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EDITOR: DR. MARY ABRAHAM

**SQUAMOUS CARCINOMA OF CONJUNCTIVA A CASE REPORT.**

**Dr. Manju Kulkarni**

**Dr. Nirmala Subramaniam**

Precancerous Dyskeratosis, Intra epithelial Epithelioma or Carcinoma in situ, and Bowen's Diseases are the various terms interchangeably used for Epitheliomatous tumours of conjunctiva with secondary involvement of the cornea is the most frequent nonpigmented malignant tumour of the conjunctiva and cornea. The lesion, occurs most commonly at the limbus and appears gelatinous with fronds of blood vessels on its surface. The majority of affected patients are males, and persons above 60 years of age. Any patient over the age of 40 years with unilateral kerato conjunctivitis refractory to routine therapy should be suspected to have a conjunctival malignancy<sup>1</sup>. According to Thiel, Bowen's Disease, a precancerous condition, tends to grow into the cornea, while squamous carcinoma infiltrates the conjunctiva and later invades the lacrimal sac, orbit and sinuses<sup>2</sup>.

**CASE REPORT:**

Mr. P.R. an otherwise healthy 48 year old male, complained of chronic redness, watering, irritation, photophobia and decreased vision in the right eye for 6 months. Topical and systemic antibiotics administered elsewhere had failed to relieve his symptoms. He claimed to

have had an episode of sudden visual loss followed by visual recovery 7 years ago which was attributed to retinal vein occlusion.

On examination, the visual acuity in the right eye was finger counting at 6 inches, not improving with pin hole or glasses. Slit lamp examination revealed an intensely congested right eye with oedema of lids. The upper tarsal conjunctiva showed a follicular reaction with mucoid discharge. There was a pearly, gelatinous vascularised lesion on the conjunctiva. The vascular fronds extended on to the cornea, simulating a dense pannus (Fig.1) The lesion extended from the 6 p' clock to 1 o'clock meridian (clockwise). The pupil was briskly reacting to light. The lens was cataractous with pigment dispersion on the anterior lens capsule. The intraocular pressure measured 17mm/Hg with the application tonometer. Gonioscopy revealed a wide open angle without signs of infiltration. There was no fundus view and ultrasonography did not reveal any abnormality. The left eye was normal in all respects. Systemic examination revealed no evidence of any other malignancy elsewhere.



Fig. 1 Gelatinous, vascularised lesion encroaching cornea between 6<sup>00</sup> and 1<sup>00</sup> meridian (clockwise)

A clinical diagnosis of conjunctival malignancy in the right eye was made and a conjunctival biopsy performed. Histopathology showed proliferated epithelial cells exhibiting frank dyskaryosis. The basal cells were hyperplastic and spindle shaped. The nuclei appeared hyperchromatic. These changes were restricted to the epithelial zone, but the sub epithelial mucosa showed an

intense inflammatory reaction in the form of plasma cells and round cells. The histopathological diagnosis was squamous carcinoma in situ. On this was done, taking care to place the incision in normal looking conjunctiva, 3mm from the lesion, using the operating microscope. Superficial keratectomy was performed in areas where the cornea was involved. The underlying bare sclera which was healthy was covered with a mucus membrane graft obtained from the patient's buccal cavity.



Fig. 2 Appearance one month following excision and mucus membrane graft.

Histopathology of the excised tissue reconfirmed the diagnosis but showed invasion of sub-epithelial tissues. The immediate post operative period was uneventful and the graft had taken well (Fig. 2) About three months later he came back with severe watering and redness. Examination showed extensive vasularization of the entire mucous membrane graft. There was recurrence of the lesion nasally

between 1 o'clock and 2.30 meridian, which encroached the cornea almost upto the papillary are (Fig. 3) The superior fornix appeared to be involved. Clinically the entire area of the mucous membrane graft appeared to be infiltrated.

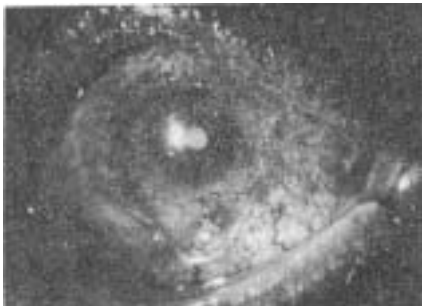


Fig. 3 Recurrence and infiltration in the graft 3 months following initial surgery.

An excenteration was performed taking into consideration the rapidity of recurrence, the extent of the tumour, histopathological evidence of involvement of sub-epithelial zones, and the patient's age.

## DISCUSSION

Recurrence of squamous cell carcinoma following total excision is well-known but has occurred very rapidly in this case, This is probably because of the sub-epithelial involvement seen on excision biopsy. The earliest reported recurrence has been 6 months following excision of the tumour<sup>3</sup>. Though beta-ray applications have been advocated. Recurrences requiring enucleation have been reported. Had the initial biopsy shown sub-epithelial invasion, excision of involvea conjunctiva and an enucleation might have prevented a subsequent exenteration. It is likely that sub-epithelial invasion had occurred in an area away from the site of initial biopsy.

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Mrs. Kuppi Bai receiving a bouquet from Miss P. Pushpa. Looking on are Dr. S.S. Badrinath (left), Dr.(Mrs). Badrinath (center) and Mr. Kripagaran (right)

Mrs. Kuppi Bai who has been with the Nethralaya from the very start has completed 10 years of active and dedicated service. Kuppi Bai is the wizard of the Medical Records Department and can recollect any case record and retrieve it in a flash without even going through the indices. The giant strides that this department has taken is largely due to the unstinting efforts of Mrs.Kuppi Bai and her colleagues.



Mr. V.S.Chintamani (Retd.) Special Director, E.I.D. Parry Ltd.

We are grateful and appreciative of the kind gesture of eye donation by the family of late Shri V.S.Chintamani, (Retd) Special Director, E.I.D. Parry Ltd., a true friend and well wishers of the Nethralaya since its inception. We hope their gesture will encourage more people to donate eyes and bring light into the dark world of the blind.

**EDITORIAL**

The last three months of 1985 included varied activities at Sankara Nethralaya. The School of Optometry inaugurated by Dr. Jay M Enoch in September 1985 has been gifted books and equipment worth a million dollars by the School of Optometry, Berkeley. What makes the event specially heart warming is that these books and equipment have been personally packed and shipped to us by Prof Enoch's students. Our first batch of students in Optometry have started their course right earnestly and are privileged to have Mr. Michael Britt and Ms. Gena Davis from the School of Optometry, Berkeley to impart knowledge to them.



Dr.Dilip Rawal (central) seen with Dr.S.S.Badrinath, Mr.Ramachandran, Mr. Pat Rawal and Dr.(Mrs.)Badrinath. (LR)



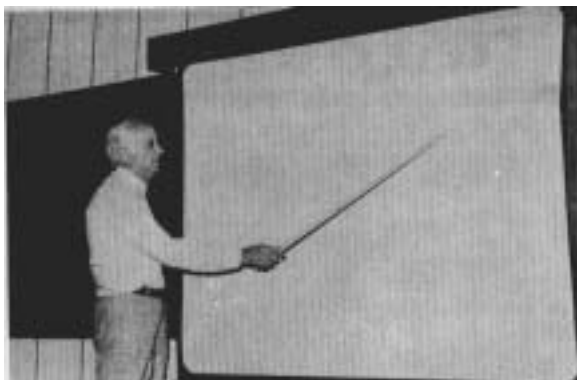
Dr. Carl Kupfer (right) seen with Dr.S.S.Badrinath In center Lt.Col.Rangachari

It was a privilege to have several reputed ophthalmologists and other eminent people in specialities related to ophthalmology visit our institution. Dr. Carl Kupfer Director, National Eye Institute, Bethesda, Maryland, U.S.A. was here on 7<sup>th</sup> October 1985. He discussed and enlightened us on current research programmes in ophthalmology, particularly related to Cataract. He also delivered a lecture on Controlled Clinical Trials. Dr. Dilip Rawal, Vice President, Alcon Laboratories, Forthworth, Texas, U.S.A. and Mrs. Rawal

visited us on 18<sup>th</sup> November 1985, when Research Projects were discussed. Dr. Rawal has very kindly offered a one year training programme in Basic Research at Alcon to any one of our Consultants. We were very happy to have with us a group of ophthalmologists from Hanoi, Vietnam, Prof. Trong Nhan, Director, President Institute of Ophthalmology, Hanoi, Dr. Van Phuc and Dr. Mrs Nhung were here on 14<sup>th</sup> December 1985. Prof. Nhan spoke to us about his personal technique of Glaucoma surgery, in addition to his experiences with corneal disease and intra ocular cysticercosis. Dr. Edward Maxwell Nicholls, Prof. of Genetics, Centre for the Bio Medical Engineering, University of New South Wales, Australia delivered a lecture on Ophthalmogenetics on 9<sup>th</sup> December 1985 and stressed the importance of genetic counselling in ophthalmology. There were two lectures on immunology. Prof. R.C. Mahajan, Head of Dept. of Parasitology, PGIMER, Chandigarh spoke on Immunology of Parasitic Diseases with special reference to immune diagnosis. A very lucid talk on Basic Immunology and the Immunological basis in Myasthenia Gravis was given by Dr. S. Sriram, Neurologist, Vermont, U.S.A.

We had three observers during the past 3 months. Dr. R.P. Pokhrel, Project leader, WHO prevention of Blindness Programme in Nepal, spent few days with us. Dr. A. Agarwal of

Bharati Medical Research Foundation, Bombay spent a week observing hospital maintenance and Dr Nitin Trivedi from Ahmedabad spent a month, observing Vitreo Retinal surgery , ultrasonography and laser photo coagulation.



**Dr.E.M.Nicholls delivering a lecture on Ophthalmic Genetics**

Dr. S.S.Badrinath received yet another award and delivered the Dr. (Mrs) Roma Roy Memorial Oration on 'Retinal Detachment with Vitreous Haemorrhage' at the B.R.Singh Hospital and Centre for Medical Education and Research, Calcutta. He conducted a massive eye camp at Surat and was ably helped by our former fellows Drs. Shrenik Shah and Mahesh Patel and by our good friend addressed the General Practitioners at the Mahavir General Hospital on the

Current Trends in Ophthalmology. While at Ahmedabad, he spoke on his Personal Experiences in Pars Plana Surgery at Dr. P.N. Nagpal's Alumni Meet. Dr. T.S.Surenderan participated in a symposium on Paediatric Ophthalmology at the V Annual Conference of the Karnataka Ophthalmological Society at Belgaum. This young paediatric ophthalmologist of ours was given the Youth Excellence Award (Cretalent'85) for renowned work in ophthalmology by the Saraswathi Vidyalalaya, Madras Dr. Chandran Abraham participated at the National Symposium on Laser in Ophthalmology held at New Delhi in November. He delivered a lecture on Diabetic Retinopathy and chaired the session on "Eye and Systemic Diseases at the Ocular Pathology Workshop held at Gulbarga. He also spoke to physicians and post graduates at the Continuing Medical Education Programme organized at Madras and to post- graduates in ophthalmology, Civil Hospital Ahmedabad on the Principles in the Management of Diabetic Retinopathy and photocoagulation, Dr. Mary Abraham participated in a 3 day WHO sponsored work-shop organized by Civil Hospital, Ahmedabad and delivered lectures relating to the Basics in Ultrasonography and the role of ultrasonography in evaluating the posterior segment in opaque media.

The III Basic Science Course commenced on 2nd December 1985 with the able co-ordination of Dr B Sridhar Rao Eminent teachers from within and outside the state are back again to impart their knowledge to students who hail from Manipal, Trichy and Madras.



**Dr. M.M. cooper delivering the inaugural address for at the Basic Science Course.**

Sankara Nethralaya became involved with the Arogyavaram Eye Hospital, Sompeta, when its Director, Dr. John P David, who left for Vienna for a year, desired assistance in patient care from Nethralaya during this period, After a preliminary visit by Dr. S.S.Badrinath to Sompeta, one of our consultants go there once a month and deal with outpatient and surgical problems. Dr. Sridhar Rao and Dr. Mythili Sriram have brought back memories of a wonderful hospital and above all the extreme kindness and graciousness of the staff and

people of Arogyavaram.

The library has shifted to the fourth floor of the Dharmashala. The increased space provides room for stocking more books, more comfortable seating and facility for listening to audio cassettes.



Dr. & Dr.(Mrs.)Badrinath seen with Dr John P David, Superintendent, Arogyavaram Eye Hospital (2<sup>nd</sup> from right)

acquired Digital Biometric Ruler (DBR 310, Sonometrics U.S.A.) will aid in accurate calculation of IOL power.



Dr. K.S.Ratnakar, inaugurating the Nikon Microscope Looking on are Dr.(Mrs.) Badrinath and Dr.J.Biswas.

Dr. Prema Padmanabhan and Dr. Nirmal Subramaniam have returned from the United States, Dr. Prema underwent training in Intraocular Lens Implantation under Dr. Akira Momose of Japan and Dr. Robert Sinskey of U.S.A. and has started implanting anterior and posterior chamber lenses. Dr. Nirmala Subramaniam trained in Oculoplasty and surgery of the Orbit with Dr. Jkennerdell at Pittsburgh

and Dr.Richard Dallow at Boston. The recently

An additional Operation Theatre, exclusive for anterior segment work became functional 6.12.85. This has helped to ease the back log of surgical cases.

Mr. R. Dhandapani, Retd. Director of Accounts and Financial Adviser (Postal) Madras, joined Medical Research Foundation on 28.10.85 as Administrative Officer.



The pathology department has acquired a sophisticated Nikon Microscope with phase contrast and computerized photographic attachment which was inaugurated by Dr. K.S. Ratnakar, Ocular Pathologist, Gulbarga, on 20.12.85. The Enzyme Immuno Assay Reader acquired in December '85 will be of great use in immunological assays.

#### **The New library complex**

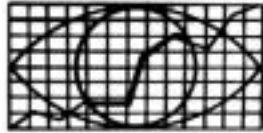
SWAN (Sankara Nethralaya Women's Auxillary) has growth, with 25 volunteers now helping at the reception, medical records, library and garden.

The utility shop run by them serves its purpose well. Besides as articles of utility for daily use, there is a sale of cards, periodicals and music cassettes.

Yet another year flown past while another lies ahead, It is a time to take stock of the past and resolve to strive harder to make 1986 more successful than the previous one. Wish you all a Happy New Year and hope that it would bring you fulfillment and success.

*Mary Abraham*

EDITOR



## RETINA

### ANALYSIS OF RESULTS AND CAUSES FOR ANATOMICAL FAILURE IN RETINAL DETACHMENT SURGERY

Dr. SARAF P K  
Dr. MANJU KULKARNI  
Dr. CHANDRAN ABRAHAM  
Dr. BADRINATH S S

The prime causes of failure to anatomically reattach the retina following a Scleral Buckling Procedure today are : 1. Inability to close all retinal breaks and 2. Proliferative vitreoretinopathy. (PVR) Factors such as high myopia, aphakia, extent and duration of detachment are not considered to be significant factors leading to failure<sup>1</sup>. The present retrospective study describes the results of Scleral buckling in rhegmatogenous Retinal Detachment surgery and analyses the causes of failure in relation to the various pre-operative, operative and post-operative factors. A comparison has been made between the results following Scleral buckling alone and Scleral buckling combined with a vitrectomy and / or Lensectomy in eyes with varying degrees of proliferative vitreo-retinopathy.

#### MATERIAL AND METHODS

506 eyes of 491 consecutive cases of Rhegmatogenous retinal detachment operated at Sankara Nethralaya between January 1980 and December 1984 were evaluated. Eyes which did not have subretinal fluid and eyes operated elsewhere were excluded from the study. 368 (75%) were males and 123 (25%) were females. The age varied from less than 10 years to more than 60 years. The period of follow up varied from 2 months to over a year (Table 1). However 13 cases where failure was evident before 2 months were included 19 of these eyes could be classified as traumatic<sup>2</sup>. Successful anatomical reattachment was defined as complete reattachment of the retina with evidence that all retinal breaks were closed. Surgical failure was defined as the continued presence or increase of subretinal fluid with or without evidence of old or new retinal breaks. The retinal breaks were localized and solid silicone implant was placed circumferentially in a dissected scleral bed in all cases (except 2 which had a radial explant) after creating a chorioretinal reaction. Trans scleral monitored cryo therapy alone was used in 444 eyes (87.7%) and diathermy alone in the dissected scleral bed in 37 eyes (7.3%). Both modalities were employed in 25 eyes (4.9%), 50 eyes (9.9%) required reinforcement of chorioretinal reaction by laser photocoagulation post operatively. Subretinal fluid was drained in 474 eyes (93.7%) by a single perforation in 374 eyes (78.9%), two perforations in 85 eyes (17.9%), 3 perforations in 14 eyes (3.0%) and 4 perforations in 1 eye (0.2%). Injection of saline, air or both in 241 eyes (47.6%) through either the Parasplana or limbus. Gel film, sandwiched between the dissected sclera and solid silicone implant was used to obtain a high buckle in 14 eyes (2.8%) 69 eyes were reoperated. A conventional revision of scleral buckling alone was done in 35 eyes (50.7%) and vitrectomy with or without scleral buckling in 21 eyes (30.4%), 12 eyes (17.4%) needed three surgeries and 1 eye (1.5%) needed 4 operations. Proliferative vitreoretinopathy was graded as described by the Retina Society 3. However we were unable to categorise eyes in PVR Grade A. All primary scleral buckling procedures were performed by two of us (Drs. MK and CA); conventional revision of previous surgery by three of us (Drs. MK, CA & SSB) and revision combined with vitrectomy procedures by one of us (Dr.SSB).

#### RESULT:

Of the 506 eyes , the retina was successfully reattached in 401 eyes (79.2%) after a primary scleral buckling operation. Of 69 reoperations 41 eyes (59.4%) reattached while 24 eyes (34.8%) remained detached . In 4 eyes (5.8%) the fundus could not be visualized because of opacities in the media. One eye developed pthisis bulbi. In reoperations, 22 eyes (62.9%) out of 35 were successfully reattached following a conventional revision buckling. The Retina could not be attached in 11 eyes (31.5%) and in 2 eyes (5.6%), the retinal status could not be assessed as the fundus was obscured by opacities in media. Of 21 eyes where vitrectomy

with or without scleral buckling and lensectomy was done, 11 eyes(52.4%) were successfully reattached. In 9 eyes (42.9%) the retina failed to settle and in one eye (4.7%) there was no view of fundus due to opacities in the media. Of 13 eyes which needed more than 2 operations the retina was successfully reattached in 8 eyes (61.5%); failed to reattach in 4 eyes (30.8%) and there was no view of the fundus in 1 eye (7.7%) 36 eyes (34.3%) could not be reoperated as 18 (17.1%) were considered inoperable and in 17 eyes (16.2%) the patient either refused surgery or did not come for follow up. One patient was considered unfit for general anaesthesia. Thus total reattachment was obtained in 442 eyes(87.4%). The results were analysed in relation to several associated individual factors given below:

1. AGE & SEX : The success rate appeared to decrease with increasing age of the patient (Table II) and female patients seemed to fare better than males.

2. REFRACTIVE STATUS: The surgical failure was 16.3%(48 eyes) in myopes, 25.2%(41 eyes) in emmetropes and 13.6% (3 eyes) in hyperopes.

3. APHAKIA: The results in aphakic eyes were poorer compared to phakic eyes. The retina was reattached in 83.4% (277 phakic eyes), while the reattachment in aphakic eyes was 70.7% (123 eyes).

4. TRAUMA: Traumatic retinal detachment has a success rate of 68.4% (13 eyes) which was lower than nontraumatic retinal detachments which had a success rate of 79.7% (388 eyes).

5. DURATION OF DETACHMENT: The duration of detachment did not significantly alter the results in anatomical reattachment (Table III).

#### 6. PREOPERATIVE FUNDUS FINDINGS:

(A) EXTENT OF DETACHMENT: Failure was found to be higher when the retina was totally detached. 35.6% (53 eyes) with total detachment had failure compared to 14.6% (52 eyes) with partial detachment.

(B) NUMBER AND LOCATION OF LESIONS: The success rate was only 70.6% (24 eyes) where retinal breaks were not evident. There was no significant difference in the success rate when the lesions were either single (success 79.8% - 75 eyes) or multiple (success 76.6% ± ± 301 eyes). However when multiple lesions were located in different quadrants, the success rate fell to 77.3% (218 eyes) in comparison with multiple lesions located in the same quadrant 86.5% (83 eyes). Further when the lesions were situated posterior to the equator the success obtained was only 65.8% (77 eyes) compared to lesions situated either anterior to the equator 84.6% (154 eyes) or at the equator 83.8% (145 eyes).

(C) PROLIFERATIVE VITREORETINOPATHY: The success decreased with increasing grades of PVR seen preoperatively (Table IV). The success rate was maximum in eyes with no PVR 85.6% (314 eyes). It dropped to 68.6% (35 eyes) in Grade B, 67.3% (37 eyes) in Grade C<sub>1</sub>, 42.9% (9 eyes) Grade C<sub>2</sub>, 42.8% (3 eyes) Grade C<sub>3</sub> 50% (1 eye each) in Grade D<sub>1</sub> & D<sub>3</sub>.

The results of surgical success and failure with reoperations in different grades of PVR is shown in Table V 2 cases where there was no inference of PVR underwent vitrectomy with or without Scleral buckling and lensectomy. Both these cases failed to have anatomical reattachment.

(D) VITREOUS HAEMORRHAGE: The presence of preoperative vitreous haemorrhage did not influence the surgical outcome. 78.3% (18 eyes) with vitreous haemorrhage were successfully reattached compared to 79.4% (336 eyes) without vitreous haemorrhage.

(E) CHOROIDAL DETACHMENT: The retina in 83.3% (10 eyes) with choroidal detachment reattached and the success in eyes without choroidal detachment was 79.1% (391 eyes).



7. OPERATIVE COMPLICATIONS: The operative complications are listed in Table VI 6.7% (7 eyes) of the total failure rate were due to one or more of these complications.

8. OPERATIVE FACTORS:

(a) Internal Tamponade: 176 out of 241 eyes (73.0%) where internal tamponade with saline or air was done had retinal reattachment. 36 eyes (14.9%) developed PVR post-operatively. 225 out of 265 eyes (84.9%) where no injections were made into the vitreous cavity, had successful retinal reattachment and only 2 eyes (0.8%) developed PVR post-operatively.

9. POSTOPERATIVE FACTORS: The Postoperative complications in this study are given in Table VII. The only significant factor among them was choroidal detachment in 90 eyes. The failure rate in the presence of postoperative choroidal detachment was 27.8% (25 eyes). 13 eyes (14.4%) developed PVR. The failure rate in 416 eyes without choroidal detachment was only 19.2% (80 eyes) and only 26 eyes (6.3%) developed PVR.

Among 20 eyes with postoperative vitreous haemorrhage 8 eyes (6.4%) of 486 eyes without postoperative haemorrhage had PVR.

The major causes attributable to failure of primary surgery in association with factors described above could be grouped under two main heads.

1. Failure to close break : 60 eyes (57.3%) This includes 7 eyes (6.7%) where the chorio retinal reaction was inadequate, 5 eyes (4.8%) in which retinal breaks were probably missed, 3 eyes (2.9%) where new breaks developed and 5 eyes (4.8%) which had a macular hole.

2. Proliferative vitreoretinopathy: 39 eyes (37.1%) In 10 eyes (9.5%) we were unable to determine the cause for failure.

**DISCUSSION:**

Most of the causes for failure in primary surgery for retinal detachment determined in this study have been recognized by several workers in this field. However, it is essential to understand that in a given case a single factor may predominate or several factors may coexist, in varying degrees of importance. The combinations in which they can occur are so numerable that it is difficult to group them together for the purpose of clinical evaluation in relation to surgical success or failure. Based on the results in this series, failure may be categorized into two heads:

1. Failure to close retinal breaks.
2. Proliferative vitreoretinopathy.

All other factors – may be considered as contributory to failure through either 1 or 2 above rather than directly producing failure.

Failure to close retinal breaks has figured high in primary scleral buckling in this series (57.3%; 60 eyes) Factors such as total retinal detachment, absence of retinal breaks, posteriorly located lesions and multiple breaks in different quadrants will fall into this category.

One should first eliminate this as the cause before ascribing failure to other associated factors. Preoperatively finding all the retinal breaks and a surgical technique which ensures proper closure of these breaks by properly applied chorioretinal reaction and a properly placed buckle of adequate width and height should minimize this cause.

Proliferative vitreoretinopathy was the next important cause for failure (37.1%; 39 eyes). This may be present preoperatively or developed post operatively. When proliferative vitreoretinopathy is seen postoperatively. It is sometimes difficult to say if the development of PVR was responsible for the failure or whether PVR developed as a natural course of disease because the surgery was inadequate.

The surgical failure in primary scleral buckling in eyes with aphakia, post-operative choroidal detachment and vitreous haemorrhage, trauma, and in eyes which had vitreous injections operatively can be attributed to the higher rate of PVR in these eyes.

Though only 6.7% (eyes) of failures were attributed to operative complications, it must be emphasized that great care must be realized that retinal incarceration, retinal hole formation, vitreous loss and rupture globe are potentially serious and have to be managed quickly and effectively. These again are likely to result in anatomical failure either because a hole is not closed or PVR develops. The importance of avoiding, or properly managing a complication lies in the fact that a grave complication in a 'simple' case can tilt the result of surgery to the extent of loss of the eye.

The result of primary scleral buckling in eyes with different grades of PVR (Table IV) were compared to the results of combined vitrectomy and scleral buckling of Dr. Natarajan, S and associates of our institution<sup>4</sup>. Their overall results showed a success rate of 44% (67 out of 152 eyes) (Table VIII). It appears that a better success rate in eyes with PVR Grade C<sub>1</sub> was obtained by scleral buckling alone compared to that obtained by a combined vitrectomy and buckling. Similar results have been reported by Jalkh and associates<sup>5</sup>. Among patients with PVR C<sub>1</sub> who had reoperations, a higher success rate was evident when a conventional revision buckling was done compared to a combined vitrectomy (Table V). The reason for this is unclear and further studies are necessary to draw any firm conclusion. As to whether operative complications were responsible for the lower success rates with combined procedures needs to be evaluated. However the comparative study suggests that in cases with PVR grade C<sub>2</sub> and C<sub>3</sub> scleral buckling with vitrectomy gives higher success rate and should be considered as the primary surgical method of choice. This avoids multiple surgeries under general anaesthesia and cuts down hospital costs; a few eyes in this series with PVR grade D1 and D3 had undergone scleral buckling as the primary procedure. This was performed in the very early part of the study and these eyes should have been subjected to a combined procedure in spite of the fact that there was an occasional success with scleral buckling alone. Similarly, eyes without PVR were subjected to vitrectomy and buckling procedures in the early part of the study. Grizzard & Hilton classified PVR Grade, I,II,III-1 to III-6, Grade I is equivalent to no PVR Grade II & III-1 together fall from Grade B to Grade C1 as defined by the retinal Society. Grade III-2 onwards corresponds with PVR grading C2 onwards. His study shows 96.9% success in Grade I and 23.5% success in Grade III 3-4. The falling success rate with increasing grades of PVR is evident. The series compares well with this study where high success rate by scleral buckling alone in grade upto III -1 (PVR C1) suggests that vitrectomy is not necessary in these eyes. The fall in success rate by scleral buckling alone thereafter demands a combination with vitrectomy to get better results.

## **CONCLUSION**

Primary retinal surgery by scleral buckling procedure gives a good success rate in the majority of the eyes with PVR upto Grade C1. Vitrectomy combined with scleral buckling procedures offers a better success rate in eyes Grades PVR C2 and over Irrespective of the several factors which may act independently or in combination to produce failure in primary scleral buckling procedures it is categories: 1.Failure to close the retinal breaks.2.Proliferative vitreo retinopathy. Recognition of these facts and utilizing the appropriate surgical technique and minimizing operative complications, will help in reducing the overall failure rate in retinal surgery.

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**TABLE I**  
**PERIOD OF FOLLOWUP**

Period	No.of Eyes	%
Less than 2 months	13	2.6
2 – 3 months	202	39.9
4 – 6 months	75	14.8
7 – 11 months	86	17.0
1 year and more	130	25.7

**TABLE II**

**RESULTS OF PRIMARY SCLERAL BUCKLING IN RELATION TO AGE GROUP**

Period	Success		Failure	
	No.of eyes	%	No.of eyes	%
Less than 10 years	11	2.2	10	20.9
11 – 20 years	61	12.1	51	83.6
21 – 30 years	63	12.5	54	85.7
31 – 40 years	62	12.3	48	77.4
41 – 50 years	101	20.0	77	76.2
51 – 60 years	117	23.1	93	79.5
More than 60 years	76	15.0	53	69.7

**TABLE III**

**DURATION OF RETINAL DETACHMENT**

Duration	Success			Failure	
	No.of cases	No.of eyes	%	No.of eyes	%
2 weeks	189	149	78.8	40	21.2
2 weeks to 1 month	123	99	80.5	24	19.5
1 month to 3 months	70	53	75.7	17	24.3
4 months to 6 months	34	24	70.6	10	29.4
More than 6 months	29	24	82.8	5	17.2

**TABLE IV**

**RESULTS OF RETINAL DETACHMENT SURGERY  
IN RELATION TO PREOPERATIVE PVR**

PVR Grading	Success		Failure		No.of eyes	%
	No.of eyes	%	No.of eyes	%		
No PVR	367	72.5	314	85.6	53	14.4
B	51	10.1	35	68.6	16	31.4
C <sub>1</sub>	55	10.9	37	67.3	18	32.7
C <sub>2</sub>	21	4.2	9	42.9	12	57.1
C <sub>3</sub>	7	1.4	3	42.9	4	57.1
D <sub>1</sub>	2	0.4	1	50.0	1	50.0
D <sub>2</sub>	0		0		0	
D <sub>3</sub>	2	0.4	1	50.0	1	50.0

**TABLE V**

**RESULTS OF REOPERATIONS FOR VARIOUS GRADES OF PVR**

PVR Grading (Reoperations)	Success	Failure	Success	Failure
NO PVR	19(61.3%)	12(38.7%)	3(60%)	2(40%)
B	2(40%)	3(60%)	-	-
C1	3(30%)	7(70%)	1(20%)	4(80%)
C2	2(100%)	0	2(50%)	2(50%)
C3	0	1(100%)	5(83.3%)	1(16.7%)
D1	0	1(100%)	2(33.3%)	1(50%)
D2	-	-	1(50%)	1(50%)
D3	-	-	0	2(100%)

**TABLE VI**

Operative complications	No.of eyes	%
Choroidal haemorrhage	48	9.5
Damage to vortex vein	28	5.5
Ratinal incarceration	25	4.9
Retinal hole at perf.site	17	3.4
Vitreous haemorrhage	10	2.0
Avulsion of muscle	7	2.0
Vitreous loss	3	0.6
Choroidal detachment	3	0.6
Rupture globe	1	0.2
Retinal tear on saline injection	1	0.2
Disc bleed	1	0.2

**TABLE VII**

Post Operative Complications	No.of eyes	%
Choroidal Detachment	90	17.8
Macular Pucker	18	3.6
Cataract	12	2.4
Glaucoma	9	1.8
Infected Buckle	8	1.6
Sterile Endophthalmitis	6	1.2
Squint	6	1.2

**TABLE VIII****RESULTS IN RELATION TO GRADES OF PROLIFERATIVE VITREO RETINOPATHY**

Post Operative Status	(Dr. NATARAJAN AND ASSCIATES) Proliferative Vitreo Retinopathy Grades						Total
	C - 1	C - 2	C - 3	D - 1	D - 2	D - 3	
Total No. of eyes	6	26	27	47	20	26	152
Anatomical Success	3	16	16	15	8	9	57
Visually Improved	3	14	16	14	7	9	63

**ACUTE RETINAL NECROSIS SYNDROME**

**DR NATARAJAN S**  
**DR BADRINATH S S**

The acute retinal necrosis syndrome is characterized by necrotizing confluent peripheral uveitis, retinitis, vitritis, retinal arteritis and papillitis which leads to retinal detachment and loss of vision within a few months in otherwise healthy patients of any age<sup>1-5</sup>. It was first described by Urayama and associates in 27 Japanese patients<sup>5</sup>, and is being reported with increasing frequency. 78 cases are now documented<sup>6</sup>. 35 have been reported from the U.S.A., 5 from the U.K., 4 from Switzerland, 2 from Ireland and one each from Scotland, W.Germany, Sweden, Egypt and Mexico. Hayreh recommends the term Acute Ocular Panvasculitis syndrome for this condition<sup>5</sup>. The rarity of this disease at other places may be more apparent than real due to lack of recognition and confusing the condition with other diseases.

These, otherwise healthy patients develop pericardial pain, episcleral injection and iridocyclitis which is soon followed by decreased vision associated with vitritis, necrotizing retinitis, retinal arteritis and papillitis. The retinitis is characterized by multiple deep yellow white patches which develop both peripherally and posteriorly. In the initial stages retinal arteritis may predominate the retinitis. This acute phase of inflammation lasts from four to twelve weeks followed by an exudative detachment of the retina. Although the condition may be bilateral, bilateral affection has been seen in only one third of the cases reported<sup>2</sup>. Retinal detachment has been noted in 75% of eyes previously reported and usually occurs within the first two to three months after the onset of symptoms. Less than one quarter of these detachments have been successfully repaired<sup>1-5</sup>. Serological studies have not shown any evidence of infectious disease<sup>7-10</sup>. Thus an infectious etiology for acute retinal necrosis has rarely been taken into consideration, although fundus lesions have been described as being very similar to those of patients in an immunosuppressive state and suffering from viral retinitis.

We report two cases of unilateral acute retinal necrosis syndrome which, to the best of our knowledge has not so far been reported from India.

**CASE 1:**

A fifty six year old lady reported to us on 29<sup>th</sup> September 1980 with sudden loss of vision in the right eye since 30<sup>th</sup> August 1980. She was diagnosed to have acute congestive glaucoma by her local ophthalmologist and was managed medically for two weeks. She was then found to have choroiditis, vitritis and retinal detachment and was referred to us. There was a history of being treated for pulmonary tuberculosis 5 years earlier. Her visual acuity in the right eye was only light perception. Anterior segment examination with the Slit Lamp revealed a clear cornea. An atropinised pupil and early posterior subcapsular cataract. The intraocular pressure was too low to be recorded. Fundus examination with the Binocular Indirect Ophthalmoscope revealed a partial

rhegmatogenous retinal detachment extending from the 4.30 to 5.30 meridian counter clockwise caused by large peculiarly shaped retinal tears located between 1.30 to 4.00 o'clock meridians (Clockwise) extending posterior to the equator. In addition, there were round holes at the 12 and 10.00 o'clock meridians with sieve like patterns adjacent the blood vessels. The vitreous showed a + + haze. A diagnosis of Acute Retinal Necrosis was made. The left eye had 6/5, N/5 visual acuity, minimal posterior subcapsular cataract, normal intraocular pressure and normal fundus except for a small area of retinal excavation at the upper temporal periphery.

Systemic examination revealed reactivation of pulmonary tuberculosis, urinary tract infection and amoebiasis. All these were medically treated by the physician. Her haematologic data was: Haemoglobin:10.4 g%; Total WBC Count: 7.100/MM<sup>2</sup>; Differential Count, Neutrophils: 66% Lymphocytes : 29%; Eosinophils: 5%; Erythrocyte Sedimentation Rate: 8 mm fall in ½ hr and 24 mm fall in 1 hr; VDRL: nonreactive; L.E. Cell Phenomena in smears: Negative Total serum Protein: 6.7G%; Albumin: 3.5 G%; Globulin 3.2G%; Motion examination: normal; Urine Culture: Growth of Coliform organisms; Indirect Haemagglutination test for Amoebiasis: 1:512 positive X-ray Chest: Bilateral Apical infiltration suggestive of Pulmonary Tuberculosis.

She was periodically examined for five years since 1980. Final examination in January 1985 showed her to retain light perception with defective projection in right eye. The eye was quiet but had developed a Total Complicated Cataract with no view of the fundus. The left eye maintained normal visual acuity and there was no evidence of uveitis, or any change in the fundus compared to her first visit.

#### CASE 2:

A twenty seven year old male was seen by us on 14<sup>th</sup> May 1984 with history of sudden blurring of vision. Redness and pain in the right eye of two weeks duration. He also gave history of seeing flashes of light. There was no useful vision in his left eye following an injury 5 years ago. He had developed painful inguinal lymphadenopathy one week after exposure to S.T.D. in April 1984 for which he was treated with systemic Penicillin.

His best corrected vision in the right eye was 6/24, N/24. Slit lamp biomicroscopy revealed large, fresh and old keratic precipitates, mild flare in the aqueous, and a few cells in the aqueous and anterior vitreous. The pupil was dilated and not reacting to light. The intraocular pressure was 12.2 mm of Hg. Binocular Indirect Ophthalmoscopy of the right eye showed a marked vitreous haze<sup>1</sup>, confluent patches of choroiditis located in the region of equator in a concentric manner and yellow plaques at the ora serrata and suggestive of Pars Planitis. The left eye was pthisical with occusio pupillae and peripheral anterior synechiae. We suspected the uveitis in the right eye to be due to syphilis, since the blood VDRL was positive. He was given two courses of injection Penidure LA24 intramuscularly at an interval of one week. He was started on topical, subconjunctival and systemic steroid therapy – 100 mg Prednisolone per day in a 4 divided doses, In spite of therapy, the vision in his right eye deteriorated to perception of light on 30<sup>th</sup> May 1984. Fundus examination revealed a hazy vitreous and organized vitreous membranes. The disc was faintly seen. A rhegmatogenous retinal detachment with sieve like opening in the retina had developed at the upper temporal quadrant. This area of the retina was peculiar in that only the retinal vessels were seen and the adjacent retina looked digested giving a trypsin digest like appearance. His haematologic data were: Haemoglobin: 14 G%; PVC: 45%; Erythrocyte Sedimentation Rate: 1 mm fall at ½ hr 3 mm at 1 hr; Platelet count: 2.45 mm<sup>3</sup>; Total Leucocyte Count: 9.350 /mm<sup>3</sup>; Differential Count Neutrophils: 77%; Eosinophils: 2% Lymphocytes 18%; Macrococytes: 3% Postprandial Blood Sugar; 90 mg%; Serum VDRL: Reactive 1:8 dilutions earlier & later repeat VDRL: nonreactive; TPHA (macro): negative at 1:80 dilution; TPHA (micro); negative at 1:20 dilution; Total Proteins: 6.5 mg%; Serum IgA: 189 mg%; IgG 1248 mg%; IgM; 208 mg% Vitreous aspirate for fungal and bacterial cultures: negative, fresh and bacterial cultures: negative fresh vitreous and fresh retinal sample examination under darkfield microscopy for treponema Opallidum; negative; Vitreous fluid for antibody to retinal 'S' antigen: negative.

A lensectomy + Vitrectomy + Scleral Buckling was performed on the right eye on 26<sup>th</sup> June 1984. A total vitrectomy including 3600 excision of the vitreous base, endodrainage of subretinal fluid and fluid gas exchange was done. During Vitrectomy the preoperative fundus finding of trypsin digest like appearance of the retina at upper temporal quadrant was confirmed by endoillumination and magnification. The retina at upper temporal quadrant failed to settle in spite of repeated attempts of fluid air exchange. A retinotomy at the upper temporal quadrant enabled satisfactory; retinal reattachment on the table. Cryo was applied to the anterior and posterior edge of tear. A large posterior buckle with 77G solid silicon implant at upper temporal quadrant was placed with a 40 band encirclage. His retina remained attached for two months post operatively. When examined on 27<sup>th</sup> August 1984 the retina has redetached totally with PVR D<sub>3</sub> which was inoperable.

#### DISCUSSION:

The first case had probably gone through the natural course of the disease until the end stage of complicated cataract. This patient had evidence of past and reactivated pulmonary tuberculosis. Whether the association of pulmonary tuberculosis to acute retinal necrosis is significant, remains to be seen.

The possible etiology of the second case is unknown. Though there was a positive history of exposure to sexually transmitted disease, all serological tests turned out to be negative. The interesting feature in this case was the trypsin digest appearance of retina at one quadrant following confluent retinitis. A similar picture has been described by Clarkson<sup>3</sup>. None of the earlier reports describe this type of clinical feature.

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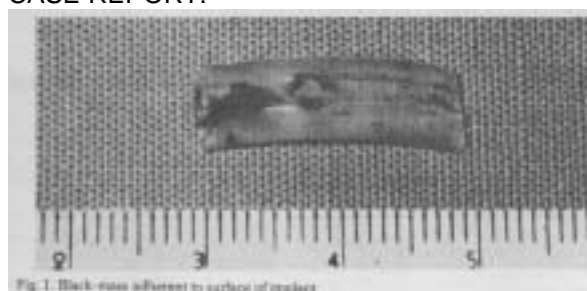
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## LATE FUNGAL INFECTION FOLLOWING SCLERAL BUCKLING PROCEDURE – CLINICO- PATHOLOGICAL REVIEW OF A CASE

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DR, BADRINATH S S

Post-operative infection remains a potential serious complication after retinal detachment operation as in all types of ophthalmic surgery. Scleral Buckling procedure for retinal detachment is of longer duration than most other eye operations and foreign material is buried in the surgical wound during this procedure. These two factors add extra risk of infection during retinal detachment operation. Post operative infection following scleral buckling has been estimated to be around 4%. It can occur within two weeks to as long as six months following surgery. Most of these are bacterial infections and fungal infections are mostly unknown. A case of late post-operative fungal infection following scleral buckling procedure is reported.

### CASE REPORT:



**Fig.1 Black mass adherent to surface of implant.**

Mr. R.V. a 70 year old male presented to us on 28.06.85 with history of having been operated for retinal detachment in the left eye elsewhere, 4 months ago. His right eye had an inoperable retinal detachment with no perception of light. The visual acuity in the left eye perception of light

with accurate projection. External examination showed the conjunctival wound to be well apposed with evidence of buckle infection. There was chamber. Fundus examination showed a total rhegmatogenous retinal detachment with proliferative vitreoretinopathy grade D1. The indentation of the previous scleral buckle was seen 360°. A combined operation of Vitrectomy and Revision of the previous Scleral Buckling was planned. A conventional Vitrectomy and Fluid Gas Exchange through the pars plana reattached the retina. On opening the conjunctiva and tenons posteriorly for proceeding with revision buckling granulation tissue was observed beneath the medical rectus adjoining the implant. On adequately exposing the previous implant (Solid Silicone No. 277 placed 360°, with an encircling band), we observed a black coloured deposit on the surface of the implant and a similar brownish black deposit on the encircling band (Fig1 & 2). A fungal infection was suspected and a decision was made to remove all the material used at previous surgery. The granulation tissue was excised and subjected to histo-pathological study. The blackish deposits on the buckle and encircling band was subjected to microbiological and histopathological examination. A KOH preparation of the black material over the implant showed fungal elements. Most of them were hyphae forms and some had terminal oval spores. We were however unable to culture the fungi either in BHIB solution or on Sabraud's media. Histopathological examination of the black material showed tightly packed islands of fungal hyphae covered partially by neutrophil rich exudates (Fig 3) Some of the hyphae at the edge of a fungal colony showed oval spores. Foreign body giant cells were also seen indicating a chronic granulomatous reaction. The fungus was confined only to the superficial surface of the implant and there was no invasion into the implant itself. The excised granulation tissue adjoining the implant was found to consist of young capillaries, numerous neutrophils, plenty of plasma cells, histiocytes, pigment laden macrophages and fibrous tissue with mature collagen. One focus of foreign body giant cells were evident. These features were suggestive of a chronic inflammatory reaction. Post-operatively there was no clinical evidence of infection. His retina remained attached for two weeks after which it re detached. One and a half months later he developed a corneal abrasion with conjunctival congestion and discharge. The scraping from the cornea showed fungal hyphae. However there was no growth on culture in BHIB solution and Sabraud's media.



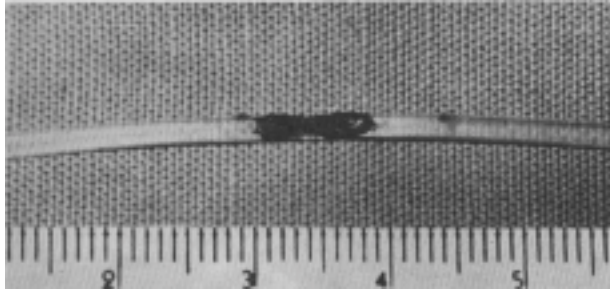


Fig.2 Brownish – black deposit on the encircling band.

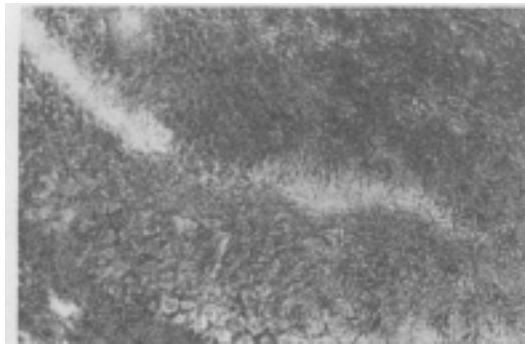


Fig.3. Microphotograph showing tightly packed islands of fungus hyphae (Haematoxylin – eosin, X40)

#### DISCUSSION:

Post operative bacterial buckle infections usually manifest acute or chronic forms and is associated with external signs of chronic irritation with persistent discharge, conjunctival injection, sub-conjunctival haemorrhage, gaping of the conjunctival wound, sinus formation or exposure of material used at previous surgery. It sometimes presents as a granuloma arising from the conjunctival wound or very rarely is discovered by intraocular signs or only operatively during a revision procedure. In this case, there was no such external manifestation. It is likely that external signs would have developed if sufficiently more time had elapsed. The extent and severity to which the orbit or sclera may be involved in such an infection is still unknown. The finding of hyphae in the KOH preparation and the demonstration of fungi histopathologically, corroborated with the clinical observation operatively provide ample evidence for a fungal infection. The failure to culture the fungus is probably due to a defect in the PH or the temperature of the media and has made identification of the type of fungus impossible. While several authors have reported on bacterial infections<sup>1234</sup> fungal infections following scleral buckling have not been reported so far. This case demonstrates that such an infection is possible and it would be worthwhile to look for fungi in a clinical or operative situation which has been described.

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## **ARGON LASER TRABECULOPLASTY IN OPEN ANGLE GLAUCOMA**

Dr. Sridhar Rao B

Dr. Vinay Nangia

### **INTRODUCTION:**

Argon Laser Trabeculoplasty (ALT) is one of the most important recent development in the management of open angle glaucoma, where non penetrating burns are applied to the inner surface of the trabecular meshwork. ALT reduces the intraocular pressure by either inducing a uveitis, damaging the ciliary body or producing structural alteration of the trabecular meshwork. The current concept is that it produces microscarring which increases the space between trabecular lamellae, facilitating aqueous out flow.

### **MATERIAL AND METHOD:**

58 eyes with open angle glaucoma underwent ALT at the Glaucoma clinic Sankara Nethralaya between 1982 and August 1985. These were eyes with uncontrolled intraocular pressure despite maximal medical therapy comprised of three principal agents; Pilocarpine 4%, epinephrine 2% and Timolo 0.5% Diamox was not a part of maximum medical therapy, except in a very few cases, as a large number of patients suffered from intolerance due to side effects. Of the 58 eyes, 41 had chronic simple glaucoma of which 2 were aphakes; 5 had juvenile glaucoma of which 3 were aphakes; 8 had uncontrolled pressure despite trabeculectomy and 4 showed evidence of pseudo-exfoliation.

All patient underwent complete glaucoma work up comprising of intraocular pressure recording, gonioscopy, field charting and disc evaluation. ALT was done under topical anaesthesia using 4% Xylocaine. The Argon Laser (Coherent 900) mounted on a Carl zeiss Slit lamp was used 35-50 spots of 50 micron size with a duration of 0.1 sec and a power range from 800 to 1000 mW were used to treat the lower angle through 1800 using a Goldmann 3 mirror lens. The adequacy of power was indicated by the appearance of blanching or the formation of bubbles. The early post treatment IOP was recorded within 1 – 3 days after treatment, following which patients were called at an interval of 1-3 months, 3-6 months, 6-9 months and then as required. An assessment of their glaucoma status was made at each visit. In almost all cases the medical therapy before ALT was continued following ALT. 6 eyes needed re treatment. Of the total 58 eyes treated, 10 have been excluded from detailed analysis as they did not come for follow-up.

### **RESULTS**

The mean drop in intraocular pressure in the 48 eyes with a mean follow up of 7.9 months was 7.08mm/ Hg (Table 1) The pressure in these eyes was maintained at normal levels with tolerated medical treatment. In 33 out of eyes 48 eyes(68.7%), surgery could be avoided because the mean drop in the intraocular pressure was 9.34mm/Hg when evaluated 1 – 3 months following ALT. (Table2) A drop of more than 4mm/Hg was evident in 31 eyes (68.08%). The best response was seen in phakic eyes with open angle glaucoma, and in eyes, which had prior filtration surgery. Eyes with pseudo exfoliation did not respond well to ALT (Table 4). Analysis of early and late results in 32 eyes with longer follow-up showed that the initial drop was sustained and there was no significant drift (Table 3) eyes with greater degree of pigmentation at the trabecular meshwork seemed to do better than eyes with poor pigmentation (Table 5). The response to ALT was found to be similar in each eye where there was bilateral involvement. In 6 eyes which had retreatment, adequate reduction of intraocular pressure was obtained in only 3; of the remaining 3 which did not respond, 1 had pseudo-exfoliation, 1 had associated central retinal vein occlusion and the other had chronic simple glaucoma and was asphakic. An early rise of intraocular pressure 3 days after treatment was

observed in only 2 eyes. The only complication during treatment was accidental iris laser coagulation in 9 eyes of which 4 developed peripheral anterior synechiae.

## DISCUSSION

Laser Trabeculoplasty has been shown by various investigators to be effective in controlling IOP in various types of open angle glaucoma.<sup>2 3 4</sup> This is probably the first such study on Indian eyes which demonstrates that Indian eyes respond well to ALT. ALT had effectively obviated the need for filtering procedures in a majority of cases.

The Short duration of follow up of 7-6 months in these patients does not permit us to assess the long term effect in controlling IOP. However, if the effect is maintained then the risk versus benefit ratio in this procedure compared to surgery is outstanding.

It was interesting to note that 4(66.6%) of 6 cases that underwent filtering surgery responded well. This indicates that patients with failed filtering surgeries, must be given a trial of ALT before submitting them to further surgery. ALT is known to give poor results in Juvenile Glaucoma.<sup>1 4</sup> Only 1 (25%) of 4 cases responded well to ALT. Glaucoma secondary to pseudo exfoliation is said to respond well to ALT.<sup>1</sup> However of the 4 cases in this series none benefited from ALT.

It is difficult to explain the exact mechanism of the effect of ALT on pigment in lowering IOP. Perhaps the increased heat absorbed by pigment would aid in reshaping the trabecular meshwork to a greater extent.

There appears to be good reason to treat the other eye of a patient if ALT is successful in one eye of a patient if ALT is successful in one eye. This is evinced by the fact that 6 (75%) of 8 pairs of eyes had successful ALT. There also seems to be a reasonable element in retreating an eye with a poor response to initial ALT. 3 (50%) of 6 eyes that underwent retreatment did well.

Accidental iris base coagulations seen in 9 eyes were due to movements of the patient's eye. Though 4 of them developed peripheral anterior synechiae it was of no consequence and the intraocular pressure remained stable in these eyes. They can hardly be considered a serious complication.

An early rise in IOP following ALT is a known complication. Of the first 100 eyes treated 21 eyes showed an average elevation of 8 mm/ Hg or more above baseline during the first three weeks after ALT. In the present series only 2 patients had an early rise in IOP when seen 1 – 3 days following ALT. The cause of rise in IOP is not definitely known. It is probable, that the use of only 35 to 50 burns which did not induce iritis in a single case was responsible for absence of early post ALT rise in IOP.

A few authors have found a sustained pressure lowering effect for 4 and 5 years respectively.<sup>5 6</sup> The longest follow up in any series is only 5 years. This is a caution against being over enthusiastic about ALT. However, even a sustained pressure lowering effect over a period of 4 – 5 years is excellent. The effect of ALT in this small series, with a short period of follow up indicates that ALT is a therapy worth trying in those who required filtering surgery. It is difficult to say whether increasing the number of burns or the area treated could have a more beneficial effect over a long term. The short term results and the low rate of complications certainly suggest, that the parameters used are adequate.

We would feel that although ALT cannot at present substitute medical therapy, it could be a substitute to filtering surgery, if its effects are only short lived the advantage gained is the postponement of surgery. Once the exact status of ALT becomes defined, it would be worthwhile considering it as an alternative to medical therapy, especially in the third world countries where illiteracy, lack of medication and poor patient compliance are as important a cause of blindness as glaucoma itself.

## SUMMARY:

The results of argon laser trabeculoplasty in 48 eyes have been analysed and discussed. The pressure lowering effect has been found satisfactory in eyes with greater pigmentation in the trabecular mesh-work, in eyes with failed filtration surgery, and in fellow eyes where the response was good in one eye. The results were unsatisfactory in eyes with juvenile glaucoma and pseudo exfoliation.

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**TABLE I**  
**OVERALL RESULT (N=48)**  
**MEAN FOLLOW UP 7.9 MONTHS**

Pre Treatment	Post Treatment	Mean drop in
IOP	IOP	IOP
MM/HG	MM/HG	MM/HG
X26.2	19.12	-7.08
SD 6.52	7.12	27.02%

**TABLE 2**  
**OVER ALL RESULT (N=33)**  
**MEAN FOLLOW UP 7.6 MONTHS**

Pre Treatment	Post Treatment	Mean drop
IOP	IOP	IOP
MM/HG	MM/HG	MM/HG
X25.3	15.96	-9.34
SD 4.8	3.58	36.9%

**TABLE 3**  
**DRIFT (N=32)**  
**MEAN FOLLOW UP 7.6 MONTHS**

Pre Treatment	Early Post Treatment	Late Post Treatment
IOP	IOP	IOP
MM/HG	MM/HG	MM/HG
X25.37	4.20	16.0
SD 4.8	4.20	3.6
	MD – 8.37 (32.99%)	MD – 9.37 (36.9%)
MD mean drop		

**TABLE 4**  
**CASES SUCCESSFUL**  
**DURATION 1 – 3 MONTHS**

	<b>Total</b>	<b>Success</b>	<b>Percentage</b>
CSG Phakes	32	25	78.12
CSG Aphakes	2	1	50
Juvenile Glaucoma	4	1	25
Post Glaucoma Surgery	6	4	66.66
Pseudo Exfoliation	4	0	0
	<b>48</b>	<b>31</b>	<b>68.08</b>

**TABLE 5**  
**RELATION OF PIGMENTATION WITH SUCCESS**  
**(DURATION : 1 – 3 months)**

Grading of Pigmentation	No.	Success	
		No.	%
1 + or less	22	15	68.18
2 + or less	19	15	78.9

In 7 cases there was no inference regarding pigmentation