Minimally Invasive Approach for Malignant Glaucoma in Pseudophakic Eyes : A Simple Technique for A Sight Threatening Situation

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Abstract:

Malignant glaucoma due to aqueous misdirection is one of the most challenging diagnostic and therapeutic situations. Timely intervention can save the eye from blindness.

This case series illustrates some of the important features and problems that may be encountered during the management of malignant glaucoma. Although eyes with malignant glaucoma may initially respond to medical management, long term cycloplegia is usually necessary to maintain resolution.

Sensitisation to atropine drops is not uncommon and may occur at any time necessitating alternative treatment. And surgical treatment, either a needle aspiration of vitreous through the pars plana or pars plana vitrectomy involves cost, discomfort and risk of complications.

Traditionally, management of malignant glaucoma involves pars plana vitrectomy to rupture the anterior hyaloid face and relieve the aqueous misdirection. Peripheral laser Nd YAG Capsulotomy outside the optic edge is a cost effective and a definitive treatment for capsular malignant glaucoma , It creates a communication between the vitreous and anterior chamber thus vitrectomy which is a more hazardous approach specially in eyes with advanced glaucomatous optic nerve head damage can be avoided. We present a series of three cases of malignant glaucoma that occurred post trabeculectomy in pseudophakic eyes and were conservatively managed using Nd:YAG laser anterior hyaloidotomy with immediate deepening of the anterior chamber and long term control of intraocular pressure.Till recent follow up there was no recurrence of aqueous misdirection.

Introduction

Malignant glaucoma continues to present a difficult diagnostic and therapeutic challenge to the ophthalmologist. The treatment of malignant glaucoma involves rupturing the anterior hyaloid face to relieve the aqueous misdirection.[1] Surgical intervention in the form of pars plana vitrectomy is the most frequently described technique to achieve this.[2] We describe a series of cases where a more conservative, previously defined technique was used to relieve the aqueous misdirection using the Nd:YAG laser.

Case 1 :

A 48year old lady pre¬sented with complaints of sudden pain and blurring of vision in the left eye. She gave history of undergoing Trabeculectomy for angle closure glaucoma in the left eye2 years back and Phacoemulsification with IOL implantation 6 months back. On examination, left eye showed very uniformly shallow anterior chamber involving both peripheral and central anterior chamber (figure 1A).Intraocular pressures (IOP) were 20 mm Hg in right eye and 44 mm Hg in left eye.

Figure 1A:

Uniformly shallow anterior chamber both centrally and peripherally

In view of a patent peripheral iridotomy and above findings, a diagnosis of malignant glaucoma was made. The patient was treated with topical and oral glaucoma medications and atropine eye drops following which the IOP dropped to 18mmHg.

During the following 3 months the IOP was maintained below 20 mm Hg on atropine once daily. However, once atropine was withdrawn due to allergic reactions, the left eye soon developed recurrence of pain and blurred vision, an IOP of 38mmHg and the same clinical picture of malignant glaucoma.

We performed Nd Yag capsulotomy and anterior hyaloidotomy through the previous patent peripheral iridotomy (Figure 1B) and through the capsule outside the IOL optic edge(Figure 1C) following which the chamber deepened immediately, both centrally and peripherally (Figure 1D) and IOP dropped to 12 mHg.

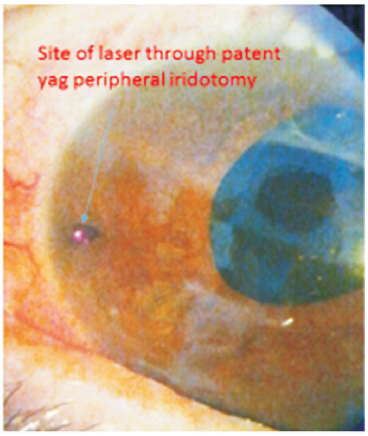

Figure 1B : Site of laser anterior hyaloidotomy

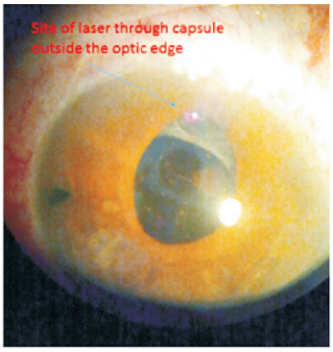

Figure 1C: Site of laser anterior hyaloidotomy

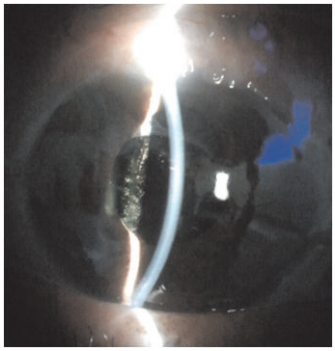

Figure 1D: Deepening of anterior chamber after laser anterior hyaloidotomy

Patient was symptomatically relived,the deep anterior chamber was maintained and IOP was controlled up to two years follow up.

Case 2:

A 20 year old girl presented to us with loss of vision in both eyes. Her vision was 6/36 in Right Eye and 1/60 in Left Eye. She gave history of trabeculectomy in both eyes two years back. Her IOP was 42mmhg in right eye and 14 mmhg in left Eye with maximal medical therapy. Slit lamp evaluation showed anterior chamber of variable depth in the right eye due to posterior synaechiae and complicated cataract. The Cup Disc Ratio was 0.85 in right eye and 0.9 in the left eye and gonioscopy showed closed angles. She underwent repeat trabeculectomy combined with phacoemulsification and IOL implantationin the right eye (Figure 2A). Three weeks after surgery she developed very shallow anterior chamber (Figure 2B), very high IOP (38 mmHg) and myopic shift in refraction caused by forward movement of lens iris diaphragm. Malignant glaucoma was diagnosed and YAG capsulotomy and anterior hyaloidotomy was performed outside the optic edge (Figure 2C) following which the anterior chamber formed immediately (Figure 2D) and IOP was contolled (14 mmHg).

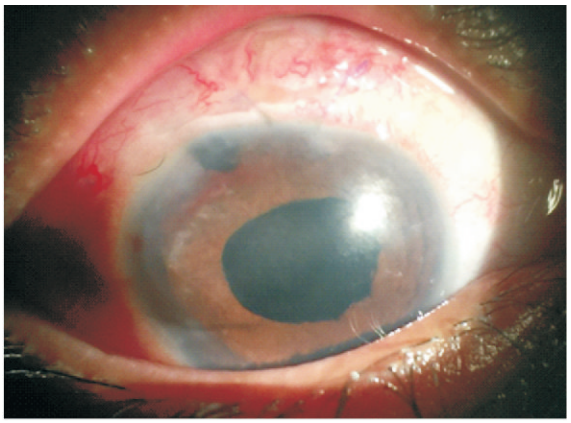

Figure 2A: Post Trabeculectomy with IOL implantation

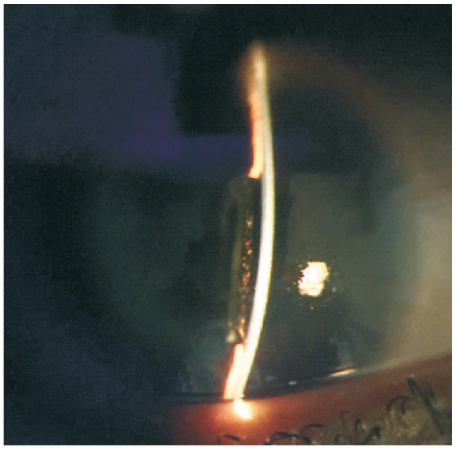

Figure 2B: Uniformly very shallow AC

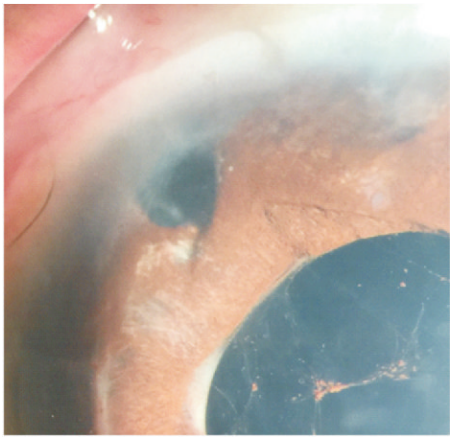

Figure 2C: Capsulotomy with anterior hyaloidotomy done via iriditomy peripheral to the IOL optic edge

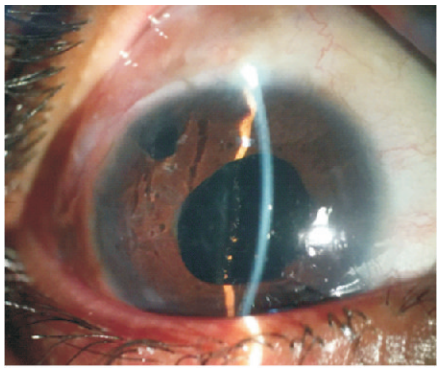

Figure 2D: Immediate deepening of the anterior chamber

Case 3:

A 56 year old lady presented to us with BCVA of 6/18 in Both Eyes and IOP of 24mmHg in right eye and 40 mmHg in the left Eye with maximal medical therapy. Slit lamp evaluation showed shallow anterior chamber with patent YAG PI and posterior subcapsular cataract in Both Eyes. Both eyes had advanced cupping. The left eye underwent combined phacoemulsification surgery with trabeculectomy. One month after surgery, the left eye developed malignant glaucoma with uniform shallow AC (Figure 3A) and very high IOP (42 mmHg). We performed YAGcapsulotomy and anterior hyaloidotomy outside the optic edge (Figure 3B,C) following which the anterior chamber formed immediately (Figure 3D) and IOP returned to 12 mmHg.

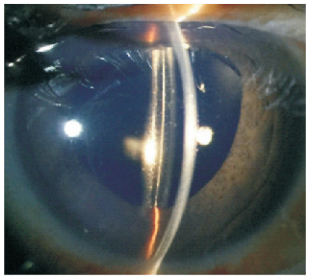

Figure 3A:

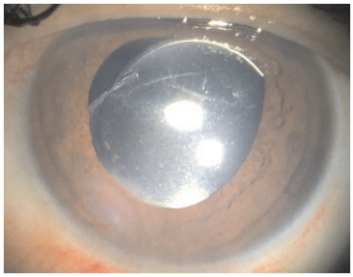

Figure 3B:

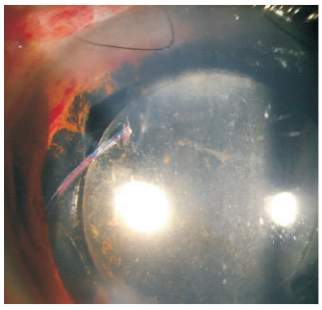

Figure 3C:

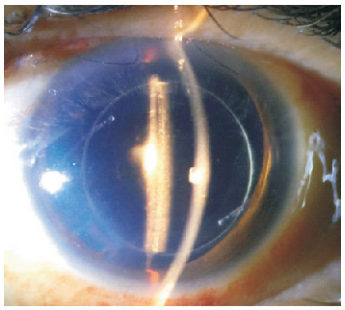

Figure 3D:

Discussion

We present a case series of malignant glaucoma that developed in eyes that had pre-existent angle closure glaucoma and had all undergone trabeculectomy. The diagnosis was based on the findings of very high IOP and uniform shallowing of both the central and peripheral anterior chamber in an eye with a patent iridectomy as opposed to pupillary block where the peripheral chamber is much shallower than the central anterior chamber.

Management of malignant glaucoma requires reversal of the aqueous misdirection from the anterior vitreous back into the anterior chamber by creating a conduit. This can be done by rupturing the anterior hyaloid face peripheral to the IOL optic circumference in pseudophakic eyes using a Nd:YAG laser to rupture the posterior capsule as well as the anterior hyaloids.3 However the channel created must be peripheral to the IOL optic to be effective . One way of improving the likely outcome of Nd:YAG laser therapy is to make the capsular opening through a dialing hole in the IOL or through a pre-existent iridotomy where present, as we have shown, thus allowing a direct passage of aqueous between vitreous cavity and anterior chamber. Making an opening in the anterior hyaloids immediately posterior to the IOL optic is futile as effective passage of aqueous into the anterior chamber is impeded by the IOL itself.

There have been several reports in the past showing successful laser treatment to resolve malignant glaucoma, similar to what we describe.[4,5,6]

In a series of three cases, Melamed et al reported successful reversal of malignant glaucoma and instant deepening of the anterior chamber with marked drop in IOP following Nd:YAG hyaloidotomy.[7] The authors also suspect that use of large optic (7 mm) posterior chamber lens implants may increase the risk of developing malignant glaucoma postoperatively and may also present an obstacle to successful hyaloidotomy as they may prevent adequate flow of aqueous from the vitreous into the anterior chamber.

Our experience reiterates the fact that such non invasive therapy should be attempted in all cases prior to invasive treatment such as needle aspiration of vitreous or surgical pars plana vitrectomy, keeping in mind that the hyaloidotomy should be peripheral to the IOL optic. Additionally, the IOP reduction following the procedure is sustained over prolonged periods of time as seen from our experience.

References:

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2. Lynch MG Brown RH, Michels RG, , Stark WJ: Surgical vitrectomy forpseudophakic malignant glaucoma, Am J Ophthalmol. 1986;102:149,.
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Scientific Programme of Mid-Term UPSOS Conference

25-26th May 2019
MRA Medical College,Ambedkarnagar,UP

DAY -1
25/05/2019 (SATURDAY)

DELEGATE REGISTRATION(ON SPOT)
Time : 11.00 AM - 12.00 PM

SURGICAL SKILLS TRANSFERCOURSES
Time : 12.00 - 2.00 PM

LUNCH SESSION
Time : 02.00 PM - 03.00 PM

SESSION 1
Convener-Dr Durgesh & Dr Nevendu Rai
Courses: Phaco and SICS
Time: 3.00 PM - 3.30 PM

LESSONS FROM THE MASTER

Chairman : Prof. S P Singh
Co- Chairman : Dr. Dharmendra Nath
Convenor : Dr. Anil Kumar Srivastava
Moderator : Dr. Amit Kumar Patel

Dr Partha Biswas

1. Phaco in Small Pupile
2. IOL Placement in PCR

PG PAPER SESSION
Time: 3.30 PM - 6.20 PM

Judges: Prof. K J Singh, Prof. Madhu Bhadauria, Prof. R C Gupta and Dr. Deepak Mishra

Topics **Talk duration: 08 Minutes**

S. No.	Title	Speaker
1	Prevalence of Dry Eye Disease in Post Menopausal Women:A teaching hospital survey. **(3.30 PM - 3.38 PM)**	**Dr. Anurag Kumar Kashyap** Dr. Rajendra P Maurya Dr. Virendra Pratap Singh Dr. Tanmay Shrivastava
2	Evaluate foldable hydrophilic and hydrophobic acrylic IOLs implantation in pediatric cataract surgery **(3.38 PM - 3.46 PM)**	**Dr. Sarswati** Dr R Y S yadav
3	Corneal Endothelium Changes After Small-Incision Cataract Surgery in Patients With Diabetes Mellitus **(3.46 PM - 3.54 PM)**	Dr. Rishi Tripathi
4	Approach to diagnosis and management of diabetic retinopathy **(3.54 PM – 4.02 PM)**	**Dr. Rajesh kumar**
5	Comparison of change corneal astigmatism in pre and post operated pterygium excision **(4.02 PM – 4.10 PM)**	**Dr. Harish Kumar**
6	Glaucoma in Females- Anaemia a risk factor **(4.10 PM – 4.18 PM)**	**Dr. Anupriya** Dr. Sunil Kumar Prof S K Bhasker
7	Blueberry eye : after fungal corneal ulcer a case report of acquired total anterior staphyloma, a rare anterior segment pathology **(4.18 PM – 4.26 PM)**	**Dr. Sameeksha Agrawal** Dr. Ankit Agrawal Dr. K K Agrawal Dr. V.K Agrawal
8	Spontaneous bilateral subluxation of PCIOL after 10 years due to pseudoexfoliation syndrome **(4.26 PM – 4.34 PM)**	**Dr. Ankit Agrawal** Dr. Sameeksha Agrawal Dr. K K Agrawal Dr. V K Agrawal
9	Macular thickness Changes assessment by Spectral Domain OCT(SD-OCT) following extracapsular cataract extraction(ECCE) **(4.34 PM – 4.42 PM)**	**Dr. Samreen Mehfooz**
10	Clinical study of ACIOL and sclerafixated PCIOL **(4.42 PM – 4.50 PM)**	**Dr. Aishwarya Madharia**
11	To evaluate biomechanical properties of cornea in thyroid ophthalmopathy **(4.50 PM – 4.58 PM)**	**Dr. Shailja mishra**
12	To analyse and study the outcome of benign cyctic orbital lesions treated with foam Sclerotherapy **(4.58 PM – 5.06 PM)**	**Dr. Stuti Tiwari**
13	Trojan horse anaesthesia: A novel method of anaesthesia for pars plans vitrectomy **(5.06 PM – 5.14 PM)**	**Dr. Ritu Singh** Prof. Sanjiv Kumar Gupta Dr. Ajai Kumar Dr. Arun Sharma
14	To study the role of medical management and their outcome in extra-ocular cysticercosis with the role of additional use topical cyclosporine. **(5.14 PM – 5.22 PM)**	**Dr. Manmeet Singh**
15	Trans scleral fixation of closed loop haptic acrylic posterior chamber intraocular lens in aphakic non vitrectomized eyes **(5.22 PM – 5.30 PM)**	**Dr. Divya Gupta** Dr. Sanjiv Kumar Gupta Dr. Siddharth Agrawal
16	To evaluate effect of intravi treal injection Ranibuzumab on CME due to Retinal vein occlusion **(5.30 PM – 5.38 PM)**	**Dr. Anil**
17	Prospective study of effectiveness of intrastromal Voriconazole injection in MGT of deep non healing fungal corneal ulcer **(5.38 PM – 5.46 PM)**	**Dr. Ashutosh**
18	Prospective outcome of Single suture on SIA in SICS **(5.46 PM – 5.54 PM)**	**Dr. Praveen Chaturvedi** Dr. Diksha Prakash Prof. OPS Maurya
19	Epidemiology of Corneal Ulcer in North India **(5.54 PM – 6.02 PM)**	**Dr. Hemendra Singh** Dr. Prashant Bhushan
22	How to write paper-Tips for PGs **(6.02 PM – 6.20 PM)**	**Dr.Deepak Mishra** *(Key Note Speaker)*