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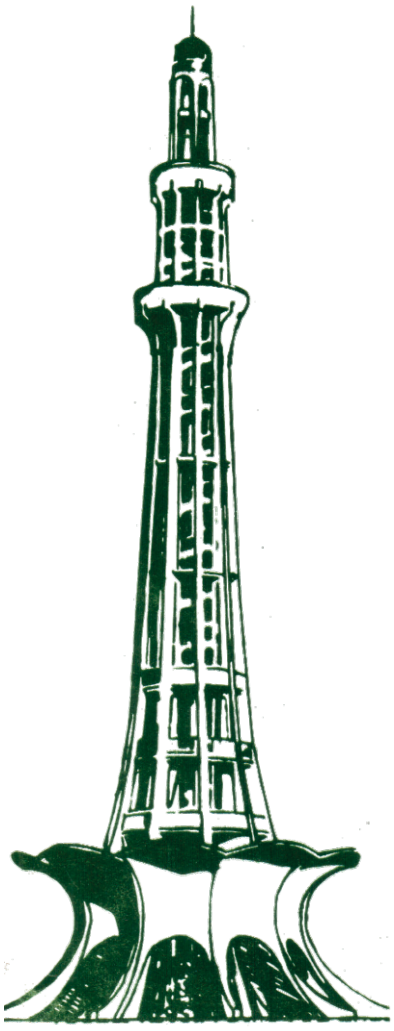

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BISMILLAHIR-RAHMANIR-RAHEEM

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Editorial

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

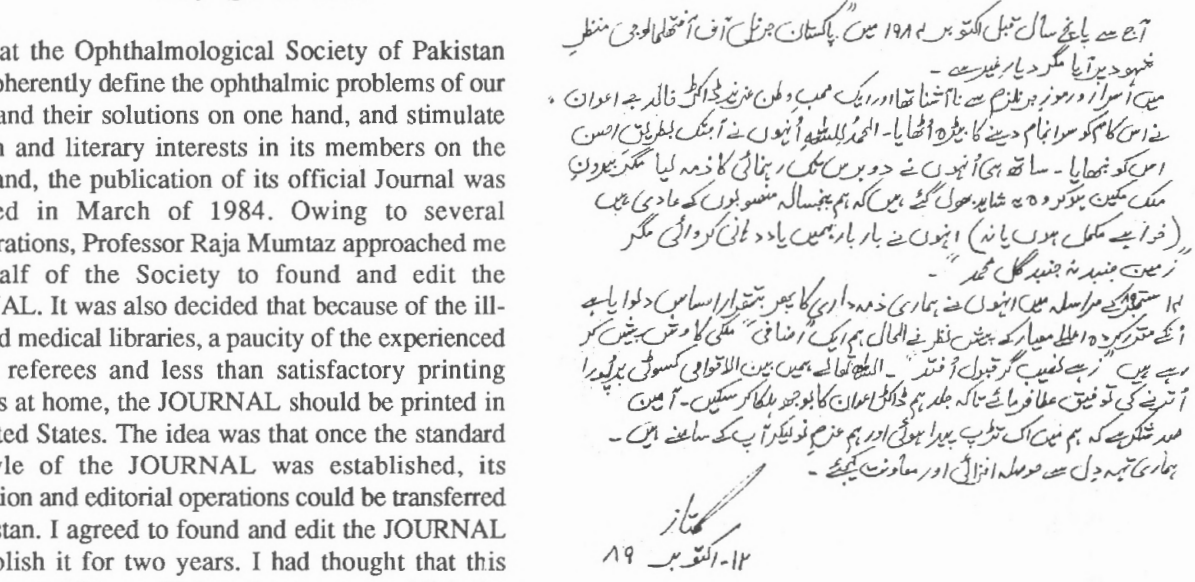
The JOURNAL Publication in Pakistan

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

Verily never will Allah change
The condition of a nation,
Unless they change
What is within themselves;
Holy Qur'an 13:11

So that the Ophthalmological Society of Pakistan could coherently define the ophthalmic problems of our people and their solutions on one hand, and stimulate research and literary interests in its members on the other hand, the publication of its official Journal was proposed in March of 1984. Owing to several considerations, Professor Raja Mumtaz approached me on behalf of the Society to found and edit the JOURNAL. It was also decided that because of the ill-equipped medical libraries, a paucity of the experienced literary referees and less than satisfactory printing facilities at home, the JOURNAL should be printed in the United States. The idea was that once the standard and style of the JOURNAL was established, its publication and editorial operations could be transferred to Pakistan. I agreed to found and edit the JOURNAL and publish it for two years. I had thought that this duration would be sufficient for me to establish the JOURNAL's direction and train an editorial team based in Pakistan, which could take over its publication without jeopardizing its standard or style. Although many colleagues in Pakistan extended help to me on an individual basis, the promised team was never constituted despite my many written reminders. In yearly extensions, my two-year project turned into a six-year struggle.

I was relieved to learn last December at Lahore that two years after the Society's mandate to find a group of local individuals interested in the editorial operations, three persons had sought this responsibility. A trial copy of their effort was also presented at the Lahore meeting. Although this specimen copy was handed a most discouraging evaluation for its glaring editorial inadequacies and innumerable infractions of style, I am hopeful that in time, with continued hard work and increasing experience of its producers, it will gradually improve and become free of all its deficiencies. We should encourage and congratulate them for their initial effort. Professor Raja Mumtaz introduced the above trial copy with following words in Urdu:



("Five years ago the Pakistan Journal of Ophthalmology came into existence, but from a foreign land. I was not familiar with requirements and operations of medical journalism, and a patriotic friend Dr. Khalid J. Awan took the responsibility to fulfill this obligation. Alhamdoolillah, he has executed this responsibility in a most commendable fashion. He had agreed to shoulder this burden for two years, but living out of our country made him forget that we have become accustomed to the "Five-Year Plans" (Whether they reach completion or not is another matter.) He reminded me repeatedly (about finding some interested individuals to work with him and learn the various tedious aspects of editing and publishing, so that the editorial operations could be transferred to Pakistan in care of their experienced hands.) However, as the saying goes, "Earth moved but did not move Ghul Mohummad."

In his letter of September 14, he once again reminded us of our responsibility. In view of the high standard he has given to the JOURNAL, we for the time being present this ancillary effort. We are lucky, if it receives acceptance. May Allah Almighty give us ability to meet the international standards, so that we may soon lighten the burden of Dr. Awan.

I am so grateful that a fresh aspiration surged in us, and we are forging ahead with a new resolve. Encourage us sincerely and give us your cooperation.

-(Signed) Mumtaz, October 12, 1989.")

I have been asked by the Society, and Professor Raja agreed with it, that I should continue the publication of the JOURNAL until a new team gains enough experience and the confidence of the Society membership. I hope that the second part of the decision by the Society which recommended that the new team must work with the present Editor for a certain period of time to become familiar with the ongoing operations is soon properly implemented. I look forward to having them aboard. I would like to reiterate the opinion I expressed in 1984 that the editorial base be broadened by recruiting capable individuals from the parts of the country other than Lahore and from the privately practicing ophthalmologists to share this responsibility. Also, direct input from the executives of the Society be sought in formulating editorial policies.

I had felt that after its existence for over a quarter of a century, a plan by the Society to publish a journal with purposes mentioned in the opening paragraph of this editorial was in reality a heedfulness of the spirit of admonition manifested in the above verse from the Holy Qur'an. For success of such undertakings, the hardest of efforts with the purest of intentions must be invested, and even then with results that are comparable to the currently prevailing standards. Any project that brings forth any lesser results only promotes the *status quo*, and is undoubtedly against the concept of the above Qur'anic verse.

There are those who say that because of the circumstances in our country, we need not follow the standards set by the rest of the world. It is true that our means do not permit us to offer sophisticated care provided to patients in the more prosperous nations, but how does it deprive us of the capability to document our professional observations in a well-designed, well-organized, well-argued, and well-written fashion is beyond comprehension. Personal motivation and hard work are the only ingredients needed to accomplish this. The limited resources of our nation may limit our ability to offer our patients the care that is comparable to that offered in other parts of the world, but we cannot use it as an excuse for the substandard presentation of professional experiences to our peers and pupils, particularly in print. If we are unable to meet the standards of medical journalism, we need not have a journal. Over 3 million scientific articles were published in the world in the last decade. Why would anyone in his right mind want to add another substandard publication to this mind-boggling number? If we cannot have a journal with good standard, we must not have one at all.

The standard of a medical publication depends on the conscientious learned peer reviewing and expert editing, and both of these require much hard work and great experience. Although it is expected of an author that his paper must be free of ambiguities, poor prose, grammatical errors, spelling mistakes, incorrect statements, etc., it is a knowledgeable reviewer or an experienced editor who can point out the questionable theses, erroneous analyses, faulty data or methods, illogical arguments, conflicts of interest, unsubstantiated conclusions, etc. in a paper. Yet, an editor's responsiblities are arduous, thankless, and filled with a risk of inciting displeasure, even enmity, of the authors and colleagues. I had one recent experience with an author whose paper needed much work and revision before it could be considered suitable for publication. He wrote me an angry letter stating that he lost his chances to become an associate professor because I did not publish his paper in time (i.e. within six weeks of its submission.)

To demand standard in medical writing is nothing new. A hundred years ago, Leber wrote, "It is in the best interest of the author as well as of the reading public that the papers be as brief, clear and well organized as possible. The better they are worked out, the more stringent the reasoning is, the more rigorously the evidence is sifted, the more succinct and convincing can be the presentation and the interest of the reader will be better sustained. He who aims at a more than ephemeral consideration of his achievement will do well to hold up publication until these requirements are strictly fulfilled." (Die Ophthalmologie seit 1870. Ein Vorwort zum XXX. Bande des Archives. -1884.) It is equally pertinent today.

Now that for the first time in our country, the publications have been made the basis for promotion in the teaching institutions, there is a danger that those who wish to meet this requirement without really working to deserve it will try to propagate the idea that our country's situation cannot allow production of well-written articles. It is the obligation of the Society to most urgently and aggressively dispel this destructive notion. The JOURNAL must demand standards in papers submitted for publication, and publish only those papers which undergo proper peer review and editing, even if the help of foreign experts is needed in achieving this goal. Only by adhering to these rules will we be able in time to produce our own quality authors, reviewers and editors.

An honest recognition of our limitations and deficiencies coupled with a determined sincere struggle to reach higher levels is the only way we shall ever receive Allah's help, for by pursuing this course we would most assuredly become the people who *"change what is within themselves."*

Camera Clinicals

In this section of THE JOURNAL, photographic documentation of interesting and challenging observations are presented to the readers. They should make their diagnoses from the given information and compare these with the expositions given on pages 46-47. -Editor

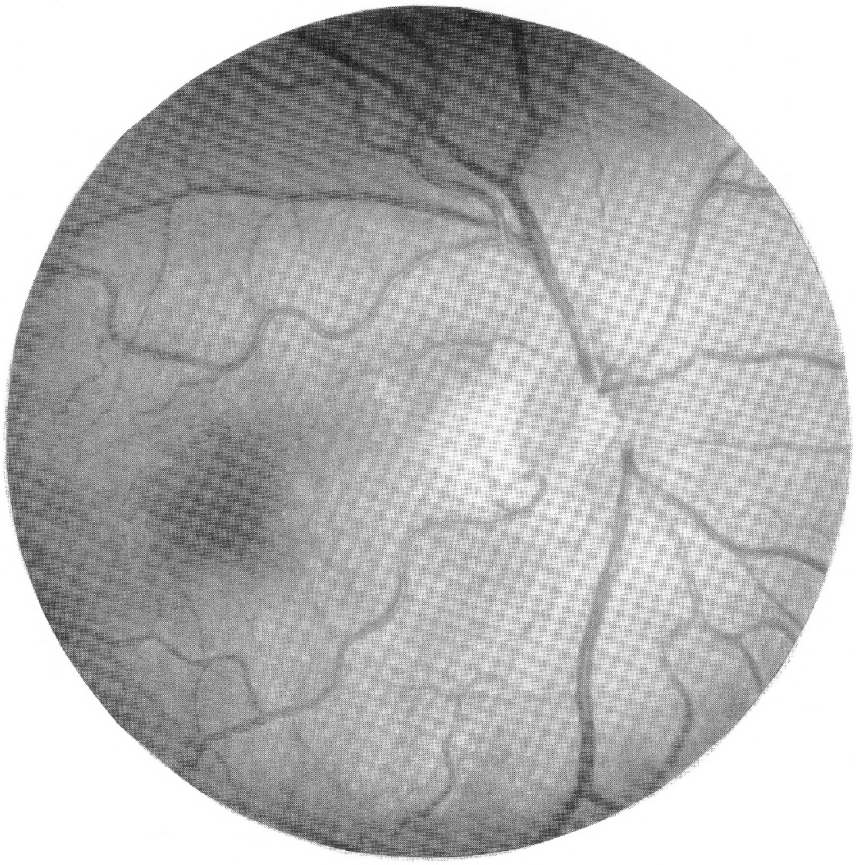


Figure 1

Figure 1: A 49-year-old woman came for ophthalmological evaluation. She reported that at the age of 30 she had noticed recurrent blurriness of sight in her right eye. The visual disturbances used to resolve spontaneously in the beginning, but after two years became permanent. The symptoms were never accompanied by pain or redness. She had sought help from different ophthalmologists over the years but to no avail. She was healthy otherwise, and never had any other trouble with her eyes. The eye examination showed that her visual acuity was counting fingers (CF) in the right eye and 20/20 (6/6) in the left eye. External examination, intraocular pressure with applanation tonometry, extraocular muscle function, retinoscopy, and slit lamp examination were all normal. There were noticed much interesting findings in the right eye on ophthalmoscopy (Figure 1). The patient was offered the option of a modality currently available for the treatment of her eye condition, with added information that this treatment had a very iimited chance of improving the sight in her right eye. The patient refused the treatment. The conditon has not changed over the last several years.

Figure 2

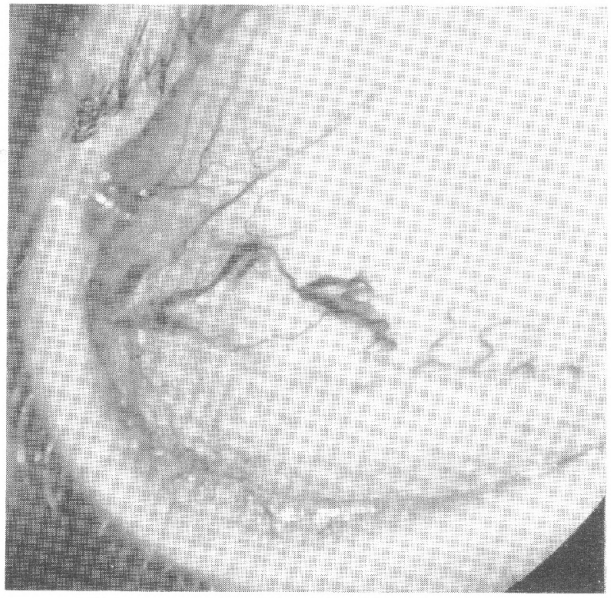


Figure 3

Figures 2 and 3: A 60-year-old coal miner complained of blurry vision and slight watering of the right eye for about one year. The appearance shown in Figure 2 developed very gradually. Except for a mild chronic obstructive respiratory problem, his general health was fine. The eye examination showed, in addition to the findings in the Figure 2, a slightly more prominent right eye with a reading of 19X16/100 mm on the Hertel's exophthalmometer. There also were some prominent blood vessels in the outer inferior fornix (Figure 3). The functions of extraocular muscles were normal. Visual acuity with correction of about two diopter hypermetropic astigmatic refractive error in each eye was 20/30 (6/9) in the right eye and 20/20 (6/6) in the left eye. The slit lamp examination, ophthalmoscopy, visual fields, and applanation tonometry were normal in both eyes.

On palpation a trilobed well-defined rounded and firm mass was felt in the inferolateral anterior orbit. These masses were not attached to the overlying skin or the globe. Systemic evaluation by an internist was normal except for mild hypertension. Detailed blood studies, body x-rays, bone marrow examination, and liver functions were normal. The CT scan of the orbits showed no bony defect. After a 4-month observation, the patient underwent right orbitotomy. Histopathologic studies confirmed one of the three diagnoses that were preoperatively entertained. The patient is doing fine one year after the surgery, but the vision in the right eye has remained unaltered.

Clinical Research

Comparative Evaluation of Oculokinetic and Automated Perimetries in Glaucoma

M. Naseem Panezai, M.D.

ABSTRACT: A recently designed method of visual field examination, called oculokinetic perimetry (OKP), is inexpensive, fully portable, and easy to perform. In this test, the patient moves the eye around a central static target to look at an array of numbers which are arranged in 16 meridians at intervals of 2.5- to 5-degrees. When fixation on a number is accompanied by the disappearance of the central target, the patient deleted that number from a specially prepared recording chart. Inversion of the recording chart at the conclusion of test gives a plotting of the central 25-degree visual field. We tested visual fields of 56 eyes of 30 patients with glaucoma by both oculokinetic perimetry and multiple-stimulus suprathreshold static perimetry (MSSP). On comparing the results of two methods, we found that in 46 (82.14%) of the eyes field changes were identical, in five (8.93%) eyes they were only slightly different, and in another five (8.9%) eyes the similarity of defects was not satisfactory. It appears from this study that oculokinetic perimetry is a useful tool for plotting the visual field defects in glaucoma. Therefore, oculokinetic perimetry can be employed as an inexpensive but reliable method for diagnosing and monitoring glaucoma in the under-developed countries. (Pakistan Journal of Ophthalmology 6:33-38, April, 1990.)

Despite recent advances in techniques of visual field analysis, there is not as yet available an ideal method for glaucoma screening. There still exists a need for a skilled observer to administer the tests. The ideal perimeter should be reliable, provide precise detection and assessment of field loss, and be available at a reasonable cost.[1] The conventional methods of visual field testing requires special equipments and expertise, and are therefore not usually practicable in nonophthalmic clinics by the bedside and in the community.

In 1985, Damato[2,3] described a new visual field test, called "oculokinetic perimetry" (OKP), which has the promise of making perimetry more widely available because it is simple, inexpensive and fully portable. It consists of a white tangent screen with a central black test stimulus and 100 peripheral fixation points of pale blue numbers arranged in 16 meridians at 2.5- to 5-degree intervals. The subject looks at each number in turn, from 1 to 100, with one eye covered. Using a specially designed record sheet, he crosses out those numbers which when fixated at cause the disappearance of the central test stimulus. The central 25° visual field is tested in 16 meridians. When the test is completed the inverted record sheet gives the results which are comparable to those obtained by conventional perimetry.[2]

MULTIPLE-STIMULUS SUPRATHRESHOLD STATIC PERIMETRY (MSSP): Henson's Central Field Screener is designed to meet the needs of the busy practitioner, who requires an instrument that can both quickly screen the visual field and perform detailed examination when necessary. It is reliable and inexpensive. The technique of visual field testing used in the Henson-Humblin CFS 2000 is known as "Multiple-stimulus Suprathreshold Static Perimetry" or MSSP. Rather than offering a single stimulus at a time, it presents patterns of either two, three, or four stimuli. The patient reports the number of stimuli he sees. This technique has two major advantages over the single stimulus technique. In the first place, by presenting more than one stimulus at a time, it speeds up the process of the field examination. Secondly, it helps to maintain the patient's attention and operates in a relatively fail-safe manner if his attention lapses.

In addition to a first-stage screening programme it

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has two more detailed programmes. The first of these more detailed programmes increases the number of tests points to 66 while the second increases these to 132. These three programmes are designed to run in stages. The first stage is the screening programme. If at the end of this stage the perimetrist suspects some change or simply wishes to test more points, he can go on to the second stage and test 66 points. If at the end of this stage the perimetrist wishes to test even more points, he can go into the third stage and present all 132 stimuli.[11]

The instrument is readily available and accessible to the majority of glaucoma patients. It can be operated by an office nurse or an ophthalmic assistant, and occassionally even a secretary can be trained relatively quickly to operate this perimeter.

The aim of my study was to compare oculokinetic perimetry with perimetry on Henson Automated Central Field Screener to learn the efficacy and reliability of oculokinetic perimetry in glaucoma, and to make recommendations on the basis of results of this study whether this simple, low cost, and easily implementable method could facilitate the detection and management of glaucoma in the under-developed countries.

Materials and Methods

Thirty patients, 13 men and 17 women, attending the Glaucoma Clinic of Bristol Eye Hospital, England, were included in this comparative study. Their ages ranged from 52 to 84, with an average of 67 years.

A standard proforma was completed by each patient, giving all the necessary information. The proforma included details of name, age, sex, occupation, address, diagnosis made by the concerned consultant, any surgery that had been or was carried out, treatment used in one or both eyes, and the visual acuity.

Oculokinetic perimetry was compared with Henson Central Field Screener in all patients. Henson perimetry was always performed first on the right eye. Before carrying out the test the procedure was explained to the patient. After completing the Henson perimetry, the patient was asked to take some rest (equivalent to the print out time of Henson, about 2 minutes) before starting the oculokinetic perimetry. The consent of each patient was always taken prior to undergoing oculokineticperimetry. This test was performed after verbal introduction to the patient seated on a chair with one eye occluded at a working distance of 33 cm. The OKP test was carried out with the test chart attached to a well-lit vertical surface, a position normally occupied by the Bjerrum Screen. This was illuminated by a 100-watt intensity light in an angled reflector about two meters from the screen in addition to illumination by the two 80 watt fluorescent tubes at about 3 meters from the screen.

Table 1
Ocular perimetry

Severity	Visual field defect
Mild	Arcuate scotoma but central 10^0 visual field normal
Moderate	Visual field defects within 10^0 of fixation
Severe	Visual field defects within 5^0 of fixation

The center of the test chart was placed at eye level. The right eye was tested first and the subject was asked to detect the blind spot to be certain that the correct procedure was being followed. The correct working distance was found by looking down at the star near the lower border of the chart covering one eye and moving the patient backwards or forwards until the letter L or R (for the left and right eye respectively) was no longer visible to him. The numbers were then read slowly from one to 100, taking about one second per number to identify the numbers which were associated with the disappearance of the test stimulus. The central target is a circular black spot of 1.4/333.3 mm size which subtends a visual angle of 0.25^0, so that is is barely visible to normal persons at 25^0 from fixation. The results were noted in a special record chart beginning with the physiological blind spot. The outlining of blind spot by the patient's responses is a useful guide to the validity of the examination.

The time required to test each eye varied from individual to individual. The patient's cooperation and concentration were also noted, and the degree of patient's compliance was entered in the proforma. The severity of visual field loss was categorized as shown in the Table 1.

The results of OKP were compared to those of Henson perimetry. The comparability of the two types of perimetry were categorized as Grade 1 if the two results were identical, Grade 2 if the visual field defects were different in extent and degree, and Grade 3 if correlation was altogether unsatisfactory.

Results

All patients were able to complete both tests without any difficulty. A brief verbal introduction was sufficient to make them understand what was required of them. The plotting first of blind spot proved a practical and good indicator of the reliability of the oculokinetic perimetry.

A total of 56 eyes of 30 patients had satisfactory testing carried out the procedure of visual fields by both, Henson automated perimetry and OKP

Table 2
Correlation between oculokinetic perimetry and Henson automated perimetry (56 eyes of 30 patients)

Degree of correlation	Extent and character of the visual field loss				No. of eyes
Classification	No Loss	Mild	Moderate	Severe	No. & %
Fields identical (Grade 1)	7 (12.5%)	21 (37.5%)	10 (17.86%)	8 (14.29%)	46 (82.14%)
Defects different in extent and density. (Grade 2)	0	0	2 (5.37%)	3 (5.36%)	5 (8.93%)
No recognizable similarity (Grade 3)	0	4 (7.14%)	0	1 (1.79%)	5 (8.93%)
Total eyes in each group	7 (12.5%)	25 (44.64%)	12 (21.43%)	12 (21.43%)	56 (100%)

techniques. Four eyes of four patients had visual acuity of counting fingers (CF), hand movement (HM), light perception (LP), and no light perception (NLP), and therefore, could not be tested with either Henson automated perimetry or oculokinetic perimetry.

The comparison of the visual fields obtained with two types of perimeters showed that there were 46 eyes (82.14%) with Grade 1 correlation, five eyes (8.93%) with Grade 2 correlation and five eyes (8.93%) with Grade 3 correlation. Table 2 shows degree of correlation between oculokinetic perimetry and Henson automated perimetry in 56 eyes of 30 patients.

The time taken by the patients for each procedure varied from individual to individual and depended on patient's intelligence and compliance. The time varied from four minutes to 14 minutes, with an average of nine minutes for each eye. This variation of time was found in both oculokinetic and Henson perimetry. The print out time of Henson perimetry, which is about two minutes, is not included. (Which means that on the average Henson perimetry took two minutes more than OKP.) The time utilized by the patient was directly proportional to the severity of field defects. Both tests were completed more quickly by the patients who had mild or no field defect at all.

All patients but one identified the blind spot by oculokinetic perimetry. This patient was unable to perform the test due to poor vision in one eye, and showed poor compliance and Grade 3 correlation with Henson perimetry in the other eye. It is interesting that in eight eyes, Henson perimetry did not demarcate the blind spot. Out of these eight eyes, two showed mild field defects of Grade 1 correlation and six showed normal visual fields, despite having been diagnosed as eyes with chronic open-angle glaucoma. One of these eyes, however, did have angle-closure glaucoma.

It may be worth mentioning that in three eyes of two patients, oculokinetic perimetry showed constriction of visual fields in addition to those visual field defects which had considerably good correlation with Henson perimetry. These two patients had constricted pupils, due to medication with pilocarpine 4% eyedrops. This constriction of visual fields was not detected by Henson perimetry.

Discussion

The area of visual field defect depends on the size, brightness and color of the target and the contrast of the background illumination. Elimination of psychological factors which may influence the patient's concentration and good fixation are essential for accuracy. Refractive errors have little influence on the peripheral field (outside the central 25^0) but must be corrected when testing the central field. Also, small pupil sizes (less than 2 mm) will simulate field constriction.[4]

The visual fields can be tested by static or kinetic perimetry. Kinetic perimetry involves the detection of a moving target, while static perimetry involves the detection of a stationary target.[4] The currently available perimeters, kinetic or static, have their advantages and disadvantages. More commonly employed techniques in my own experience include the following.

CONFRONTATION TEST: This is the simplest test which is useful for the detection of hemianopias and altitudinal defects, but not subtle field defects due to glaucoma. The examiner sits facing the patient at a distance of about one meter. They cover opposite eyes so that the uncovered eyes have mutually congruent fields. The examiner then introduces a slowly moving test target, such as his fingers, into the visual field until the target is perceived by the patient. The patient and examiner's fields are congruent, so the presence of a defect in patient's field is uncovered by an absence of response from him when the object is visible in the examiner's field. Although with practice a confrontation field can be obtained from almost any patient, full extent, character and details of field loss cannot be obtained by confrontation method.

LISTER PERIMETRY: Lister's perimeter consists of a semi-circular frame that can be rotated about a central axis. The target is brought in from various directions and the patient indicates when he first sees the target by tapping with his finger, etc. It is seldom more useful than the confrontation method in detection of a peripheral field defect, but is of considerable value in documenting the natural course of a peripheral defect.

TANGENT SCREEN PERIMETRY: The tangent screen can only be used to test the central 30° of the visual field. Fewer than 10% of patients with field defects will have defects limited only in the periphery; hence, if the central field is normal, the examiner can be 90% certain that there is no defect in the peripheral field either. The central field is the most important part of the glaucoma field examination. Also, by the time the visual loss has become functionally significant, the central field certainly will be involved.[5]

The patient is seated one or two meters from a black screen with one eye covered and the other fixing on the central spot on the screen. He is instructed to report when he first sees the target being moved by the examiner from the periphery of the screen toward its center and then when it disappears. The steps in tangent screen perimetry are to plot the blind spot, find the scotoma, and then plot dimensions of scotoma.[6]

The causes of poor examination technique include failure to maintain correct working distance, failure to maintain even illumination, failure to plot from the blind to the seeing area, moving the target too quickly, failure to recognize artefacts such as spectacle frames, prominent eye brows and large noses (when the peripheral fields are being plotted the patient's spectacles should be removed but they should be worn when plotting central fields), failure to watch the patient's fixation, failure to challenge the patient by occasionally deliberately hiding the target, and failure to instruct the patient adequately.

GOLDMANN PERIMETRY: This is the most preferred of all perimeters for detection of peripheral defect, although central field examination also be done with it. The earliest paracentral scotomas (25°) are usually missed with Goldmann's perimeter, so it is preferable to limit its use to advanced glaucoma. It is usually used to produce a kinetic field but can be adopted for some basic static perimetry.[4] The perimeter's hemispherical dome is equipped with a chin rest for the patient. The instrument has control in the rear to change the test object size, color or brightness. A special photometric device keeps the contrast between the target and background luminosity at a constant ratio. A telescope with an incorporated fixation at all times.

Because the test conditions and intensity of the target remain constant, Goldmann's perimeter permits greater reproducibility and standardization of the results.[6]

CENTRAL FIELD ANALYSIS: A more rapid, requiring about 20 minutes, assessment of the central 30° field can be obtained by the Friedman's analyzer, a static perimeter that consists of a black screen with a series of built-in flashing light-targets of constant size but variable intensity. The screen is illuminated by a standard light source and the patient is tested at 330 mm distance. At the beginning of the test, the central (macular) threshold is established by varying the illumination intensity of the flash at the fixation target. The field test is then run 0.2 log units of illumination above this threshold. The test flashes are displayed in set patterns on the screen, and the illumination threshold at which each flash is seen is recorded. Those target dots where flashes are seen at threshold are left unmarked on the score sheet. Those seen at a higher intensity are so indicated in the record. Those not seen at all are marked black.[4] The Analyzer is used for detection of early field loss or scotomas, and so is good for detection of early glaucoma. Its major disadvantages are poor patient compliance and lack of peripheral field, so this test requires good concentration from the patient and a skilled operator, but produce standardized field for long term follow up.

AUTOMATED PERIMETRY: Octopus and Humphrey perimeters have been perhaps the most important development in making the initial diagnosis of glaucoma and its subsequent monitoring for progression.[7] Detection of visual field abnormalities in their earliest stage enables the clinician to initiate timely treatment to prevent further glaucomatous visual loss and perhaps, in some instances, even reverse it.[8] Its major advantages are (1) standardization of the testing process with relative freedom from technician-induced variablity; (2) random stimulus

presentation with bracketing strategies that allow rapid measurements of differential light sensitivity at multiple points within the field of vision; and (3) quantitation of visual field data, which facilitates statistical analysis of individual and population data.[7] These quantitative data permit an easier and more accurate analysis of the visual field than the subjective interpretation of a visual field plot.[2] The automated perimetry is not without its drawbacks.

In eyes with very advanced field loss, the automated perimeters are less valuable since there may be only a handful of test locations where there is still any response to the test stimuli. This greatly limits the ability to detect any change in the field and is very discouraging to the patient who is only able to respond to as few as a single stimulus out of the 50 presented.[9] Also, while the detection programmes are quick, the quantitative programmes are much more time consuming. Determination of a quantitative central (30^0) visual field on a Humphrey or Octopus perimeter will take an average of about 15 minutes. Therefore to test both eyes and to print out the results require about 40 to 45 minutes per patient. If the ophthalmologist wishes to test the peripheral field as well, an additional 20 to 30 minutes must be allocated. This is considerably longer than the average time to manually plot Goldmann fields.[9]

Clinical trials have demonstrated that many automated perimeters and test strategies can provide visual field evaluation that are equal to or better than those typically obtained with manual perimetry. When used properly, most devices now provide clinically acceptable detection and false positive rates.[10]

The interpretation of visual field results also requires some assessment of the patient's ability to reliably perform the perimetric task because the sensitivity and specificity of visual field tests may be strongly influenced by patient's reliability. In some cases, however an increase in the variability of a patient's threshold responses may not indicate poor cooperation but rather may reflect subtle defect in the visual field.

With manual techniques the perimetrist subjectively evaluates the reliability of the patient's responses, so the adequacy of the reliability assessment depends on the skill of the examiner.[12]

This study has demonstrated that oculokinetic perimetry can provide visual field evaluation that is comparable or equal to that achieved by Henson automated perimetry in glaucoma. The study involved 30 adults between the ages of 52 years and 84 years, who were attending the out-patient department. It was accepted at the out set that this aspect of the study would be very subjective. However, it was hoped that it would either ascertain or disprove the reliability of oculokinetic perimetry when compared, on the basis of conclusions of this study, with Henson automated perimetry, if both tests were accurately monitored and correctly performed. I also had intention of gaining more information on the credibility of both Henson automated perimetry and oculokinetic perimetry.

Our results show that out of a total of 56 eyes of 30 patients tested, a strong similarity (Grade 1) existed between both methods in 46 eyes (82.14%). A slightly difference between two tests was seen in (8.93%) eyes (Grade 2). In five (8.93%) eyes, two tests produced contradictory results (Grade 3). I think that this dissimilarity was due to patient's poor compliance to the tests, pupillary constriction, and, at least in one patient, due to non specific field defect on Henson perimetry. The number of patients in this group is small and the figures may not be representative. However, excellent comparability indicates the accuracy and reliability of oculokinetic perimetry.

Oculokinetic perimetry is simpler than conventional techniques, both for the patient and for the perimetrist. This method removed the need for the subject's eye to be kept immobile throughout the procedure and for the test stimulus to be moved into appropriate points in the visual field. An expensive equipment and highly trained perimetrists are, therefore, not required for oculokinetic perimetry.[2]

In the present study, I found that the test was easily understood by the patient after a brief verbal introduction. I also observed that oculokinetic perimetry was appreciated by many patients due to its simplicity and was completed by them with great interest.

Detection of visual field abnormalities in their earliest stage is the primary reason for performing perimetry in patients in whom glaucoma is suspected. Such information enables the clinician to initiate early treatment and prevent loss or progession of, and perhaps even reverse, visual field loss.[8]

Conventional perimetry is largely confined to eye clinics because of the need for special equipment and/or highly trained personnel.[13]

The obvious conclusion from this study is that oculokinetic perimetry could facilitate the detection and management of glaucoma, especially in remote areas of under-developed countries, where conventional perimetry is not possible. Susceptible individuals who are not adequately supervised could perform oculokinetic perimetry at periodic intervals at home with the assistance of a friend or a relative if necessary.[3]

The Henson automatic strategy has the definite advantage of the short examination time and relatively lower cost of the equipment. It seems suitable for the

screening of large populations with expected low prevalence of glaucoma.[14] On account of its simplicity oculokinetic perimetry was very well accepted by the patient in our study, resulting in quick completion and shorter examination time. As far as the cost of OKP is concerned, it doesn't need more than a simply designed chart and proper illumination.

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Ophthalmic 'Pastpourri"

Shiny Teeth, Shinier Eyes

Miswak (brushing of teeth) "strenghtens gums and improves eyesight."

The Prophet Sallallaho Alaihi Wassallam-**Seventh Century**
A hadith from Fazail-e-Namaz by Maulana M. Zakariya, p7.

Ocular Injuries

Incidence and Prognosis of Concussive Hyphema in Northwest Frontier Province of Pakistan

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ABSTRACT: Sixty-three consecutive cases of concussive traumatic hyphema admitted to the Department of Ophthalmology, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar from May 1987 to July 1988 were studied prospectively. Majority of the patients (61.9%) were under the age of 15, and male to female ratio was 7:1. Eye Injury mostly occurred during sports, while at play, by flying objects such as stones, mudballs and *goli dandas*. Only a little over one half of the patients, 35 (55.6%), sought medical attention within 24 hours. Twenty-seven (42.9%) patients had total hyphema. Recurrent hyphema occurred in 12 (19.0%) patients, and nine of these had delayed presentation. Glaucoma, corneal staining, necessity of surgical intervention, and poor visual outcome often accompanied recurrent hyphema. Of the 36 patients with known final visual acuity, 12 (33.3%) had a visual acuity of 20/200 (6/60) in the affected eye. These figures are much higher than the figures reported from the developed countries, despite the fact that in the developing countries the incidence of hyphema in more or less similar to that of our study. The reason for delayed presentation, higher number of total hyphemas, and poor visual outcome are poverty, illiteracy, poor public awareness, and a lack of eye care facilities in the rural areas of Pakistan. An aggressive public health education and implemention of sound epidemiological principals are needed to improve the situation. (Pakistan Journal of Ophthalmology 6:39-42, April, 1990.)

Bleeding into the anterior chamber following trauma has varied prognostic implications. It may have an uneventful recovery, or may lead to a series of complications such as rebleeding, glaucoma, corneal staining, hemophthalmitis and phthisis bulbi.[1] Unfortunately, no standardized management, and these exist considerable differences of opinion about the treatment of hyphema.[2] Different therapeutic regimens include any combination of sedation, bed rest, unilateral, bilateral or no patching of the eyes, miotics, mydriatics, topical and systemic corticosteroids, antifibrinolytics and intraocular pressure lowering therapeutic agents. We conducted a study to learn the incidence and prognosis of traumatic hyphema in the Northwest Frontier Provence (NWFP) of Pakistan.

Material and Methods

A prospective study was performed on 63 cases of traumatic hyphema admitted between May 1987 and July 1988 to the Ophthalmology Department of the Postgraduate Medical Institute, Lady Reading Hospital, Peshawar. Each patient had full eye examination and his age, sex, cause of injury, time interval between injury and presentation, visual acuity, intraocular pressure, and the level of hyphema, were carefully recorded. Any episodes of secondary rebleeding and other complications following primary bleeding were entered in the medical record. Hyphema was divided in 5 grades according to the quantity of blood in the anterior chamber. The initial therapeutic regimen for all patients was bed rest and patching of only the involved eyes. The patients who had intraocular pressure above 22 mm Hg also received oral acetazolamide. Sedation and analgesics were used as and when required.

Corticosteroids were used only in cases of clinically manifest traumatic iritis. No miotics or mydriatics were prescribed as a routine. Surgical evacuation of blood from the anterior chamber was carried out in cases of uncontrolled secondary glaucoma secondary eight-ball hyphemas.

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Reprint requests at the above address to Mohammad Daud Khan, Professor and Chairman.

Results

Young males were predominantly affected (Table 1). Thirty nine patients (61.9%) belonged to the age group 0-15 years, and male to female ratio was 7:1. Only 35 patients (55.6%) presented within 24 hours of injury (Table 2). The average delay between injury and seeking of medical care was 2.25 days. Sports and play was the most common cause of injury (Table 3). Children were affected most frequently, (Perhaps because it is they who frequently engage in such aggressive activities like slingshot shooting, *goli danda* and throwing of stones.)

Table 1
Traumatic hyphema
Age and sex distribution (63 cases)

Age in years	Male	Female	Total	Percentage
0-15	33	06	39	61.9%
16-30	18		18	28.6%
>30	04	02	06	9.5%
0->30	55	08	63	100%

Table 2
Traumatic hyphema
Interval between injury and clinic visit

Time	No. of cases	Percentage
2 hours	18	28.6%
2-6 hours	09	14.3%
7-24 hours	08	12.7%
2-3 days	14	22.2%
4-7 days	12	19.0%
>7 days	02	3.2%
2 hours->7 days	63	100%

Table 3
Traumatic hyphema
Age relationship to cause of eye injury (63 patients)

Causes	0-15	16-30	>30	Total	%
Playing				42	66.6%
Slingshot	16				
Stones	10				
Sticks	04	02			
Goli danda	03				
Toy pistol	03				
Others	02	01	01		
Fighting or assault	01	06	02	09	14.3%
Occupational		05	02	07	11.1%
Road traffic accidents		01	01	02	3.2%
Domestic		02		02	3.2%
Miscellaneous		01		01	1.6%
All causes				63	100%

Table 4
Traumatic hyphema
Grades of hyphema at presentation (63 cases)

Grade	Blood in Anterior Chamber	Number of cases	%
Grade I	Microscopic	07	11.1%
Grade II	1/3	19	30.2%
Grade III	1/3-1/2	07	11.1%
Grade IV	1/2-<Total	03	4.7%
GradeV	Total	27	42.9%
Overall		63	100%

Other causes of injuries were fights and assaults, occupational and road traffic accidents, which mostly occurred in the patients above the age of 15.

Table 4 shows level of hyphema at the time of presentation. Highest number (27) of patients presented with total hyphema. Out of these, nine had secondary hyphema with a delay of 3 or more days in presentation. In 45 (71.4%) patients hyphema absorbed within 5 days of hospitalization. Of the 12 patients who had secondary hemorrhage, three (4.8%) patients bled during their stay in the hospital while 9 patients first presented with secondary hemorrhage. All these patients who bled secondarily during hospital stay had Grade IV (more than 1/2 of the anterior chamber) and Grade V (total) hyphema at the time of presentation. Twenty three patients developed secondary elevation of intraocular pressure. The secondary glaucoma was more common in the group with rebleeding seven out of nine cases). Corneal staining occurred in four patients (6.4%), all having eight-ball hyphema with elevated intraocular pressure. Surgery was required in 12 patients (19.0%), most of them (8 patients) having secondary hemorrhage.

Table 5 shows visual acuity of patients at the time of admission and discharge. In one patient visual acuity could not be assessed due to very young age. At admission 56 (88.9%) patients had visual acuity of less than 20/200 (6/60) while only six patients had visual acuity 20/200 (6/60) or better. This improvement occurred with appropriate treatment, and at discharge 31 (49.2%) patients had VA of 20/200 (6/60) or better.

Table 5
Traumatic hyphema
Presenting and final visual acuity
(63 cases)

VA	Admission		Discharge		Follow-up	
	No.	%	No.	%	No.	%
6/6-6/12	3	4.8	17	27.0	12	33.3
6/18-6/24			6	9.5	7	19.5
6/36-6/60	3	4.8	8	12.7	5	13.9
CF	12	19.0	13	20.6	4	11.1
HM	11	17.4	8	12.7	3	8.3
PL	32	50.8	10	15.9	5	13.9
NPL	1	1.6				
Non-assessible	1	1.6	1	1.6		
Total	63	100.0	63	100.0	36	100.0

CF:counting finger; HM: hand movements; PL: perception of light; NPL: no perception of light.

Only 36 patients came for follow up examination, which ranged from six weeks to 16 months. Twelve patients had final visual acuity of 20/20 (6/6) to 20/40 (6/12). Visual acuity was less than 20/200 (6/60) in 33.3% cases. Of these five patients had vitreous hemorrhage, three had optic nerve damage, two had choroidal rupture involving macula, and the remaining two macular hole and dense corneal staining.

Discussion

In our series, the majority of patients affected with traumatic hyphema were young males. This figure correlates well with many other series.[1-4] Only 27 (55.6%) of patients were seen within 24 hours of injury. This figure is in sharp contrast to other studies, where more than 90% of the patients reported for primary care within 24 hours.[5-6] The picture was even more grim in Nigeria, where only 34.2% of the patients sought medical attention within 24 hours of injury.[2] However, the different factors responsible for delay in presentation in Nigerian population and almost similiar to those of our series. The most important among these factors are poverty, illiteracy and a lack of facilities for eye care in rural areas. The delay in presentation accounted for the higher rate of complications in hyphema patients in both series.

Highest number of patients (42.9%) presented with total hyphema. Similar high ratios have been obeserved in Nigeria[2] and Thailand.[3] This figure is less than 15% in most of other series.[1,4,7] The reason for high number of total hyphema cases in our series may be that the patients with large secondary hyphema are forced to seek medical help, while the patients with minor hyphema do not bother to come to the doctor, particularly in the rural areas of Pakistan and the underdeveloped countries.

The incidence of secondary hemorrhage in traumatic hyphema varies greatly in different studies, ranging from 3.5% to 41%.[1-4] In our study, secondary bleeding occurred in 12 (19.0%) of the patients. This figure was much lower in the hospitalized patients, only three (4.8%) of the patients having rebled during their stay in the hospital, while nine patients first presented with secondary hyphema.

Four of our patients (6.3%) developed corneal staining. Three of these had delayed presentation with secondary hemorrhage, signifying our increased rate of complications in this group.

Unfortunately, there is no standardized therapy for traumatic hyphema.[1] We employed only bed rest, patching of involved eye and sedation when needed. Successful removal of blood from the anterior chamber by irrigation through a paracentesis incision has been reported.[7] We interviewed surgically only when there was secondary bleeding with 8-ball hyphema or uncontrollable glaucoma. Many authors feel that corticosteroids, topical or systemic; patching, monocular versus binocular; and the use of mydriatics or miotics have no beneficial effect on the resolution of hyphema or prevention of rebleeding.[8-10] Aspirin is thought to have detrimental effect upon hyphema by contributing to rebleeding.[13,14] In traumatic hyphema, the final visual outcome is more often related to other associated ocular injuries than to hyphema itself or to rebleeding.[2,3] In our series, out of 12 patients who had final visual acuity of less than 20/200 (6/60), 11 had additional damage from trauma in the posterior segment of the eye accounting for the poor visual status. Only one patient had poor vision directly related to hyphema, from dense blood staining of the cornea.

To achieve any dramatic changes in the overall outcome of traumatic hyphema in our society, preventive medicine must form the cornerstone of management. Incidence, prevalence, circumstances and severity of eye injuries can only be determined through implementation of sound epidemiological principals. Data collected from this can be used to develop a clinical pattern of these eye injuries in a particular area of the country, and proper measures to reduce the incidence and severity of injuries may then be devised and put into practice.

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Ophthalmic "Pastpourri"

A Prophetic Prophylaxis

In Arabia of old, children had a game in which a stone placed between the thumb and the curved index finger was thrown at an opponent by the flip of index finger. Prophet Muhammad (PBUH) forbade children from playing this game, saying, "Neither can it kill any game, nor can it fell an enemy; it does, however, injure many an eye and crack many a tooth."

Saeed Abdullah ben Moghaffal (RAU) - 7th Century
A hadith (Mutfiq-elaih)

Clinical Research

An Experience with Surgical Management of Primary Chronic Angle-closure Glaucoma in Pakistan

M. Afzal Bodla, M.D.

ABSTRACT: Out of a total of 26 eyes of Pakistani patients with primary chronic angle-closure (non-congestive) glaucoma, seven had 1/2 to 2/3 of the filteration angle closed off by synechiae, 13 had synechiae that involved 1/2 or less of the angle, and remaining six had only iridotrabecular contact without any synechiae. Seven eyes with synechiae in more than one half of the angle underwent trabeculectomy, and the other 19, with no synechiae or synechiae in less than half of the angle, had surgical peripheral iridectomy. Although intraocular pressure was well in control postoperatively in trabeculectomy eyes, two of these had postoperative flat anterior chamber with consequent cataract formation. Of the 19 eyes with iridectomy, 14 had controlled intraocular pressure postoperatively, four needed miotics to control the intraocular pressure, and the remaining one had to undergo trabeculectomy because of the failure of iridectomy despite additional medical therapy. These results show that Pakistani population with primary chronic angle-closure glaucoma responds to surgical treatment based on gonioscopic findings similar to that reported in studies from other parts of the world. It is important that all ophthalmologists practicing in Pakistan become efficient in performing gonioscopy to detect and differentiate primary chronic angle-closure glaucoma in its early stages, when the treatment is simpler and easier with surgical or laser iridectomy. (Pakistan Journal of Ophthalmology 6:43-45, April, 1990.)

Primary chronic angle-closure (non-congestive) glaucoma presents in hyperopic eyes with shallow anterior chambers and narrow angles with insidious and symptomless iridotrabecular contact leading to gradual rise in intraocular pressure (IOP) without associated discomfort, pain, colored haloes or congestion.[1] When a threshold is reached, changes in the optic nerve head start, resulting in optic disc cupping and visual field defects similar to those seen in open-angle (or chronic simple) glaucoma. In Pakistan, gonioscopic evaluation is often not included in ophthalmologic evaluation, leading to an erroneous diagnosis of primary chronic angle-closure glaucoma as chronic simple (open-angle) glaucoma in many cases. This results in an unsatisfactory medical management of a distinctly surgical entity, with, of course, equally disappointing outcome. This unfortunate circumstance in Pakistan causes a greater loss of sight on one hand and necessitates a more serious filtering surgical intervention instead of the the simpler peripheral iridectomy on the other hand by causing long delay in the accurate diagnosis.

The purpose of the study presented here was to evaluate the treatment of primary chronic angle-closure glaucoma by surgical management based on the gonioscopic findings in Pakistani patients.

Materials and Methods

This study included 26 eyes in which the diagnosis of primary chronic angle-closure (non-congestive) glaucoma had been confirmed. After full eye examination, these eyes were divided into three groups on the basis of gonioscopic findings. Group one included seven eyes with peripheral anterior synechiae that involved the one half or more of the circumference of the filteration angle. These eyes also had advanced optic disc cupping with moderate to advanced glaucomatous visual field defects. Group two consisted

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of 13 eyes with less than one half of the angle circumference showing synechiae. These eyes had mild to moderate cupping and early to moderate glaucomatous visual field changes. The third group had remaining six eyes with no peripheral anterior synechiae but slitlike angles with iridotrabecular contact and increased cup/disc ratio without field defects.

The surgical intervention consisted of either invasive surgical peripheral iridectomy or trabeculectomy. All eyes in group one underwent trabeculectomy, and all eyes in groups two and three were treated with peripheral iridectomy. No laser iridotomies were done due to non-availability of the laser facility.

Results

A satisfactory control of IOP was achieved in all seven eyes that had trabeculectomy. However, two of these developed postoperative shallow anterior chambers and later on lens opacities. Out of 19 eyes with peripheral iridectomy, IOP was normalized in 14, additional topical miotics were required to achieve it in another four, and trabeculectomy was required to achieve it when even additional medical therapy failed in one eye. These last five eyes had preoperative peripheral anterior synechia in less than one half of the circumference of the angle.

Discussion

Primary chronic angle-closure (non-congestive) glaucoma,[1] characterized by a symptomless presentation, ophthalmoscopic findings resembling those of chronic simple glaucoma, and gonioscopic findings of angle-closure glaucoma, is not uncommon in Pakistan. Illiteracy, poverty and poor follow-up make it very difficult to manage these cases medically, and one has to eventually decide in favor of surgical intervention. Unfortunately, gonioscopy has not yet become a routine diagnostic prodcedure in ophthalmic practice in Pakistan. This is responsible for misdiagnosis of primary chronic angle-closure glaucoma as chronic open angle glaucoma because if the presence of glaucoma cupping and a lack of acute symptoms. Subsequently, these misdiagnosed cases end up being managed, medically or surgically, by the options applicable only to chronic open-angle glaucoma. Quite a few of these eyes can be managed by a simple peripheral iridectomy, if a proper timely diagnosis is made by a careful gonioscopic examination in suspected cases.

The obstruction to outflow system in the angle-closure glaucoma may be subdivided into functional and structural components. Functional occlusion of the angle by an apposition of the peripheral iris to the trabecular meshwork is the primary obstructive process. This phase of the disease is reversible, and almost always eliminated by iridectomy, which relieves the relative pupillary block.[2] The persistence of functional component in the presence of congestion, when fibrin leaks to glue the iris to trabecular meshwork, leads to the development of peripheral anterior synechiae.[3] Lowe[1,4,5] states that in the absence of congestion which is a common finding in these cases, the iris may remain against the trabecular meshwork for months or years without forming adhesions. Some of these eyes can actually loose all vision from prolonged increased intraocular pressure, and yet the iris will sometimes drop free of the trabecular meshwork if an iridectomy is performed. The ideal operation is one which does not excessively jeopardize the patient, and peripheral iridectomy is a far safer operation than any of the filtering procedures, which comparatively have a much higher rate of postoperative complications, e.g. shallow anterior chamber, lens opacification, hypotony, etc.

Barkan[6] confirmed the deepening of anterior chamber, widening of filteration angle, and the collapse of iris bombe following iridectomy. Chandler,[7,8] Hass and Scheie[9] also had the same experience. It has been concluded that relative pupillary block is an active factor in the pathogenesis of angle-closure glaucomas. The action of iridectomy shortcircuits the seclusion of pupil, ensuring collapse of the iris bombe and opening of the angle and deepening of the anterior chamber. Posner[10] supplies an explanation based on suction hypothesis for the effectiveness of a peripheral iridectomy. The iridectomy in fact transfers the narrow-angle eye into a wide-angle eye, by making available to the outflow channels the entire reservoir of the aqueous contained in the posterior chamber. In a study conducted by Murphy and Spaeth,[11] cases with synechial closure and trabecular damage were treated by peripheral iridectomy at a success rate of 52% with peripheral iridectomy alone, and of 80% with iridectomy and topical miotics.

Chandler and Trotter[8] favor peripheral iridectomy as a first step surgical treatment despite synechial closure and trabecular damage. Response to miotic treatment is a valuable guide in these cases. Preoperatively if the tension can be brought to normal or near normal with a reasonable use of miotics, and gonioscopic examination shows a major portion of the angle free of synechiae, peripheral iridectomy is the procedure of choice, even if there is marked cupping and atrophy of the disc with marked field changes. On the other hand, if the tension remains considerably elevated inspite of regular miotic treatment, and gonioscopic examination suggests extensive peripheral anterior synechiae, a

filtration operation should be chosen. Chandler[7] further states that in borderline cases with a lack of control with miotics, mild to moderate synechial closure, and mild to moderate optic cupping with field loss, peripheral iridectomy can be performed at 11 or 1 o'clock position. If the postoperative tension is still too high even with the addition of miotics, a filtration operation can be done at the 12 o'clock position. Forbes[2,12] also agrees with these findings, as in two of his cases with synechial closure of a one half or two-thirds of the angle with moderate to advanced glaucomatous cupping, tension was controlled and no further change in the visual fields noticed with peripheral iridectomy and post-operative miotics. Surgical results of Luntz[13] also prove the success of peripheral iridectomy in such eyes.

Out of 34 eyes with chronic angle closure (non-congestive) glaucoma in my study, 19 were treated by peripheral iridectomy. Control was achieved in 14 of these. In 7 eyes angle before operation was estimated to be closed by more than 75%. Thus, of the 19 eyes treated by peripheral iridectomy, the disease was controlled in 14 (78%).

Lowe[1,4,14] while discussing the surgical treatment of chronic creeping angle closure glaucoma advocates peripheral iridectomy as the safest surgical procedure despite the synechiael closure. He disagrees with use of acetazolamide as a medical treatment, which by fluctuations in intraocular pressure may enhance the formation of peripheral anterior synechiae. Peripheral iridectomy halts the progressive creep of iris into angle of the anterior chamber, though in certain cases after peripheral iridectomy continued medical treatment may be necessary to control the tension.

My surgical results are also in accordance with those of Chandler,[7] Forbes,[12] Murphy and Spaeth[11] and Lowe.[1,5,14] Out of 26 eyes, in 7 with peripheral anterior synechiae of more than 1/2 or 2/3rd of the angle, moderate to advanced cupping, and moderate to advanced visual field defects, tension was controlled in all (100%) by trabeculectomy, but two eyes developed post-operative shallow anterior chamber and lens changes. Nineteen (19) eyes underwent peripheral iridectomy, out of which 13 had less than 1/2 of the angle closed with synechia, and had mild to moderate cupping with mild to moderate visual field defects. Six eyes had no synechial closure but only iridotrabecular contact with increased cupdisc ratio. Out of above 19 eyes, success rate of peripheral iridectomy was achieved in 14 (73.6%), while in four eyes with less than 1/2 of the angle showing synechial closure topical miotics had to be added post-operatively to achieve satisfactory control of intraocular pressure. One eye showing 1/2 of the angle with synechiae and moderate optic disc cupping did not show any response even with the addition of miotics, and I had to perform trabeculectomy.

We may conclude from the above discussion, that there is an urgent need in Pakistan to differentiate primary chronic angle-closure (non-congestive) glaucoma from chronic simple glaucoma by making goinioscopy a routine diagnostic procedure. Surgical management of these eyes depends entirely upon the presence and extent of peripheral anterior synechiae, and not simply on the ophthalmoscopic findings. A correct evaluation of the angle of anterior chamber allows a satisfactory treatment by the simpler approaches of peripheral iridectomy, or peripheral iridectomy combined with miotics, instead of the more complex and serious procedure of trabeculectomy, entailing more postoperative complications.

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Camera Clinicals: Expositions

Figure 1

Optic Pit with Chorioretinal Coloboma and Macular Detachment

ABSTRACT: A 49-year-old woman with a unilateral rare combination of a congenital optic pit and a small retinochoroidal coloboma adjacent to the optic disc in her right eye developed recurrent macular detachment at the age of 30. It resolved spontaneously after several years, but the vision remained counting fingers (CF). A large cilioretinal artery entering the eye through the bare sclera in the area of retinochoroidal coloboma supplied the entire inferotemporal quadrant of the retina. Weakened chorioretinal structure at the edge of an optic pit may be a cause of subretinal seepage of vitreous or cerebrospinal fluid, causing subsequent macular detachment. (Pakistan Journal of Ophthalmology 6:31,46, April, 1990.) Reprint requests to Khalid J. Awan, FPAMS, 1921 Park Ave. S.W., Norton, VA 24273, USA.

Optic pit is a rare developmental anomaly which usually is not associated with any visual distrubance. However, nearly one half of the eyes with optic pits develop macular detachment after the age of 20. In some uncommon instances, as in this patient, the pit may be associated with retinochoroidal or optic disc coloboma.[1,2] The detachment of macula is perhpas due to the seepage of vitreous or cerebrospinal fluid under the retina through the pit. Multiple or bilateral optic pits have been reported.[1-3] They usually occur near the disc border, predominantly the temporal border, but centrally located optic pits are not unusual. Arcuate or other visual field defects are not uncommon in eyes with optic pits without associated macular detachment.[2] Optic pits are an isolated anomaly but very rarely may be associated with basal encephalocele.[2] Treatment with photocoagulation at the edge of the optic pit has been tried with initially encouraging but eventually disappointing results in some patients.[1,2]

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The Prime Pit

"Ophthalmoscopic examination showed papilla round, with a small flattening on the temporal side; but within its area were two black or olive-green depressions, with elliptical contours (see plate 1). They were both in the substance of the optic nerve, near the scleral ring. One was situated at the nasal end of the horizontal diameter of the papilla, and had its long axis vertical; the other at the lower end of the vertical diameter of the papilla, with its longer axis horizontal....The botton of the second was obscured by a delicate grayish veil,...from the parallactic displacement of its edges in the inverted image, the condition of its surroundings and the course of the vessels, it was plainly shown that it was depression, and not a simple pigmentation or elevation."

The first description of optic pit.
By Theodore Wiethe-1882
111-7182

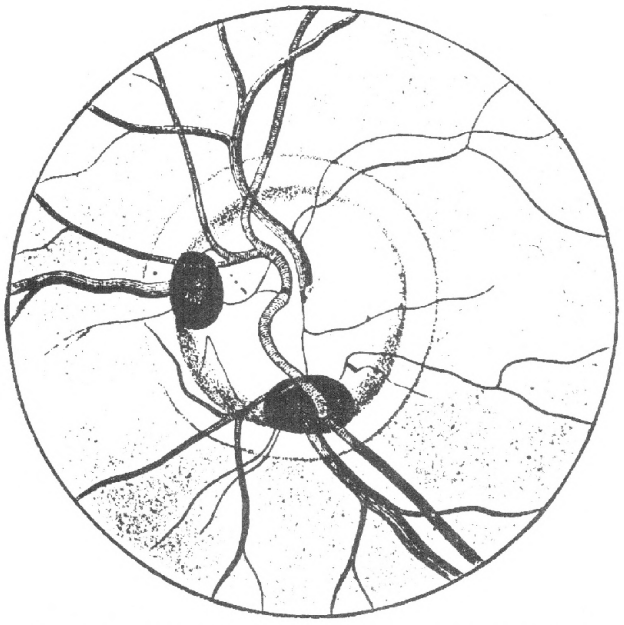

Figure: Left eye. Multiple optic pits in a 62-year-old woman. This is a black and white reproduction of the original color drawing that appeared with Wiethe's paper in 1882.

Figures 2 and 3

Primary Malignant Lymphoma of the Orbit with Visual Loss

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

ABSTRACT: A 60-year-old coal miner had non-Hodgkin's type malignant lymphoma of the right anteroinferior orbit that was histopathologically confirmed. Detailed studied showed no systemic involvement. The right eye of the patient developed loss of two Snellen lines in visual acuity, despite the fact that the tumor did not involve the globe. Although a passive congestion of the conjunctival veins in the outer inferior fornix was present, there was no subconjunctival extension. Excisional biopsy of the tumor followed by uncomplicated irradiation did not improve the vision; conversely, no further deterioration of sight has been noted in ten postoperative months. (Pakistan Journal of Ophthalmology 6:32,47, April, 1990.) Reprint requests to Khalid J. Awan, FPAMS, 1921 Park Avenue, SW, Norton, VA 24273, USA.

Lymphomas have always escaped a histopathologic classification on which to reliably base the clinical course of disease. This is particularly frustrating in lesions of the orbit. Hence, although histopathologic classification of an orbital lesion as lymphoid reactive hyperplasia conveys a benign course, a coexistent or eventual systemic disease may be expected in 15 to 25% of the cases. Basically, three histopathological categories of lymphoid tumors of orbit are (1) benign reactive lymphoid hyperplasia, (2) atypical lymphoid hyperplasia, and (3) malignant lymphoma. This classification is significant in that 5-year mortality rate for the first category is 6%, for the second category 19% and for the third category 58%.[1]

Anatomically, lymphocytes are present only in the conjunctiva and the lacrimal gland, and neither lymphocytes nor lymph nodes are present in the orbit. Hence, over 90% of the conjunctival lymphoid lesions are localized, whereas nearly 50% of the orbital lymphoid lesion are associated with lymphoproliferative manifestations elsewhere in the body.[1] Of the cytologically proven malignant lymphomas of the orbit, 40% are primary and localized.[1] The incidence of lymphomatous tumors of the orbit varies from 7.5% to 11% of all the orbital tumors.[1,2] In a statistical analysis of 581 orbital tumors in Pakistanis, 88 (11.73%) had hemopoietic and reticuloendothelial origin.[3]

Lymphoid tumors of the orbit appear without any congestion or discomfort and grow very slowly, gradually causing downward proptosis of the globe. Mild motility disturbance and only rarely visual decrease may be noted by the patient. Lacrimal gland area is the preferred site, but lymphomas may appear anywhere in the orbit. Hence, these tumors must be differentiated from other tumors of the lacrimal gland. The tumor molds to the shape of the globe and does not cause any bony changes. Both of these features are clearly demonstrable by CT scanning. The lesion is usually palpable as a freely movable diffuse firm mass, but may present, as in my case, as a lobulated structure under the skin. In the conjunctiva, the lymphoma appears as a reddish rubbery (salmon) mass. Clinically, benign and malignant lymphoid lesions look alike.[1] They are usually noncapsulated and on cutting exhibit friablity and color that resemble fish-flesh. The epithelial tumors of the lacrimal gland on the other hand have firmer stroma and show bony changes in 80% of the cases.[1] Immunohistochemical methods have become available for the diagnosis of lymphoma, but are not always conclusive.[2,4]

Once lymphoma of the orbit is suspected, a thorough general systemic evaluation by an internist and an oncologist to rule out generalized disease becomes imperative. Complete blood work, chest x-ray, CT of the liver and other parts of the body, serum protein electrophoresis, and bone marrow biopsy should be performed. If evidence for systemic involvement is present, chemotherapy is the best choice. On the other hand if systemic findings are negative, a biopsy may help determine the true nature of the tumor. An excisional biopsy may suffice in some of the localized lesions, or radiotherapy, 1500 to 2500 cGy for lymphoid hyperplasias and 2500 3000 cGy for malignant lymphoma, following biopsy may prove adequate therapy.[2]

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Critiques

Book Reviews

Edited by Khalid J. Awan, FPAMS

ATLAS OF CONTEMPORARY OPHTHALMIC SURGERY. Edited by Henry M. Clayman. 1990, The C.V. Mosby Company (11830 Westline Industrial Drive, St. Louis, Missouri 63146 USA.) Clothbound, full-size, illustrated with black and white drawings and photographs, index, 1,060 pages. Price: US $130.00.

This heavy (nearly 8 lbs) and handsomely produced tome contains contributions from 17 experts, 16 American and one Canadian, and the Editor, who was assisted in his editorial work by nine of the contributors. In the preface, the Editor states that he has tried to "produce a comprehensive work without miring the reader in every variation of technique." Apparently, the need for the *Atlas* arose due to the rapid advances in technology and surgical techniques during "the last 20 years."

The book follows the popular format of text on the left hand pages with related artwork or photographic figures on the facing pages. On the surface the book under review much resembles King and Wadsworth's An Atlas of Ophthalmic Surgery, the last edition of which appeared about nine years ago, and may even be considered by some as a rehash of that book. However, this book has much to its merit than mere up-to-dateness.

The contents of the book are divided into eight sections of "Corneal Surgery," "Cataract Surgery," "Glaucoma Surgery," "Strabismus Surgery," "Vitreous Surgery," "Retinal Surgery," "Ophthalmic Plastic Surgery," and "Orbital Surgery." Each chapter briefly gives the essentials of the type of surgery discussed in it, such as anatomical aspects, patient evaluation and preparation, indications, etc. The contents are not all inclusive, but they do detail very well the procedures the Editor considers to be most popular and successful today, a fact that is clearly stated in the preface of the book.

The writing is to the point and most conducive to reading, and the artwork by Cantarella and Bittman is not only beautiful, it is also crystal clear in illustrating the points made in the accompanying text. The brevity in writing has not been achieved at the expense of explanation of salient steps of surgical procedures, which are clearly explained in a very organized fashion. The printing is excellent on a very high quality paper. I have no doubt that the quality of this book is such that it will serve well all ophthalmologists, the tyro and the trained.

It is the practicality that appears to have received most consideration in the text of this book. The valuable personal experience of the expert contributors has further enhanced this aspect. Hence, the *Atlas* is more than an impressive pictorial account of the successive surgical steps of ophthalmic procedures. It also is a well-organized treatise on the logical analysis of these procedures.

I wish the Editor had suggested to the contributors to discuss the complications of various procedures and their management in a little more detail and, better yet, in a separate subsection of each chapter. This would have made the book a source on ophthalmic surgery that would had rid its readers of the need to simultaneously consult other books. After all, the success of all surgical operations depends heavily on the avoidance and proper handling of their complications. The quality of this atlas is so good that I wish the Editor and the contributors would give serious thought to this suggestion while working on the next edition. There is plenty of empty space in the text pages to easily accommodate this idea.

Another minor objection I have is the dumping of all the references in one section of bibliography at the end of the book. It would have been infinitely more useful to the reader if they were clearly cited within the text and listed at the end of each related chapter. I seriously doubt if in the present format they will ever attract much attention.

It would have been also befitting a "contemporary" publication on ophthalmic surgery to include a mention of less familiar but quite modern options, such as treatment of trichiasis with cryotherapy or laser photoablation, etc. Although the Editor considers the advent of botulinum toxin therapy one of the signs of "contemporary spurt of progress in ophthalmology," no where in the book is included a step by step technique of performing its injection. These are not drawbacks in this excellent book, but only comments that might be helpful in the preparation of next edition. The fact is that this superb book will prove immensely useful to all ophthalmic surgeons, the novice and the noted.

CURRENT OCULAR THERAPY 3. Edited by Frederick T. Fraunfelder, F. Hampton Roy, and S. Martha Meyer. 1990, W.B. Saunders Company (The Curtis Center, Independent Square West, Philadelphia, Pennsylvania 19106 USA). Clothbound, indexed, 849 pages. Price: US $80.00.

The first edition (1980) of this marvelous and most useful book was an instant hit with ophthalmologists. The second edition (1985) also received universally

favorable reviews. Judging from the quality of this edition, I can safely predict that it will become one of the most important and repeatedly-consulted books on the shelves of physicians who treat patients with eye diseases. A convincing testimonial to this is that in just one decade the book has had three editions. The tradition of a new edition every five years is now established for *Current Ocular Therapy*, and I for one shall always eagerly await the appearance of the future editions for as long as I stay in practice.

The list of the authors spreads across 20 pages. Most are American, but experts from Australia, Belgium, Bolivia, Brazil, Canada, Denmark, Egypt, England, Finland, France, Germany (West, of past), India, Israel, Italy, Japan, The Netherlands, Panama, Puerto Rico, Saudi Arabia, South Africa, and Sudan have contributed chapters to make this a truly international scientific feat. Muneera A. Mahmood of Pakistan has also contributed a chapter on "Lacrimal Hypersecretion." (This reviewer is another Pakistani who was part of the first edition.) The experience of the contributors ranges from their being current fellows to professors emeriti. Even ophthalmologists in private practice have written for this book, which has further added to its practical value. Other than ophtahlmologists, the writers belonging to the fields of internal medicine, surgery, neurology, neurological surgery, dermatology, pediatrics, genetics, parasitology, oncology, and even dental surgery and community health are represented on the author list.

As before, each entity is discussed under the headings of introduction, therapy, ocular or periocular manifestations, precautions, and comments. Each chapter has a few to many most up-to-date references listed at its end. The contents are divided into two main parts. The first part is subdivided into 17 sections on the basis of disorders, such as infections, metabolic disorders, connective tissue disorders, etc. The contents of the 18 chapters of the second part are based on anatomical structures in alphabetical order from the anterior chamber to the vitreous. A very practical and helpful section, "Drug Roster" outlining the ocular preparation of most drugs is appended at the end of the book.

"This is a superb reference book and should be of tremendous help to any practicing ophthalmologists. It probably should be on the desk of every ophthalmologist who treats patients," wrote Professor F.C. Blodi, the Consulting Editor of the JOURNAL, about the first edition of *Current Ocular Therapy*. This also is true of this edition with one difference: the edition under review is more current. Moreover, in regard to this volume, I would like to replace "probably should" in Blodi comments with "must."

THE VISUAL FIELDS. TEXT AND ATLAS OF CLINICAL PERIMETRY, 6th Edition. By David O. Harrington and Michael V. Drake. 1990, The C.V. Mosby Company (11830 Westline Industrial Drive, St. Louis, Missourri 63146 USA) Clothbound, indexed, illustrated with 318 black and white figures and two colored plates, 405 pages. Price: US $53.95.

Quantitative perimetry was founded by Jannik Peterson Bjerrum in 1889, and made popular in the early part of this century by his pupil Henning Kristian Rönne. The popularity and importance it enjoys today in the English speaking world is mostly due to the efforts and writings of another pair of teacher and pupil, namely H.M. Traquair and his book on perimetry in the first half of this century and David O. Harrington and his book in our half of it. Dr. Harrington deserves considerable praise for creating a most appealing classic in the art and science of perimetry, and also commendation is due to the publisher for its continued excellent technical production.

Ever since its first appearance in 1956, *The Visual Fields* has remained rich in content, lucid in writing, vast in scope, highly illustrative and impressive in organization.

The late Edward Jackson, the first Editor-in-Chief of the present series of the *American Journal of Ophthalmology* once wrote about perimetry: "One who feels he should be excused from study of recent methods and the wide significance of perimetry should feel it a duty to retire from ophthalmic practice. He should not hold himself out to the public as prepared to give advice in the most advanced and exact of medical specialties." The kind of perimetry Dr. Jackson is referring to is the one one can become acquainted with only by the study of a book like *The Visual Fields*, the 6th edition of which has the most up-to-date discussion of all current techniques.

COMPUTERIZED VISUAL FIELDS. WHAT THEY ARE AND HOW TO USE THEM. Edited by William R. Whalen and George L. Spaeth. SLACK Incorporated (6900 Grove Road, Thorofare, New Jersey 08086 USA) 1985. Hardcover, 414 pages, no index, illustrated. Price: US $75.00.

Computerized perimetry has become of age and an integral part of good ophthalmic care. Sixteen giants in the field of clinical application of perimetry have contributed to this text, the contents of which are divided into two sections of Practical Technology and Clinical Application. A third section is a year by year 52-page bibliography. The contents of the book are very good for anyone interested in learning computerized visual fields and their technical aspects.

Abstracts from Elsewhere

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

Ophthalmology
The Journal of the American Academy of Ophthalmology

EFFECTS OF PUPILLARY CONSTRICTION ON AUTOMATED PERIMETRY IN NORMAL EYES. KA Lindenmuth, GL Skuta, R Rabbani DC Musch. The authors studied the effects of pupillary constriction (pilocarpine 2%) on automated static threshold perimetry in 20 normal subjects using the Humphry Field Analyzer 30-2 and STATPAC programs. They concluded that changes in pupillary diameter may produce significant declines in threshold sensitivities and support the importance of consistent pupillary diameters on serial automated visual field examinations. *(Ophthalmology 96:1298-1310, 1989.) Reprint requests to Gregory L. Skuta, MD, WK Kellogg Eye Center, 1000 Wall St, Ann Arbor, MI 48105-1994.*

EFFECTS OF PUPILLARY DILATION ON AUTOMATED PERIMETRY IN NORMAL PATIENTS. KA Lindenmuth, GL Skuta, R Rabbani, DC Musch, TJ Bergstrom. The effects of pupillary dilation (tropicamide 1%) on automated static threshold perimetry were studied in 18 normal subjects using the Humphrey field analyzer 30-2 and STATPAC programs. The mean defect worsened by 0.83 decibels (standard deviation, 0.92 decibels) in dilated fields as compared with baseline visual fields (P=0.001). These findings indicate that pupillary dilation in healthy subjects who are not receiving ocular medications produces statistically significant declines in threshold sensitivities. Valid comparison of results from serial visual field testing, therefore, depends on control of or adjustments for the effect of pupillary dilation. *(Ophthalmology 96:367-370, 1989.) Reprint requests to Gregory L. Skuta, MD, WK Kellogg Eye Center, 1000 Wall St. Ann Arbor, MI 48105-1994.*

STATIC THRESHOLD ASYMMETRY IN EARLY GLAUCOMATOUS VISUAL FIELD LOSS. WJ Feuer, DR Anderson. Static threshold visual field testing of both eyes with the Humphrey perimeter in 10 normal subjects showed that mean sensitivity of the field seemed virtually identical in the two eyes. They also report several cases which demonstrate that a mild (1 dB) generalized depression of the visual field is the only recognizable abnormality in the visual field in eyes with early glaucoma. *(Ophthalmology 96:1285-1287 1989.) Reprint requests to Douglas R. Anderson, MD, Bascom Palmer Eye Institute, PO Box 016880, Miami, Fl 33101.*

REPRODUCIBILITY OF TOPOGRAPHIC MEASUREMENTS OF THE OPTIC NERVE HEAD WITH LASER TOMOGRAPHIC SCANNING. FE Kruse, ROW Burk, H Volcker, G Zinser, U Harbarth. The authors used the new technique of laser tomographic scanning to quantify structures of the optic nerve head. A laser beam was focused onto the surface of the optic nerve head and the reflected light was detected in a confocal detection unit. The consequent change of focus produced a tomographic scanning series and allowed measurement of three-dimensional structures. To analyze the reproducibility of optic cup measurements the authors did ten recordings of one eye of eight normal volunteers. They concluded that confocal laser tomographic scanning is a safe, effective, convenient method to measure and document the topography of the optic nerve head and should be a valuable technique for follow-up of glaucoma patients. *(Ophthalmology 96:1320-1324, 1989.) Reprint requests to F.E. Kruse, MD, Department of Ophthalmology, Heidelberg University, D-6900 Heidelberg, INF 400, West Germany.*

NATIONAL SURVEY OF THE PREVALENCE AND RISK FACTORS OF GLAUCOMA IN ST. LUCIA, EAST INDIES. Part I. Prevalence Findings. RP Mason, O Kosoko, MR Wilson, JF Martone, CL Cowan, JC Gear, D Ross-Degnan. Although blacks appear to be at higher risk for blindness for glaucoma, there is little information available on the epidemiology of glaucoma in blacks. Using a cluster sampling technique with systematic allocation of clusters, the authors conducted a national survey of black individuals 30 years of age and older, in St. Lucia. A total of 1679 individuals underwent a screening examination that included visual acuity, intraocular pressure (IOP) measurement, and cup/disc (C/D) evaluation. Every third person had a screening field on the Humphrey field analyzer. Individuals with either elevated IOP, abnormal C/D ratio, or an abnormal screening visual field were referred for a definitive examination and threshold visual fields. A total of 520 people were referred. Identified by stringent criteria for the diagnosis of glaucoma, which required reliable threshold visual fields abnormal by the mirror image method, 147 individuals had glaucoma for a prevalence of 8.8% in the 30 years of age and older

population. *(Ophthalmology 96:1363-1368, 1989.) Reprint requests to Roger P. Mason, MD, Division of Ophthalmology, Howard University Hospital, 2041 Georgia Ave, Washington, DC 20060.*

LONG-TERM NATURAL HISTORY OF LATTICE DEGENERATION OF THE RETINA. NE Byer. An initial series of patients with lattice degeneration was reported to the Academy in 1964 and a follow-up report given in 1973. The author reports a continuing prospective study of 276 consecutive untreated patients (423 eyes) with lattice degeneration with follow-up from 1 to 25 years (average, 10.8 years). Clinical retinal detachment (RD) occurred in 3 (1.08%) of 276 patients and 0.7% of eyes. Tractional retinal tears were seen in eight (2.9%) patients and 1.9% of eyes; one of these led to a clinical RD. Clinical or progressive subclinical RD occurred in 3 (2%) of 150 eyes with atrophic holes. Subclinical RD was seen in 10 (6.7%) of 150 eyes with atrophic holes, involving 9 (7.5%) of 120 patients, and had a much less serious prognosis than clinical detachment. The author recommends that prophylactic treatment of lattice with or without holes in phakic eyes, unless other eye already had RD, should be discontinued. *(Ophthalmology 96:1396-1402, 1989.) Reprint requests to Norman E. Byer, MD, 3400 Lomita Blvd, Torrance, CA 90505.*

GROWTH FEATURES OF CHOROIDAL NEOVASCULAR MEMBRANES IN AGE-RELATED MACULAR DEGENERATION. ML Klein, PA Jorizzo, RC Watzke. The authors studied 80 eyes of patients with choroidal neovascular membranes (CNVMs) associated with age-related macular degeneration between 1982 and 1988. In each case, fluorescein angiography was done on two occasions separated by an interval of 2 days to 11 weeks (average, 13 days) without intervening photocoagulation. Forty-three CNVMs (54%) grew toward the fovea during the interval between fluorescein angiograms, with growth rates ranging from 1 to 24 um daily (average 10 um daily). The CNVM growth was related to the time interval between angiograms, but was not associated with morphologic features of the CNVM. These results reinforce the need for early detection and prompt evaluation of elderly patients with symptoms of CNVMs. *(Ophthalmology 96:1416-1421, 1989.) Reprint requests to Michael L. Klein, MD, Department of Ophthalmology, Oregon Health Sciences University, 3181 S.W. Sam Jackson Park Rd, Portland, OR 97201.*

FOVEAL ABLATION FOR SUBFOVEAL CHOROIDAL NEOVASCULARIZATION. EE Boldrey. Subfoveal choroidal neovascularization (SFCN) often progresses to destroy much central visual function. In this study, laser photocoagulation which included the entire foveal avascular zone was applied to SFCN in the second eye of 13 consecutive patients. Each patients had untreated SFCN in their first eye with visual acuity less than or equal to 20/400. Each second eye had SFCN of recent onset which was less than or equal to 1 disc diameter (DD) in size and visual acuity less than or equal to 20/200. In 10 of 13 976.9%) treated eyes, SFCN was eliminated for 3 to 30 months. These eyes all retained strikingly better visual fields (Amsler or automated) than their fellow untreated eyes, markedly better subjective vision, and Snellen visual acuities of 20/70 to 20/400. Foveal photocoagulation may be useful in selected cases of SFCN with small neovascular nets and poor visual acuity. *(Ophthalmology 96:1430-1436 1989.) Reprint requests to Edwin E. Boldrey, MD, 300 Homer Ave, Palo Alto, CA 94301*

SURGICAL MANAGEMENT OF VITREOMACULAR TRACTION SYNDROMES. RR Margherio, MT Trese, AR Margherio, BK Cartright. The authors treated 106 consecutive symptomatic eyes consideered to be at high risk for idiopathic macular holes developing with pars plana vitrectomy with membrane peeling. The elimination of the vitreomacular traction resulted in improved vision in 89% of the eyes, no change in 7%, and decreased vision in 4%. A total of 62% of the patients were women (median age, 67 years). Follow-up ranged from 6 months to 118 months (average, 35 months). Complications included accelerated nuclear sclerosis in 16% and a 2% incidence of retinal detachment, macular pucker, and macular holes. *(Ophthalmology 96:1437-1445 1989.) Reprint requests to Raymond R. Margherio, MD 3535 W. 13 Mile Rd Suite 507, Royal Oak, MI 48072.*

LEGAL BLINDNESS CAN BE COMPATIBLE WITH SAFE DRIVING. G Fonda. The author presents evidence that some people with 20/200 visual acuity and a field of vision greater than 120° can drive safely in the daytime at a speed of not more than 40 mph. Eight individuals with 20/200 visual acuity (legally blind) were tested for the distance at which they could recognize six traffic symbols. The study was done to see whether a person with 20/200 visual acuity could recognize symbols at a distance great enough to stop safely. Subjects recognized the symbols at a distance determined by the U.S. Bureau of Public Roads, within which a vehicle traveling 40 mph could stop safely. *(Ophthalmology 96:1457-1459, 1989.) Reprint requests to Gerald Fonda, MD, Saint Barnabas Low Vision Center, 101 Old Short Hills Rd, Suite 102-B, West Orange, NJ*

07052. Editor's Note: Several readers raised questions about the safety of driving by legally blind (20/200) persons.

A LONG-TERM CLINICAL TRIAL OF TIMOLOL THERAPY VERSUS NO TREATMENT IN THE MANAGEMENT OF GLAUCOMA SUSPECTS. DL Epstein, JH Krug, E Hertzmark, LL Remis, DJ Edelstein. The authors randomly assigned 107 patients with intraocular pressures (IOPs) between 22 and 28 mmHg with normal visual fields on Goldmann perimetry and without evidence of optic nerve damage to either a timolol treatment (TT) or a no treatment (NT) arm in a prospective clinical trial. The patients were followed for an average of 56 and 51 months, respectively. Criteria for failure were a confirmed IOP of greater than 32 mmHg, stereophotographically documented optic nerve progression, or development of glaucomatous visual field loss by Goldmann or Octopus perimetry. Timolol was found to be significantly protective with an adjusted risk ratio of 0.38. A trend toward a substantial loss of effectiveness of timolol on IOP was not observed. Seasonal fluctuations in IOP were observed, with higher IOP occurring in the winter. The results demonstrate a favorable influence of timolol therapy on the clinical course of patients with mildly elevated IOP. The date lead us to advocate earlier treatment of such patients. *(Ophthalmology 96:1460-1467, 1989.) Reprint requests to David L. Epstein, MD, 243 Charles St, Boston, MA 02114.*

THE WISCONSIN EPIDEMIOLOGIC STUDY OF DIABETIC RETINOPATHY. XI. The Incidence of Macular Edema. R Klein, SE Moss, BEK Klein, D Davis, DL DeMets. The authors examined the 4-year incidence of macular edema and its relationship to various risk factors in a group of younger onset insulin-taking persons (n=610) and older onset persons (n=652). The presence of macular edema at the baseline and follow-up examinations was determined from gradings of stereoscopic fundus photographs. The overall incidence of macular edema in the younger onset group was 8.2% (50/610); in the group of older onset persons using insulin, 8.4% (23/237) and in the group of those not using insulin 2.9% (11/379). The incidence of macular edema was associated with higher level of glycosylated hemoglobin, longer duration of diabetes, and more severe retinopathy at the baseline examination in both younger and older onset groups. These data provide accurate population-based estimates of incidence of macular edema, and suggest that the level of glycemia is a significant risk factor for the development of macular edema.*(Ophthalmology 96:1501-1510, 1989.) Reprint requests to Ronald Klein, MD, MPH, Department of Ophthalmology, University of Wisconsin Medical School, Madison, WI 53792.*

IMPORTANCE OF THE VITREOUS IN YOUNG DIABETICS WITH MACULAR EDEMA. FP Nasrallah, F Van De Velde, AE Jalkh, CL Trempe, JW McMeel, CL Schepens. The authors assessed retrospectively the clinical records of 80 patients (137 eyes) with diabetic retinopathy who were 50 years of age or younger and who had undergone a vitreous examination. The group comprised 53 patients (91 eyes) with macular edema and 27 patients (46 eyes) without macular edema. Vitreous studies using the El Bayadi-Kajiua lens determined whether the posterior vitreous was attached to the retina in the macula. Forty (42.1%) of 91 eyes in the edema group and none (0%) of the 46 eyes in the nonedema group had a detached posterior vitreous. This difference was statistically significant, indicating that young diabetic patients with macular edema have a significantly higher rate of posterior vitreous detachment than those without macular edema. *(Ophthalmology 96:1511-1517, 1989.) Reprint requests to Fadi P. Nasrallah, MD, Eye Clinic, VA Hospital, Martinsburg, WV 25401.*

LOSS OF HUMAN PHOTORECEPTOR SENSITIVITY ASSOCIATED WITH CHRONIC EXPOSURE TO ULTRAVIOLET RADIATION. JS Werner, VG Steele, DS Pfoff. The crystalline lens of the human eye absorbs most of the incident ultraviolet radiation (UVR), but when the lens is removed, this radiation can reach the photoreceptors. The consequences of UVR exposure on cone receptor sensitivity were determined from psychophysical measurements in patients who had undergone bilateral cataract extraction and implantation of intraocular lenses (IOLs). The IOL implanted in one eye contained chromophores that absorb incident UVR, whereas that implanted in the other eye transmitted UVR. Five years of exposure to ambient UVR was associated with a selective loss in sensitivity of the short-wave cone photoreceptors. These results are consistent with the hypothesis that chronic exposure to UVR may damage the human retina. *(Ophthalmology 96:1552-1558, 1989.) Reprint requests to John S. Werner, PhD, Department of Psychology, University of Colorado, Boulder, CO 80309.*

DELAYED SUBRETINAL FLUID ABSORPTION AFTER PNEUMATIC RETINOPEXY. CK Chan, IF Wessels. The authors observed that out of a total of 38 eyes consecutively treated with pneumatic retinopexy, eight had delayed subretinal fluid absorption (DSRFA). In

six of eight eyes, a shallow pocket of loculated fluid developed with small subretinal pigment precipitates, possible a unique feature associated with pneumatic retinopexy. Although loculated DSRFA may not affect the anatomic success, poor visual outcome can result if the macula is involved (4 eyes). Loculated submacular DSRFA may cause bothersome postoperative symptoms, because its resolution may be prolonged for months. Factors found significantly associated with DSRFA were subretinal precipitates and heavy cryotherapy. Demarcation lines, dependent subretinal fluid by the acula, long duration of detachment, and phakic status were factors more frequently found in eyes with than without DSRFA, although the correlations lacked statistical significance. A detailed description of loculated DSRFA after pneumatic retinopexy not found in the literature is presented. *(Ophthalmology 96:1691-1700, 1989.) Reprint requests to Department Secretary, Loma Linda University Eye Medical Group, 11370 Anderson St, Suite 1800, Loma Linda, CA 92354.*

RURAL ENDOPHTHALMITIS. HC Boldt, JS Pulido, CF Blodi, JC Folk, TA Weingeist. The antibiotic regimens recommended for empiric use in posttraumatic endophthalmitis are based on data collected from medical centers in large metropolitan areas. In rural areas, trauma resulting in endophthalmitis frequently involves injuries with perforating objects that are contaminated with organic matter. These rural cases therefore may not be comparable with endophthalmitis occurring after nonrural injuries. A 10-year retrospective analysis was performed to investigate the incidence of rural endophthalmitis as well as determine the type of causative organisms. Endophthalmitis developed in 24 (30%) of 80 patients with rural penetrating trauma, compared with 23 (11%) of 204 patients with nonrural penetrating trauma. Of 24 patients, Bacillus spp were isolated in 11 (46%), followed by gram-negative rods in 7, Staphylococcus epidermidis in 6, and streptococcal species in 5. In 10 (42%) of these 24 patients with rural trauma, more than one organism was isolated. Bacillus spp were involved in six (60%) of ten of these mixed infections. Based on these findings, the authors suggest an intravitreal regimen of gentamicin combined with either vancomycin or clindamycin for the empiric therapy of rural endophthalmitis. *(Ophthalmology 96:1722-1726, 1989.) Reprint requests to Jose S. Pulido, MD, Department of Ophthalmology, University of Iowa Hospitals and Clinics, Iowa City, IA 52242.*

VISUAL LOSS CAUSED BY RAPIDLY PROGRESSIVE INTRACRANIAL MENINGIOMAS DURING PREGNANCY. WL Wan, JL Geller, SE Feldon, AA Sadun. The typical growth pattern of intracranial meningiomas is slow, producing insidious and chronic visual disturbances. In contrast, during pregnancy meningiomas may follow a rapidly progressive course, producing dramatic and relatively acute visual loss, as is demonstrated by three cases. This accelerated growth pattern is probably mediated by hormone receptors in these tumors. Nausea, vomiting, and other symptoms caused by the tumor may be attributed ot pregnancy, delaying the diagnosis. Symptoms may abate spontaneously after delivery only to recur with greater rapidity and severity during subsequent pregnancies. Hormone-responsive intracranial meningiomas must be considered in the differential diagnosis of visual disturbances during pregnancy. Close cooperation between the ophthalmologist, neurosurgeon, obstetrician, and neonatologist is essential for an optimal outcome. Although surgical excision remains the treatment of choice, hormonal therapy may be valuable in treating unresectable or partially resectable meningiomas. *(Ophthalmology 1990; 97:18-21, 1989.) Reprint requests to Alfredo A. Sadun, MD, Department of Ophthalmology, University of Southern California, 1355 San Pablo St, Los Angeles, CA 90033.*

MANAGEMENT OF ENCAPSULATED FILTRATION BLEBS. BJ Shingleton, CU Richter, AR Bellows, T Hutchinson. On the basis of their experience with 49 eyes of 49 patients followed for 6 to 48 months, the authors concluded that vigorous medical therapy, including glaucoma medications, topical steroids, and digital massage, is particularly important for encapsulated blebs during the first 2 months after surgery. After this period, IOP decreases and often remains sufficiently reduced to avoid further surgical intervention. *(Ophthalmology 1990; 97:63-68, 1989.) Reprint requests to Bradford J. Shingleton, MD, Ophthalmic Consultants of Boston, Inc, 50 Staniford St, Boston, MA 02114.*

CHOROIDAL DETACHMENT, FLAT ANTERIOR CHAMBER, AND HYPOTONY AS COMPLICATIONS OF NEODYMIUM: YAG LASER CYCLOPHOTO-COAGULATION. M Maus, LJ Katz. The authors report severe hypotony, flat anterior chamber, and serous choroidal detachment after transscleral neodymium: YAG laser cyclophotocoagulation (Nd:YAG-CPC) in three cases of intractable glaucoma. The three patients had failed previous filtering surgery and were receiving maximal medical therapy. The types of glaucomas treated were two cases of primary open-angle and one chronic-angle closure. The complications were noted between 1 and 2 weeks from the time of

treatment. One patient improved spontaneously after 1 week of observation. Another patient required drainage of the choroidal effusion and anterior chamber reformation. The last patient remains under observation with a low intraocular pressure (IOP) and a slowly resolving serous choroidal detachment. Though the incidence of shallow anterior chambers is three cases (0.5%) in this series of 750 Nd:YAG-CPCs it represents a serious problem that had not been reported previously. *(Ophthalmology 1990; 97:69-72.) Reprint requests to L. Jay Katz, MD, Glaucoma Department Wills Eye Hospital, 9th and Walnut Streets, Philadelphia, PA 19107-5599.*

AN IN VITRO AND CLINICAL COMPARISON OF CORNEAL STORAGE WITH CHONDROITIN SULFATE CORNEAL STORAGE MEDIUM WITH AND WITHOUT DEXTRAN. JH Lass, WJ Reinhart, DL Skelnik, WE Bruner, RP Shockley, JY Park, DL Hom, RL Lindstrom. The authors assessed the safety and efficacy of 1% dextran in Chondroitin Sulfate Corneal Storage Medium (CSM) in reducing corneal swelling after 4°C storage in a corneal endothelial cell culture system. No difference was found in all endothelial morphometric parameters between the two groups pre- and post-operatively. The addition of dextran to CSM medium results in significant intraoperative corneal thinning without adversely affecting endothelial DNA synthesis in vitro and endothelial survival in vivo. *(Ophthalmology 1990; 97:96-103.) Presented in part at the Annual Meeting of the Association for Research in Vision and Ophthalmology, Sarasota, May 1989.*

ANTERIOR SEGMENT EVALUATION OF INFANTS WITH RETINOPATHY OF PREMATURITY. ME Hartnett, MM Gilbert, TM Richardson, JH Krug, T Hirose. The authors prospectively examined the anterior segment of 27 eyes of 17 premature infants with stages IV and V ROP. Out of a total of 26 eyes, angle closure of greater than 1800 was noted in 3 (12%), prominent Schwalbe's line in 4 eyes (15%), high iris convexity in 15 (28%), hypopigmentation of the iris root in 19 (73%), translucent matrix in the angles ("Barkan's-type" membrane) in 18 (69%), posterior synechiae in 16 (62%), visible iris or angle vessels in 12 (46%), and pigment clumping in the angle recess in 12 (46%). This study identified structural abnormalities in the anterior segment of ROP infants, including pathologic changes and anatomic features that could have a developmental origin. *(Ophthalmology 1990; 97:122-130.) Reprint requests to M. Elizabeth Hartnett, MD, Retina Associates, 100 Charles River Plaza, Boston MA 02114.*

RECOGNITION AND REPAIR OF THE "LOST" RECTUS MUSCLE. A Report of 25 Cases. DA Plager, MM Parks. The authors reported 25 consecutive cases of lost muscle over a 10-year period. All patients showed a large-angle strabismus and all muscles had marked limitation of excursion it its field of action. This complication of ocular surgery or trauma, unlike the slipped muscle which has its empty capsule attached to the sclera, is characterized by the absence of any attachment of the muscle or its capsule to the sclera. Eleven of the 25 muscles were retrievable largely because of attachments through intermuscular septum to adjacent oblique muscles. The remaining 14 muscles were considered irretrievable, and these patients underwent a muscle transposition procedure. The clinical features and surgical repair of the lost muscle are described and compared with those of the slipped muscle. *(Ophthalmology 1990; 97:131-137.) Reprint requests to David A. Plager, MD, Department of Ophthalmology, Indiana University, 702 Rotary Circle, Indianapolis, IN 46223.*

TRAINING OPHTHALMOLOGY RESIDENTS TO TREAT PATIENTS WITH VISION LOSS. Results of a Demonstration Program. SL Greenblatt. Ophthalmology residents attended a day-long training program designed to teach them about the rehabilitation needs of visually impaired and blind patients. A pretest measuring the participants' knowledge of rehabilitation services and their rehabilitation-oriented activities was administered before the training program and a posttest measuring the same items was administered 6 months after the program. Several of the rehabilitation-oriented measures that participants themselves take with visually impaired and blind patients increased substantially during the 6-month period as did their knowledge of rehabilitation services available in the community. The referrals made for these rehabilitation services and the participants' interactions with allied health professionals who serve visually impaired and blind patients increased only slightly. These findings suggest the need to institutionalize training for residents in the topic of rehabilitation and to allocate time within their schedules for making referrals and working cooperatively with allied health professionals. *(Ophthalmology 1990; 97:138-143.) Reprint requests Susan L. Greenblatt, PhD, Institute for Scientific Research, 33 Bedford St, Suite 19A, Lexington, MA 02173.*

BLOOD PRESSURE AND RETINOPATHY IN TYPE I DIABETES. H Chase, SK Garg, WE Jackson, MA Thomas,

S Harris, G Marshall, MJ Crews. The authors evaluated the relationship between blood pressure and diabetic retinopathy in 249 young subjects with type I diabetes. Although hypertension is known to be associated with an increased risk for retinopathy, the effects of high-normal blood pressure are unknown. Retinopathy (158 of 249 subjects, 63%) is considerably more common in a young diabetic population than is hypertension (7 of 249 subjects, 2%). Thus, if blood pressure is important in the etiology or progression of diabetic retinopathy, levels below the hypertensive range (<141/90 mmHg) must be considered. The combined effect of hypertension and high-normal blood pressure (>90th percentile but <141/90 mmHg) was studied. Elevation in diastolic blood pressure, alone, and in combination with elevated systolic blood pressure, correlated significantly (P<0.03) with retinopathy. The presence of high-normal blood pressure resulted in a prospectively higher occurrence of retinopathy and of progression of preexisting retinopathy. Glycohemoglobin (HbA1) and duration of diabetes also correlated with retinopathy. Both good glycemic control and maintenance of diastolic blood pressure below the 90th percentile for age may be important in relation to diabetic retinopathy. *(Ophthalmology 1990; 97:155-159. Reprint requests to H. Peter Chase, MD, Barbara Davis Center of Childhood Diabetes, Box B140, 4200, East Ninth Ave, Denver, CO 80262.*

QUADRANTIC VENOUS-STASIS RETINOPATHY SECONDARY TO AN EMBOLIC BRANCH RETINAL ARTERY OBSTRUCTION. JS Duker, LE Magargal, GW Stubbs. The clinical features of venous-stasis retinopathy include midperipheral blot retinal hemorrhages, dilated retinal veins, attenuated arterioles, peripheral retinal microaneurysms, macular edema, as well as retinal and optic disc neovascularization. The authors recently evaluated a 71-year-old woman who presented with an asymptomatic calcific embolus in her right infero-temporal branch retinal artery. Classic venous-stasis retinopathy that was limited to the territory of the obstructed arteriole was present concurrently. This case appears to demonstrate that chronic retinal hypoperfusion and resultant venous-stasis retinopathy can be produced by not only high-grade, fixed stenosis but also by embolic disease. *(Ophthalmology 1990; 97:167-170.) Reprint requests to Larry E. Magargal, MD, Retina Vascular Service, Wills Eye Hospital, 9th and Walnut Sts, Philadelphia, PA 19107.*

HISTOPATHOLOGIC VERIFICATION OF VERHOEFF'S 1918 IRRADIATION CURE OF RETINOBLASTOMA. DM Marcus, JL Craft, DM Albert. The authors studied an eye obtained postmortem from the first patient with a successfully irradiated retinoblastoma. Ths patient, first treated by Verhoeff in 1917, had been followed for 71 years. Ophthalmoscopy disclosed a depressed chorioretinal scar, approximately 3 disc diameters (DD) in size, with baring of the sclera temporal to the macula. This case is historically significant, in that Verhoeff and Reese debated as to whether this tumor regressed spontaneously or secondary to irradiation. Results of histopathologic, immunohistochemical, and ultrastructural examination showed a chorioretinal neuroglial scar without evidence of calcification, necrotic tumor cells, or residual retinoblastoma. By a comparison of the clinical and histopathologic findings in spontaneously regressed retinoblastoma, retinoma/retinocytoma, and irradiated retinoblastoma, the authors concluded that Verhoeff was correct in his belief that x-ray therapy had cured this patient. *(Ophthalmology 1990; 97:221-224.) Reprint requests to Daniel M. Albert, MD, David G. Cogan Eye Pathology Laboratory, Harvard Medical School Massachusetts Eye and Ear Infirmary, 243 Charles St Boston, MA 02114.*

BACTERIAL ADHERENCE TO EXTENDED WEAR SOFT CONTACT LENSES. MI Aswad, T John, M Barza, K Kenyon, J Baum. The authors studied the adherence of Pseudomonas aeruginosa and Staphylococcus aureus to extended wear soft contact lenses (EWSCLs) with and without focal deposits using both a radiolabeling technique and electron microscopy. P. aeruginosa showed significant adherence to contact lenses in vitro. In contrast, S. aureus failed to show significant adherence to contact lenses in vitro (i.e., the radioactive uptake was not significantly above background). The extent of adherence of pseudomonas was proportional to the number of focal deposits on the lenses. Results of electron microscopic examination showed the bacteria to be adherent primarily to large focal deposits (>150 um). There was no pseudomonal adherence to the small focal deposits (<50 um) and little adherence to the areas in between the focal deposits. The authors hypothesize that worn lenses, especially those with large focal deposits, serve as a vehicle for the transport of P. aeruginosa to the cornea. This hypothesis could be a partial explanation for the high incidence of keratitis caused by P. aeruginosa in EWSCL patients. *(Ophthalmology 1990; 97:296-302.) Reprint requests to Jules Baum, MD, New England Medical Center 750 Washington St, Box 277, Boston, MA 02111.*

BILATERAL POSTINFECTIOUS OPTIC NEURITIS AND INTRAVENOUS STEROID THERAPY IN CHILDREN. BK Farris, DJ

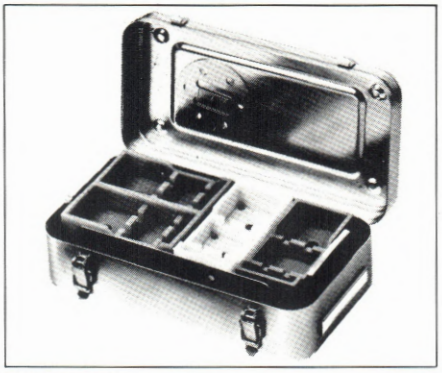
Pickard. Six patients presented with acute, simultaneous, bilateral optic neuritis. Five of the six patients admitted to a recent history of a brief upper respiratory or gastrointestinal illness, presumably viral in nature. Visual acuity was severely reduced in all patients. Five of the six patients also demonstrated marked neurologic deficits, including seizure activity and cerebellar dysfunction. Three patients demonstrated enhancing intracranial lesions on magnetic resonance imaging (MRI) consistent with demyelinative plaques, whereas lumbar puncture was abnormal in three patients, HLA tissue typing was performed on five of the six patients. All patients were treated with intravenous methylprednisolone, followed by a 2-month tapering course of oral prednisone. Each patient experienced a rapid and nearly complete recovery of vison during treatment. *(Ophthalmology 1990; 97:339-345.) Reprint requests to Bradley K. Farris, MD, University of Oklahoma, Dean A. McGee Eye Institute, 608 Stanton L. Young Blvd, Oklahoma City, OK 73104.*

MANAGEMENT OF SIDEROSIS BULBI DUE TO A RETAINED IRON-CONTAINING INTRAOCULAR FOREIGN BODY. SR Sneed, TA Weingeist. The authors report 14 cases of siderosis bulbi secondary to a retained iron-containing intraocular foreign body (IOFB). The IOFB was removed with a sclerotomy and external magnet (5 eyes), a pars plana vitrectomy (PPV) and intraocular forceps (5 eyes), a PPV and intraocular magnet (1 eye), and a PPV with aspiration using the suction mode of the vitrectomy instrument (1 eye). A siderotic cataract extraction from 11 eyes gave visual acuity ranging from 20/15 to 20/40. The most recent cases of this also had posterior chamber intraocular lens (PC IOL) implantation. No patient in this series experienced visual deterioration after receiving medical attention. The current management of siderosis bulbi is discussed. *(Ophthalmology 1990; 97:375-379.) Reprint requests to Thomas A. Weingeist, MD, PhD, Department of Ophthalmology, University of Iowa Hospitals and Clinics, Iowa City, IA 52242.*

LONG-TERM FOLLOW-UP OF THE PHYSIOLOGIC ABNORMALTIES AND FUNDUS CHANGES IN FUNDUS ALBIPUNCTATUS. MF MARMOR. Fundus albipunctatus (FA) is considered to be a congenital stationary night-blinding disorder, but there has been no electrophysiologic or photographic documentation of long stability or change. This documentation is presented for two cases followed for 13 to 14 years. The physiologic (functional) deficits appeared to be stable, in support of the concept that FA is not a progressive dystrophy. However, the fundus lesions evolved in appearance from flecks in childhood to relatively permanent punctate dots that increase in number over the years. *(Ophthalmology 1990; 97:380-384.) Reprint requests to Michael F. Marmor, MD, Department of Ophthalmology, Stanford University School of Medicine, Stanford, CA 94305.*

A NEW CLASSIFICATION OF OPHTHALMIC DISORDERS WITH STANDARDIZED OPHTHALMIC ABBREVIAIONS. LM Spencer, GR Spencer. The authors present a classification of ocular disorders that is both comprehensive and easy to use. Each disorder is assigned a unique abbreviation and cross referenced to the International Classification of Diseases, 9th edition (ICD-9). Ophthalmic procedures, medications, and other terms are similarly standarized and abbreviated. The result is a system of ophthalmic terminology that improves the quality of the medical record, facilitates ICD-9 coding, and makes computer date entry faster and more accurate. The system is published as a standard text with companion handbook. A computer program that uses the system also has been developed. *(Ophthalmology 1990; 97:385-389.) Reprint requests to Louis M. Spencer, MD, 1200 West Gonzales Road, Oxnard, CA 93030. A complete set of the published materials described in this paper is available for the cost of shipping and handling.*

OPTIC NERVE DAMAGE IN ALZHEIMER'S DISEASE. AA Sadun, CJ Bassl. The authors examined histologically the optic nerves from ten patients with Alzheimer's disease and compared their findings with those from age-matched controls. Specific and nonspecific measures of degeneration were noted in eight of ten Alzheimer's disease optic nerves; no degeneration was noted in any of the controls. Results of histologic examination of the retinas of one eye of three Alzheimer's disease patients also showed degeneration of retinal ganglion cells and their axons in the nerve fiber layer. Morphometric analysis of optic nerve in many cases of Alzheimer's disease showed predominant loss of the largest class of retinal ganglion cells (M-cells) that contribute large caliber fibers to the optic nerve. The M-cell system mediates specific visual functions. It is known that selective involvement of the M-cell population leads to clinically measurable neuro-ophthalmic and psychophysical impairments in many Alzheimer's disease patients. *(Ophthalmology 1990; 97:9-17.) Reprint requests to Alfredo A. Sadun, MD, PhD, Departments of Ophthalmology and Neuro-Surgery, University of Southern California School of Medicine, 1355 San Pablo St, Los Angeles, CA 90033.. USA.*



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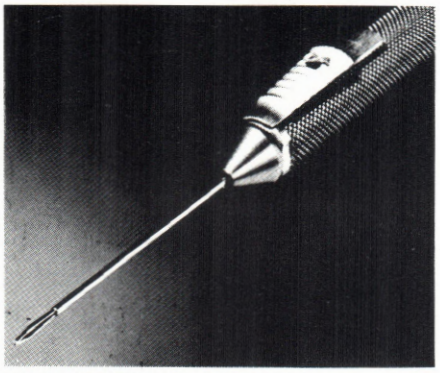

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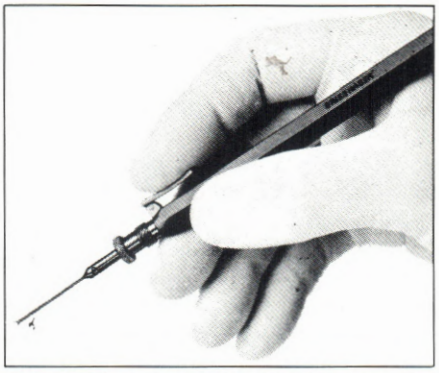

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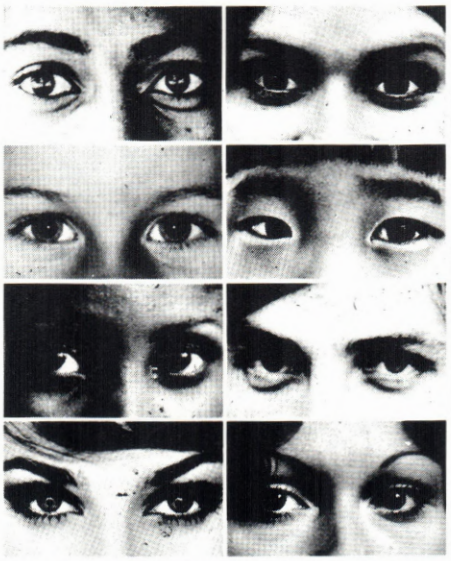

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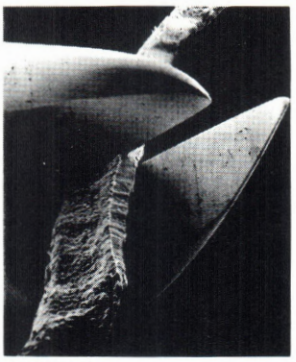

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