KUGLER PUBLICATIONS

Volume 13 • Issue 2 • 2013 • 1560-2133

Asian Journal of OPHTHALMOLOGY

open access journal est. 1998

WGA CONSENSUS SERIES

KUGLER PUBLICATIONS
www.kuglerpublications.com

Asian Journal of OPHTHALMOLOGY

open access journal est. 1998

Volume 13 issue 2, 2013 • ISSN: 1560-2133

Asian Journal of Ophthalmology is the peer-reviewed journal for The Asian Pacific Glaucoma Society (APGS), The Asia Pacific Ophthalmic Trauma Society (APOTS) and all others with an interest in Ophthalmology.

Advertising inquiries

The Asian Journal of Ophthalmology offers many sponsorship and advertising opportunities, both online and in print. Please mail us at info@asjoo.com to access the media kit or for queries.

Copyright

Disclaimers

Chief editor:
Paul Chew,
Paul.Chew@asjoo.com

Editorial office:
Asian Journal of Ophthalmology/
Kugler Publications,
P.O. Box 20538,
1001 NM Amsterdam,
The Netherlands.
info@asjoo.com

Publisher:
Kugler Publications,
P.O. Box 20538,
1001 NM Amsterdam,
The Netherlands.
info@kuglerpublications.com
www.kuglerpublications.com

Manuscript submissions:
Information for authors is available via the website (www.asjoo.com), through which all manuscripts should be submitted. For inquiries please contact us at: info@asjoo.com.

Peer-review manager:
Kayoko Welsh,
Kayoko.Welsh@asjoo.com

Publication frequency
The Asian Journal of Ophthalmology is published four issues per year (quarterly) electronically. Each issue will consist of approximately 48 pages. A selection of the best papers is published in print twice a year and distributed free of charge at congresses through Kugler Publications or partners.

Open access policy
The Asian Journal of Ophthalmology provides immediate open access to its content after (free) registration, on the principle that making research freely available to the public supports a greater global exchange of knowledge. There are no fees required to publish in the journal.

Focus and scope

As new technologies and therapeutic interventions are continually being developed, Ophthalmology has become a field of rapid change, particularly in the Asia-Pacific region, where disease patterns and health care delivery differ greatly from those seen in the West. Asian Journal of Ophthalmology was established in 1998 with the aim of disseminating information relevant to Ophthalmology and glaucoma throughout Asia and to interested groups worldwide.

The objectives of Asian Journal of Ophthalmology are as follows:

- To provide a platform for the publication of information with a focus on Ophthalmology in Asia.
- To disseminate information that will improve the care of patients with all types of ophthalmological disorders, with a special focus on glaucoma.
- To increase the understanding of such disorders through reporting of educational activities.
- To publish the results of research programmes to expand knowledge about the causes, prevention, and treatment of ophthalmological disorders.
- To work closely with Asian and international researchers to achieve these aims.
- To provide a forum for young and relatively inexperienced researchers to present their research results as Original Articles via an international platform.
- To maintain and promote relationships with any organization with similar goals.

Although the focus of Asian Journal of Ophthalmology mainly was on glaucoma with close ties to the South-East Asian Glaucoma Interest Group (SEAGIG) in the past, the journal now focuses on the entire spectrum of Ophthalmology. This resulted in collaboration with the Asia Pacific Ophthalmic Trauma Society (APOTS).

The Asian Journal of Ophthalmology and Kugler Publications have started to collaborate since mid 2012 on the publication of the journal. A new website has been launched (www.asjoo.com), which facilitates all aspects of the peer-review and publication process, from manuscript submission to publication.

For further information and manuscript submissions please visit our website: www.asjoo.com.

Table of contents

Editorial

The ***Asian Journal of Ophthalmology*** is an independent peer reviewed publication dedicated to the dissemination of timely ophthalmic knowledge and new Asian information on eye disease and therapy to the Asia Pacific region and beyond.

The journal is proud to be starting a new volume and a new face under the able oversight of Kugler Publications who have taken on the publication since August 2012. Since that time more journals have entered the market and the competition is great to prove value to our readership. This is a challenge we shall strive to rise to continually.

The process of takeover is almost complete now and we can focus once again on running a good and hopefully valuable periodical to our readers benefit and interest.

Over the past year the journal has been having an unavoidable slowdown in the publication process due to handover and staff changes. For the inconvenience this has caused our readers and contributors I sincerely apologize. These problems are now resolved and I look forward to a more streamlined and timely editorial review process as we did before.

We will continue our editorially friendly policy of assisting authors to bring Asian ophthalmology data to print and we shall also continue to provide timely review articles of current scientific and clinical interest by expert authors as educational articles.

With the launch of a new APGS and all its new energy, it seems fitting that I introduce to you a renewed ***Asian Journal of Ophthalmology*** for your use. I humbly request your support of our journal and readers, reviewers and contributors as well editorial board and will appreciate all comments and contributions that our learned colleagues see fit to submit.

Finally I would like to acknowledge and thank Simon Bakker, Joanne Tan and Kayoko Welsh without which this journal would not be possible.

Paul Chew

Asian J Ophthalmol. 2013;2:33-41

Effect of phacoemulsification with intraocular lens implantation in eyes with cataract and functioning filtering blebs

Devendra Maheshwari, Rengappa Ramakrishanan, Mohideen Abdul Kader, Neelam Pawar, Ankit Gupta
Aravind-Zeiss Centre for Excellence in Glaucoma, Aravind Eye Hospital & Postgraduate Institute of Ophthalmology, Tirunelveli, India

Abstract

Aim: *To evaluate the effect of phacoemulsification with intraocular lens implantation in eyes with pre-existing trabeculectomy.*

Methods: *This prospective single-center clinical study evaluated intraocular pressure in 60 eyes of 60 patients who underwent phacoemulsification and implantation of a foldable intraocular lens after a previous successful trabeculectomy. Patients who had a trabeculectomy more than one year prior to the study were included. Intraocular pressure, number of antiglaucoma medications, bleb appearance, and visual acuity were recorded preoperatively, and at each follow-up examination and 12 months after phacoemulsification.*

Results: *The mean intraocular pressure before phacoemulsification was 12.42 mmHg (SD, 4.60 mmHg), which increased to 14.98 mmHg (SD, 4.18 mmHg), 14.47 mmHg (SD, 3.58 mmHg), 15.44 mmHg (SD, 3.60 mmHg), and 15.71 mmHg (SD, 3.47 mmHg) after one, three, six, and 12 months, respectively. At each follow-up visit, the mean IOP was significantly higher than the preoperative value ($p < 0.001$, $p = 0.015$, $p \leq 0.001$, and $p = 0.001$ at month one, three, six, and 12, respectively). The mean preoperative best-corrected visual acuity was 0.98 logMAR (SD, 0.44 logMAR) and the mean postoperative best-corrected visual acuity at 12 months was 0.20 logMAR (SD, 0.21 logMAR) [$p = 0.0001$]. The mean preoperative number of antiglaucoma medications used was 0.57 (SD, 0.63), which increased to 0.65 (SD, 0.63), 0.70 (SD, 0.72) 0.68, (SD, 0.70), and 0.67 (SD, 0.77) at one, three, six, and 12 months, respectively, but there were no statistically significant differences. Bleb size decreased clinically after phacoemulsification. Nineteen of 60 eyes (32%) developed fibrosis of bleb with decreased bleb size.*

Conclusion: *Phacoemulsification with intraocular lens implantation significantly increased intraocular pressure and increased the number of antiglaucoma medications in eyes with pre-existing functioning filtering blebs.*

Key words: *Phacoemulsification, intraocular pressure, trabeculectomy, lens implantation, intraocular*

Introduction

A well-functioning bleb is a sign of successful trabeculectomy surgery. The development of a cataract is one of the calculated risks of filtering surgery.[1-4] Cataract surgery in a patient with previous trabeculectomy is generally considered to have an adverse effect on the long-term survival of the filtering bleb. A few retrospective studies have

Correspondence: Dr Devendra Maheshwari, Aravind-Ziess Centre for Excellence in Glaucoma, Aravind Eye Hospital, Tirunelveli, Tamil Nadu 627001, India.
E-mail: drdev_ophthal@hotmail.com.

evaluated the effects of phacoemulsification on filtering blebs.[3,5-8] Most of these retrospective studies have shown that intraocular pressure (IOP) control is worsened or that greater numbers of antiglaucoma medications are required after phacoemulsification,[6,7] while a few studies have shown no negative effect on IOP or on the number of antiglaucoma medications required.[5,8,9] Park *et al*. suggested that the impairment of IOP control after clear corneal incision phacoemulsification in eyes with previous trabeculectomy is comparable to that of the natural course of trabeculectomy.[5] The aim of this prospective study was to evaluate the effects of temporal clear corneal phacoemulsification on IOP control and bleb appearance in eyes with a filtering bleb.

Methods

Patients

This prospective study was performed between January 2007 and December 2008 at Aravind Eye Hospital, a tertiary eye care referral center in Tirunelveli, South India. Patients who had undergone a successful trabeculectomy at least one year previously and required phacoemulsification for cataract were enrolled. Patients with acute angle closure, secondary angle-closure glaucoma, inflammatory glaucoma, neovascular glaucoma, IOP > 21 mmHg with antiglaucoma medications before cataract surgery, or a follow-up duration of < 12 months were excluded. The institutional review board approved the study.

Design

The following preoperative data were recorded for all patients: age at time of phacoemulsification, sex, glaucoma diagnosis, type of cataract, time since the most recent trabeculectomy, IOP (measured by Goldmann tonometry), and best-corrected visual acuity (BCVA). Intraoperative iris manipulation, intraocular lens (IOL) type and placement, and intraoperative and postoperative complications were also recorded. Variables retrieved from the patients' medical records included the type of antifibrosis agent used in the trabeculectomy, and BCVA, IOP, and antiglaucoma medications prior to trabeculectomy.

Patients were examined at one week and one, three, six, and 12 months after surgery (and more often when necessary). BCVA, biomicroscopic examination, IOP, postoperative complications, and number of antiglaucoma medications were noted at each follow-up visit. Use of antiglaucoma medications was reported as the number of drugs taken, with no differentiation as to the type or frequency of medication use. Visual fields were assessed by static perimetric analysis (Humphrey Field Analyzer, 24-2; Carl Zeiss Meditec, Dublin, USA) at six months and one year after phacoemulsification.

The appearance of the filtering bleb before phacoemulsification was compared clinically with that after phacoemulsification. Changes in bleb size (area and/or height) and vessel density were recorded as unchanged, reduced, or increased at each visit. Quantitative classification of the filtering bleb was used to detect large changes in the bleb appearance before phacoemulsification and at each follow-up visit, as follows:[10]

- grade 0 = no conjunctival elevation
- grade 1 = localized conjunctival elevation at the trabeculectomy site
- grade 2 = elevation of approximately 90° around the trabeculectomy site
- grade 3 = elevation of > 90° and < 180°
- grade 4 = conjunctival elevation ≥ 180°.

Surgical success of the trabeculectomy was expressed as follows:

- complete success = IOP < 17 mmHg without antiglaucoma medication
- relative success = IOP < 17 mmHg with antiglaucoma medication
- failure = IOP > 17 mmHg with antiglaucoma medication.

Procedure

All phacoemulsification procedures were performed by one of the authors. The technique and general protocol were similar for all patients. A clear corneal temporal phacoemulsification was performed under topical anesthesia, and there was no conjunctival manipulation. Posterior synechiolysis and/or pupil stretching were performed as needed. A foldable acrylic posterior chamber IOL (AcrySof SA60AT or AcrySof MA60BM; Alcon, Fort Worth, Texas, USA) was inserted into the capsular bag. When necessary, 10-0 nylon sutures were used to close the temporal wound. No sutures were passed through the bleb. Care was taken at the conclusion of surgery. Thorough removal of viscoelastic was done.

The usual postoperative treatment included a combination of dexamethasone and tobramycin five or six times daily for two weeks. The dosage was tapered by one drop weekly until discontinuation after eight weeks.

If newly-onset bleb flattening occurred, when the vessel density into or around the bleb increased or when the IOP increased, postoperative anti-inflammatory treatment was intensified by giving prednisolone acetate every one to two hours during waking hours. Two patients required needle revision of the bleb and antiglaucoma medications. The procedure was performed under an operating microscope. Topical anesthesia was applied to the eye three times, with one minute between each drop. The conjunctiva was entered several mm from the flap site with a 27-gauge needle mounted on an insulin syringe. Aqueous flow was established in one patient after perforation of the scar tissue around an encysted bleb, whereas it was necessary to dissect beneath the scleral flap and enter the anterior chamber for the other patient. 5-Fluorouracil 5 mg (25 mg/mL) was injected into the subconjunctival space around the bleb. After needling, all hypotensive therapies were stopped and replaced by an intensive topical steroid/antibiotic combination.

Statistical analysis

Longitudinal comparisons of IOP were made by using two-tailed Student's *t* test for paired samples. Comparisons of BCVA and the number of glaucoma medications were tested by using Wilcoxon signed-rank test. The probability of success after phacoemulsification was estimated by using Kaplan-Meier survival analysis. The distribution of survival rates for preoperative and intraoperative factors was compared by using the log-rank test.

The Statistical Package for the Social Sciences 14.0 for Windows (SPSS Inc, Chicago,

Illinois, USA) was used for all analysis. A p value of ≤ 0.05 was considered statistically significant.

Results

Sixty eyes of 60 patients who had undergone a previous successful trabeculectomy and for who phacoemulsification was indicated were enrolled. The demographic data of the patients are presented in Table 1. The most frequent preoperative diagnosis was primary open-angle glaucoma. An acrylic foldable posterior chamber IOL was inserted into the capsular bag in 59 eyes and into the ciliary sulcus in one eye. Iris hooks or synechiolysis were used to enlarge the pupil in nine eyes (15.0%) during phacoemulsification, one of which had a posterior capsule tear without vitreous loss and a posterior chamber IOL was implanted into the ciliary sulcus. The mean number of glaucoma medications used before phacoemulsification ranged from zero to two (Table 1).

The mean IOP before phacoemulsification and at each follow-up visit is shown in Table 2. After phacoemulsification, the mean IOP increased significantly compared with the mean IOP before phacoemulsification by 2.56 mmHg after one month ($p < 0.001$), 2.05 mmHg after three months ($p = 0.015$), 3.02 mmHg after six months ($p < 0.001$), and 3.29 mmHg at the last visit ($p = 0.001$; two-tailed Student's t test). At all follow-up visits, the IOP remained significantly higher than before phacoemulsification ($p < 0.001$) (Table 2).

A decrease in bleb size was observed in 38 eyes (63.3%), 42 eyes (70.0%) and 46 eyes (77.6%) at three, six, and 12 months, respectively. The bleb size did not increase during follow-up. At the last follow-up visit, 11 eyes with primary angle-closure glaucoma and eight eyes with primary open-angle glaucoma developed fibrosis.

On the first day after phacoemulsification, nine eyes (15.0%) had an IOP spike > 10 mmHg above the IOP before phacoemulsification. One eye (1.7%) had an IOP > 30 mmHg on day one postoperatively. The IOP increment was significantly greater in eyes with an IOP of ≤ 10 mmHg before phacoemulsification (5.28 mmHg [SD, 5.81 mmHg]) compared with eyes with a preoperative IOP > 10 mmHg (2.25 mmHg [SD, 4.34 mmHg]) [$P = 0.012$; Student's t test]. One month after phacoemulsification, the mean number of antiglaucoma medications increased from 0.57 (SD, 0.62) to 0.67 (SD, 0.77) [$p = 0.65$, Wilcoxon signed-rank test] and remained increased at all postoperative visits (Table 3). Eyes with IOPs ≤ 10 mmHg before phacoemulsification had a 94.1% probability of not needing medications after phacoemulsification versus 52.8% for eyes with IOPs > 10 mmHg before phacoemulsification. At the last follow-up visit, the mean number of antiglaucoma medications was 0.67 (SD, 0.77; range, 0-3; $p = 0.51$). At the last visit, antiglaucoma medication was required in 17 eyes (28.33%), eight of which needed antiglaucoma medication at the one-month postoperative visit.

The success rates after phacoemulsification were 83.6%, 73.3%, and 71.6% at one month, six months and one year, respectively (Kaplan-Meier survival analysis). In two eyes, IOP was not controlled with antiglaucoma medication and required needling, one of which required repeat trabeculectomy.

Bleb size clinically decreased after phacoemulsification; 31.7% of eyes developed bleb fibrosis with a decrease in bleb size in 36.7% of eyes in the primary angle-closure glaucoma group and 26.7% of eyes in the primary open-angle glaucoma group

developed fibrosis of the previously elevated bleb. There was no statistically significant difference between eyes with primary open-angle glaucoma and primary angle-closure glaucoma ($p = 0.793$).

The BCVA improved significantly after phacoemulsification, from a mean of 0.20 (0.69 logMAR) before surgery to 0.98 (0.26 logMAR) after one year ($p = 0.001$; Wilcoxon signed-rank test). Fifty-two eyes (86.7%) had improved BCVA at the last visit compared with the preoperative BCVA. BCVA did not improve in eight eyes. Forty-three eyes (71.7 %) achieved a final BCVA of 0.5 or better. Comparison of BCVA before trabeculectomy (0.98; 0.30 logMAR) with that at the last visit after phacoemulsification showed that five eyes (8.3%) had the same BCVA, 52 eyes (86.7%) had better BCVA, and three eyes (5%) had worse BCVA.

Discussion

There are several studies on IOP change after phacoemulsification in eyes that have undergone glaucoma filtering surgery.[3,6,7,10-13] However, comparison among these studies is difficult because of their different protocols. A specific glaucoma diagnosis is important when considering the effect of phacoemulsification after trabeculectomy to exclude variables that could affect IOP control such as acute angle-closure glaucoma or secondary glaucoma. Only a few studies included a large number of patients.[3,6,10] Allen *et al*.[13] and Rebolleda and Muñoz-Negrete[7] reported that phacoemulsification significantly increased IOP and the number of antiglaucoma medications in eyes with pre-existing functioning filtering blebs. The functioning of the pre-existing filtering bleb may be compromised by phacoemulsification, thus causing an IOP increase, even when a clear corneal incision is performed and surgical precautions are taken to preserve the area of the bleb.[3-5,8,9] There are various reports in the literature regarding long-term increase in IOP after phacoemulsification in eyes with filtering blebs (Table 4).[5-7,9,14,15]

Park *et al*.[5] reported that IOP was not significantly different one year after phacoemulsification from the value before phacoemulsification, although three eyes requiring additional glaucoma surgery were excluded from the analysis. In this study, IOP before phacoemulsification also had a significant effect on the possibility of failure ($p = 0.0023$). Patients who maintained IOP control without additional medication after cataract surgery had a significantly lower mean IOP before phacoemulsification than those whose surgery was classified as failure ($p = 0.008$), and the success rate was significantly higher for patients who had an IOP ≤ 10 mmHg before phacoemulsification.

A statistically significant increase in the mean number of glaucoma medications used after phacoemulsification was observed, although this was significantly lower than the number used before trabeculectomy at all intervals after phacoemulsification. Eyes with IOP ≤ 10 mmHg before phacoemulsification had a 94.1% probability of not needing medications after phacoemulsification compared with 52.8% for eyes with IOP > 10 mmHg before phacoemulsification. In this study, a decrease in bleb size was observed in 77.6% of eyes. Similarly, bleb scarring occurred in most eyes after phacoemulsification, but diminished during the follow-up period. Fibrosis of the bleb with a decrease in bleb size developed in 31.7% of eyes (36.7% of eyes in the primary angle-closure glaucoma group and 26.7% of eyes in the primary open-angle glaucoma group). There was no

statistically significant difference between eyes with primary open-angle glaucoma and those with primary angle-closure glaucoma (p = 0.793).

Wygnanski-Jaffe *et al*. have also observed bleb scarring and shrinkage after cataract extraction, sometimes with worsened IOP control.[10] The mechanism that induces IOP elevation and flattening of the filtering bleb after cataract surgery is not known. It is likely that the inflammatory response elicited by surgery induces subconjunctival scarring, flattening of the filtering bleb, and the subsequent IOP increase that occurs postoperatively.[16]

In this study, BCVA improved in most eyes (n = 52; 86.7%) after phacoemulsification, whereas BCVA worsened in three eyes (5.0%). Watson *et al*. followed 150 eyes of 94 patients for up to 22 years and concluded that, despite successful trabeculectomy, 59% of patients had progression of visual field damage.[17] These authors further concluded that there was a 'long-term reduction in the visual acuity and visual fields of about one-third of the patients', unrelated to postoperative IOP, preoperative visual field, or other definable factors.[17] Cataract extraction justifies the improvement in visual fields observed postoperatively.[18] There is always a possibility of decreased IOP control over time after successful trabeculectomy, even without non-glaucoma related surgical interventions.

In this study, a statistically significant increase in IOP and number of glaucoma medications was observed at each postoperative visit after phacoemulsification, despite all eyes having a well-functioning bleb. In conclusion, performing phacoemulsification after successful trabeculectomy may trigger bleb failure in eyes with a pre-existing filtering bleb and a permanent increase in IOP could be precipitated.

References

1. Sugar HS. Postoperative cataract in successfully filtering glaucomatous eyes. Am J Ophthalmol 1970;69:740-746.
2. D'Eemo F, Bonomi L, Doro D. A critical analysis of the long-term results of trabeculectomy. Am J Ophthalmol 1979;88:829-835.
3. Mills KB. Trabeculectomy: a retrospective long-term follow-up of 444 cases. Br J Ophthalmol 1981;65:790-795.
4. Stamper RL, Lieberman MF, Drake MV. Becker-Shaffer's diagnosis and therapy of the glaucomas. 8th ed. St Louis: Mosby Elsevier; 2009; pp. 503-507.
5. Park HJ, Weitzman M, Caprioli J. Temporal corneal phacoemulsification combined with superior trabeculectomy. Arch Ophthalmol 1997;115:318-323.
6. Chen PP, Weaver YK, Budnenz DL. Trabeculectomy function after cataract extraction. Ophthalmology 1998;105:1928-1935.
7. Rebolleda G, Muñoz-Negrete FJ. Phacoemulsification in eyes with functioning filtering blebs: a prospective study. Ophthalmology 2002;109:2248-2255.
8. Mietz H, Andresen A, Welsandt G, Krieglstein GK. Effect of cataract surgery on intraocular pressure in eyes with previous trabeculectomy. Graefes Arch Clin Exp Ophthalmol 2001;239:763-769.
9. Manoj B, Chako D, Khan MY. Effect of extracapsular cataract extraction and phacoemulsification performed after trabeculectomy on intraocular pressure. Cataract Refract Surg 2000;26:75-78.
10. Wygnanski-Jaffe T, Barak A, Melamed S, Glovinsky Y. Intraocular pressure increments after cataract extraction in glaucomatous eyes with functioning filtering blebs. Ophthalmic Surg Lasers 1997;28:657-661.
11. Dickens MA, Cashwell LF. Long-term effect of cataract extraction on the function of an established filtering bleb. Ophthalmic Surg Lasers 1996;27:9-14.

12. Yamagami S, Araie M, Mori M, Misshima K. Posterior chamber intraocular lens implantation in filtered or non-filtered glaucoma eyes. Jpn J Ophthalmol 1994;38:71-79.
13. Allen LE, Manuchehri K, Corridan PG. The treatment of encapsulated trabeculectomy blebs in an out-patient setting using a needling technique and sub conjunctival 5-fluorouracil injection. Eye 1998;12:119-123.
14. Crichton AC, Kirker AW. Intraocular pressure and medication control after clear corneal phacoemulsification and AcrySof posterior chamber intraocular lens implantation in patients with filtering blebs. J Glaucoma 2001;10:38-46.
15. Seah SK, Jap A. Cataract surgery after trabeculectomy. Ophthalmic Surg Lasers 1996;27:587-594.
16. Siriwardena D, Kotech A, Minassian D, Dart JK, Khaw PT. Anterior chamber flare after trabeculectomy and after phacoemulsification. Br J Ophthalmol 2000;84;1056-1057.
17. Watson PG, Jakeman C, Ozturk M, Barnett MF, Barnett F, Khaw KT. The complications of trabeculectomy (a 20-year follow-up). Eye 1990;4:425-438.
18. Kwon YH, Kim CS, Zimmerman MB, et al.. Rate of visual field loss and long-term visual outcome in primary open-angle glaucoma. Am J Ophthalmol 2001;132:47-56.

Table 1
Demographic and clinical characteristics of 60 patients who underwent phacoemulsification and implantation of a foldable intraocular lens after a previous successful trabeculectomy.

Characteristic	Number (%)
Sex	
Male	33 (55.0)
Female	27 (45.0)
Eye	
Right	28 (46.7)
Left	32 (53.3)
Age (years)	
Range	51-69
Mean (SD)	59.93 (8.71)
Glaucoma diagnosis	
Primary open angle	25 (41.7)
Pigmentary	2 (3.3)
Pseudoexfoliation glaucoma	5 (8.3)
Primary angle closure	28 (46.7)
Time between trabeculectomy and phacoemulsification (months)	
Range	12-18
Mean (SD)	12 (4.58)
Number of glaucoma medications before phacoemulsification	
0	30 (50.0)
1	26 (43.3)
2	4 (6.7)
3	0 (0)

Table 2
Comparison of preoperative and postoperative intraocular pressure at each follow-up visit.

Intraocular pressure (mmHg)			
Follow-up	**Mean (SD)**	**Range**	**p Value**
Preoperative	12.42 (4.61)	4-21	
Month 1	14.98 (4.18)	10-30	<0.001
Month 3	14.47 (3.05)	10-28	0.015
Month 6	15.44 (3.60)	10-23	<0.001
Month 12	15.71 (3.47)	9-23	0.001

Table 3
Comparison of preoperative and postoperative glaucoma medication at each follow-up visit.

Number of patients (%)					
Number of medications	**Preoperative**	**Month 1**	**Month 3**	**Month 6**	**Month 12**
0	30 (50.0)	26 (43.3)	26 (43.3)	26 (43.3)	26 (43.3)
1	26 (43.3)	29 (48.3)	27 (45.0)	27 (45.0)	23 (38.3)
2	4 (6.7)	5 (8.3)	6 (10.0)	5 (8.3)	4 (6.7)
3	0 (0)	0 (0)	0 (0)	4 (6.7)	2 (3.3)
Total	60 (100)	60 (100)	60 (100)	59* (98.3)	55† (91.7)
Mean deviation	0.57	0.65	0.7	0.68	0.67
Standard deviation	0.63	0.63	0.72	0.7	0.77

*** One patient did not administer the medication as prescribed and was excluded from this analysis.**
† Five patients did not administer the medication as prescribed and were excluded from this analysis.

Table 4
Summary of studies on the effects of phacoemulsification in eyes with filtering blebs.

Study	Number of patients	Follow-up (months)	Success rate (%)	Definition of success	Comments
Seah and Jap[15]	6	13.6	67	IOP 19 mmHg with no additional surgery or medications	Retrospective
Chen et al.[6]	57	17.6	74	No additional medications, bleb needling, or glaucoma surgery	Retrospective
Park et al.[5]	40	20.1	80 (3 years)	No increase in medications; IOP 21 mmHg or 20% reduction on 2 consecutive visits compared with pre-trabeculectomy	Case control
Manoj et al.[9]	21	15.1	100	IOP 18 mmHg and within the target pressure	Retrospective
Crichton and Kirker[14]	69	23.2	77	No additional surgery and no additional medications compared with pre-cataract surgery	Retrospective
Rebolleda and Muñoz-Negrete[7]	49	19.5	67.4	No glaucoma medications, surgery, or bleb needling to control IOP	Prospective
Present study	60	12	71.67	IOP <21 mmHg with 1 or 2 antiglaucoma medications and bleb needling to control IOP	Prospective

Asian J Ophthalmol. 2013;2:42-47

Anterior lamellar recession in the management of the trachomatous cicatricial entropion of the upper eyelids: Outcomes and indications

Naser Owji, Mansooreh Jamshidian Tehrani
Poostchi Eye Research Center, Shiraz University of Medical Sciences, Shiraz, Iran

Aim: *To evaluate the success and complications of anterior lamellar recession (ALR) in trachomatous cicatricial entropion.*
Methods: *Twenty-six consecutive patients (forty upper eyelids) with trachomatous cicatricial entropion underwent ALR between 2003 and 2010. All patients had aberrant lashes with severe abnormal lid margin. Anatomical success was defined as disappearance of lid margin abnormality. Presence of aberrant lash did not indicate a treatment failure. Complete success was described as anatomical success without abrading abnormal lashes.*
Results: *ALR was performed on the 40 upper eyelids (19 right and 21 left). The average duration of follow-up time was 34 months (range: six to 84 months). Anatomical success was achieved in 28 out of 40 lids (70%). Trichiasis developed in 18 eyelids post-operatively (45%), so complete success rate was 55%.*
Conclusion: *ALR is a well-established procedure with an acceptable success rate for management of trachomatous cicatricial entropion and severe lid margin abnormality. The most important drawback of this procedure is development of trichiasis.*

Key words: *Trachoma, cicatricial entropion, trichiasis, anterior lamellar recession (ALR)*

Introduction

Cicatricial entropion results from a scarring and shortening of the conjunctival and tarsal plate. Various conditions such as auto-immune and inflammatory diseases, surgical and traumatic conditions, and infectious diseases may lead to cicatricial entropion. Trachoma is the most common infectious cause of blindness worldwide.[1] Recurrent chronic conjunctivitis, most probably of the upper tarsal conjunctiva, leads to cicatricial entropion, abnormal eyelashes, and abnormal keratinized lid margin. Abrading eyelashes and keratinized lid margin cause mechanical trauma to the ocular surface and cornea leading to the patient's discomfort, foreign-body sensation, and decreased visual acuity secondary to corneal opacity. Early diagnosis of cicatricial eyelid changes and selection of an appropriate surgical procedure to create a healthy environment for the ocular surface play an important role in the prevention of blindness as a complication of trachoma.

ALR is one of the procedures used for correction of cicatricial entropion and trichiasis.[2-9] Few studies are available that present the effect of this procedure in trachomatous entropion and trichiasis.[5,8,9] Because our country is an endemic area for trachoma, in the present study, we aimed to report the results of ALR in patients with trachomatous cicatricial entropion of the upper eyelid in our center. We also aimed to determine

Correspondence: Naser Owji, MD, Poostchi Eye Research Center, Poostchi Street, Shiraz, Iran.
E-mail: owjin@sums.ac.ir , dr_oji@yahoo.com

the indications of performing this procedure according to our experiences as well as reviewing the related studies.

Patients and methods

This study was performed on 40 upper eyelids of 26 patients with trachomatous cicatricial entropion who were operated by a single surgeon using ALR technique during 2003 to 2010. The protocol of the study was approved by the local Ethics Committee of the Poostchi Ophthalmology Research Center affiliated to Shiraz University of Medical Sciences, Shiraz, Iran. Informed consent was obtained from the patients after giving detailed information.

The inclusion criteria were presence of cicatricial entropion and aberrant lashes with sever abnormal lid margin. Eleven of 40 lids had had previous unsuccessful operations for entropion and abnormal lashes. Severe abnormal lid margin was defined as keratinized and rounding of the lid margin with posterior migration of meibomian glands orifices (Fig. 1).

Fig. 1. Severe lid margin abnormality in patients with trachomatous entropion.

Patients' demographic data, abnormal lids, extent of involvement (generalized or localized), tarsal plate consistency (existence of shrinkage, or loosening), and previous lid surgeries were evaluated by standard clinical history taking and detailed lid examination and inspection before and after the surgery.

Extent of eyelid involvement was categorized as generalized (100% of lid involvement) and localized eyelid involvement (less than 100% of lid involvement).

Tarsal plate consistency was categorized considering the presence or absence of tarsal shrinkage (shortening with or without thickening) or loosening (loss of tarsal consistency) or both.

Surgical technique

The operation was performed either under standby sedation or under general anesthesia, based on the patients' cooperation. Standby anesthesia was accomplished by intravenous sedation and local infiltration of 2% lidocaine through 1:100,000 epinephrine. In the general-anesthesia method, lidocaine injection was not administered.

For generalized involvement, the eyelid margin was incised along the most posterior abnormal eyelash from the lateral commissure to just lateral to the lacrimal punctum. For localized lid involvement, the incision was done two mm from the abnormal site with vertical relaxing incision of the skin, then the dissection was done toward the superior tarsal border and retractors released from tarsal plate. A ribbon of anterior lid margin including an abnormal row of lashes and keratinized tissue from anterior lamella, was excised. The skin and muscle flap along with the normal lashes of the entire extent of

the eyelid were then recessed and fixed four mm superior to the margin of the upper eyelid, and anchored to the anterior tarsal surface using three or four 6-0 Vicryl horizontal mattress sutures (Fig. 2).

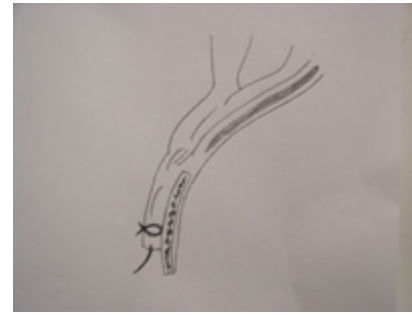


Fig. 2. Anterior lamellar recession procedure.

Post-operative care included prescribing a combination of a hydrocortisone eye ointment and erythromycin ointment for six weeks, which were tapered until discontinued. The patients were visited in regular intervals of one day, one week, one month, three months, and six months post-operatively and after that at the discretion of the surgeon.

The success of the operations was categorized as anatomical or complete. Anatomical success was defined as disappearance of lid margin abnormality and keratinization, appropriate localization of mucocutaneous junction, and no skin touching the ocular surface. Presence of aberrant lash did not indicate a treatment failure. Complete success was described as anatomical success without abrading the abnormal lashes.

Statistical analysis was performed using Statistical Package for Social Sciences software version 17 (SPSS Inc., Chicago, Illinois). For subgroup analyses, nominal variables were analyzed using Chi-Square test. A p value ≤ 0.05 was considered statistically significant.

Results

Twenty-six patients (40 upper eyelids) including seven men and 19 women were diagnosed to have trachomatous trichiasis. Generalized involvement was present in 25 eyelids and localized involvement was present in 15 eyelids. The age range was from 51 to 90 years (mean: 68.8 years).

Of the 40 eyelids, 19 had good tarsal consistency, six had loosening, four had shrinkage, and 11 had both tarsal loosening and shrinkage. ALR was performed for 19 right and 21 left eyelids. The average duration of the follow-up visits was 34 months (range: 6 to 84 months). Previous operations were done on 11 of the 40 eyelids.

Anatomical success was achieved in 28 lids (70%). Trichiasis developed in 18 (45%) eyelids post-operatively, so the complete success rate was 55% in our series.

Nineteen patients had good tarsal consistency (47.5%) and 21 (52.5 %) patients had abnormal tarsal consistency. The success in the good tarsal group was 15 out of 19 lids (78.9%) and in the abnormal tarsus group 13 out of 21 lids (61.9%). Fischer exact test did not show a significant association between tarsal consistency and final success, which could be caused by low power of the study (P = 0.5). Only a subgroup analysis between the success of the good-tarsus group and the group with shrinkage and loosening showed a significant difference (15 of 19 [78.9%] versus 3 of 11 [27.2%]. [P = 0.008] The success in the group with generalized lid involvement was 17 of 25 lids (68%) and in the group with localized lid involvement 11 of 15 lids (73.3%). Chi square test did not show a significant association between the extent of lid involvement and primary and final success, which can be explained again by the low power of the study (P = 0.5).

No significant post-operative complications, such as hematoma or suture abscess, were observed.

Discussion

ALR is a well-established procedure for the correction of cicatricial entropion and trichiasis. This procedure is performed using various techniques. The procedure has been presented in the literature with different terms including: grey line split with anterior lamellar reposition;[4,6,7] tarso-conjunctival advancement;[3] lamellar division;[2,5] tarsal advance;[9] and ALR.[7] The ALR procedure involves complete splitting of the lid from the grey line or posterior to the more posterior aberrant eyelashes and keratinized lid margin with or without disinsertion of eyelid retractors and subsequent recession of anterior lamella three to seven mm posterior to the lid margin (Fig. 2).

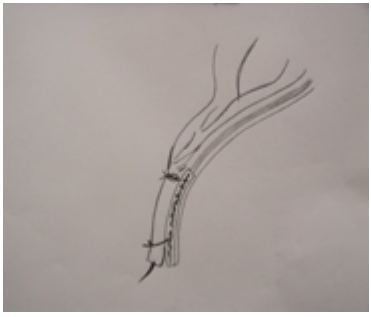


Fig. 3. Anterior lamellar reposition and lid splitting procedure.

ALR should be differentiated from anterior lamellar repositioning and lid split. Some investigators used the term 'anterior lamellar repositioning' for the presentation of an ALR procedure,[4,6,7] and erroneously the outcomes of these two procedures have been compared,[7] while the technique, outcome, and indications of the two procedures are different.[2] It concerns anterior lamellar repositioning via lid crease incision and one-to-two-mm lid margin splitting without ALR (Fig. 3).

ALR is used for correction of entropion[2-7] and trichiasis.[8,9] This procedure was investigated in the treatment of trachomatous trichiasis in some articles.[9] In some studies, the major cause of entropion and trichiasis was trachoma.[5,8] To the best of our knowledge our study is the first report showing the outcome of ALR in trachomatous cicatricial entropion of the upper eyelid with long-term follow-up. We performed this procedure in patients with severe cicatricial lid margin abnormality secondary to trachoma. The anatomical success was 70% and complete success rate was 55%.The success rate was related to tarsal-plate consistency. In patients with normal tarsus, the ALR success rate was 78.9%. The success rate in patients with tarsal shrinkage and loosening was 27.2%. The difference was statically significant (P = 0.008).

Kemp and Collin[2] recommended this procedure for patients with moderate entropion and marked lid retraction and for patients with severe entropion. Sodhi and Pandey[6] used ALR in 84 eyelids with cicatricial entropion and various etiologies with an overall success rate of 88.09% after one year follow up. The severity of entropion was not mentioned. ALR was performed by Pungnumkul[8] on 18 eyelids with major upper lid trichiasis (> five eyelashes) with a success rate of 77.77% and a mean follow up of 144 days. Reacher et al.[9] used ALR in patients with major trichiasis. The overall success rate in 41 patients was 27%. The severity of entropion was not determined in this study.

Koreen et al.[7] used ALR with buccal mucousal grafting for the correction of 35 eyelids with moderate to severe cicatricial entropion. Trichiasis was present in 94% of the eyelids pre-operatively. The anatomical success rate of the primary repair was 77%. Trichiasis or

distichiasis were present in 54% of the eyelids post-operatively.

Direct comparison of these studies with ours is not possible. The wide range of the success rate for ALR procedures (27%-97%) reported by several studies could be due to different population, different types of eyelid abnormalities (trichiasis and/or entropion) included in these studies, different severity of entropion or trichiasis, different surgical skills, different techniques and follow-up durations, and difference in the definition of success.

One of the most important factors affecting the success of a specific procedure for the correction of cicatricial entropion and associated eyelid abnormalities is the selection of the appropriate surgery. The severity of entropion and the association of misdirected eyelashes and severity of lid margin abnormality should be considered for the selection of the appropriate surgical procedure.[10] The severity of cicatricial entropion could be classified as mild, moderate, and severe. Mild entropion is defined as a condition in which the eyelashes do not abrade the cornea in primary position but touch to the globe in up-gaze or down-gaze. Moderate entropion is diagnosed when there is a lash globe contact in the primary position. Severe entropion is manifested as a totally disorganized margin with metaplastic lashes and trichiasis, definite or gross lid retraction, and keratin plaques on the palpebral conjunctival surface.[2] For mild to moderate cicatricial entropion without lid retraction, anterior lamellar repositioning with or without lid splitting, Wies procedure, and tarsal fracture might be the procedures of choice.[2,10] In moderate cicatricial entropion with lid retraction and severe entropion, ALR could be used.[2] We used this procedure in patients with severe lid margin abnormality irrespective of severity of entropion to keep away keratinized tissue and abnormal lashes from the ocular surface.

Several surgeons modified the ALR technique to improve the success rate. Some of them used an anchoring suture in the fornix that stably repositioned the anterior lamella on the posterior lamella.[4,5] Fixing the tarsus to the cheek by tarsal traction sutures has been reported.[3] Covering of the bare tarsus by an amniotic membrane graft and a mucous membrane graft were performed by others.[4,7]

We did not use these modified techniques. The shortcoming of the ALR procedure in our study was the development of trichiasis. In 45% of our patients, abrading lashes were present post-operatively. This is compatible with the Koreen et al. study.[7] In their patients, trichiasis and distichiasis were present in 54% of eyelids postoperatively after ALR and mucous membrane graft. It seems that coverage of the bare tarsus with a mucous membrane graft did not effectively prevent recurrence of aberrant lashes.

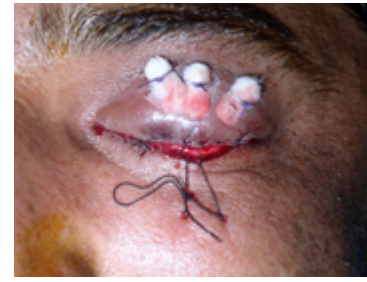


Fig. 4. Anterior lamellar recession with fornix suture and fixing traction suture.

We agree with Sodhi[6] that recurrence of trichiatic lashes is due to gradual downward sliding of recessed anterior lamella, so placement of a fornix suture and tarsal traction sutures may stable the anterior lamella in a recessed position and improve the success of ALR (Fig. 4) As previously mentioned, with this modified techniques the success rate (no

lash abrading the globe) of this procedure reported by Sodhi[6] and Kuckelkorn[3] was 88.09% and 80.55%, respectively. The other shortcomings of this procedure are that it is a difficult technique for not so skillful surgeons, the prolonged surgical time, and disturbed cosmesis at early post-operative days.

In spite of the above-mentioned shortcomings, ALR has several advantages, including:

- In ALR, keratinized lid margin could be trimmed and new, healthy, smooth lid margin is formed;
- Aberrant lashes could be excised or recessed away from the lid margin;
- Release of eyelid retractors may improve the lid retraction caused by the cicatricial process or previous failed surgery.This procedure does not involve the conjunctiva directly, so it does not aggravate auto-immune conjunctival diseases.

We can summarize the indications of ALR as follows:

- Severe lid margin abnormality with keratinized lid margin and aberrant lashes;[2,6,9]
- Presence of major trichiasis (> five eyelashes);[8,9]
- Moderate to severe entropion with lid retraction;[2,6]
- Entropion and trichiasis in auto-immune conjunctival diseases, where conjunctival incision may aggravate the disease.

Conclusion

ALR is recommended and used for correction of cicatricial entropion of all severities, and for treatment of trichiasis with acceptable success rate. This procedure addresses all cicatricial eyelid changes secondary to trachoma, but we recommend this procedure in selected cases with significant cicatricial eyelid margin abnormalities and trichiasis, and in cases with auto-immune conjunctival diseases. For a lesser degree of cicatricial eyelid changes, simpler procedures should be used.

References

1. Burton MJ. Trachoma: an overview. Br Med Bull 2007;84:99-116. Epub 2008 Jan 5.
2. Kemp EG, Collin JR. Surgical management of upper lid entropion. Br J Ophthalmol 1986;70(8):575-579.
3. Kuckelkorn R, Schrage N, Becker J, Reim M. Tarsoconjunctival advancement: a modified surgical technique to correct cicatricial entropion and metaplasia of the marginal tarsus. Ophthalmic Surg Lasers 1997;28(2):156-161.
4. Seng-Ei Ti, Sharon LC, Tow Soon-Phaik Chee. Amniotic Membrane Transplantation in Entropion surgery. Ophthalmolgy 2001;108(7):1209-1217.
5. Sodhi PK, Yadava U, Mehta DK. Efficacy of lamellar division for correcting cicatricial lid entropion and its associated features unrectified by the tarsal fracture technique. Orbit 2002;21(1):9-17.
6. Sodhi PK, Yadava U, Pandey RM, Mehta DK. Modified grey line split with anterior lamellar repositioning for treatment of cicatricial lid entropion. Ophthalmic Surg Lasers. 2002;33(2):169-174.
7. Koreen IV, Taich A, Elner VM. Anterior lamellar recession with buccal mucous membrane grafting for cicatricial entropion. Ophthal Plast Reconstr Surg 2009;25(3):180-184.
8. Paichit Pongnumkul. Modified Grey Line Split with Anterior Lamellar Repositioning for Upper Lid Trichiasis. Thai J Ophthalmol 2003;17(2):153-161.
9. Reacher MH, Huber MJ, Canagaratnam R, Alghassany A. A trial of surgery for trichiasis of the upper lid from trachoma. Br J Ophthalmol 1990;74(2):109-113.
10. Owji N, Bagheri A, Aslani A. Combined Wies procedure and direct internal eyelash bulb extirpation an effective procedure for treatment of cicatricial entropion and trichiasis. Asian J Opthalmol 2006:8(1):28-30.

Asian J Ophthalmol. 2013;2:48-51

Repeated pupillary capture and pigmentary glaucoma after implantation of reversed three-piece sulcus intraocular lens

Ha-Uyen T. Nguyen,[1] Elizabeth Yeu-Lin,[1,2] Albert P. Lin[1,2]
[1]Baylor College of Medicine; [2]Michael E DeBakey Veterans Affairs Medical Center, Houston, Texas, USA

Abstract: *A 58-year-old man underwent phacoemulsification, anterior vitrectomy, and a reversed three-piece intraocular lens placement in the sulcus. He developed pseudophakic pupillary block with optic capture of the intraocular lens four months later and underwent intraocular lens repositioning combined with surgical iridectomy. After 18 months, he had elevated intraocular pressure that was thought to be secondary to complicated cataract surgery, and he was prescribed topical glaucoma medications. He had poor adherence and follow-up attendance. After another six months, he presented to the Baylor College of Medicine, Houston, USA, with an intraocular pressure of 30 mmHg and advanced pigmentary glaucoma. The intraocular lens optic was captured by the pupil after dilation. A trabeculectomy and intraocular lens exchange was performed. Reversed intraocular lens in the sulcus may present as repeated intraocular lens pupillary capture and result in the development of pigmentary glaucoma.*

Key words: *Phacoemulsification, lenses, intraocular, intraocular pressure, glaucoma, trabeculectomy*

Introduction

Pseudophakic pupillary block is a known complication of reversed intraocular lens (IOL)[1,2] and there have been reports of IOL repositioning with good results.[2] However, there have been no reports of repeat presentation after repositioning. This report is of a patient with a reversed sulcus IOL presenting with repeated pupillary capture of the IOL optic associated with the development of advanced pigmentary glaucoma.

Case report

A 58-year-old man presented in 2008 with visually significant cataract in the left eye and best-corrected visual acuity (BCVA) of 20/70, intraocular pressure (IOP) of 16 mmHg, and cup-disc ratio of 0.55. He underwent phacoemulsification cataract extraction and had posterior capsular rupture at another institution. Anterior vitrectomy was performed, followed by sulcus placement of a 17.0 D MA60AC IOL (Alcon Laboratories, Inc, Fort Worth, Texas, USA) 3-piece IOL with prolen haptics (13 mm length, 6 mm optics, 10° posterior vault). One month after surgery, his BCVA was 20/30 and IOP was 17 mmHg.
Four months postoperatively, the patient developed sudden-onset pain and blurred vision. Ocular examination revealed vision of counting fingers, microcystic corneal oedema, IOP of 34 mmHg, and pseudophakic pupillary block with pupillary capture of

Correspondence: Dr Albert P. Lin, 2002 Holcombe Boulevard 112C, Houston, Texas 77030, USA. E-mail: alin@bcm.edu.

the IOL. The patient was given topical and oral aqueous suppressants and the IOL was repositioned and surgical iridectomy was performed. Two months later, his BCVA was 20/30 (-1.75 + 0.50 x 118), IOP was 14 mmHg, and cup-disc ratio was 0.6. Glaucoma suspect status was diagnosed given the enlarged cup-disc ratio. A baseline Humphrey visual field was unreliable.

After 18 months, the patient was found to have an IOP of 23 mmHg and an increased cup-disc ratio of 0.75. He was diagnosed with secondary glaucoma with trabecular dysfunction from complicated cataract surgery and was given travoprost and combination timolol and dorzolamide. His IOP improved to 17 mmHg.

Six months after this visit, the patient presented to the Baylor College of Medicine, Houston, USA, for evaluation. Examination showed stable vision, relative afferent pupillary defect, IOP of 30 mmHg, diffuse pigments on the corneal endothelium, 4+ pigments in the chamber angle (Fig. 1), and cup-disc ratio of 0.85. Humphrey visual field demonstrated dense arcuate defects involving the fixation. He was not using his drops and medical therapy was restarted. At the follow-up visit, his IOP was 22 mmHg and he was

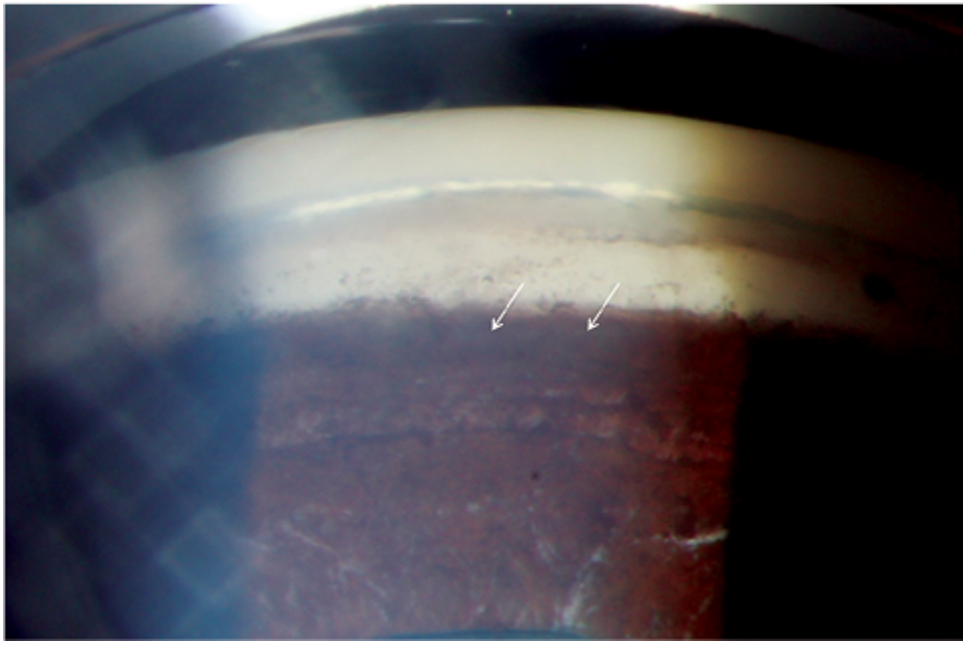


Fig. 1. Examination of the inferior chamber angle shows dense pigment deposition. The scleral spur is barely visible (arrows).

found to have pupillary capture of the IOL optic. His BCVA was 20/25 (-2.00 sphere) and the remaining findings were unchanged. The haptic was pointing in a clockwise direction (S-shaped; Fig. 2) and a diagnosis of a reversed sulcus IOL was made. Combined trabeculectomy with mitomycin C and IOL exchange was performed. The reversed intraocular lens was removed, additional anterior vitrectomy was performed, and the

IOL was replaced with a sulcus 17.5 D Alcon MA60AC. One month after surgery, his BCVA was 20/25 + 1 (-0.75 + 0.50 x 105) and the IOP was six mmHg. The IOL was found to be in a good position with and without dilation (Fig. 3).

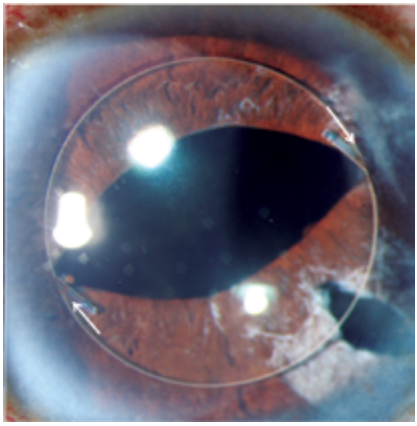


Fig. 2. Pupillary capture of the intraocular lens optic with haptics in the sulcus. The haptics were pointing clockwise (arrows), indicating that the intraocular lens was reversed.

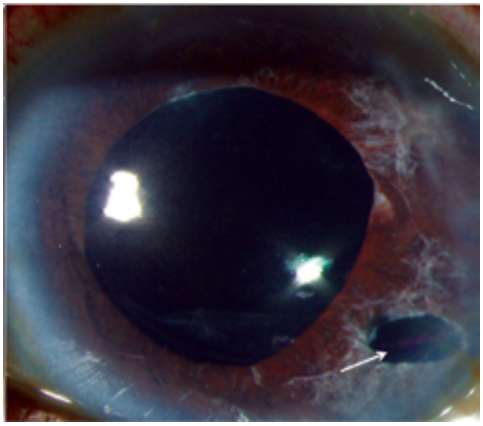


Fig. 3. The intraocular lens was stable on dilation after exchange and trabeculectomy. The haptics were pointing counter clockwise (arrow), indicating that the intraocular lens was in the correct orientation.

Discussion

Pseudophakic pupillary block with IOL placement in the capsular bag or sulcus has been described and managed with IOL repositioning, either non-invasively or surgically.[1-5] Secondary glaucomas, such as pigmentary glaucoma and uveitis glaucoma hyphaema (UGH) syndrome, are well-known problems associated with sulcus IOL placement.[6,7] This report describes a patient with unrecognized reversed sulcus IOL placement that presented with repeated pupillary capture of the IOL optic and advanced pigmentary glaucoma despite previous repositioning and iridectomy. The authors did not observe the IOL capture until the second visit, presumably because the IOL only moved forward subsequent to the dilation at the first visit.

Potential problems with reversed sulcus IOL include pseudophakic pupillary block, secondary glaucoma, and changes in effective IOL power. Pseudophakic pupillary block may have resulted in this patient because the posterior vault of the lens resulted in anterior displacement of the lens optic towards the pupil when it was reversed. When the IOL is placed in the capsular bag, the angulation may decrease over time due to scarring of the anterior and posterior capsule, but this process does not occur when the lens is placed in the sulcus. If residual vitreous was still present behind the IOL, additional posterior pressure may also have contributed to this movement. Pupillary block did not occur when the IOL optic was captured by the pupil the second time because of the patent iridectomy.

Secondary glaucoma can occur from optic or haptic contact with adjacent ocular

structures such as the iris, ciliary body, or vasculature. This patient most likely had pigment liberation from the iris, as evidenced by the amount of pigment deposited on the corneal endothelium and chamber angle. Excessive pigment deposition may lead to trabecular dysfunction and elevated IOP over time.

Changes in effective lens power may come from changes in IOL position as well as the anterior and posterior radii of curvature of the IOL. The IOL position moved anteriorly away from the retina in this patient because of the sulcus placement, anterior vault, and optic capture by the pupil, which all contributed to an increase in effective lens power and a shift towards myopia. The intended aim of the original cataract surgery was not known, but the patient's refraction changed from -1.50 to -2.00 spherical equivalent when he presented with the IOL optic in the anterior chamber. Postoperatively, even though the IOL power was increased by +0.50 sphere, refractive error decreased to -0.50 spherical equivalent because pupillary capture was no longer present and the IOL now had a posterior vault. The Alcon MA60AC is an anterior biconvex IOL with similar anterior and posterior radii of curvature. In an average eye, a reversed IOL of this type will result in a negligible change in postoperative refractive error (-0.05 to -0.34 sphere in an eye with 23 mm axial length).[8] It is interesting to note the patient did not have significant inflammation, synechiae formation, or iris transillumination defects despite the large amount of pigment observed on the cornea and chamber angle. After the surgery, the patient had excellent vision and IOP without choroidal effusion.

A reversed sulcus IOL may result in pseudophakic pupillary block, secondary glaucoma, and unintended postoperative myopia. When a patient presents with a sulcus IOL and repeated pupillary optic capture, a reversed IOL should be suspected, although findings of a reversed IOL may be subtle and may sometimes be missed at initial presentation. IOL exchange combined with trabeculectomy was indicated in this patient because of the repeat presentation despite IOL repositioning, patent iridectomy, and the need to control IOP in the presence of advanced pigmentary glaucoma.

References

1. Awan MA, Choi J. Reversed sulcus-fixated posterior chamber intraocular lens leading to pupillary capture. Asian J Ophthalmol 2006;8:151-152.
2. Harsum S, Low S. Reversed vaulted AcrySof intraocular lens presenting as pupillary block. Eye 2009;23:1880-1882.
3. Galvis V, Tello A, Montezuma S. Delayed pupillary capture and noninvasive repositioning of a posterior chamber intraocular lens after pupil dilation. J Cataract Refract Surg 2002;28:1876-1879.
4. Nagamoto S, Kohzuka T, Nagamoto T. Pupillary block after pupillary capture of an AcrySof intraocular lens. J Cataract Refract Surg 1998;24:1271-4.
5. Khokhar S, Sethi HS, Sony P, Sudan R, Soni A. Pseudophakic pupillary block caused by pupillary capture after phacoemulsification and in-the-bag AcrySof lens implantation. J Cataract Refract Surg 2002;28:1291-1292.
6. Allingham RR, Damji KF, Freedman S, Moroi SE, Shafranov G. Shield's Textbook of glaucoma. 5th ed. Philadelphia: Lippincott Williams & Wilkins 2005; pp. 416-417.
7. Almond MC, Wu MC, Chen PP. Pigment dispersion and chronic intraocular pressure elevation after sulcus placement of 3-piece acrylic intraocular lens. J Cataract Refract Surg 2009;35:2164-2166.
8. Nawa, Y, Okamoto M, Tsuji H, Ueda T, Kanzaki M, Hara Y. Dioptric changes in eyes with reversed intraocular lenses. J Cataract Refract Surg 2005;31:586-589.

Asian J Ophthalmol. 2013;2:52-56

The use of intravenous pulse-steroid therapy in optic neuropathy from nasopharyngeal carcinoma

Karen B. Reyes,[1,2] Kong Yong Goh[1]*

[1]Department of Ophthalmology, Neuro-Ophthalmology Service, Tan Tock Seng Hospital, Singapore;

[2]Department of Ophthalmology, Neuro-Ophthalmology service, Cardinal Santos Medical Center, Philippines

Abstract: *Although nasopharyngeal carcinoma (NPC) is commonly seen in patients from Asia, optic neuropathy is a rare initial presenting symptom of this disease. This is an interventional case report discussing the clinical response of NPC-related optic neuropathy to pulse-steroid therapy.*

We discuss two patients who initially presented with signs of optic neuropathy. On imaging, a skull-base tumor was noted infiltrating the area of the affected optic nerve. An excision biopsy of the tumor revealed nasopharyngeal carcinoma. Both patients were pulsed with intravenous (IV) methlyprednisolone one gm/day for three days, followed by oral steroids (one mg/kg/BW) with gradual tapering. After two weeks, both showed visual improvement and chemo- and radiation therapy commenced at this time.

In these two cases, pulse-steroid therapy did not hinder the chemo- and radiation therapy for nasopharyngeal carcinoma. Steroid therapy brought immediate visual recovery and gradual oral tapering could assist in optimizing visual outcomes for patients with compressive optic neuropathy from nasopharyngeal carcinoma.

Key words: *Optic neuropathy; nasopharyngeal carcinoma; IV pulse-steroid therapy; vision loss; skull-base tumor*

Introduction

Nasopharyngeal carcinoma (NPC) commonly affects patients from the Asian region (Southern China, Taiwan, Singapore)[1-4] and optic neuropathy is a rare initial presenting symptom of this disease.[3-7] We discuss two cases of patients who initially presented with signs of optic neuropathy. On imaging, a skull-base tumor was noted infiltrating the area of the affected optic nerve. Both patients were pulsed with IV methlyprednisolone one gm/day for three days followed by oral steroids (one mg/kg body weight) with gradual tapering over the course of two months. Approximately after the second week of steroid therapy, both patients showed visual improvement. However, the clinical course of the two patients differed after a month, as the second case was non-compliant to the steroid therapy.

A retrospective review of all cases diagnosed with NPC who initially presented with optic neuropathy at Tan Tock Seng Hospital, Singapore during the period of January 2000-January 2010 was done. All case notes with the diagnosis of both NPC and optic

*The authors have no financial interests regarding the products mentioned in this paper.

Correspondence: Karen Bulan Reyes, MD, Cardinal Santos Medical Center, 10 Wilson St, Greenhills, San Juan, Philippines 1500.
E-mail: kurr_b_reyes@yahoo.com

neuropathy were searched in the main patient database of the hospital searching through the ENT, ophthalmology and neuro-surgery services.

Only two cases fulfilled the criteria of having both diagnosis of NPC and optic neuropathy. Both cases underwent a thorough neuro-ophthalmologic examination (visual acuity, Ishihara color plates, and visual-field testing; anterior and posterior eye evaluation, extra-ocular muscle motility examination and cranial nerves assessment). In addition, skull base neuro-imaging was done to establish presence of a mass lesion in the area and excision biopsy by the ears, nose and throat (ENT) service to confirm diagnosis of NPC. Each case was reviewed for demographic data, clinical course before and after diagnosis and treatment.

Case reports

Case 1

A 57-year-old Chinese man presented a three-month history of blurred vision in the right eye with associated headaches. He also had suffered from epistaxis and left tinnitus for a year with a loss of appetite and weight loss. On examination, visual acuity (VA) was hand movements on the right eye with an afferent pupillary defect and mild inferior optic-disc swelling. The left-eye vision and optic disc were normal. However, on motility exam, there was a limitation of abduction in the left eye. Corneal sensations were decreased in both eyes. A CT-scan of the orbits and brain showed a mass with bony erosions in the skull base with extension to the pons, and a high suspicion of involvement of the right optic nerve (Fig. 1a). He was immediately referred to ENT where he underwent excision biopsy.

While awaiting the biopsy results, he was immediately started on IV pulse methylprednisolone one gram/day for three days. Histology revealed that he had an undifferentiated

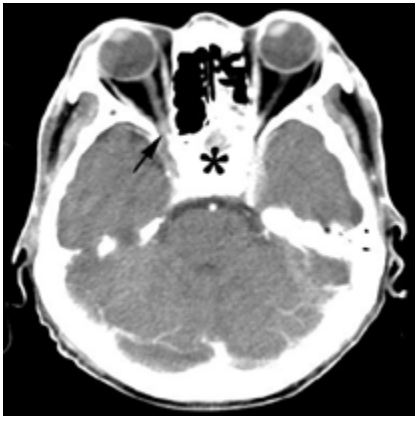


Fig. 1a. Case 1. Axial contrast-enhanced CT scan of the head showing a mass lesion at the post-nasal space with extension to the pons (asterisk). The posterior portion of the right optic nerve was thickened (arrow).

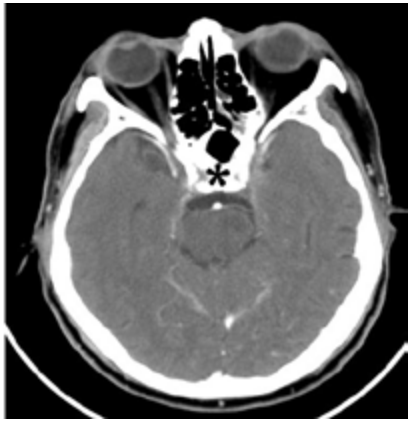


Fig. 1b. Case 1. (Two months post chemo- and radiation therapy.) Axial contrast-enhanced CT scan showing interval decrease in the primary nasopharyngeal mass with residual nasopharyngeal asymmetry, left more than right (asterisk).

carcinoma of the nasopharynx. After the intravenous therapy, his vision improved to counting fingers. He was discharged with a starting dose of oral prednisolone (one mg/kg body weight) with a gradual taper over a period of two months. By the second week of steroid therapy, his best corrected vision had improved to 6/24. At this time, the patient finally consented to radio- and chemotherapy. Three months later, after the completion of his steroid-, radio- and chemotherapy, the patient's best corrected vision in the right eye improved to 6/9. The left eye was stable, although with the limitation of abduction. A repeat CT-scan of the head reported an interval decrease in size with a residual nasopharyngeal asymmetry with the left side greater than the right (Fig. 1b).

Case 2

A 57-year-old Chinese man complained of a two to three months' history of blurred vision in the left eye. He had a history of hypertension. No other symptoms were noted.

On examination, the VA was light perception of the left eye with an afferent pupillary defect, and a slight optic disc elevation. The right eye vision and discs were normal. Motility exam and other cranial nerves were intact. An MRI of the brain revealed a large infiltrative mass at the left skull base with a thickening of the left nasopharyngeal soft tissue with significant infiltrative involvement of the surrounding structures, especially in the left orbital apex, sphenoid and ethmoid sinuses (Fig. 2a). He was immediately referred to the ENT for an excision biopsy.

While waiting for the biopsy results, he was pulsed with IV methylprednisolone one gm/day for three days and slowly tapered with oral prednisolone (starting with one mg/kg body weight) over two months. The biopsy revealed undifferentiated nasopharyngeal carcinoma. On the third day of IV steroids, his best corrected vision improved to 6/45. He was discharged with an oral steroid taper starting with a dose of one mg/kg/day. By the second week of the steroid therapy, his best corrected vision remained at 6/45. The patient was able to identify 11 of the Ishihara color plates. At this point, his chemo- and radiation therapy started. One month later, the vision in the left eye dropped to counting fingers. The patient was now in his second session of chemotherapy. However, it was found that he had stopped his oral steroids for a month due to financial constraints. Once again he was pulsed with IV methylprednisolone one gm/day for three days with a gradual taper of oral steroids. However, the vision in his left eye remained at counting fingers and an optic disc pallor was noted. Two months later, even after the completion of the

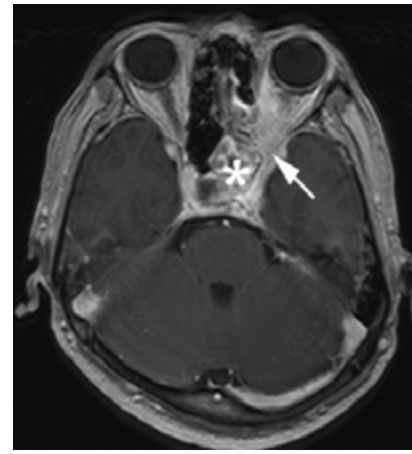


Fig. 2a. Case 2. Axial contrast-enhanced T1-weighted MRI scan of the brain showing a heterogeneously enhancing mass at the left basal skull. The extensive left ethmoid and sphenoid sinus opacification and soft tissue is suggestive of breaching and infiltration of the mass (asterisk). The infiltrative mass was noted to have significantly encroached the left orbital apex likely compressing the left optic nerve at this point (arrow).

chemo- and radiation therapy and a positive reduction of the tumor size seen through the MRI scan with no signs of tumor progression or crowding in the area of the orbital apex (Fig. 2b), the vision in his left eye did not show any improvement.

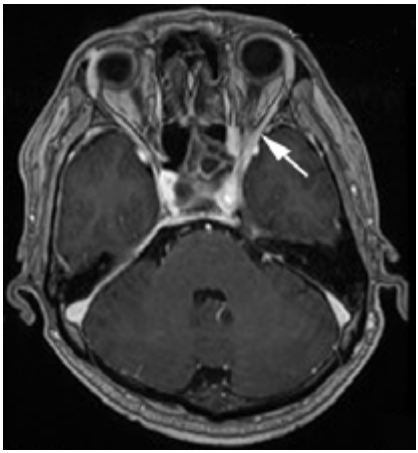


Fig. 2b. Case 2. (Two months post chemo- and radiation therapy.) Axial contrast-enhanced T1-weighted MRI scan of the brain showing that the left nasopharyngeal mass has lessened in bulkiness. There was no tumor progression or crowding of the orbital apex (arrow); its current extent was grossly similar to the prior scan.

Discussion

The ophthalmologist has two main goals when managing patients with optic neuropathy: identifying the cause of the disease and treating the visual loss. Hence, imaging becomes integral, especially in this region where the occurrence of tumors like NPC is well-documented.[1-4] Pulse-steroid therapy has been known to relieve optic neuropathy that is inflammatory or compressive in nature.[5-7] In both reported cases, imaging results show infiltration in the area near the optic nerve.

It is rare for NPC to initially present as optic neuropathy. Previous reports showed that NPC patients who presented with optic neuropathy were initially diagnosed with optic neuritis, and additional improvement of vision was noted after chemo- and/or radiation therapy.[4-7]

Some authors theorized that methylprednisolone reduces the compressive effects of a tumor by reducing tissue edema, resulting in the immediate visual improvement of the patient. Staying on course with the appropriate chemo- and radiation therapy helps reduce the main tumor which further improves the visual function.[7] The debulking effect of chemo- and radiation therapy would, at the earliest, be noted one week after the initial treatment. Maintaining the patient on oral steroids while undergoing chemo- and radiation therapy may provide an adjunctive effect in reducing the compressive effects of the tumor. Although some reports state that optic neuropathy can result from the paraneoplastic effect of NPC, especially in cases where imaging did not show signs of infiltration[5] at the orbital apex or the areas near the optic nerve, pulse-steroid therapy can still improve vision as the steroid therapy can temporarily treat the inflammation of the paraneoplastic effect. In our two cases, the neuro-imaging studies revealed that the effect is mainly compressive due to its close proximity rather than a paraneoplastic

effect.

In our reported cases, IV pulse methylprednisolone offered immediate visual improvement. There was a close temporal relationship between the use of steroids and visual improvement in both cases. It is the authors' preference to initially treat with IV pulse steroids over oral steroids alone. Since optic neuropathy due to NPC is very rare, the authors are unable to ascertain whether the efficacy of IV pulse steroids is better than oral steroids alone. A further study is needed to investigate this.

To optimize visual results, apart from primarily treating the NPC with the appropriate chemo- and radiation therapy, initial pulse intravenous methylprednisolone therapy followed by a gradual oral taper of steroid is paramount in controlling the inflammation/edema which is causing the optic neuropathy while stopping the steroids abruptly can lead to a recurrence of visual loss, as seen in case 2.

IV pulse steroids with a gradual oral taper can offer immediate visual relief for patients with compressive optic neuropathy due to NPC, whilst awaiting chemo- and radiation therapy. This treatment regimen did not hinder nor compromise the primary therapeutic regimen of chemo- and radiation therapy, as seen in these two cases.

Acknowledgement

Arneil U. Ang, MD, FPROS.

References

1. Hughes PJ, Scott PM, Kew J, Cheung DM, Leung SF, Ahuja AT, van Hasselt CA. Dysphagia in treated nasopharyngeal cancer. Head Neck 2000;22:393-397.
2. Witte MC, Neel III HB. Nasopharyngeal Cancer. Baltimore: Lippincott-Raven; 1998:1637-1652.
3. Park KA, Oh SY. Nasopharyngeal carcinoma presenting with rapidly progressive severe binocular optic neuropathy and periocular pain in a young man. J Neuro-Ophthalmol 2010;30:1-3.
4. Tsai CC, Ho HC, Kau HC, Kao SC, HSU WM. Optic neuritis: a rare manifestation of nasopharyngeal carcinoma. Eye 2002;16:501-503.
5. Hoh ST, Teh M, Chew SJ. Paraneoplastic optic neuropathy in nasopharyngeal carcinoma – report of a case. Singapore Med J 1991;32:170-173.
6. Prasad U, Doraisamy S. Optic nerve involvement in nasopharyngeal carcinoma. Eur J Surg Oncol 1991;17:536-540.
7. Puri P, Puri S, Pepper I. Optic neuritis: a rare manifestation of nasopharyngeal carcinoma. Eye 2004;18:110.

Asian J Ophthalmol. 2013;2:57-61

Late post-operative endophthalmitis in a non-diabetic patient with urinary tract infection due to Candida albicans

M. Jayahar Bharathi, R. Ramakrishnan, C. Shivakumar
Department of Microbiology & Molecular Biology, Aravind Eye Hospital & PG Institute of Ophthalmology, Tirunelveli, Tamil Nadu, India

Abstract: *A 56-year-old women presented with redness, pain and diminution of vision in the right eye for the past month after having undergone cataract surgery six months earlier by phacoemulsification with implantation of a posterior chamber intraocular lens. No history of trauma, systemic or any ocular surface diseases were recorded. She had symptoms of photophobia and floaters. B-scan ultrasonography in the right eye demonstrated membrane echoes that were suggestive of endophthalmitis supported with thickened retinal choroid sclera complex. The intra-vitreal aspirate and urine specimen revealed presence of yeast-like fungus under direct microscopy and culture, while the blood, sputum and vaginal swab samples proved negative. Microbiological evaluation of ocular and other clinical specimens clearly confirmed that the source of infection could be attributed to the urinary tract being infected with C. albicans which could have arisen from contamination. This report fortifies the possible risk of urinary tract infection as a causative agent in post-operative endophthalmitis.*

Key words: *Post-operative endophthalmitis, Candida albicans, urinary tract infection, risk of post-cataract endophthalmitis*

Introduction

Post-operative infectious endophthalmitis is one of the most devastating complications that can be encountered after any intraocular procedure, especially after a cataract surgery.[1,2] The incidence, risk factors, prophylaxis, and management of endophthalmitis have been widely reported in ophthalmic literature.[1-3] The ocular surface and adnexa acts as primary source for infectious agents in culture-positive cases of post-operative endophthalmitis.[4] Many studies have demonstrated the predominance of bacteria as a cause of post-cataract surgical endophthalmitis, while fungal pathogens causing post-operative endophthalmitis are rare.[1-3] The yeast-like fungus *Candida albicans* has been reported as one of the common causes in endogenous endophthalmitis;[3] endophthalmitis due to *C. albicans* of exogenous origin six months after the cataract surgery without any hematogenous dissemination in an immunologically healthy patient is rare. This case is analyzed in this report.

Correspondence: Dr. M. Jayahar Bharathi, Department of Microbiology & Molecular Biology, Aravind Eye Hospital & PG Institute of Ophthalmology, Tirunelveli, Tamil Nadu, India 627 001. E-mail: jayahar@tvl.aravind.org

Case report

A 56-year-old women presented with redness, pain, watering and diminution of vision in her right eye for the past month. Six months earlier, she had undergone an uncomplicated cataract surgery by phacoemulsification with implantation of a posterior chamber intraocular lens. There was no history of trauma, diabetes, hypertension, cardiac diseases or any ocular surface diseases. She had symptoms of photophobia and floaters. On examination, the best corrected visual acuity (VA) was 20/600 in the operated eye (right) and 20/30 in the left eye. She had been using ofloxacin eye drops six times a day at the time of presentation. Slit-lamp biomicroscopic examination revealed grayish white exudates (10 mm x 6 mm) in the inner lip of the corneal section and in the papillary area (4 mm x 3 mm) of the anterior chamber adherent to the corneal endothelium of the right eye. Incidence of associated corneal edema, severe anterior chamber reaction and hypopyon (0.5 mm) were recorded. Aqueous flares and cells were both 3+. Severe circumcorneal congestion was noted. Intraocular pressure was 20 and 18 mmHg in the right and left eye respectively. Fundus details were obscured partially due to corneal edema and anterior chamber reaction, but appeared with the absence of red reflex. The chest X-ray was normal with the blood sugar level touching 75.0 mg/dl during fasting and 98.0 mg/dl postprandially.

B-scan ultra-sonography demonstrated membrane echoes suggestive of endophthalmitis that were supported with thickened retinal choroid sclera complex. A clinical diagnosis of the post-operative endophthalmitis was made and aqueous humor (AH) was aspirated, and intraocular antibiotic injections of vancomycin (1 mg/0.1 ml) and amikacin (400 µgm/0.1 ml) were given. The microbiological analysis of the AH showed negative for presence of any microbes. The patient was treated with 0.3% ciprofloxacin eye drops hourly and 1% cyclopentolate eye drops three times a day. Oral ciprofloxacin 750 mg twice a day, and oral prednisolone 70 mg/day (1 mg/kg) were also administered. The left eye was normal. Based on the typical clinical findings of infectious endophthalmitis, IOL removal (due to the instability of the IOL) and core vitrectomy were performed along with repeated aspiration of the AH. The confirmatory diagnosis of infectious endophthalmitis was established by the microbiological evaluation of AH and vitreous fluid (VF), which were collected by using standard techniques. The part of the collected intraocular aspirates were immediately inoculated into the blood agar, chocolate agar, Sabouraud's dextrose agar and

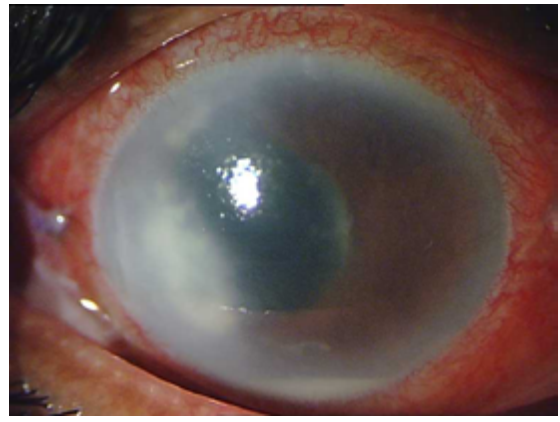


Fig. 1. Slit-lamp biomicroscopic photograph showing an inflamed eye with grayish white exudates (10 mm x 6 mm) extending from the inner lip of the corneal section extending up to the papillary zone (4 mm x 3 mm) associated with hypopyon (0.5 mm) and vitreous exudates.

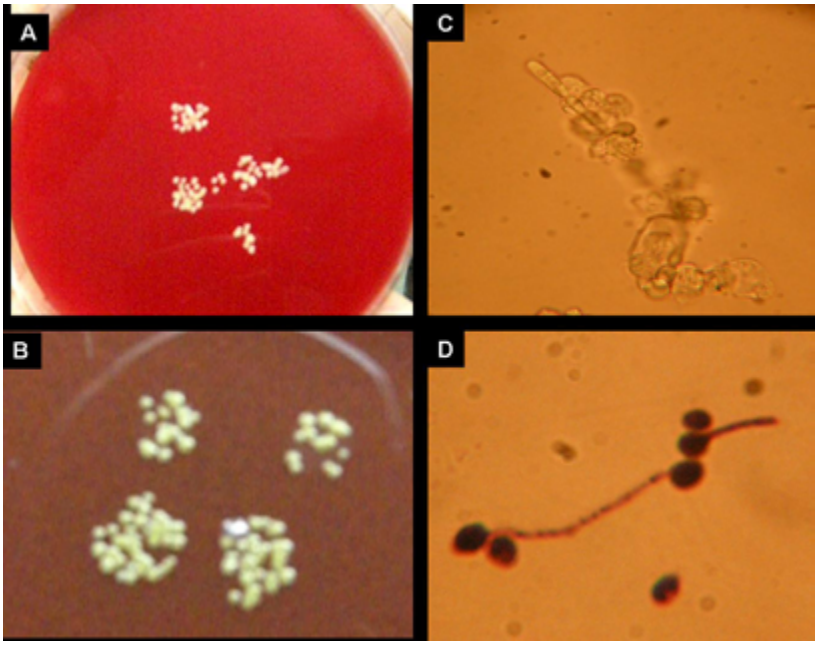


Fig. 2.
A. Candida albicans colonies at the inoculated sites on the blood agar plate inoculated with intra-vitreal aspirate.
B. Candida albicans colonies at the inoculated sites on the chocolate agar plate inoculated with intra-vitreal aspirate.
C. Vitreous aspirates mounted with 10% potassium hydroxide solution showing long pseudohyphae along with clusters of spherical shaped blastoconidia at the septa of a yeast-like organism.
D. Vitreous aspirate stained with the Gram-staining technique, showing long pseudohyphae along with clusters of spherical shaped blastoconidia at the septa of a yeast-like organism.

also into the liquid media- thioglycolate medium and brain-heart infusion broth in the operating room.[5] The remaining part of the intraocular aspirates were smeared for 10% KOH wet mounting and Gram-staining procedures.[5] In the early morning mid-stream urine, vaginal swab, sputum and blood specimens were collected and subjected to microbiological analysis using standard protocols.[6,7] The inoculated plates for bacterial isolation were incubated both aerobically and anaerobically, while the fungal Sabouraud's dextrose agar plates were incubated under biochemical oxygen demand. The 10% KOH wet mounting and gram-stained smear of AH, VF and urine specimen were found to be positive for a yeast-like fungus. Similarly, the culture of AH, VF and urine specimen were also found to be positive for (significant) *Candida albicans* growth. The blood specimen showed no growth, while the sputum specimen was negative for the growth of *Candida* species even after seven days after the incubation. Standardized microbiological evaluation protocols were followed for ocular and non-ocular clinical specimens.[5-7] The pathological analysis of peripheral blood smear showed a normal blood picture and no evidence for immuno-competency disorders or parasitic

infections. After the yeast-like fungus (*Candida* sp.) was seen in smears of AH and VF without the presence of bacteria, the treatment regimen was changed to intra-vitreal voriconazole twice and topical 0.15% amphotericin B and 1% voriconazole topically on an hourly basis. In spite of intensive antifungal therapy, the vision in that eye could not be restored, resulting in phthisis.

Discussion

The microbial etiology of endophthalmitis varies with geographical location and also from person to person depending on the microbial flora at the ocular surface.[1-3] The most common infecting organism of the post-operative endophthalmitis following cataract extraction are the coagulase-negative *Staphylococcus* species.[1,2,3] Gram-negative bacteria and anaerobes are much less frequent causative agents.[1-3] A review of the literature showed that fungal endophthalmitis is common among patients with systemic debilitating diseases, malignancy, intravenous drug use, chemotherapy, systemic antibiotics and prolonged corticosteroids therapy, alcoholism and diabetes.[8] However, filamentous fungi are also frequently encountered among traumatic endophthalmitis and endophthalmitis due to fungal keratitis, while the yeast-like fungi *Candida* species are common among endogenous endophthalmitis in cases with candidemia.[9] *Candida* endophthalmitis and disseminated candidiasis usually occurs in patients with parental drug abuse and in severely ill patients whose immune mechanisms have got altered.

Candida species are part of the human flora; they exist commensally. When the immune system is compromised, these organisms become potentially pathogenic.[8-10] In the present case, endophthalmitis occurred six months after the post-operative period due to *C. albicans* which was recovered from two of the four cultured specimens, viz., vitreous aspiration and urine. Blood culture was negative and hence the evidence for candidemia or hematogenous dissemination of *Candida* to the eye was eliminated. Higher rates of positive urine cultures have been reported in candidemia and immuno-compromised cases.[8] It is construed from the study that the risk of developing endophthamitis could arise from urinary tract infections harboring *C. albicans* which could be ascribed to contamination through improperly cleaned after urination, or unclean hands, that might have acted as potent carriers. The continuous contact of the operated eye and its adnexal structures with the contaminated hands carrying *C. albicans* could be the primary cause of eye infection in our case. This report documents and fortifies the risk of urinary tract infection as a causative agent in post-operative endophthalmitis.

References

1. Lemley CA, Han DP. Endophthalmitis: A review of current evaluation and management. Retina 2007;27:662-680.
2. Ramakrishnan R, Bharathi MJ, Shivkumar C, Mittal S, Meenakshi R, Khadeer MA, et al. Microbiological profile of culture-proven cases of exogenous and endogenous endophthalmitis: a 10-year retrospective study. Eye 2009;23:943-956.
3. Kresloff MS, Castellarin AA, Zarbin MA. Endophthalmitis. Surv Ophthalmol 1998;43:193-224.
4. Speaker MG, Milch FA, Shaf MK, Eisner W, Kreiswirth BN. Role of external bacterial flora in the pathogensis of acute postoperative endophthalmitis. Ophthalmology 1991;98:639-649.

5. Wilhelmus KR, Liesegang TJ, Osato MS, Jones DB. Cumulative Techniques and Procedures in Clinical Microbiology 13A, Laboratory Diagnosis of Ocular Infections. Washington DC: American Society for Microbiology, 1994.
6. Clarridge J, Johnson JR, Pezzlo M. Cumulative Techniques and Procedures in Clinical Microbiology 2B, Laboratory Diagnosis of Urinary Tract Infections. Washington DC: American Society for Microbiology, 1998.
7. Dunne WM, Nolte FS, Wilson M. Cumulative Techniques and Procedures in Clinical Microbiology 1B. Blood Cultures III. Washington DC: American Society for Microbiology, 1997.
8. Chakrabarti A, Shivaprakash MR, Singh R, Tarai B, George VK, Fomda BA, Gupta A. Fungal endophthalmitis: Furteen years' experience from a center in India. Retina 2008;28:1400-1407.
9. Donahue SP, Craig MG, Zuravleff JJ, Eller AW, Nguyen MH, Peacock JE Jr, et al. Intraocular candidiasis in patients with candidemia. Clinical implications derived from a prospective multicenter study. Ophthalmology 1994;101:1302-1309.
10. Rensch F, Schlichtenbrede FC, Jonas JB. Postoperative mycotic endophthalmitis. J Cataract Refract Surg 2010;36:1233-1234.

Asian J Ophthalmol. 2013;2:62-64

Cavernous haemangioma of the retina

Jed Lusthaus,[1] James Wong,[1,2] Greg Horowitz[1]
[1]*Sydney Eye Hospital, Sydney, Australia;*
[2]*Sydney Retina Clinic and Day Surgery, Sydney, Australia*

Abstract: *A 29-year-old man was found to have an incidental finding of peripheral cavernous haemangioma of the retina (CHR). Fundus examination revealed peripheral retinopathy with fine haemorrhage. Traditional appearance of CHR was demonstrated by fluorescein angiography. OCT showed the saccular appearance with an overlying epiretinal membrane, consistent with CHR. All other investigations were negative and there was no suggestion of systemic dermatological or neurological involvement.*
CHR is a rare and usually incidental finding associated with a small risk of associated systemic vascular and neurological involvement. We have demonstrated the fundal and OCT appeaance of peripheral CHR, which is an important clinical and diagnostic finding.

Key words: *Cavernous haemangioma of the retina, spectral-domain optical coherence tomography, time-domain optical coherence tomography, fluorescein angiography, phacomatosis*

Introduction

Cavernous haemangioma of the retina (CHR) is a congenital, unilateral vascular hamartoma[1] initially described by Niccol and Moore in 1934,[2] but later expressed as a separate clinical entity by Gass.[2,3]

Spectral-domain optical coherence tomography (SD-OCT) was compared with time-domain OCT (TD-OCT) to diagnose the following case of CHR, which is a rare condition and can be associated with vascular lesions in the central nervous system (CNS).

Case report

A twenty-nine year old man presented with one year of deteriorating vision in his left eye. Refraction indicated myopia and astigmatism, with left eye vision correcting from 6/36 to 6/6. Slit lamp examination and intraocular pressures were unremarkable.

Dilated fundus examination revealed fine striae at the left posterior pole, consistent with premacular fibrosis. In addition a vascular abnormality was noted in the left retinal periphery, inferior to the optic disc (Fig. 1). Initially it appeared to be a clump of fine haemorrhage with white patches, but on review was appreciated to be a typical cavernous haemangioma:

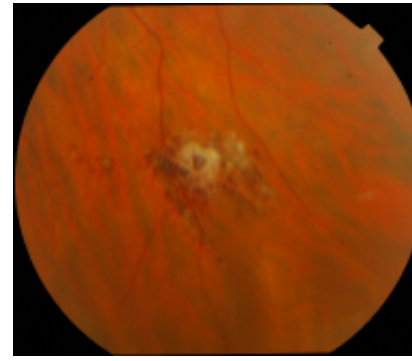


Fig. 1. Peripheral colour fundus photograph of cavernous hemangioma of the retina demonstrating whitish glial tissue overlying 'cluster of grapes' saccular aneurysms.

Correspondence: Dr Greg Horowitz, Maroubra Eye Clinic, 102 Gale Rd, Maroubra, NSW 2035. E-mail: gghoro@bigpond.net.au

a cluster of saccular aneurysms resembling 'a bunch of grapes'. There was a prominent white fibrous component, but no exudate.

Combined Heidelberg Spectralis HRA with SD-OCT demonstrated the aneurysms with simultaneous fluorescein angiogram and illustrated peripheral saccular retinal lesions with overlying epiretinal membrane (ERM) (Fig. 2a). An image for comparison can also be seen with Zeiss Stratus TD-OCT (Fig. 2b).

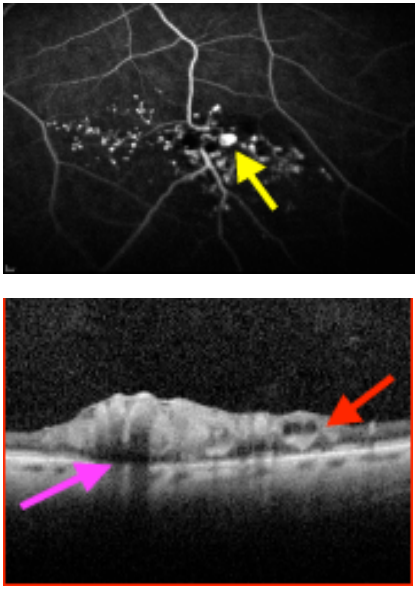


Fig. 2. Comparison of spectral-domain OCT with simultaneous fluorescein angiography demonstrating dilated saccules (a) and time-domain OCT (b) over cavernous hemangioma showing mostly solid lesion with overlying epiretinal membrane, dilated saccule (red arrow) and optically-empty subretinal space (pink arrow)

The patient did not have any subcutaneous vascular lesions or CNS lesions confirmed on MRI. The decreased vision was attributed to his refractive error, so that the left premacular fibrosis and left retinal cavernous haemangioma were essentially incidental findings.

The patient has been followed for twelve months with no change in his vision or appearance of his left macula.

Discussion

Cavernous haemangioma of the retina or optic nerve head is a rare, congenital vascular hamartoma.[1,2] It is usually unilateral and sporadic, but occasionally can be inherited as autosomal dominant and in this situation it is more likely to be bilateral and have systemic associations.[1-4] In our patient the vascular lesion was found incidentally, as is often the case. It had a typical appearance, but there was one of the uncommon complications, namely premacular fibrosis (the other, also uncommon complication is vitreous haemorrhage).[5]

Aside from the possibility of developing vitreous haemorrhage there are few clinically important associations with CHR, namely the systemic vascular abnormalities of the brain and skin.[2,5] The presence of neurological involvement with cutaneous and

retinal haemangiomas constitutes a rare autosomal dominant phacomatosis, known as cavernoma multiplex[4] or Weskamp-Cotlier syndrome. Although there is no suggestion of familial disease in our case, it is important to be mindful of this connection. Since most eyes with CHR have good visual acuity, treatment is only indicated when vision is impaired by recurrent vitreous haemorrhage, or premacular fibrosis.

OCT is a useful, non-invasive diagnostic tool that allows *in-vivo* optical dissection of retinal and choroidal layers. TD-OCT images have only recently been reported in one case of CHR.[5] Like this case, we found a mostly solid lesion with overlying epiretinal membrane. The haemangioma was confined to the inner retina as the RPE interface appeared to be intact. It has been suggested that traction of this epiretinal membrane can rarely cause vitreous haemorrhage.[5] We report additional findings of dilated saccules and an optically-empty subretinal space below the main lesion complex (Fig. 2). Our findings correlate with the reported histopathological appearance of glial tissue and thin-walled, endothelial-lined vascular channels.[5] SD-OCT has not previously been documented in the literature, but provides a clearer and more detailed evaluation of the retina compared to TD-OCT.

In summary, CHR has a very distinctive ophthalmic appearance. When diagnosed, patients should have neuro-imaging to exclude an associated vascular abnormality of the brain.

References

1. Messmer E, Laqua H, and Wessing A. Nine cases of cavernous hemangioma of the retina. Am J Ophthalmol 1983;95:383-390.
2. Hewick S, Lois N, and Olson JA. Circumferential peripheral retinal cavernous hemangioma. Arch Ophthalmol 2004;122:1557-1560.
3. Gass JD. Cavernous hemangioma of the retina. A neuro-oculo-cutaneous syndrome. Am J Ophthalmol 1971;71(4):799-814.
4. Sarraf D, Payne AM, and Kitchen ND. Familial cavernous hemangioma. Arch Ophthalmol 2000;118:969-973.
5. Pringle E, Chen S, Rubenstein A, et al. Optical coherence tomography in retinal cavernous haemangioma may explain the mechanism of vitreous haemorrhage. Eye 2009;23:1242-1243.
6. Sayanagi K, Sharma S, Yamamoto T, et al. Comparison of Spectral-Domain versus Time-Domain Optical Coherence Tomography in Management of Age-Related Macular Degeneration with Ranibizumab. Ophthalmology 2009;116:947-955.

Asian J Ophthalmol. 2013;2:65-67

Detection of clinically occult parotid gland and lymph nodal metastases in a case of meibomian gland carcinoma using 18-FDG PET CT

Prathamesh Vijay Joshi, Vikram Ramchandra Lele, Rozil Gandhi
Department of Nuclear Medicine and PET-CT, Jaslok Hospital and Research Centre, Mumbai, India

Abstract: *Meibomian gland carcinoma is a rare malignancy of the eyelid. We report a case of using 18-Flurodeoxyglocose Positron Emission Tomography-Computed Tomography (18-FDG PET-CT) for the detection of metastatic disease in a 60-year-old patient with meibomian gland carcinoma.*

Key words: *18-FDG PET-CT, meibomian gland carcinoma, parotid gland, eyelid malignancy, metastasis, ocular neoplasm*

Case Report

A 60-year old gentleman, a known case of meibomian gland carcinoma, was referred to our department for a whole body 18-F-FDG PET-CT scan. Six months before, he underwent excision of left upper eyelid swelling, clinically diagnosed as chalazion. The histopathology report revealed it to be a meibomian gland carcinoma. After three months he had local recurrence and left orbital exenteration was performed. Considering the aggressive course of the malignancy, a 18-F-FDG PET-CT study was performed to assess the whole body disease status. The scan revealed increased metabolic activity in the enlarged left parotid gland (Fig. 1) and left cervical lymph node (Fig. 2). No evidence of increased metabolic activity was noted at the surgical site (Fig. 3) and the rest of the body. We reported the left parotid gland and left supraclavicular lymph node as

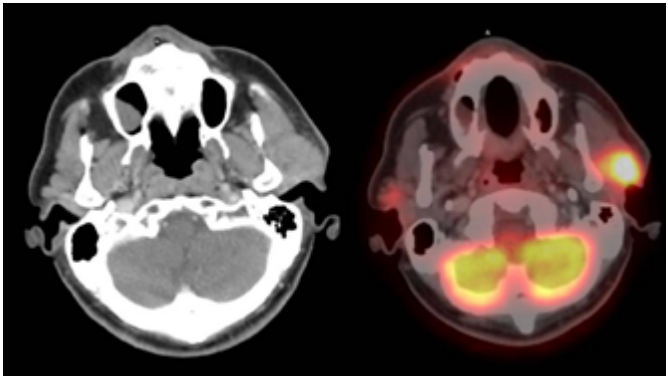


Fig. 1. CT and fusion PET-CT image showing metabolically active disease in heterogeneously enhancing enlarged left parotid gland. Standardized uptake maximum value (SUVmax) is 3.5 cm2/ml.

Correspondence: Dr Prathamesh Vijay Joshi, Department of Nuclear Medicine and PET-CT, Jaslok Hospital and Research Centre, Worli, Mumbai- 400026, India
E-mail: drprathamj@gmail.com

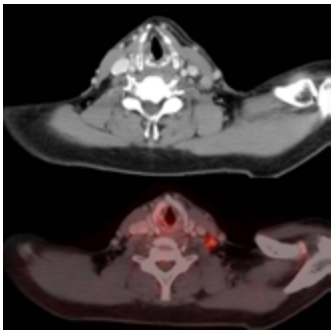


Fig. 2. CT and fusion PET-CT image showing metabolically active disease in left level IV lymph node. Standardized uptake maximum value (SUVmax) is 2.5 cm2/ml.

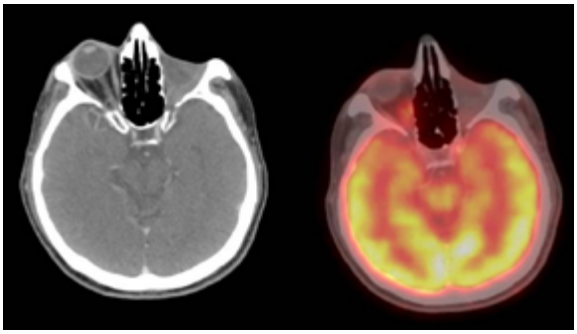


Fig. 3. CT and fusion PET-CT image showing no evidence of abnormal metabolic activity in left orbit (post surgery site). The FNAC of this region revealed no evidence of residual/ recurrent disease.

metastatic lesions. Histopathological examination of the left parotid gland and left supraclavicular gland after surgical excision confirmed metastatic meibomian gland carcinoma. Fine-needle aspiration cytology (FNAC) of the surgical site (where 18-F-FDG PET-CT did not show abnormal metabolic activity) did not reveal any residual disease.

Discussion

Cancer cells are known to show increased rates of glycolysis metabolism,[1] and for this reason a PET study using [18F] fluorodeoxyglucose, a glucose analogue, has been used for the detection of primary and metastatic tumors.[2] PET/CT, often regarded as the 'one-stop shop' for many malignancies, provides co-registered structural and metabolic images, allowing for accurate localization of sites of disease. This powerful imaging technique has minimized the suffering of a growing number of patients with serious diseases, including cancer, infection and inflammation, brain and cardiovascular disorders.[3] In our case, we report the use of this extremely sensitive technique for diagnosing metastatic disease in a patient with meibomian gland carcinoma.

Meibomian gland carcinomas of the eyelid are rare neoplasms, accounting for less than 1% of all eyelid tumors. They usually mimic chalazia and undergo repeated curettage before a definitive diagnosis is made.[4] Its an aggressive ocular neoplasm with potential for regional and distant metastasis. Early diagnosis and prompt surgical treatment can reduce mortality.[5] This tumor occurs twice as often on the upper as on the lower eyelid, which reflects predominance of meibomian glands in the upper eyelid.[6]

Secondary spread to the parotid gland is usually through the lymphatic route. Many lymph nodes are present in the pre-auricular area, on the surface and within the parotid gland, and drain superficial tissues from the scalp (including upper eyelid, as in our case) and face.[7]

Use of FDG PET in staging this aggressive malignancy has been reported in the past in a case report.[8]

Conclusion

To conclude, our case suggests 18-F-FDG PET/CT can be used in restaging meibomian gland carcinoma. By diagnosing clinically occult metastases, FDG PET/CT can contribute in better management of this aggressive malignancy.

References

1. Weber G. Enzymology of cancer cell. N Eng J Med I977;296:541-55I.
2. Hoh CK, Schiepers C, Seltzer MA, et al. PET in oncology will it replace the other modalities? Semin Nuci Med 1997;27:94-106.
3. Basu S, Alavi A, Unparalleled Contribution of 18F-FDG PET to Medicine Over 3 Decades J Nucl Med 49: 17N-37N.
4. Mashburn, MA, Chonkich GD, Chase DR. Meibomian gland adenocarcinoma of the eyelid with preauricular lymph node metastasis. Laryngoscope1985;95:1441-1443.
5. Yasumura S, Shojaku H, Wada R, et al. Usefulness of Positron Emission Tomography for Management of Ocular Sebaceous Carcinoma. Clin Nuc Med 2010;35(2):98-100
6. Dailey RA, Ng JD. Sebaceous gland carcinoma. In: Roy FH, Fraunfelder F (eds.), Roy and Fraunfelder's Current Ocular Therapy, 6th ed. 2008; 272.
7. Seenu V, Misra MC, Khazanchi RK, et al. An eyelid swelling with a parotid mass. Postgrad Med J 1997;73(856):123-125.
8. Krishna SM, Finger PT, Chin K, et al. 18-FDG PET/CT staging of ocular sebaceous cell carcinoma. Graefe's Arch Clin Exp Opthalmol 245: 359-360.

Asian J Ophthalmol. 2013;2:68-70

Subretinal crystalline lens – an unusual complication of blunt trauma

Kalpana Badami Nagaraj, Srilatha Tirumale, K.S. Sriprakash, C.S. Savitha, Chaitra Jayadev
Minto Regional Institute of Ophthalmology, Chamrajpet, Bangalore, Karnataka, India

Abstract: *We describe the case of a 65-year-old Indian male with a subretinal crystalline lens; an unusual complication of blunt trauma. The patient underwent a three port pars plana vitrectomy during which the subretinal location of the crystalline lens under the inferior giant retinal tear was confirmed. The lens was maneuvered into the vitreous cavity and appropriately managed.*

Key words: *Blunt trauma, subretinal crystalline lens*

Introduction

Posterior dislocation of the crystalline lens following blunt trauma is a well-known complication.[1] We report a case of subretinal migration of the lens through a giant retinal tear following blunt trauma. The lens was brought into the vitreous cavity and was managed appropriately. This complication has not been reported in literature so far.

Case report

A 65-year-old Indian male came with symptoms of loss of vision, pain, watering and swelling of the lids following blunt trauma to his right eye sustained two weeks before presentation. His best corrected visual acuity was perception of light in the right eye and 20/60 in the left eye. Examination of the right eye revealed lid edema, ecchymosis, subconjunctival hemorrhage, inflammatory reaction and vitreous in the anterior chamber. The crystalline lens was not present in the pupillary plane. Fundus examination of the right eye showed vitreous hemorrhage with inferior bullous retinal detachment and a suspicious giant retinal tear. The lens was not visible in the vitreous cavity. Examination of the left eye did not reveal any abnormalities. B-scan ultrasonography of the right eye confirmed an inferior retinal detachment with underlying echoes suggestive of a crystalline lens (Fig. 1).

Fig. 1. B-scan ultrasound image showing the subretinal location of the lens

A three port pars plana vitrectomy under local anesthesia was performed. A subtotal retinal detachment was noted sparing the macula with a giant retinal tear inferiorly. The subretinal location

Correspondence: Dr Kalpana Badami Nagaraj, FRCS(Glasg), FMRF, DNB, Minto Regional Institute of Ophthalmology, AV road, Chamrajpet, Bangalore – 560018, Karnataka, India.
E-mail: badamikal@gmail.com

of the crystalline lens was confirmed (Fig. 2). The lens was maneuvered through the giant retinal tear (Fig. 3) using the suction of the vitrector and endoilluminator, into the vitreous cavity (Fig. 4) and appropriately managed. The retina was reattached. At three months follow up, the patient's vision was 20/200 and the retina remained attached.

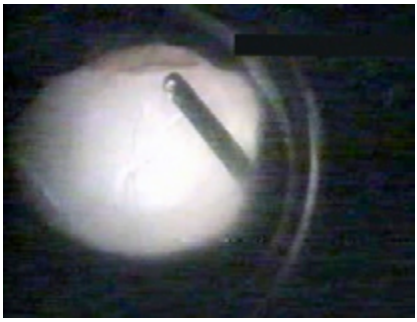


Fig. 2. Subretinal crystalline lens as seen through the inferior retinal detachment with giant retinal tear.

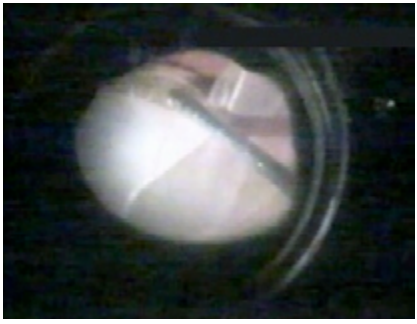


Fig. 3. Crystalline lens being maneuvered through the giant retinal tear.

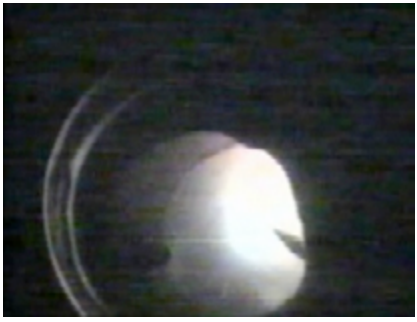


Fig. 4. Crystalline lens in the vitreous cavity.

Discussion

Blunt trauma is associated with vitreous hemorrhage, dislocation of the lens and retinal detachment.[1,2] We report subretinal migration of the crystalline lens, an unusual complication of blunt trauma and hitherto unreported.

A lens nucleus dislocated through a retinal dialysis into the subretinal space as a complication of pars plana lensectomy in one report was managed by reattaching the retina over the lens. There was subsequent slow resorption of the lens material with good visual recovery.[3] In another report, the lens had migrated subretinally during phacoemulsification and was managed by creating a retinotomy over the nucleus.[4] The mechanism for the subretinal migration of the crystalline lens in our case could be the impact of the trauma producing dislocation of the lens and the giant retinal tear simultaneously. The lens movement into the subretinal space may have been influenced by the direction of the impact, gravity and/or vitreous adhesions. Following trauma, B-scan ultrasonography aids in diagnosing the nature and extent of the injury.[5] We managed the subretinal lens by maneuvering it through the tear into the vitreous cavity. Management options might vary depending on the location and status (clear or cataractous

and extent of cataract) of the lens in addition to the associated retinal pathology.[6-9] Subretinal migration of crystalline lens is an unusual complication following blunt trauma. However, timely and effective intervention can ensure good visual recovery.

References

1. Williams DF, Mieler WF, Williams GA. Posterior segment manifestations of ocular trauma. Retina 1990;10 Suppl 1:S35-44.
2. Steinberg DA, Leslie CL. Traumatic dislocation of the crystalline lens. J Trauma 2005;58(1):213-214.
3. Lawrence B. Katzen, MD, Gerald D. Rogell, MD. Subretinal Lens An Unusual Complication of Pars Plana Lensectomy. Arch Ophthalmol 1981;99:1396-1397.
4. Rani A, Pal N, Vohra R, Mandal S, Azad R. Subretinal dislocation of the crystalline lens: Unusual complication of phacoemulsification. J Cataract Refract Surg 2005;31(9):1843-1844.
5. Aironi VD, Gandage SG. Pictorial essay: B-scan ultrasonography in ocular abnormalities. Indian J Radiol Imaging 2009;19(2):109-115.
6. Seo MS, Yoon KC, Lee CH. Phacofragmentation for the treatment of a completely posterior dislocation of total crystalline lens. Korean J Ophthalmol 2002;16(1):32-36.
7. Yao K, Shentu X, Jiang J, Du X. Phacofragmentation without perfluorocarbon liquid for dislocated crystalline lenses or lens fragments after phacoemulsification. Eur J Ophthalmol 2002;12(3):200-204.
8. Oh J, Smiddy WE. Pars plana lensectomy combined with pars plana vitrectomy for dislocated cataract. J Cataract Refract Surg 2010;36(7):1189-1194.
9. Dickinson PJ, Greven CM. Avoiding and managing the dislocated crystalline lens. Compr Ophthalmol Update 2006;7(3):113-127.

Asian J Ophthalmol. 2013;2:71-72

Ong eye speculum for glaucoma surgery

Keith Ong
University of Sydney, Australia; Royal North Shore Hospital, Australia; Dalcross Adventist Hospital, Australia; and Ryde Hospital, Australia

In glaucoma surgery such as trabeculectomy, access to the superior sclera, conjunctiva and limbus is required. This can be a challenge in patients with small palpebral fissures. A superior rectus bridle suture or more commonly a traction suture through the superior peripheral cornea is used to rotate the eye to look down, thus exposing the superior sclera. Although the superior corneal traction suture causes minimal trauma, it may contribute to mild inflammation and can leave a small scar in the superior cornea.

The Ong eye speculum has a larger inferior inner blade of 12-15 mm compared to the standard speculum inner blades of about 5 mm (Fig. 1). The larger inferior blade pushes on the inferior conjunctival fornix and hence rotates the eyeball down (Fig. 2).

Fig. 1. Ong Speculum for the right eye.

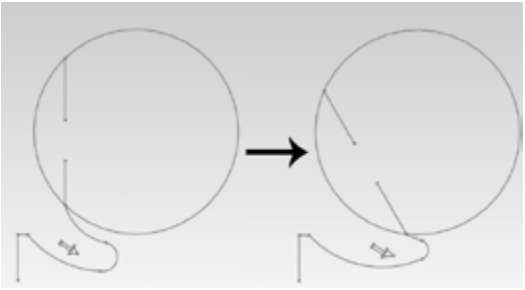


Fig. 2. Pushing on the inferior conjunctival fornix turns the eye down.

The inferior conjunctival fornix is 8-10 mm from the limbus[1], and with the inferior blade being 12-15 mm, it would rotate the eye down five to seven mm, which in most cases would provide adequate exposure of the superior conjunctiva/sclera.

The superior arm has the standard five-mm size anterior and posterior blades to cradle the eyelid margin. The inferior arm has a five-mm anterior blade; and the posterior blade has a five-mm section to cradle the lid margin, and an inferior section of seven to ten 10 mm which is angled and curved posteriorly to push on the inferior fornix. This bend and curve prevents the tip of inferior blade of the speculum from impinging on the orbital floor and indenting the cornea-sclera; and also helps rotate the globe in the desired direction by pushing on the inferior conjunctival fornix. These two sections make up the 12-15 mm inferior posterior blade.

This new eye speculum design facilitates exposure of the superior sclera and limbus

Correspondence: Keith Ong, 2 Railway Avenue, Eastwood NSW 2122, Australia
E-mail: keith.ong@sydney.edu.au

by rotating the eyeball to look down, without the need for a traction suture through the superior peripheral cornea, when doing trabeculectomy. It is also useful when doing procedures such as needling of filtration bleb and subconjunctival 5-Fluorouracil injections in which exposure of the superior conjunctiva is required. When there is akinesia of the globe after peribulbar, retrobulbar or subtenon's local anaesthetic, this speculum is useful as the patient is not able to voluntarily infraduct the eye.

The initial design was an open-wire eye speculum based on the Kratz-Barraquer design. The Ong speculum is now manufactured with the Lieberman speculum adjustable mechanism. This improves the functionality of the Ong speculum as it enables the amount of infraduction to be varied. The eye can be in primary position when the speculum is semi-open (Fig. 3). When the speculum is in open position, the inferior blade pushes on the inferior fornix and infraducts the eye (Fig. 4).

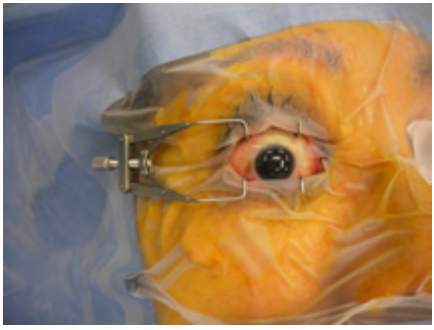


Fig. 3. Ong Speculum semi-open – eye in primary position.

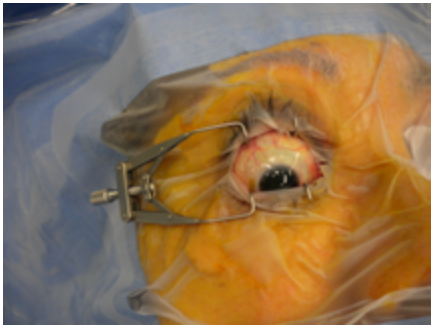


Fig. 4. Ong Speculum in open position – eye rotates down.

A range of sizes would enable the desired amount of infraduction to be achieved. The small Ong speculum is suitable for most trabeculectomy cases, and the large Ong speculum is useful when more infraduction is required, such as in glaucoma seton surgery. The small speculum may also be more appropriate for the smaller fornix of the oriental eye, while the larger speculum may suit the more capacious fornix of the Caucasian eye.

A full descriptive name of this eye speculum design would be Ong-Lieberman eye speculum. The Ong eye speculum is a descriptive nomenclature for an eye speculum with a larger inferior blade which pushes on the inferior conjunctival fornix to rotate the eyeball down.

The Ong Eye Speculum is manufactured by Amann Ophthalmic Instruments (Germany), and available through Designs for Vision (Australia). The catalogue numbers are E10460-50 (large left) and E10461-50 (large right), and E10460-40 (small left) and E10461-40 (small right). The author-designer has no financial interest in the product.

References

1. Wolff's Anatomy of the Eye and Orbit. 8th Ed. London: Chapman and Hall, London 1997; p. 52.

Asian J Ophthalmol. 2013;2:73-75

Contact-lens related keratitis caused by an atypical organism

Vanitha Ratnalingam, Pooi Yee Thean, Shamala Retnasabapathy, Chandramalar Santhirathelaga
Ophthalmology Department, Sungai Buloh Hospital, Selangor, Malaysia

Abstract: *This is a case report of contact-lens related, infectious keratitis with a subsequent perforation. A tectonic penetrating keratoplasty was performed and Sphingomonas paucimobilis was cultured from the corneal button. One week post surgery, the patient developed a re-infection involving the donor button. This was treated based on culture and sensitivity of the corneal button and the infection resolved. Two months post surgery, the patient's vision was counting fingers in the affected eye. The corneal infection had completely resolved, but the graft had failed despite the use of topical steroids.*

Key words: *Sphingomonas paucimobilis, corneal ulcer, contact lens, keratitis, atypical organism*

Case report

A 41-year-old Malaysian woman was referred to our centre for a left eye contact-lens related corneal ulcer. She was initially treated at a district hospital, where Stenotrophomonas maltophilia was cultured from her contact lens casing and solution.

At presentation, her vision was hand movement in the affected eye. There was a central corneal ulcer measuring 4 x 3.4 mm with an area of thinning centrally. There were satellite lesions within the corneal stroma and a hypopyon measuring less than 1 mm. Corneal sensation was reduced.

She was treated with ceftazidime and fortified gentamicin drops. However, as her condition continued to deteriorate, topical antifungals, amphotericin B drops and fluconazole drops were commenced. Six weeks after presentation, she developed a central corneal perforation.

A tectonic penetrating keratoplasty was carried out after which intensive topical antibiotics and antifungals were continued. The excised corneal button culture was positive for Sphingomonas paucimobilis which was sensitive to ciprofloxacin, gentamicin and augmentin. The histopathological examination showed no fungal elements.

One week post-operatively, the patient developed a recurrent corneal ulcer involving the donor button at 6 o'clock position (Fig. 1). Based on the sensitivity of the previously excised corneal button,

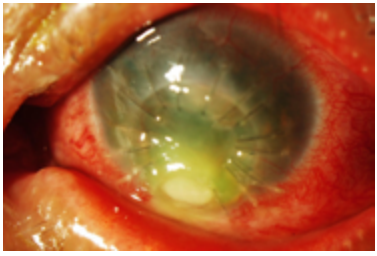


Fig. 1. Recurrence of infection day 7 post penetrating keratoplasty.

Correspondence: Vanitha Ratnalingam, Opthalmology Department, Sungai Buloh Hospital, Jalan Hospital, 97000 Selangor, Malaysia
E-mail: v_ratnalingam@yahoo.com

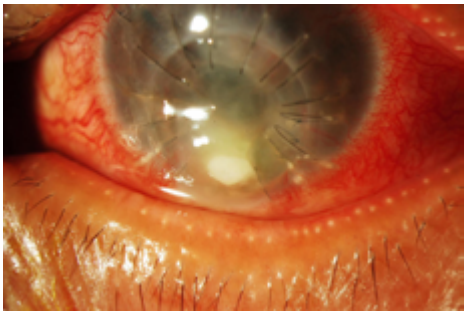


Fig. 2. Good response of infection to topical ciprofloxacin noted within 48 hours.

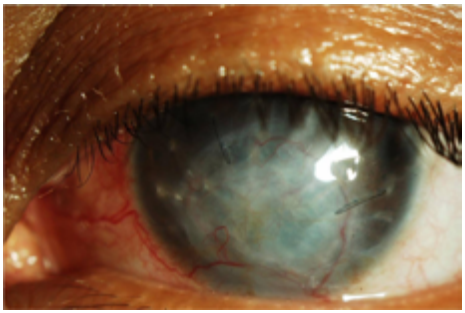


Fig. 3. Three months post surgery; healed corneal ulcer.

the patient was treated with ciprofloxacin and fortified gentamicin drops. The infection responded and resolved completely (Fig. 2). At her last visit there was no infection, but her corneal graft had failed despite the administration of topical steroids.

Discussion

Sphingomonas paucimobilis is an aerobic, non-fermenting, oxidase and catalase-positive, gram-negative bacillus. It was first reported in 1977 and named Pseudomonas paucimobilis.[1] However, based on phylogenetic data, it was later renamed under the genus Sphingomonas.[2]

Unlike Pseudomonas aeruginosa, which is more virulent and a notorious cause of contact-lens keratitis,[3,4] Sphingomonas paucimobilis has low virulence and is rarely isolated from human materials, just like many non-fermentative bacilli. This is due to the absence of a lipopolysaccharide outer core, which has been replaced by glycosphingolipids.[5] A pubmed search revealed only two case reports of ocular infections with Sphingomonas paucimobilis. Both were cases of postoperative endophthalmitis.[6,7] There have been no reported cases of Sphingomonas paucimobilis keratitis.

Following surgery in our patient, cultures of the infected corneal button grew Sphingomonas paucimobilis. One week postoperatively, the patient developed a recurrence of the infection along the inferior rim of the donor button which was successfully treated with ciprofloxacin and gentamicin based on the disc susceptibility. Apart from our culture and sensitivity findings, the referring district hospital reported indirect evidence of a possible infection with Stenotrophomonas maltophilia based on cultures of the patient's contact lens solution and contact lens casing. While we cannot rule out co-infections with two atypical organisms, we were unable to re-confirm results from the first culture as the specimens were no longer available.

Both these organisms are very similar and known to colonize fluids including irrigation solutions. Sphingomonas paucimobilis is a non-fermentating, oxidase- and catalase-positive bacillus, unlike Stenotrophomonas maltophilia which is a catalase-positive, oxidase-negative bacillus and has positive reaction for extracellular DNase. Our findings were confirmed by these tests.

Conclusion

This case reports a corneal infection with Sphingomonas paucimobilis which to the best of our knowledge is the first to be reported in literature. It also illustrates the difference between two similar organisms, Stenotrophomonas maltophilia and Shingomonas paucimobilis, which were both previously classified under the same genus pseudomonas. This is important in order to identify the micro-organism correctly and to ensure effective treatment.

References

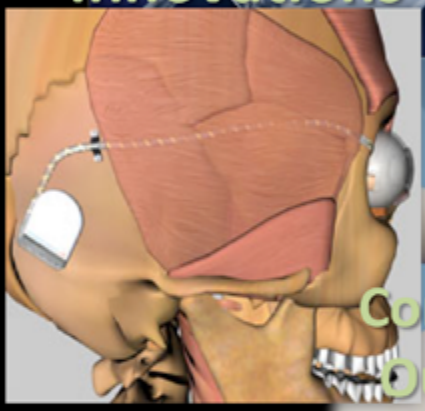
1. Holmes B, Owen RJ, Evans A Malnick H, Willcox WR. Pseudomonas paucimobilis, a new species isolated from human clinical specimens, the hospital environment and other sources. Int J Syst Bacteriol 1977;27:133-146.
2. Yabuuchi E, Yano J, Oyaizu H, Hashimoto Y, Ezaki T, Yamamoto H. Proposals of sphingomonas paucimobilis gen. nov., sphingomonas yanoikyae sp. nov., sphingomonas adhaesiva sp. nov., sphingomonas capsulate comb. nov., and two genospecies of the genus sphingomonas. Microbiol Immunol 1990;34:99-119.
3. Cheng KH, Leung SL, Hoekman HW,Beekhuis WH, Mulder PG, Geerards AJ, Kijlstra A. Incidence of contact lens-associated microbial keratitis and its related morbidity. Lancet 1999;354:181-185.
4. Schomack MM, Faia LJ,Griepentrog GJ. Pseudomonas keratitis associated with daily wear of Silicon Hydrogel Contact Lenses. Eye and Contact Lens 2008; 34:124-128.
5. Kawasaki S, Moriguchi R, Sekiya K Nakai T, Ono E, Kume K, Kawahara K. The cell envelope structure of the lipopolysaccharide lacking gram negative bacterium sphingomonas paucimobilis. J Bacteriol 1994;176:284-290.
6. Adams WE, Habib M, Berrington A,Koerner R, Steel DH. Postoperative endophthalmitis caused by sphingomonas paucimobilis. J Cataract Refract Surg 2006;32:1238-1240.
7. Seo SW, Chung IY, Kim E, Park JM. A case of postoperative sphingomonas paucimobilis endophthalmitis after cataract extraction. Korean J Ophthalmol 2008;22:63-65.

Ophthalmic Implants & Surgical Symposium

COMING SOON

18 – 19 Oct 2013

Venue TBC



Glaucoma Drainage Device

Retinal Implant

Orbital Implant

Explore the current state of art of Biomedical engineering in Ophthalmology with our guest speakers

Discover key aspects of latest evidences evolving development of cost-effective innovations through needs-driven approach to impose improvement in patient care

NUHS
National University Health System

For enquiries, kindly contact our secretariat at ophthalmic.implant.surgical@gmail.com

Brought to you by Department of Ophthalmology, NUHS

7th International Congress on GLAUCOMA SURGERY ICGS 2014 - Singapore

International Society of Glaucoma Surgery

www.isgs.info

Suntec Singapore International Convention & Exhibition Centre

20-22 February 2014

MAIN TOPICS

New glaucoma drainage devices
Angle closure glaucoma
Congenital / pediatric glaucoma
Trabeculectomy
Wound healing modulation
Non-penetrating surgery
Tube shunts
Lasers
Cataract and glaucoma surgery
Glaucoma medications
Ocular imaging
Epidemiology
Glaucoma surgical complications
New technology

Honorary Congress President
Ivan Goldberg

EXECUTIVE BOARD

President
Tarek Shaarawy

Vice President
Mark Sherwood

Keith Barton
Paul Chew
William E. Sponsel

Secretary & Treasurer
Tanuj Dada

ORGANISING SECRETARIAT

Viale G. Matteotti, 7
50121 Florence, Italy
Ph. ++39/055/50351
Fax ++39/055/5001912
E-mail: icgs2014@oic.it

Save the date

Asian Journal of OPHTHALMOLOGY

Volume 13 • Issue 2 • 2013 • 1560-2133

Contents

www.asjoo.com
www.kuglerpublications.com

KUGLER PUBLICATIONS