocular toxocariasis, a disease very rarely reported in Pakistan, is caused by *Toxocara canis*, the common roundworm of the dog. The organism exists only in larval form in humans, and requires other mammalian hosts, such as dog, cat, etc., in order to complete its life cycle. The eggs passed in feces of these animals gain entrance into a child's alimentary tract via hands contaminated with soil containing these ova. Once swallowed, the eggs mature into larvae in the intestine, bore through the intestinal wall and pass via the blood stream to the eye and other organs.[2]

Ocular toxocariasis may manifest itself in a variety of ways. The most common form is a submacular granulomatous lesion. The second commonest being a peripheral retina granuloma near the pars plana. Such cases may simulate pars planitis.[2] Traction bands or retinal folds may extend back to the posterior pole, causing macular or tractional retinal detachment. In third type, the posterior segment inflammation ranging from mild cells in the vitreous to an intense endophthalmitis may appear. The white reflex and poor vision in such eyes may arouse a suspicion of the eye's harboring a retinoblastoma, prompting an enucleation.

Case History

A 4-year-old boy failed school examination. He had loss of sight, esotropia, and leukokoria in the left eye. On examination, visual acuity in the left eye was hand movements (HM). The leukokoria was mainly in the lower half of pupil (Figure 1). The slit lamp examination showed no anterior chamber reaction. Left pupil reacted uniformally but sluggishly. Examination of the ocular fundus with three-mirror contact lens showed a white, vascularized retrolental mass at 6 o'clock near the ora serrata. This concave white mass was almost touching the lens, and a white fibrous band was extending from it to the posterior pole. Dense inflammation with membrane formations was present in the vitreous cavity, and only a hazy view of the optic disc was possible on ophthalmoscopy.

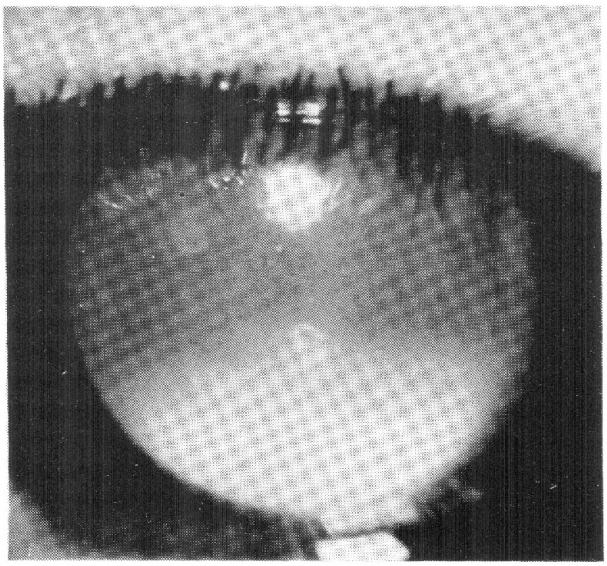


Figure 1 (Bodla): Left eye. Note inferior leukokoria.

A thorough systemic evaluation was unremarkable, and did not show any lymphadenopathy, hepatomegaly or pulmonary lesions. Different investigations were carried out to arrive at the proper diagnosis. X-rays of the orbits did not show any calcification. B-scan ultrasonography of the left globe showed a band, without any calcification in it, extending from the ora serrata to the posterior pole (Figure 2). Body bone scan for any metastatic lesions was negative. Two interesting findings of blood analysis were an

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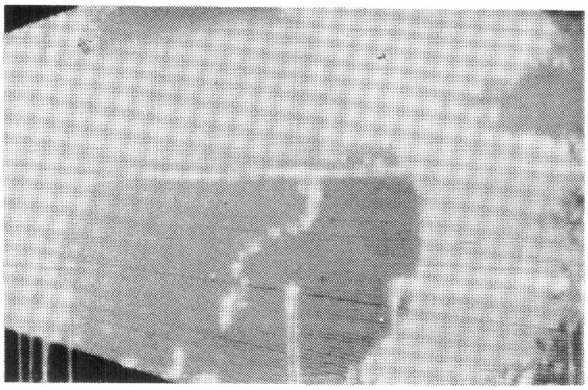

Figure 2 (Bodla): Left eye. B-scan ultrasonograph. Note a non-calcified band extending to the posterior from the periphery of the retina.

eosinophilia of more than 4% and the elevated antibody titers for A and B blood groups.

Systemic corticosteroids were given to successfully suppress the intraocular inflammation.

Discussion

Ocular toxocariasis may manifest itself in a variety of ways, all of which are typically unilateral. Three most frequent clinical forms are (a) a solitary granulomatous macular lesion, (b) a peripheral retinal inflammatory granuloma, and (c) an intense destructive endophthalmitis. Other presentations include various types of preretinal gliosis, which usually occurs over the optic disc and the macular areas.

Macular granulomatous lesion is the most frequent manifestation of ocular toxocariasis. Peripheral ganuloma over the ora serrata or pars plana is the second most common lesion.[2] In its active phase, the peripheral type of ocular toxocariasis may resemble pars planitis. However, in toxocariasis the yellow-white inflammatory reaction may be located superiorly. Also, pars planitis is an overwhelmingly (80%) bilateral disease, and usually occurs in the older age group. Once the active process of disease has died out, prominent traction bands or retinal folds, or both, may extend backward from the scar to the posterior pole, causing distortion of the macula or tractional retinal detachment. An intense and destructive endophthalmitis is the the third type of clinical manifestation of ocular toxocariasis.

Gass et al.[5] described a new clinical entity, named diffuse unilateral subacute neuroretinitis (DUSN), which may be another possible manifestation of ocular toxocariasis. In two patients with this disease, these authors observed a motile, round worm, "probably a *Toxocara*," under the retina. However, in a later publication they rejected this probability, and declared that nematodes other than *Toxocara* were the underlying cause of DUSN.[6] They realized that the second-stage larva of *Toxocara* does not exceed 400μ in length and the larvae in the retinas of their patients measured upto 2,000μ. Kazacos et al.[7] have found that the raccoon and skunk nematode, *Baylisascaris procyonis*, is one of the definite etiologic organism. Other authors also have suggested that nematodes other than the *Toxocara canis* may figure in the pathogenesis of this entity.[8,9] Nonetheless, though rare, *Toxocara* has been presumed to be the cause of this syndrome at least in two patients from London's Moorfields Eye Hospital.[6] Moreover, in a recent report from the United States the ELISA titer of 1:128 in a 26-year-old Ghanian man with diffuse unilateral subacute neuroretinitis strongly pointed to *Toxocara* as the likely cause.[10] Diffuse unilateral subacute neuroretinitis (called "unilateral wipe-out syndrome" by Gass[11] in an earlier publication) is characterized in its early stages by "visual loss, vitritis, mild papilledema, and successive crops of multiple, evanescent, gray white, deep retinal lesions." The end-stage may show diffuse or focal depigmentation, optic atrophy, electroretinographic changes and severe visual loss.

Sometimes a local inflammation of the optic disc characterized by an elevation of the disc, telangiectasia of its vessels, and subretinal exudation is caused by the nematode larva, and rarely this optic neuritis may be lead to the central retinal artery obstruction.[12]

In cases with peripheral inflammatory mass, visual acuity may range from normal to light perception. Typical vitreous strands may extend from the peripheral white mass to the posterior fundus. These represent the track of inflammation caused by movement of the larva to the peripheral retina, choroid, or vitreous. Occasionally, a dense cellular reaction may occur in the posterior segment. The peripheral retinal granuloma may mimic the cicatricial phase of the retinopathy of prematurity (ROP), called retrolental fibroplasia (RLF) in the past. The bilaterality of this disease, a history of premature birth, and an exposure to oxygen are easy pointers to the correct diagnosis. In persistant hyperplastic primary vitreous, there is a relative microphthalmia, microphakia and elongated ciliary processes, with a history of retrolental mass at a much earlier age.

The patients with ocular toxocariasis usually are children in the age group of two to nine. Leukokoria or strabismus may be the first hint of the problem. On examination these eyes may reveal retinal detachment with telangiectasis and yellow vitreous exudates, which must be differentiated from retrinoblastoma , Coats' disease, and other disorders that give rise to leukokoria. In Coats' disease, signs of inflammation or fibrosis in vitreous are characteristically absent.

The diagnosis of toxocariasis is made on the basis of clinical appearance and a history of contact with puppies or dogs. A peripheral eosinophilia of more than 3% is helpful. The elevated titers of antibodies against the blood groups A and B are also noted in

toxocariasis. The modern test of choice to confirm toxocariasis is the enzyme-linked immunosorbent assay (ELISA). In this test, antibodies in human serum and intraocular fluids are detected and assayed by utilizing secretory antigens extracted in vitro from the second-stage larva of *Toxocara*. Although for the general purpose the titers of 1:32 or higher are required for a positive test, a titer of 1:8 or higher is considered sufficient for the diagnosis of ocular toxocariasis in otherwise clinically compatible cases.[13] Unfortunately, we do not have ELISA test available in Pakistan, but the clinical course, the local findings, and other laboratory studies point to the diagnosis of ocular toxocariasis than any other disorder that may present with similar clinical picture.

Therapy of ocular toxocariasis consists of use of systemic corticosteroids alone or with anthelminthic agents. Scleral buckling procedure or pars plana vitrectomy or both also have a place in the management of cases with prominent retinal bands or folds with tractional retinal detachment.[14] For current detailed information on ocular toxocariasis or visceral larva migrans (VLM), the reader is advised to read two excellent recent reviews on the subject.[15,16]

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Ophthalmic "Pastpourri"

Glaucomatocyclitic Crisis - A Century Ago

Modern ophthalmic textbooks also describe glaucomatocyclitic crisis under the title of the Posner-Schlossman syndrome, because of the claims that these American authors were the "first" to describe this entity in 1948. According to the leading authorities of today, the entity has the following charateristics: "unilateral," "patient does not complain of pain," " trace of aqueous flare and slight increase in the number of aqueous cells," "normal visual fields and optic discs," and " the elevated intraocular pressure (which) can last from a few days to several weeks."

-*The Glaucomas*, (pages 1211-1213), edited by Robert Ritch, M. Bruce Shields, and Theodore Krupin - **1989**

A hundred years ago, Professor Schweigger of Berlin commented in one of his papers on glaucoma: "I have observed unilateral plus tension as a temporary manifestation in eyes unaffected by either inflammation or glaucoma." *(Could he have been talking about glaucomatocyclitic crises in which then less refined methods of examination prevented the observation of mild inflammatory changes in the anterior chamber we so easily pick up today? - Editor)*

Prof.C. Schweigger - **1891**

1-20-91477

Review Article

A Brief Review of the Fungal Ocular Infections and Their Therapy

Akhtar J. Khan, F.R.C.S.

ABSTRACT: Generally, fungal elements invading the eye belong to the category of airborne saprophytes. Diagnosis is made by characteristic clinical features, specific staining, and culture on Sabouraud's dextrose agar without cycloheximide. It is necessary that several colonies of the same fungus be isolated for a specific diagnosis. The therapy of fungal infection is based on agents from three groups, polyenes, imidazoles, and fluorinated pyrimidines. Of these, amphotericin B, natamycin (both polyenes), ketoconazole, and miconazole are currently the most popular, natamycin holding the lead. (Pakistan Journal of Ophthalmology 7:40-46, April, 1991.)

Mycotic or fungal infection of the eye was till recently considered to be a rarity, and there were few reported cases in the ophthalmic literature. The reason is that in the past the diagnosing of fungal disease was difficult. The infection was also resistant to the available treatment. As the disease in many cases proved fatal, enucleation was generally undertaken to save the patient's life.[1]

Corneal trauma, caused either by foreign bodies containing vegetable matter and soil, or by surgery predisposes the eye to colonization by fungi.[1] Other conditions that may facilitate colonization by invading fungal organisms that are present in the external environment are previous corneal disease, exposure keratitis, radiation keratitis, herpetic lesions, serpiginous lesions, and other disorders, such as facial palsy and bullous keratopathy.[2,3] The increasing popularity of the contact lenses and the carelessness of their wearers in taking precautionary measures such as the use of properly sterilized cleaning solutions are also reported to be another cause of fungal infection.[4,5,6,7] It may be pointed out that lesion after surgery or trauma may not be apparent even up to six months, during which time the vision may not be appreciably impaired.[2] Drug abuse has also been reported as a cause of mycotic infection, especially endophthalmitis.[8] Ophthalmic literature contains recent reports about endogenous dissemination of systemic mycosis to the orbit, retina, optic nerve, sclera, conjunctiva and adjacent tissues.[9,10,11] Sometimes surgery may also result in deep penetration of fungus into the globe from an ulcerative lesion or a contaminated instrument, creating endophthalmitis.[10,12]

History

The first recorded case of fungal infection was that of canaliculitis, described by Cesoni in 1670.[13] Von Graefe[14] diagnosed the disease in 1854 and identified its etiologic agent, an *Actinomycete*. Leber[15] was first to report in 1879 that mycotic keratitis was caused by *Aspergillus* infection of the cornea. As the diagnosis of the fungal infection was difficult, only 63 cases of the disease were reported in ophthalmic literature up to 1951.[16] The pathology of fungal keratitis reviewed in an article published in 1953, included only 31 cases, in which the organism had been demonstrated in the tissue.[17] The rate of increase in the detection of these cases in recent years is confirmed by the fact that out of a total of 150 cases reported so far, 85 had occurred between 1951 and 1963.[1]

Incidence of fungal infection

Recent research has proven that fungal infections are not so uncommon as it was previously believed. As a result of improvements in diagnostic techniques, the detection of mycotic infection has become possible. A number of reviews have, therefore, appeared recently confirming the increased incidence of this disease.[7,16-23] However, despite this success in the technologies of diagnosis, there are still difficulties in predicting fungal infection, defining its morbidity, and instituting an effective treatment.[1]

Ophthalmologists working in the tropical countries, including Pakistan, have now begun to describe their experience with substantial numbers of cases.[7,23-25] The assessment of accurate incidence of this disease is more difficult in Pakistan, because of a lack of proper record keeping and facilities for its diagnosis.[7,23] Fungal infection may be quite common in this country, because of (1) the hot tropical climate, (2) vast rural areas, and (3) population having neither medical facilities, nor health care awareness. The farmers may get invasion of their eyes by foreign bodies containing vegetable matter. Even in cities, where medical treatment is available, doctors generally mistake this disease for bacterial ulcer and may treat it with combined antibiotics and corticosteroids.[7,23] These drugs further mask the infection, making treatment more difficult. When steroids are used,

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perpendicular penetration through the Bowman's membrane leads to penetration of cornea, and also the internal orbit is invaded.[1] Rise in frequency of keratomycosis has also been reported to be due to the use of corticosteroids for the treatment of inflammatory diseases. This knowledge has resulted in reduction in the indiscriminate use of steroids in the U.S.A.[1,9,10,11]

Laboratory diagnosis

It is, therefore, advised that all corneal ulcers should be investigated, as a matter of routine, in the laboratories.[23] For the diagnosis of mycotic infection,[1,12,21,26,27] it should be remembered that fungal elements are difficult to identify. Besides, the etiologic agents are saprophytic organisms, which usually penetrate deep within the corneal structure and are absent on its surface.

In order to obtain viable fungal material, it is necessary to use extensive debridement. A direct smear is valuable for rapid diagnosis. Fungal elements are easily seen in potassium hydroxide (KOH). Gram stain may be useful. Fungi, being saprophytic soil organisms, require culture procedures different from those used for systemic or cutaneous bacterial pathogens. It is important to know that Grams staining must be meticulous; otherwise, the results will be totally non-conclusive, or even false negative.

It is necessary to take multiple cultures. The preferred medium for culture is Sabouraud's agar that does not contain antifungals, such as cycloheximide.[1] Fungi generally grow on almost all antibiotic-free laboratory media at room temperature within 24 hours to three days.

Most of the organisms are species rarely encountered in a medical mycology laboratory, so identification is often difficult. Such cultures should be sent to reference laboratories and other medical mycologists for verification of identification.[1]

Classification of fungi

A large variety of fungi, bacteria, yeasts and other microorganisms are present in the external environment.[1,27] A majority of fungal organisms that invade the eye are soil saprophytes, whose conidia fly with the wind or float in the air. However, a healthy adult has a high level of natural immunity to fungal infections.[27] This natural resistance to foreign invaders is of nonspecific type and depends on genetic factors, as well as age, sex, nutrition and hormone balance. Its other determinants are the mechanical barriers of intact skin, mucous membrane, and surface secretions etc. The cell mediated immune response is the mainstay of the body's defense against fungal infection.[27] Whenever the natural defenses are weakened or broken, due to an injury or surgical operation, particularly in case of the cornea, these microorganisms find this situation suitable for colonization.[1,27]

Pathogenic fungi

The fungal kingdom is inhabited by a vast number of organisms and microorganisms. These pathogenic fungi are heterogeneous and are scattered into four taxonomic classes based on their methods of reproduction.[27]

(1) Zygomycetes: Zygote production follows fusion of hyphal tips.
(2) Basidiomycetes: Sexual spores are borne on special club-shaped cells called basidia.
(3) Ascomycetes: Sexual spores are produced within an ascus.
(4) Deuteromycetes: Lack sexual spores and reproduce by asexual spore formation only.

The fungi of the first three classes produce sexual spores and are known as "perfect fungi", while the last one is known as "fungi imperfecti".[27] Although the number of fungal species invading the eye is as large as the organisms inhabiting the earth, the following three fungus species are recorded to be the most aggressive opportunists, and account for the majority of the fungal keratitis cases recorded in literature.[1]

(1) *Fusarium sp.*
(2) *Aspergillus fumigatus and*
(3) *A. Niger.*

Other fungi which may invade the eye are: *Candida albicans* and related species,[10,28,29] *Fusarium solani*,[30-33] *Fusarium oxysporum*,[34] *F. moniliforme*,[12] *Paecilomyces lilacinus*,[12] *etc.*

Characteristics of fungal pathogens

The ocular pathogens may be divided into three groups.[35]

(1) Filamentous fungi,
(2) Yeasts, and
(3) Diphasic organisms.

FILAMENTOUS FUNGI: These are multicellular organisms and produce tubular projections, called hyphae, which are further divided into septate or nonseptate.[35]

The septate hypae show distinct divisions between cellular elements. The multinucleate septate filmanentous fungi are the dangerous pathogens that cause corneal disease. In this group are included *Fusarium, Aspergillus* and *Penicillium* spp. In nonseptate filamentous fungi are included *Phycomycetes* and *Rhizopus*, but they are not very common as corneal pathogens.[35]

YEASTS: These are unicellular organisms, which reproduce by budding. Those buds that don't separate from the parent organism are known as pseudohyphae, and they don't have multiple nuclei and other cellular

organelles. *Candida* and *Cryptococcus* species are the most common causes of ocular infection.[35]

DIPHASIC ORGANISMS: These fungi, which may exist in either filamentous or non-filamentous form, are usually responsible for hematogenous ocular and orbital diseases.[35]

Of these fungi, filamentous septate fungi and the yeasts are the most important common corneal pathogens.[35] The fungi isolated from the cornea vary from different geographical regions. For example, septate filamentous fungi are most common causes of infection in the southern states and the *Candida* species predominate in the northern states of the U.S.A. Worldwide, *Aspergillus* and *Fusarium* are reported to have caused the most frequent and severe ocular infection.[36,37] Fungal isolates obtained from corneal ulcers in India usually belong to filamentous fungi, e.g. *Aspergillus* sp. and *Fusarium*.[37]

Ocular fungal infections

Fungal eye infections are classified into three categories, each with a particular set of predisposing factors, type of pathology, group of etiologic agents, and specific therapeutic procedures[1]: (1) mycotic keratitis, (2) endogenous oculomycosis, and (3) extension oculomycosis.

Mycotic keratitis

It is fungal infection of the cornea, usually following trauma or a superficial disease. The debilitated tissue becomes the most favored site for colonization as a result of exposure keratitis, congenital defects, or ulcers initiated by other causes. The main clinical features of mycotic keratitis include severe inflammatory reaction, vascularization, ciliary flush, flare of the anterior chamber, and folds in Descemet's membrane. The ulcer is characterized by raised epithelium, with a white shaggy border. When the fungal elements penetrate the corneal stroma, there is a distinct radiating margin, with fuzzy, hyphate border extending beyond the ulcer edge, forming satellite lesions. A sterile hypopyon and a persistent "corneal ring" may be visible beyond the edge of the ulcer. It is composed of neutrophils, cosinophils and plasma cells.[1,38,39]

The progression into the globe of a fungal ulcerative lesion, a deep penetrating injury, or surgery may lead to fungal endophthalmitis.[1] Intraocular infection first appears as a white mass in the vitreous behind the pupil, and a grayish infiltrate occurs which gradually becomes more extensive. Although the lesion may continue for many days, or even months, vision is not much affected for some time. There may be hypopyon, redness of the eye, and some pain, which may recede after some days. However, the lesion continues and increases progressively. In most of the cases the eye of the patient is enucleated, because the disease is resistant to all treatment.[1,10,12,40]

Endogenous oculomycosis

This ocular infection occurs as a result of dissemination of fungal organisms from other parts of the body, creating systemic oculomycosis. About 25 cases of *Cryptococcosis*,[18,59] nine cases of systemic Coccidiodomycosis[9] and six cases of blastomycosis[60] have been reported. The most common cause of endogenous oculomycosis is *Candida albicans*. The eyes afflicted with disseminated mycosis usually have granulomatous uveitis.[1,10,29,61]

During the last few decades numerous agents for the treatment of fungal keratitis have been used.[1,35] It has been experienced that effective eradication of fungi is usually found to be difficult due to the deeply invasive nature of the infectious process.[35] The fungus invading the eye penetrates through the cornea into the anterior chamber making the drugs used ineffective. Search is on for an effective agent with pharmacologic properties, which enable it to penetrate the cornea and reach the underlying fungus.[35]

There are a few antifungal agents used for the treatment of mycotic keratitis, and several studies have assessed their comparative efficacy. These antifungal agents may be divided into three main groups,[35] the polyenes, the Imidazoles, and fluorinated pyrimidines.

Extension oculomycosis

Many diabetic patients, who develop rhinocerebral mucormycosis, also develop oculomycosis through extension of infection to the adjacent orbits.[1] Rhinosporidiosis and meningeal cryptococcosis also cause extension oculomycosis. This disease results in orbital pain, with ophthalmoplegia ptosis, localized anesthesia, proptosis, limitation of movements of the eyeball, fixation of the pupil, and loss of vision. Hyphae may be seen coursing through the vitreous.[1]

As the disease advances, the fungus enters the blood vessels, resulting in infarction and necrotic sequelae in the brain and softening of the frontal bones. The patient becomes lethargic and some times falls into coma within seven or ten days. A few patients are reported to have died within two days after the systemic infection was detected. Overall mortality rate ranges between 80 and 90%. Most common fungus isolated from patients suffering from this disease is *Rhizopus oryzae*, or *R. arrhizus*. The organisms detected in this disease are reported to be saprophytic soil fungi, also termed as the "black bread molds".[1]

Therapeutic agents

Polyenes were the first effective antifungal agents discovered for the treatment of mycotic keratitis. Their molecular structure consists of a conjugated doublebond system of variable size linked to mycosamine, an amino acid sugar.[41,63] This group of durgs includes the following three important antifungal agents, nystatin, amphotericin B, and natamycin (pimaricin).

NYSTATIN: Nystatin, the first polyene to be discovered, in 1950, has been used successfully in some cases in which the fungus was resistant to other agents, e.g. amphotericin B.[42] It is too toxic and has poor ocular penetration, which has made its use limited.

AMPHOTERICIN B: It is a heptaene polyene, discovered in 1956 by Gold and colleagues.[41] It is insoluble in water, unstable at 37 degree C. and rapidly degrades, if exposed to light.[43,44] It is, therefore, necessary to use additives, e.g. deoxycholate. Methyl esterification enhances its water solubility, while maintaining good antifungal activity. The drug had greater success when the disease was caused by fungi other than *Fusarium*.[45] It is severely irritating, and the treatment may be painful, with exaggerated inflammatory response, scarring and permanent damage to the eye. Although more widely used, if other treatments are available, the use of amphotericin B is contraindicated.[1]

NATAMYCIN (PIMARICIN): It is a tetraene polyene antibiotic drug derived rom the actinomycete *Streptomyces nataliense* in 1955,[1] and its clinical usefulness has been studied since 1958.[1,46] Although it is insoluble and moderately toxic when administered systemically, it is essentially without irritation or discomfort when used topically.[31,32] The studies conducted have proved that natamycin is the most valuable ocular antifungal agent discovered to date. It has been used most successfully in mycotic keratitis, particularly in *Fusarium* infection.[31,32,47,48]

Natamycin is the only antifungal commercially available in the United States in a 5% topical ophthalmic solution as Natacyn™. [35,49] Unfortunately, the drug is not available in Pakistan. The treatment schedule of Natacyn has now been standardized.[49] The drug is administered as a 5% solution. The dry antimycotic is dissolved in distilled water with 4 N sodium hydroxide. It is neutralized to pH 7 with 4 N hydrochloric acid. After stirring it for two hours to make it a lotion-like suspension, and adjusting the pH to 6.5 or 7.0, it is autoclaved for 20 minutes at 110 degree C., 15 psi. It is then kept in plastic dropper bottles and stored in the dark at 4 degree C. The suspension is given as drops on the lower tarsal conjunctiva every one to three hours until the infection subsides.[1] Jones et al[31] who treated 18 consecutive cases with natamycin reported only two failures. Natacyn™ 5%, the topical ophthalmic form of natamycin is available in 15 ml bottles from Alcon Laboratories, Inc.[35] These containers may be stored at room temperature or refrigerated, but care should be taken to avoid freezing, exposure to light and high temperatures. Before use, it must be shaken well.[35] O'Day[37] opts for loading dose approach, in which one drop is instilled into the conjunctival sac at half hour intervals. This rate may be gradually reduced to one hourly drop 6-8 times daily after 3-4 days of administration.

Natamycin has been acknowledged as the most effective drug for the treatment of filamentous fungi, especially *Fusarium* and *Aspergillus* infections, which are the most common causes of fungal keratitis the world over. There have been some cases of failure, but a large series of patients treated with this drug have established its efficiency and primacy in the treatment of fungal infections caused by filamentous fungi.[47,50-52] Its popularity has been limited to an extent only by its cost.[35]

Imidazoles: The discovery of the anti-protozoal compound thiabendazole, a substitutive benzaidazole, in 1965, as an antifungal drug, was hailed as an important breakthrough. Later on, a number of related new antifungal agents, the imidazoles, were developed. Three of them, miconazole, clotrimazole and ketoconazole are commercially available in the United States. They generally exhibit fungistatic activity in vitro at low concentrations and fungicidal activity at high concentrations.[35]

MICONAZOLE: Miconazole has a broad spectrum of activity against filamentous fungi in vitro, and also yeasts and gram positive bacteria.[36,53,54] Miconazole 1% used topically has shown minimal toxicity[35] and appears to be well tolerated.

CLOTRIMAZOLE: Synthosized in 1967, it showed a broad antifungal activity in vitro and is reported to be of great value int he treatment of *Aspergillus* infection in vivo.[36,56] A topical ophthalmic preparation can be made with 1% clotrimazole in arachis (peanut) oil.[57]

KETOCONAZOLE: It is a recently developed imidazole and has shown great efficacy in the treatment of keratomycoses by damaging the fungal cell wall. Clinically, ketoconazole appears to be effective against *Candida, Aspergillus, Fusarium* and *Curvularia* spp.[58]

Fluorinated pyrimidines

One of the fluorinated pyrimidiens is flucytosine (5-fluorocytosine).[35] It is transported across the fungal cell membrane by a specific permease elaborated by certain fungi.[41] Flucytosine is effective against yeasts, including *Candida* and *Crytptococcus*.[44] It should not be used alone but as an adjunct therapy in the treatment of yeast keratitis.

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Commentary

Current Management of Oculomycosis

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Over two decades ago, ocular infection with a fungus was a rare event, at least in what could be properly diagnosed by the then available techniques[1] Significant advances in diagnostic methods and an enhanced clinical awareness during the past ten years have made the diagnosis of oculomycosis more common, and over 100 different fungal species pathogenic to the eye have been recognized.[2] Although any of these species can be found anywhere in the world, it appears that *Candida* is more common in the cold climate areas of Western countries and *Aspergillus* and *Fusarium* are more frequent in Indo-Pakistan. In the United States, *Fusarium solani* is the most common isolate in warm southern regions, but *Candida* is more common in the colder northern area.[4] In another Western report *Candida* was found 21.4% of the times in fungal keratitis in the U.K. and only 0.6% of the time in India; on the other hand, *Aspergillus* and *Fusarium* species were found 50% of the time in the UK and 65% of the times in India.[3] In a study from South India, the authors found no *Candida* cases among the 82 cases of fungal keratitis.[1] In another report from New Delhi, the authors isolated *Aspergillus* and *Fusarium* species in 31 out of 46 cases and *Candida* only in two cases.[5] Therefore, the management of oculomycosis will obviously differ in in these geographical regions. This is not just because of the prevalence of different types of organisms in these countries, but also on account of the limitations of choice in available therapeutic agents, climate, and socioeconomic circumstances in our parts of the world.

Efficacy of any treatment depends on accurate diagnosis, which in the case of fungal ocular infections is fraught with difficulties. Classical clinical features of a fungal keratitis include an indolent course, localized yellow-white infilterate with dry, crumbly, slightly raised surface, crenated edge with fingerlike projections, satellite lesions, a surrounding ring or halo, history of trauma, recurrent hypopyon, and, at times, intact epithelium on top of the lesion. However, it is important to remember that all of these features may be entirely absent, and each fungus can cause its own totally unpredictable disease.[4,6] Hence, every effort should be made for laboratory isolation of fungus in suspected cases.

Although potassium hydroxide (KOH) smear studies for fnngi has fallen out of favor in the West, Srinavasan[3] in India was able to correctly diagnose 73 out of 82 culture-positive keratomycosis cases by 10% KOH smear. Garm stain unless done meticulously may prove to be of no help. Deep corneal scrapings, preferably done in the operating room, in keratitis, and vitreous biopsy in endophthalmitis should be cultured on Sabouraud dextrose agar without cycloheximide and with an antibiotic such as gentamicin.

Currently, natamycin (pimaricin) in 5% solution is the most popular antifungal, and it is effective against 70 to 90 % of fungi that cause keratitis. It is most effective against *Fusarium* and *Aspergillus*. Amphotericin B 0.15% concentration is as effective as higher concentrations but is a lot less toxic effects.[7] It is applied every five minutes for an hour to get quick therapeutic levels, after which the frequency is reduced. It is most effective against *Candida* and *Cryptococcus*. There also exists an additive effect between amphotericn B and flucytosine (5-fluorocytisine), which can be used as 1% topical solution. Amphotericin B combined with subconjunctival rifampin has an enhanced effect.[2] Of the azole agents, miconazole, 1% drops in arachis oil or 2% cream, and ketoconazole, in 1-5% concentration, or orally 300 mg daily, are most favored. In some situations combined therapy of these two, miconazole topically and ketoconazole orally may be employed. Miconazole, which has a broad spectrum activity against fungi, may also be used subconjunctivally and intravenously. Newer agents like itraconazole and fluconazole have shown great potency against fungal infections and have fewer adverse effects than other antifungal agents. However, their use in ophthalmology has not yet been tried. It is to be noted that removal of epithelium allows greater penetration of antifungal agents into the corneal stroma. In fungal endophthalmitis, ketaconazole may be used orally, as it has good ocular penetration. Amphotericin B is given intravenously in doses of 0.5 mg/kg per day. Flucytosine is another

oral option. Amphotericin B (5 μg) and miconazole (40 μg) may be administered intravitreally. Another agent that has received almost no attention in the Western literature, but has been found to be very efficacious [61 (82.4%) out of 74 culture-proven cases of fungal keratomycosis] is 1% silver sulfadiazine. Five time a day topical applications of 1% silver sulfadiazine ointment proved effective against *Aspergillus* (65.2%), *Fusarium* (88.8%), and *Candida* (100%).[8] It appears that its easy availability, relatively low cost, effectiveness even in deeper corneal lesions, freedom from local and systemic toxic affects should make silver sulfadiazine a hot ocular antifungal item in Pakistan, at least in clinical research fields.

Newer more efficient drug delivery methods, such as collagen shields,[9] liposomes,[2] are also bound to make therapy of oculomycosis more effective in the future. Excimer lasers can also play a role in elimination of superficial infections of the cornea by precise removal of the involved stromal layers. [10]

Surgical intervention, such as penetrating keratoplasty must be used very selectively, and in cases where there is danger of intraocular invasion of infection. As fungi grow poorly in vascularized tissues, a properly done conjunctival flap may be very helpful in cases where perforation is imminent. Of course, vitrectomy is a very useful modern technique in the successful treatment of some cases of fungal endophthalmitis.[11] Finally, proper use of contact lenses, precautionary measure against trauma in areas more likely to harbor fungi, elimination of improper prescribing of corticosteroids by doctors, etc. can go a long way in prevention of oculomycosis.

The word of wisdom about corticosteroids in oculomycosis is to avoid their use. However, in some rare situations where inflammatory reaction is so severe as to threaten more destruction of the ocular tissues than the fungal infection itself would, a very cautious and judicious use of corticosteroids in conjunction with heavy antifungal therapy may be employed with good results.[2,11,12] Corticosteroids may also be added to reduce inflammation in cases of endophthalmitis after a short period of antifungal therapy.[4]

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Ophthalmic "Pastpourri"

The "Largest" Series on Diabetic Retinopathy

In 1891 Henry Freidenwald, while discussing diabetic changes in the ocular fundus, wrote about the "Extensive" experience of Prof. Hirschberg, of Berlin: "In a more recent article he demonstrates that there are typical forms of diabetic retinitis, which present characteristic appearances. The number of cases upon which he bases this study is very large, comprising twenty-five cases, "which is a greater number than has hitherto been published by any single observer." He distinguishes three kinds of retinal disease that occur in diabetic patients. "First, a very characteristic inflammation of the central part of th retina with small, bright spots, and usually fine spots of blood. Second, hemorrhages of the retina, with the consequent inflammatory and degeneration, whose connection with the constitutional disease yet remains to be demonstrated."

- Henry Freidenwald, **1891**

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Book Reviews

Edited by Khalid J. Awan, F.P.A.M.S.

ATLAS OF OPHTHALMIC SURGERY, VOLUME I: SURGERY OF THE ANTERIOR SEGMENT. By W. Banks Anderson, Michael Cobo, Gary Foulks, and Calvin Mitchell, 1991. Mosby Year Book, Inc., 11830 Westline Industrial Drive, St. Louis, MO 63146, USA. 211 full-size pages, 15 pages of contents and index, illustrated with color artwork by Thomas Waldrop, clothbound. US$ 150.00.

This book is intended "as a manual for students of ocular surgery," and "as a concise and readily accessible aid suitable for use in the operating suite by both surgeons and staff." All the described procedures are presented in a step by step fashion. The format of material presentation follows the standard style of text on the left page and the illustrations on the right.

The contents of the *Atlas* are divided into six parts: "Preparation" containing remarks about operating microscope, preoperative mydriasis, anesthesia, measures to achieve preoperative hypotony, and the initial extraocular surgical steps, such as creating of conjunctival flaps, limbus exposure, preparation of corneoscleral groove, etc.; "Surgery of the Lens and Pseudophakos," "Surgery of the Conjunctiva and Limbus," "Surgery of the Cornea," "Surgery of the Sclera," and "Surgery of the Anterior Segment Trauma." Each surgical step is illustrated with excellent and amazingly lifelike artwork by the very capable Mr. Waldorp.

The material that is included in the book is presented with such clarity in writing and with so sharply illustrative figures that one wishes more aspects of anterior segment surgery were covered by the authors. Although all chapters contain highly useful material, some are lacking in some important aspects; whereas, others allot too much space to less important items. Hence, currently popular techniques of capsulorhexis and scleral fixation of posterior chamber intraocular lenses in the absence of capsulozonular support or as secondary procedure are entirely omitted. Conversely, four pages and 16 color illustrations are devoted to the repair of iridodialysis. This very infrequent surgical procedure could have been adequately dealt with in a single paragraph with just two (C and G) illustrations. It is also hoped that in the next edition the authors also include a sufficient number of current references.

Because the book is intended for "students of ocular surgery," it would have been helpful to include information about the various types of instruments, such as pachometers, and availability sources of others, such as keratoprostheses. On the same count, some discussion of the complications of techniques presented, either in the introductory writing or at the end of each chapter, would have further enhanced the value of the *Atlas*.

Some authorities may disagree with some of the steps the authors of the *Atlas* present. Hence, cruciate anterior capsulotomy, as is shown on page 167, may make aspiration of the cortex difficult, or even complicated, by unintentional suction of the large dentate capsular flaps into the aspiration portal even in the experienced hands. Also, an attempt to impale the nucleus for its removal may cause rupture in the posterior capsule and nucleus's dislocation into the vitreous. The marking of optical center before radial keratotomy also needs more clarification.

These few critical remarks aside, this book has many distinctive features, some of which are either totally ignored, or mentioned in a most cursory fashion in most other texts on eye surgery. It was a delight to go through the excellent chapters on surgery of the conjunctiva, diagnostic taps, etc. The book is printed on a very high quality paper, and produced handsomely by the publisher. It will prove very useful to its intended readers.

COLOR ATLAS OF OPHTHALMIC SURGERY. STRABISMUS. By Kenneth W. Wright, 1991. J.B. Lippincott Company, East Washington Square, Philadelphia, PA 19105, USA. 256 full-size text pages, 20 pages of contents table and index, hardcover, illustrated with color photographs and line drawings. US$ 150.00.

This atlas is the first of a series on ophthalmic surgery that is being produced by Dr. Wright as the Editor-in-Chief and Dr. Stephen J Ryan, Jr. as the Consultant. The other volumes under preparation are titled Cataracts, Glaucoma, Cornea and Refractive Surgery, Plastic Surgery, and Retina. This volume contains contributions by Dr. Wright and his five learned and experienced American colleagues. Bernard Szirth and Wendy McNamara photographed the material for the color illustrations and Timothy Hengst and Dianna Wong did the explanatory line drawings to accompany these photographs.

The contents of the *Color Atlas* are divided into 14 chapters: Surgical Anatomy by Laurie E. Christensen and Dr. Wright, Basic Surgical Techniques (Do's and Don'ts) , Limbal Incision and Rectus Recession, Fornix Incision and Rectus Recession, Pearls for Rectus Recession, Rectus Strengthening Procedures, Adjustable-Suture Technique, Muscle Transposition for Rectus Palsy, Inferior Oblique Muscle Surgery, Superior Oblique Weakening Procedures, all by Dr. Wright, Horizontal Rectus Offsets and the Y Splitting

Procedure by Michael X. Repka, Superior Oblique Strengthening Procedures by Monte A. Del Monte (with Dr. Wright), Posterior Fixation Suture by Burton J. Kushner, and Chemodenervation in Strabismus Surgery by Malcolm L. Mazow. At the end, there are also four very useful appendices on Surgical Numbers, Anesthesia, Instruments for Muscle Surgery, and Post-operative Care. Five pages of an up-to-date and chapter by chapter bibliography conclude the text.

This is not the first atlas on extraocular muscle surgery, but there is no doubt in the mind of this reviewer that it contains the most stunningly beautiful and sharply delineative color photographs of actual surgery he has ever seen in print. The line drawings are also of high quality and further enhance the value of book as a learning tool. They also abundantly clarify the written steps of surgery where no photographic representations are at hand. The excellent writing is to the point and easy to read. The techniques that are included show the influence of two of Dr. Wright's mentors, Dr. Marshall M. Parks and Dr. David L. Guyton, the acknowledged giants of pediatric ophthalmology and strabismology.

The up-to-datedness of the *Color Atlas* is confirmed by the fact that an excellent chapter on the recent promising advent of chemodenervation by application of botulinum toxin in strabismus management is also included. This chapter not only gives history, pharmacology, and the rationale for usage of botulinum toxin, but also describes with tables and photographs the determination of dosage, technique of injection, complications and the post-injection care of the patient. The appendix on "Surgical Numbers" gives tables for the amount of resection and recession of rectus muscles for a given degree of deviation. This chapter also gives these numbers for three muscle surgery, vertical deviations, and the Kestenbaum procedure for nystagmus. These figures are drawn from the recommendations of Dr. Parks, with modification according to the author's own experience.

The book is exquisitely printed on a superior quality paper with a very attractive design, making it a true specimen of "beauty and the beef." It is highly recommended for the trainees and the trained alike.

DICTIONARY OF EYE TERMINOLOGY, Second Edition, 1990. By Barbara Cassin, Sheila A.B. Solomon, and edited by Melvin L. Rubin. Triad Publishing Company, 1110 NW 8th Avenue, Gainsville, FL 32601. Paperback, 286 pocket-size pages. US$ 17.95.

This book came into existence because the authors Cassin and Solomon, both office workers at the University of Florida's Shand's Eye Clinic, felt the personnel and trainees there were frustrated at the "difficulty of deciphering eye 'jargon'." The first edition of the *Dictionary* appeared in 1984 and had 256 pages, 30 pages less than the present second edition. The increase in size is about 10 pages per dollar, but the new edition is worth a lot more in technical help to the secretaries and assistants of ophthalmologists.

In addition to definitions of nearly 4,000 ophthalmic words and terms, the *Dictionary* has a page of line sketches showing anatomical structures of the eye and orbit and a 10-page section on the most commonly used abbreviations in ophthalmic communications. An interesting feature, of more help to the transcribers, is the phonetic entries and their correct spellings, e.g. "zerophthalmia" (correct spelling xerophthalmia), etc. The *Dictionary* also demonstrates the confusion that ever-increasing number of acronyms is creating in ophthalmic, and indeed all other medical, communication and understanding. For instance, is FBS fasting blood sugar, or is it foreign body sensation? (LE has three, LP two, PC seven entries, and so on.) At many places, the authors have included line drawings for better understanding of the terms, e.g. Jackson cross cylinder, sunburst dial, adduction, Maddox rod, peripheral iridectomy, etc.

To be critical, some of the entries one would expect to be included are not there, but then no dictionary can be all-inclusive and absolutely comprehensive. When all is said and done, the *Dictionary* is a very useful tool for those secretaries, nurses, medical students, and even non-ophthalmic physicians who help the ophthalmologists in taking care of the eye patients. Hence, this thriftily priced book, which easily fits into the pocket of a gown or a jacket, is enthusiastically recommended for the para-ophthalmic personnel. It might be an excellent idea to give it as a welcoming gift to all new employees in an ophthalmic clinic or office.

MULTIPLE CHOICE QUESTIONS IN OPHTHALMOLOGY, 1990. By D F P Larkin. Wolfe Publishing Ltd, 2-16 Torrington Place, London WC1E 7LT, England. Paperback, 128 pocket-size pages. £ 9.95.

This paper-back is primarily to familiarize the candidates for the written examination of the new College of Ophthalmologists of England with examination method and to help them in preparation for the examination. The book contains 300 selected multiple choice questions (MCQ) of varying difficulty and complexity. Some of these are routine, but nevertheless important; whereas, others are quite esoteric and may require further study before answering. All questions have great clinical value for ophthalmologists at all stages of experience and expertise.

The first 62 pages contain questions and their multiple choice answers, divided into 17 groups of different subjects. The remainder of the book is devoted to the accurate answers. This book is a very good tool for self-assessment for all ophthalmologists, and not necessarily just the examinees. Hence, the *MCQ* is of value to anyone interested in self-evaluation. *-KJA*

Abstracts from Elsewhere

Edited by Khalid J. Awan, F.P.A.M.S.

Ophthalmic Surgery

PATIENT SATISFACTION IN OCULOPLASTIC SURGERY. AM Putterman. The authors state that patient satisfaction in oculoplastic surgery was evaluated through questionnaires sent to patients, referring physicians, and oculoplastic surgeons. Two oculoplastic surgical procedures, cosmetic blepharoplasty and acquired blepharoptosis treatment, were analyzed. One hundred forty-five patients and 85 referring physicians of the practices of five oculoplastic surgeons were questioned. Sixty-nine additional oculoplastic surgeons were also surveyed. The results of treatment were consistently emphasized as the most important factor in patient satisfaction, a finding that contrasted greatly with the decreased emphasis on the cost of treatment. This implies that patients value the quality of medical care and are willing to pay for it. The preference of patients contrasts sharply with the trend of government and third-party payers to emphasize cost containment at the possible sacrifice of quality of care.

The surveys also showed that pain and discomfort and office waiting time are more important to patient satisfaction than oculoplastic surgeons realize and that the surgeons will have to address these issues in order to improve satisfaction. Also, there is a falloff of surgeon-patient communication postoperatively which is less satisfying to patients and recognized, but not acted on, by surgeons. Therefore, more postoperative surgeon-patient communication by telephone is also likely to improve patient satisfaction. *(Ophthalmic Surgery 1990; 21:15-21.) Reprint requests to: Allen M. Putterman, MD, Department of Ophthalmology, University of Illinois at Chicago, College of Medicine, 1855 West Taylor Street, Chicago, IL 60612.*

LIMBAL ANESTHESIA FOR CATARACT SURGERY. M Furuta, T Toriumi, K Kashiwagi, S Satoh. The authors presented a new technique for the administration of anesthesia in cataract surgery. The techniques consists of injecting 0.5 ml of locally-acting anesthetic subconjunctivally (or sub-Tenon's) along the superior limbal border. Using this method, we performed extracapsular cataract extraction (ECCE) with and without posterior chamber intraocular lens (PC-IOL) implantation or secondary PC-IOL implantation on 176 cataract patients. Anesthesia was successfully induced in the majority of these patients and all surgeries were carried out successfully with no major complications. Voluntary eye movements remained but did not interfere with surgery. On the contrary, they helped expose certain surgical sites. This new anesthetic method for cataract surgery is simple and minimizes complications attributed to other blind anesthetic techniques. *(Ophthalmic Surgery 1990; 21:22-25.) Reprint requests to: Masashi Furuta, MD, Department of Ophthalmology, Suwa Red Cross Hospital, Kowata 19, Suwashi, Nagano, Japan.*

ALBEDO CONCENTRATION IN THE ANTERIOR EYE: A PHENOMENON THAT LOCATES SOME SOLAR DISEASES. MT Coroneo. The author described concentrations of reflected solar radiation (albedo) found at the usual sites of various conditions associated with exposure to the sun-pterygium, pinguecela, climatic droplet keratopathy and cataract and eyelid malignancy. Since the degree of limbal albedo concentration appears to be related to corneal curvature, patients at risk can be identified by a simple test and preventative measures taken. *(Ophthalmic Surgery 1990; 21:60-66.) Reprint requests to: Minas T. Coroneo, BSc[Med], MB BS, MSc, FRACS, FRACO, Department of Ophthalmology, University of New South Wales, High Street, Randwick, NSW, 2031, Australia.*

MUCINOUS ADENOCARCINOMA OF THE ORBIT ARISING FROM A STABLE, BENIGN-APPEARING EYELID NODULE, JB Holds, JH Haines, N Mamalis, RL Anderson, MJ Wolin. The authors noted that mucinous adenocarcinoma is a rare eyelid tumor which should be considered in the differential diagnosis of a nodular or cystic lesion of the eyelid. This lesion may be locally aggressive and requires complete excision to prevent local recurrence or regional metastases. We present what we believe is the first report of a mucinous adenocarcinoma manifesting as a stable, benign-appearing nodule that has already given rise to a much larger secondary lesion. This case underscores the importance of performing a biopsy on even benign-appearing eyelid nodules. *(Ophthalmic Surgery 1990; 21:163-166.) Reprint requests to: Nick Mamalis, MD, Department of Ophthalmology, University of Utah Health Sciences Center, 50 North Medical Drive, Salt Lake City, UT 84132.*

TREATMENT OF SEVERE LOWER EYELID RETRACTION WITH SCLERAL AND FREE SKIN GRAFTS AND BIPEDICLE ORBICULARIS FLAP. JJ Hurwitz, KF Archer, JS Gruss. The authors discussed that surgical repair of lamellar shortening must treat the anterior and posterior shortening, plus the scarring between Mueller's muscle, capsulopalpebral fascia, and periosteum. They described

a repair method in which a full-thickness, free skin graft is used to correct the anterior lamellar defect, and a homologous scleral graft is used to correct the posterior defect. Vascular support for the two free grafts is provided by a bipedicular orbicularis muscle flap. *(Ophthalmic Surgery 1990; 21:167-172.) Reprint requests: Jeffrey J. Hurwitz, MD, FRCS(C), Mount Sinai Hospital, Suite 408, 600 University Avenue, Toronto, Ontario, Canada M5G 1X5.*

MALIGNANT GLAUCOMA INDUCED BY AN INTRAOCULAR LENS. JE Reed, JV Thomas, RA Lytle, RJ Simmons. The authors presented a case of malignant (ciliary block) glaucoma apparently induced by a large posterior chamber intraocular lens (PC-IOL) . The involved eye was small, with an axial length of 21.7 mm and a preoperative refractive error of +8.25 D. An uncomplicated extracapsular cataract extraction with implantation of a PC-IOL with a 7 mm optic was performed. WIthin 1 week postoperatively, malignant glaucoma developed, for which surgical intervention was required. We recommend avoiding implantation of PC-IOLs with large optics in certain small eyes, since these implants may be more likely than lenses with smaller optics to induce malignant glaucoma in such eyes. *(Ophthalmic Surgery 1990; 21:177-180.) Reprint requests to: Librarian, New England Glaucoma Research Foundation, 100 Charles River Plaza, Boston, MA 02114.*

THE APONEUROTIC APPROACH TO CONGENITAL PTOSIS. DR Jordan, RL Anderson. The authors reported that by using a surgical technique directed at the levator aponeurosis, they successfully corrected 228 cases of congenital ptosis. The advantages of this approach are: normal anatomic planes and structures of the eyelid are maintained; basic and reflex tear secretion, goblet cells, or meibomian glands remain undisturbed, allowing maintenance of the three-layered tear film; any aponeurotic defects may be explored and repaired relatively easily; all elevating structures are preserved (aponeurosis rather than muscular levator is removed, Mueller's muscle is left intact, Whitnall's ligament is not violated); posterior sutures, which may irritate the cornea, are avoided; no tarsus or conjunctiva are removed.*(Ophthalmic Surgery 1990; 21:237-243). Reprint requests to: David R. Jordan,MD, 267 O'Connor St., Suite 611, Ottawa, Onatrio, Canada K2P 1V3.*

THE POSITION OF THE EYEBROW. JH Oestreicher, JJ Hurwitz. The authors discussed the position of the eyebrow, which varies from person to person, as an important factor determining the final result of blepharoplasty, ptosis and other aesthetic surgery. They developed a new instrument for measuring the position of the eyebrow-a clear, curved, plastic face mask with inscribed distance gradations in millimeters and a sliding horizontal step to catch the superior orbital rim for measurement. *(Ophthalmic Surgery 1990; 21:245-249). Reprint requests to Jeffrey J. Hurwitz, MD, Mount Sinai Hospital, 600 University Avenue, Suite 408, Toronto, Ontario M5G 1X5.*

A NEW UNIVERSAL LASER APPARATUS FOR INTRA AND EXTRAOCULAR IRRADIATION TASKS IN THE EYE. F Fankhauser, S Swasniewska. The authors described a universal laser apparatus for multipurpose clinical tasks. The main unit consists essentially of a Haag-Streit slit lamp combined with a rigidly mounted Q-switched laser. The apparatus is designed basically for performing photodisruptive tasks. Radiation emitted by either a pseudocontinuous cw Nd:YAG laser (with a dynamic range of 10W) or by an air-cooled 4-W argon ion laser energy source either may be transmitted via fiber optics into the main unit or, when detached from the main unit, may be used independently. Energy emitted by the modules and transported by specialized light cables and delivery systems can be used to perform transscleral Nd:YAG laser irradiation of the ciliary body or the choroid and retina. Probes are available for endocoagulation of the latter two by either cw Nd:YAG or argon laser light. Other probes are being developed for chorioretinotomy, internal sclerostomy, dissection of the sclera, or for other extrabulbar work. All functions are monitored and displayed by a central processor. *(Ophthalmic Surgery 1990; 21:258-262.) Reprint requests to: Franz Fankhauser, MD, University Eye Clinic, 3010 Bern, Switzerland.*

ANTERIOR STROMAL PUNCTURE FOR RECURRENT EROSION: FURTHER EXPERIENCE AND NEW INSTRUMENTATION. RS Rubinfeld, PR Laibson, EJ Cohen, JJ Arentsen, RC Eagle. The authors discussed the anterior stromal puncture having been recently proposed as a new treatment for recalcitrant cases of recurrent corneal erosion. Concerns about the risks of corneal perforation and scarring, as well as doubts regarding its efficacy have prevented many patients from benefiting from this procedure. We introduce a new, inexpensive, commercially available instrument designed to standardize this technique, minimize scarring, and prevent corneal perforation.

In a clinical trial involving 25 consecutive patients with recurrent erosions resistant to vigorous conservative treatment, the first 11 patients underwent stromal puncture in which a straight tuberculin needle was used; the following 14 were treated with a newly designed prototype needle. All patients in this series remained free of erosions after completion of stromal puncture, except for one woman with marked diffuse anterior basement membrane dystrophy, who went on to develop spontaneous bilateral erosions. Follow-up ranged from 2 months to 30 months (mean, 13

months). There were no complications of stromal puncture, and subjective and objective evaluations revealed no significant postoperative glare. Microscopic analysis of eye bank eyes subjected to anterior stromal puncture procedures demonstrated that the new prototype needle provided shallower penetration and thus less likelihood of perforation or excessive scarring than the straight needle. Also, postoperative discomfort and scarring appeared to be significantly less in patients treated with the prototype needle. *(Ophthalmic Surgery 1990; 21:318-326.) Reprint requests to: Roy S. Rubinfeld, MD, 5454 Wisconsin Avenue, Suite 950, Chevy Chase, MD 20815.*

APRAXIA OF LID OPENING IN BLEPHAROSPASM. DR Jordon, RL Anderson, KB Digre. The author stated that apraxia of lid opening is a nonparalytic motor abnormality characterized by difficulty in initiating the act of lid elevation. It has been reported with extrapyramidal disorders, including Parkinson's disease, Huntington's chorea, progressive supranuclear palsy, and Shy-Drager syndrome. We found seven cases (7%) of functionally disabling apraxia of lid opening in 100 consecutive blepharospasm patients studied. It is important for physicisns treating blepharospasm to be aware of the association between these two visually debilitating disorders. *(Ophthlamic Surgery 1990; 21:331-334.) Reprint requests to: Richard L. Anderson, MD, Department of Ophthalmology, University of Utah Health Sciences Center, 50 North Medical Drive, Salt Lake City, UT 84132.*

SIDE EFFECTS OF THE USE OF BOTULINUM TOXIN FOR TREATMENT OF BENIGN ESSENTIAL BLEPHAROSPASM AND HEMIFACIAL SPASM. HK Kalra, EH Magoon. The authors stated that from April 1983 to April 1988, 381 botulinum toxin injections for lid spasms were administered to 106 patients. Sixty-nine had bilateral blepharospasm and 37 had hemifacial spasm. Of the 381 injections, 308 had been given to patients who returned for follow-up examinations. No systemic effects were noted at any of these visits; all side effects were temporary; there were no serious complications. Ptosis, the most frequently encountered proble, occurred after 26 (8.4%) of the injections. Other complications included: corneal exposure (after eight injections, 2.59%); face droop (after 11 injections, 3.57%); diplopia (after five injections, 1.62%); and subtle visual blurring (after eight injections, 2.59%). One patient noted jaw tenseness, another mentioned tearing, one reported brow droop, and another complained of crossed eyes. Ten injections had minimal effect; in these cases a repeat injection usually was effective. Only four patients chose surgery after beginning injections. We conclude that botulinum toxin injections are a safe, effective means of treating lid spasms. *(Ophthalmic Surgery 1990; 21:335-338.) Reprint requests to: Elbert H. Magoon, MD, Canton Eye Center, Inc, 800 McKinley Avenue, NW, Canton, OH 44703.*

HIGH DOSE CORTICOSTEROIDS FOR TREATMENT OF VISION LOSS DUE TO INDIRECT INJURY TO THE OPTIC NERVE. SR Seiff. The author stated that thirty-six patients with vision loss due to indirect injury to the optic nerve were retrospectively studied. Twenty-one had been acutely treated with high-dose intravenous dexamethasone and 15 had not. The visual acuity of 62% of the treated patients and of 33% of the untreated patients improved. This difference was not statistically significant. However, of those patients whose vision did improve, the vision of those on steroids began to improve earlier (P<.05). *(Ophthalmic Surgery 1990; 21:389-395.) Reprint requests to: Stuart R. Seiff, MD, Ophthalmic Plastic and Reconstructive Surgery Service, Department of Ophthalmology K301, University of California San Francisco, San Francisco, CA 94143.*

A MODIFIED EXTRACAPSULAR CATARACT EXTRACTION FOR PEDIATRIC CATARACTS. AR Caputo, S Guo, RS Wagner, WH Constad. The authors presented a modified procedure of extracapsular cataract extraction (ECCE) with a small central posterior capsulectomy for pediatric cataracts that is designed to eliminate posterior capsule opacification and to keep open the option of later secondary implantation of a posterior chamber intraocular lens. Of 76 study eyes in which the procedure was performed only three developed posterior capsule opacification. All seven control eyes that had standard ECCE with the posterior capsule left intact developed secondary membranes shortly after surgery. *(Ophthalmic Surgery 1990; 21:396-400.) Reprint requests to: Anthony R. Caputo, MD, Pediatric Ophthalmology, The Eye Institute of New Jersey, 15 South Ninth Street, Newark, NJ 07107.*

SLIT LAMP REFORMATION OF THE ANTERIOR CHAMBER FOLLOWING TRABECULECTOMY. SL Gerber, LB Cantor. The authors stated that out of 50 consecutive trabeculectomies performed over a 10-month period, 13 flat or shallow anterior chambers were reformed immediately following surgery a total of 19 times without complication at the slit lamp, using hyaluronic acid. Three months after surgery, there was no significant difference between the reformed and nonreformed eyes in terms of intraocular pressure or visual acuity change. They concluded that reformation at the slit lamp using hyaluronic acid is a safe, effective means of restoring anterior chamber anatomy following trabeculectomy. *(Ophthalmic Surgery 1990; 21:404-406.) Reprint requests to: Louis B. Cantor, MD, Indiana University School of Medicine, Department of Ophthalmology, 702 Rotary Circle, Indianapolis, IN 46202.*

PROSPECTIVE TOPOGRAPHIC ANALYSIS IN PERIPHERAL ARCUATE KERATOTOMY FOR ASTIGMATISM. DAJ McCluskey, R Villasenor, PJ McDonnell. The authors stated that delimited peripheral arcuate keratotomy was performed on five eyes of four patients with naturally-occurring astigmatism. Refraction, keratometry, and computer-assisted corneal topographic analysis were performed before and after the procedure. In some eyes, preoperative topographic analysis revealed steepening distributed symmetrically about the corneal apex; in three eyes the steepening was asymmetrically distributed about the corneal apex. In one eye, surgery in a single, step hemi-meridian superior to the corneal apex flattened that steep hemi-meridian but did not appear to alter the topography of the inferior steep hemi-meridian. Refractive and keratometic astigmatism decreased in all eyes (mean reductions of 3.25 and 2.30 diopters, respectively), and all incisions healed without incident. Surgery extended beyond the zone of steeping in one eye, shifting the axis of astigmatism. A large, multicenter, randomized trial will be necessary to determine whether detailed preoperative topographic analysis can be used to improve the results of surgery for astigmatism. *(Ophthalmic Surgery 1990; 21:464-471.) Reprint requests to: Peter J. McDonnell, MD, Doheny Eye Institute, 1355 San Pablo Street, Los Angeles, CA 90033.*

SCANNING ELECTRON MICROSCOPY OF CORNEAL INCISIONS USING STEEL, DIAMOND, AND SAPPHIRE BLADES. WS Van Meter, C Breen, DP Hainsworth, R Geissler. The authors stated that in order to compare the wound morphology they produce, they used steel (Myocure), diamond (CILCO DK 121), and sapphire (Katena K2-6500) blades, to make parallel linear incisions, 500 µm deep, in 12 fresh enucleated porcine eyes. There was no discernible difference among the blades in terms of either the morphology of the collagen lamellae of the sides or the depth of the incisions produced. The major differences in the cuts produced were attributable primarily to the differences in the footplates. *(Ophthalmic Surgery 1990; 21:475-480.) Reprint requests to: Woodford S. Van Meter, MD, Department of Ophthalmology, University of Kentucky, 800 Rose Street, Lexington, KY 40536-0084.*

A NEW GLAUCOMA FILTER IMPLANT. MJ Dobrogowski, PJ Dolman, GR Douglas. The authors performed a new glaucoma filtration procedure in nine rabbits in a preliminary trail. A silastic tube with an internal diameter of 0.35 mm was passed across the anterior chamber through two limbal openings, and the free ends were buried postequatorially n sub-Tenon's space. At a later date, using an Nd:YAG laser in the thermal mode, holes 0.05 to 0.30 mm in diameter were burned in the tube in the anterior chamber. This procedure significantly lowered intraocular pressure in four rabbits on two successive tries; however, a third treatment given in two cases did not further decrease the pressure. *(Ophthalmic Surgery 1990; 21:481-485.) Reprint requests to: Michael J. Dobrogowski, MD, Ste 235, 2025 West 42nd Avenue, Vancouver, BC, Canada V6M 2B5.*

VITREOUS CHANGES AND MACULAR EDEMA IN CENTRAL RETINAL VEIN OCCLUSION. M Kado, AE Jalkh, A Yoshida, M Takahashi, N Wazen, CL Trempe, CL Schepens. The authors discussed that the condition of the posterior vitreous was determined in 56 eyes with central retinal vein occlusion (CRVO). Using a life-table analysis, it was studied in 56 eyes. The incidence of posterior vitreous detachment (PVD) in the CRVO eyes at the first vitreous examination did not differ significantly from that in 64 age-matched control eyes. However, the incidence of PVD in CRVO eyes increased from 39.3% at the first vitreous examination to 58.5% after 6 months, and to 69.6% 1 year from the examination. The incidence of PVD in CRVO eyes during follow-up was statistically higher than that of the controls (P = .009). The incidence of PVD after the first vitreous examination was significantly higher in eyes with hemorrhagic retinopathy than in eyes wih venous stasis retinopathy (P = .04). In the 34 eyes with macular edema, the edema lasted significantly longer in those with vitreomacular attachment (VMA) at the first examination than in those without VMA at this time (P = .02). VMA may play an important role in the pathogenesis and chronicity of macular edema in CRVO. *(Ophthalmic Surgery 1990; 21:544-549.) Reprint requests to: Alex E. Jalkh, MD, Eye Research Institute, 20 Staniford Street, Boston, MA 02114.*

MANAGEMENT OF MACULAR PUCKERS ASSOCIATED WITH RETINAL ANGIOMAS. PL Schwartz, DM Fastenberg, JL Shakin. The authors noted that monocular visual loss in four patients was caused by epiretinal macular membranes associated with peripheral retinal capillary angiomas or angioma-like lesions. Three patients had solitary vascular lesions and one had two discrete vascular lesions. All patients were in good health, with no evidence of the von Hippel-Lindau syndrome. In three patients, spontaneous peeling of the macular membranes and visual improvement occurred 2 to 6 months after obliteration of the angioma-like lesions with cryotherapy (two patients), or cryotherapy combined with argon laser (one patient). The fourth patient underwent a vitrectomy 8 months after the macular pucker had failed to respond to treatment of the vascular lesion. *(Ophthalmic Surgery 1990; 21:550-556.) Reprint requests to: Peter L. Schwartz, MD, 600 Northern Boulevard, Great Neck, NY 11021.*

EVALUATION OF PERIBULBAR ANESTHESIA IN EYE CAMPS. K Kishore, HC

Agarwal, NN Sood, SM Betharia, R Sihota, CN War, VK Chhabra. The authors stated that modified peribulbar anesthesia was administered with a 26-gauge, half-inch, insulin needle to 367 eyes of 360 patients in three eye camps in India. The intraocular procedures consisted of cataract extraction in 349 eyes, trabeculectomy in 11 eyes, and combined cataract extraction and trabeculectomy in seven eyes. The overall success rate of the anesthesia technique was 90.2% (supplemental anesthesia was required in 36 eyes). There was good lid and globe akinesia and anesthesia, adequate pupillary dilatation for intracapsular cataract extraction, and excellent hypotony. No significant local or systemic complications were observed, except for mild to moderate chemosis in some eyes, which did not produce any intraoperative or postoperative problems. We found this technique easy to learn, relatively safe, effective, and well tolerated by our patients. *(Ophthalmic Surgery 1990; 21:566-570.) Reprint requests to: N.N. Sood, FAMS, FRCS, Dr Rajendra Prasad Centre for Ophthalmic Sciences, All India Institute of Medical Sciences, Ansari Nagar, New Delhi, India 110029.*

EXPERIENCE WITH PHOTOCOAGULATION IN BEHCET'S DISEASE. LS Atmaca. The authors stated that between 1973 and 1987 both eyes of 300 patients with the uveoretinitis-type lesions characteristic of Behcet's disease were examined. Of the 556 eyes whose fundus could be examined, 38 eyes (6.8%) in 33 patients (11%) had developed retinal capillary nonperfusion, branch retinal vein occlusion, or retinal or disc neovascularization. These eyes were treated by photocoagulation, primarily to forestall vitreous hemorrhage and the development of neovascular glaucoma, as well as to decrease the macular edema resulting from vein occlusion. The treatment, which was well tolerated, was successful in closing retinal capillary nonperfusion areas and eliminating retinal neovascularization. Disc neovascularization was resolved completely in some cases, and partially in others. *(Ophthalmic Surgery 1990; 21:571-576.) Reprint requests to: Leyla S. Atmaca, MD, Gazi Mustafa Kemal Bulvari 23/1, Ankara, Turkey.*

VISUAL RESULTS AND COMPLICATIONS OF TRANSSCLERALLY SUTURED INTRAOCULAR LENSES IN PENETRATING KERATOPLASTY. DG Heidemann, SP Dunn. The authors retrospectively reviewed the charts of 56 consecutive patients who had undergone penetrating keratoplasty with transscleral fixation of a posterior chamber intraocular lens. Follow-up ranged from 3 to 28 month (mean, 11.1 months). Postoperative visual acuity improved in 46 patients (82%), remained the same in eight (14%), and worsened in two (3.6%). In 32 patients with at least 10 months' follow-up, best corrected visual acuity as measured with a pinhole or hard contact lens was 20/40 or better in 12 (38%), 20/50 to 20/10 in 10 (31%), and 20/200 or worse in 10 (31%). Problems with lens decentration, tilt, or scleral suture-related infections were minimal. Glaucoma was the most common cause of decreased vision in patients with 10 or more months' follow-up. Three patients (5.4%) developed rhegmatogenous retinal detachments early in the postoperative course. *(Ophthalmic Surgery 1990; 21:609-614.) Reprint requests to: David G. Heidemann, MD, Michigan Cornea Consultants, Southfield, MI 48013.*

SMALL-INCISION TECHNIQUES IN OPHTHALMIC PLASTIC SURGERY. R Dortzbach, JJ Woog. The authors discussed that a stepped surgical incision, in which an initial small cutaneous incision is followed by progressively longer incisions in the subcutaneous tissues, limits postopertive scar formation in the skin. Placement of incisions parallel to relaxed skin-tension lines further reduces the size of the scar. They describe how these principles may be applied to ophthalmic plastic surgical procedures to improve cosmesis. Autogenous fascia lata can be harvested with scissors through a 15-mm incision parallel to relaxed skin-tension lines, placed over the middle of the iliotibial tract. Lacrimal bypass operations can be performed well and with good cosmesis through a 12 to 15-mm skin wound if the above principles are followed. *(Ophthalmic Surgery 1990; 21:615-622.) Reprint requests to: John J. Woog, MD, Ophthalmic Consultants of Boston, Inc, 50 Staniford St, Boston, MA 02114.*

CENTRAL RETINAL VEIN OBSTRUCTION AND AXIAL LENGTH. MM Brown, GC Brown, H Menduke. The authors noted that the axial lengths of 24 consecutive adult eyes with unilateral central retinal vein obstruction (CRVO) were compared with those of contralateral unaffected eyes and those of a control population. The lengths of the two eyes of persons with a unilateral CRVO were not significantly different. By contrast, eyes of persons with CRVO averaged 0.67 mm (approximately 2 diopters) shorter than their control counterparts (P = .03). This anatomic difference may be a factor in the development of CRVO. *(Ophthalmic Surgery 1990; 21:623-624.) Reprint requests to: Gary C. Brown, MD, 910 E. Willow Grove Ave, Wyndmoor, PA 19118.*

CURRENT TRENDS IN SUTURE FIXATION OF POSTERIOR CHAMBER INTRAOCULAR LENSES. HA Sen, PW Smith. The authors discussed that corneal surgeons were surveyed with regard to their technique of suture fixation of posterior chamber intraocular lenses in the absence of posterior capsular support. Fifty-nine percent of the 260 respondents stated they perform the procedure almost exclusively during penetrating keratoplasty. Scleral fixation was marginally favored

over iris fixation by these surgeons. Most intraoperative problems reported were related to the relative technical difficulty of the procedure, although transient hemorrhage from the ciliary body was also mentioned. Postoperative complications cited included mechanical problems involving the lens and iris, cystoid macular edema, glaucoma, and endophthalmitis. *(Ophthalmic Surgery 1990; 21:689-695.) Reprint requests to: Harsha A. Sen, MD, Department of Ophthalmology, University of Virginia Hospital, Health Sciences Center, Box 475, Charlottesville, VA 22908.*

OCULAR ANESTHESIA FOR CATARACT SURGERY: A DIRECT SUB-TENON'S APPROACH. EA Hansen, CE Mein, R Mazzoli. The authors describe a new technique in which ocular anesthesia is obtained by dissection of the superior quadrants, as in strabismus or retinal surgery, followed by direct infusion of the retrobulbar space with local anesthetic agent, using a blunt 19-gauge cannula. In 112 cases of cataract surgery in which they used this direct sub-Tenon's approach, they found it to be a safe, simple, and effective method of achieving rapid ocular anesthesia. *(Ophthalmic Surgery 1990; 21:696-699.) Reprint requests to: COL Calvin E. Mein, MD, MC, Ophthalmology Service, Department of Surgery, Brooke Army Medical Center, Fort Sam Houston, TX 78234-6200.*

TRABECULAR PIGMENTATION FOLLOWING EXTRACAPSULAR CATARACT EXTRACTION AND POSTERIOR CHAMBER INTRAOCULAR LENS IMPLANTATION. K Sugiyama, Y Kitazawa. The authors prospectively evaluated the change in trabecular pigmentation following extracapsular cataract extraction and posterior-chamber intraocular lens implantation in 70 patients (94 eyes) with senile cataracts. Using the Boys-Smith pigment gradation lens to measure semiquantitatively the amount of pigment visible in the angle, they estimated the mean trabecular pigmentation preoperatively and at 3-month intervals postoperatively. Both the mean pigmentation and the number of eyes with heavy pigmentation rose after the operation and then gradually returned to preoperative levels. There was no correlation between the amount of trabecular pigmentation and intraocular pressure. *(Ophthalmic Surgery 1990; 21:700-703.) Reprint requests to: Yoshiaki Kitazawa, MD, Department of Ophthalmology, Gifu University School of Medicine, 40 Tsukasa-machi, Gifu-shi 500, JAPAN.*

LOWER EYELID RETRACTION: A MINIMAL INCISION SURGICAL APPROACH TO RETRACTOR LYSIS. JB Holds, RL Anderson, SM Thiese. The authors state that lower eyelid retraction associated with prior blepharoplasty, trauma, or other conditions is a challenging problem for the ophthalmic surgeon. They describe a procedure involving tightening the lower eyelid and supraplacing the lateral canthus in combination with in-glove lysis of the lower eyelid retractors and scar tissue. This is accomplished through a small lateral incision. To date, they have treated over 200 eyelids using this technique with excellent results. We recommend this technique for the treatment of mild to moderate degrees of lower eyelid retraction. *(Ophthalmic Surgery 1990; 21:767-771.) Reprint requests to: John B. Holds, MD, Bethesda Eye Institute, St Louis Universtiy Department of Ophthalmology, 3655 Vista Avenue, St Louis, MO 63110.*

GLAUCOMA TRIPLE PROCEDURES: EFFICACY OF INTRAOCULAR PRESSURE CONTROL AND VISUAL OUTCOME. S Longstaff, RPL Wormald, A Mazover, RA Hitchings. The authors noted that sixty-three glaucoma triple surgeries [combined trabeculectomy, extracapsular cataract extraction (ECCE), and posterior-chamber intraocular lens (PC-IOL) implantation] were reviewed. Intraocular pressure (IOP) was controlled satisfactorily in all cases; 25% required additional glaucoma therapy but fewer glaucoma medications. Eighty-six percent achieved 6/12 or better visual acuity. Postoperative IOP and visual acuity results were similar to those achieved by trabeculectomy or ECCE/PC-IOL, respectively. Cumulative years of preoperative glaucoma therapy had an adverse effect on postoperative IOP control. *(Ophthalmic Surgery 1990; 21:786-793.) Reprint requests to: Roger A. Hitchings, FRCS, Moorfields Eye Hospital, City Road, London, EC1V 2PD, England.*

CYCLOCRYOTHERAPY IN SELECTED CASES OF CONGENITAL GLAUCOMA. MF Al Faran, KF Tomey, FA Al Mutlaq. The authors investigated the efficacy of cyclocryotherapy, a procedure which destroys the ciliary epithelium, thereby decreasing the production of aqueous humor, by retrospectively studying 109 eyes with advanced primary congenital glaucoma that had undergone the procedure. The eyes were divided into two groups: group I comprised 75 eyes (69%) that had undergone conventional surgical procedures for congenital glaucoma prior to cyclocryotherapy; group II, 34 eyes (31%) that had not undergone any such previous procedures. All eyes were followed for at least 12 months after the last cyclocryotherapy. With "success" defined as "having an IOP $\geq$ 8 mmHg, $\leq$ 19 mmHg with or without medication," the success rate in all eyes was 30%, with no significant difference between the success rates in groups I and II ($P > .05$). Chronic hypotony (IOP < 8 mmHg) was found in seven eyes (6%). Six eyes (6%) developed cataract during the course of treatment with cyclocryotherapy. Cyclocryotherapy appears to be a reasonable addition to the treatment of eyes with advanced, uncontrolled,

primary congenital glaucoma. *(Ophthalmic Surgery 1990; 21:794-801.) Reprint requests to: Mubarak F. Al-Faran, MD, King Khaled Eye Specialist Hospital, PO Box 7191, Riyadh 11462, Saudi Arabia.*

INTRAOCULAR GAS INJECTION IN THE TREATMENT OF CORNEA-LENS TOUCH AND CHOROIDAL EFFUSION FOLLOWING FISTULIZING SURGERY. WA Franks, RA Hitchings. The authors stated that five eyes with large choroidal detachments and flat anterior chambers following fistulizing surgery were treated with injection of perfluoropropane into the anterior chamber. In all cases the choroidal detachments resolved within 4 days, without the need for drainage. Three phakic eyes developed anterior capsular opacification in the area of contact between the gas bubble and the anterior capsule. Injection of perfluoropropane is recommended as a simple and effective approach to the management of choroidal detachments with flat anterior chamber in pseudophakic eyes and in cataractous phakic eyes. *(Ophthalmic Surgery 1990; 21:831-834.) Reprint requests to: R.A. Hitchings, MD, FRCS, Consultant Ophthalmologist, Moorfields Eye Hospital, City Road, London, EC1V 2PD, England.*

THE USE OF RELEASABLE SUTURES IN MOLTENO GLAUCOMA IMPLANT PROCEDURES TO REDUCE POSTOPERATIVE HYPOTONY. F El-Sayyad, A El-Maghraby, M Helal, A Amayem. The authors used releasable sutures to minimize immediate postoperative hypotony and flat anterior chamber in 19 cases of refractory glaucoma requiring insertion of a single-plate Molteno implant in a one-stage procedure. A slip knot using 7-0 nylon suture was fashioned around the Molteno tube under a lamellar scleral flap. In 18 of the 19 eyes, anterior chamber depth was normal immediately after surgery. *(Ophthalmic Surgery 1991; 22:82-84.) Reprint requests to: F. El-Sayyad, FRCS, El-Maghraby Eye Specialist Hospital, PO Box 7344, Jeddah 21462, Saudi Arabia.*

EXCISION OF LIMBAL DERMOIDS. RW Panton, J Sugar. The authors reviewed the clinical files of 10 patients who had undergone excision of unilateral epibulbar limbal dermoids. Preoperatively, all of the affected eyes had worse visual acuity ($P < .02$) and more astigmatism ($P < .01$) than the contralateral eyes. Postoperatively, every patient was cosmetically improved. Of the eight patients for whom both preoperative and postoperative visual acuity measurements had been obtained, in six it had changed minimally ($\leq$ 1 line), and in two it had improved ($\leq$ 2 lines). Surgical complications included persistent epithelial defects (40%) and peripheral corneal vascularization and opacity (70%) These complications do not outweigh the cosmetic and visual benefits of dermoid excision in selected patients. *(Ophthalmic Surgery 1991; 22:85-89.) Reprint requests to: Joel Sugar, MD, Department of Ophthalmology, University of Illinois at Chicago, 1855 W Taylor St, Chicago, IL 60612.*

NOCARDIA ASTEROIDES INFECTION FOLLOWING SCLERAL BUCKLING. LP King, WB Furlong, WS Gilbert, C Levy. The authors reported a case of delayed external ocular Nocardia asteroids infection following scleral buckling for rhegmatogenous detachment. Surgical removal of the exoplant material allowed isolation and identification of the organism. Topical and systemic antibiotic therapy following exoplant removal yielded a favorable result. *(Ophthalmic Surgery 1991; 22:150-152.) Reprint requests to: Lowrey P. King, MD, Storm Eye Institute, Medical University of South Carolina, 171 Ashley Ave, Charleston, SC 29425.*

VISUAL OUTCOME IN PSEUDOPHAKIC EYES WITH CLINICAL CYSTOID MACULAR EDEMA. RS Ruiz, OA Saatci. The authors discussed thirty-nine eyes with clinical cystoid macular edema (CME) following extracapsular cataract extraction and intraocular lens (IOL) implantation were reviewed retrospectively. Chronic CME, defined as clinically symptomatic MCE persisting more than 6 months, developed in 14 of the 39 eyes (36%): in 5 of the 7 (71%) eyes in which vitreous loss occurred and anterior chamber IOLs were implanted; and in 9 of 32 (28%) eyes in which no complications occurred and posterior chamber IOLs were implanted. The mean duration between diagnosis and last follow-up visit was 34 months. Only 4 of the 14 eyes (29%) with chronic CME achieved a visual acutiy better than 20/40. Vitreous loss did not affect long-term visual prognosis. *(Ophthalmic Surgery 1991; 22:190-193.) Reprint requests to: Richard S. Ruiz, MD, Hermann Eye Center, 6411 Fannin, 7th Floor, Houston, TX 77030.*

SUBCONJUNCTIVAL ANESTHESIA: AN ALTERNATIVE TO RETROBULBAR AND PERIBULBAR TECHNIQUES. WC Petersen, M Yanoff. The authors present a method of the anterior segment of the eye that avoids the risks of the potential complications associated with retrobulbar and peribulbar anesthesia. The method consists of topical anesthesia plus 0.5 cc of lidocaine (with hyaluronidase and epinephrine) injected beneath the superior conjunctiva. We have demonstrated the safety and effectiveness of this technique in 431 consecutive cases. *(Ophthalmic Surgery 1991; 22:199-201.) Reprint requests to: Walter C. Petersen, MD, 801 Broadway, Suite 623, Seattle, WA 98122.*

INTRAOCULAR LENS DAMAGE IN EXPERIMENTAL ND: YAG LASER CAPSULOTOMY: A COMPARISON OF PERSPEX CQ AND CROSS-LINKED PMMA LENSES. H Erbil, S Sinav. The authors talked of the threshold resistance to Nd:YAG laser irradiation of cross-linked lathe-cut PMMA intraocular lenses was slightly higher than that of Perspex CQ lenses: 6.0 mJ

vs 4.5 mJ for single laser spots, and 3.5 mJ vs 3.0 mJ for four spots. These levels produced nicks and pits in the lenses; higher levels created small breaks. *(Ophthalmic Surgery 1991; 22:202-203.) Reprint requests to: Hasan Erbil, MD, Ondokuz Mayis Tip Fakultesi, Department of Ophthalmology, Samsun, Turkey.*

EARLY VISUAL REHABILITATION FOLLOWING KERATOPLASTY USING A SINGLE CONTINUOUS ADJUSTABLE SUTURE TECHNIQUE. GO Temnycky, KJ Lindahl, JV Aquavella, RA Erdey. The authors measured postkeratoplasty visual acuity, refraction, retinoscopy, keratometry, and corneal topography in 105 patients, in 33 of whom an adjustable continuous technique had been used, and in 72 of whom a standard technique (in which the continuous suture was not adjusted) had been used. In the eyes in which the sutures were adjusted (within 6 weeks following surgery), acuity improved (preadjustment mean, 20/205; postadjustment mean, 20/100), and astigmatism decreased (preadjustment mean, 8.41 diopters; postadjustment mean, 2.22 D). Visual acuity and astigmatism in the control group were unchanged at the same point after surgery. *(Ophthalmic Surgery 1991; 22:208-212.) Reprint requests to: James V. Aquavella, MD, 919 Westfall Road, Rochester, NY 14618.*

OUTPATIENT DACRYOCYSTORHINOSTOMY. SC Dresner, KG Klussman, DR Meyer, JV Lingerg. The authors reported 105 dacryocystorhinostomy procedures in 87 patients performed on an outpatient basis. Seventy-six patients received local, and 29 received general, anesthesia. The patients left th hospital an average of 2.6 hours after surgery, and 14 were admitted after surgery - 9 immediately, and 5 after some delay, primarily for epistaxis. There were no serious complications related to the outpatient nature of the surgery. The success rate was 94%. We conclude that outpatient dacryocystorhinostomy is successful, well accepted by patients, and safe, provided that inpatient care facilities are readily available should be needed. *(Ophthalmic Surgery 1991, 22:222-224.) Reprint requests to: Steven C. Dresner, MD, 2222 Santa Monica Blvd, Suite 101, Santa Monica, CA 90404.*

CANALICULAR STENOSIS FOLLOWING PROBING FOR CONGENITAL NASOLACRIMAL DUCT OBSTRUCTION. DB Lyon, RK Dortzbach, BN Lemke, RS Gonnering. The authors stated that a canalicular stenosis was identified in 29 of 66 (44%) children and 35 of 80 (44%) lacrimal drainage systems undergoing silicone intubation for congenital nasolacrimal duct obstruction, having previously had unsuccessful probings. The stenoses were equally divided between boys and girls and between right and left sides. There was no significant difference in age at the tinme of probing, number of prior probings, or age at intubation between children with and without canalicular stenosis. Stenoses may be congenital or acquired as a result of faulty probing. Any child undergoing a second lacrimal procedure after a failed probing should be evaluated for evidence of a canaliculat stenosis. If a stenosis is present, a silicone stent should be placed to try to salvage the canaluicullus. *(Ophthalmic Surgery 1991; 22:228-232.) Reprint requests to: David B. Kyon, MD, 2600 North Mayfair Rd, Suite 950, Milwaukee, WI 53226.*

METHYLENE BLUE STAIN GUIDING LAYERED EXCISION IN MOHS' MICROGRAPHIC SURGERY. DD Yu, P Yeatts, B Leshin. The resection of a continuous layer of tissue by means of Mohs' micrographic surgery is problematic at several periorbital sites. They authors paint the wound with 10mg/mL methylene blue after grossly excising the tumor. Then a 2- to 3-mm normal tissue around the edge and deeper to the base of wound is excised leaving no stained tissue behind. The specimen is examined by horizontal frozen sections, and residual tumor is designated on the map. The designated area with tumor is painted again and excised. The process is repeated until a tumor-free plane is reached. *(Ophthalmic Surgery 1991; 22:233-236.) Reprint requests to: Patrick Yeatts, MD, Department of Ophthalmology, Bowman Gray School of Medicine, 300 S. Hawthorne Road, Winston-Salem, NC 27103.*

A NEW LOOK AT POSTOPERATIVE INSTRUCTIONS FOLLOWING CATARACT EXTRACTION. RS Perkins, RJ Olson. The authors sought to determine whether, given the decreasing rate of complications associated with cataract surgery and IOL implantation, postoperative restrictions placed on patients undergoing these procedures could be significantly and safely relaxed. We reviewed the charts of 216 patients who had undergone capsulorhexis or "can-opener" capsulotomy, phacoemulsification, and insertion of an oval IOL over a 3-year period, noting any operative or postoperative complications. All of these patients had been examined the day after surgery and, if no complications were noted, had veen instructed only to refrain from activities that produced pain. No shield was required, and no instructions were given to restrict showering, hair washing, or any other normal physical activity. We found no complications related to any postoperative activity. These results suggest that current postoperative instructions typically restricting such patients' activities should be reevaluated. *(Ophthalmic Surgery, April, 1991; 22:66-68.) Reprint requests to: Randall J. Olson, MD, Department of Ophthalmology, University of Utah Health Sciences Center, 50 North Medical Drive, Salt Lake City, UT 84132. USA.*

IN THE NAME OF ALLAH, THE BENEFICENT, THE MERCIFUL

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Whoever therefore sees,
Does so for himself;
And whoever remains blind,
Does so to his own loss.
Holy Quran 6:105

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