



Combined Phacoemulsification with Express Device: A Procedure of choice in Advanced Open Angle Glaucoma



***Dr Baswati Prasanth
Specialist Ophthalmology
Ahalia Hospital
Abudhabi***

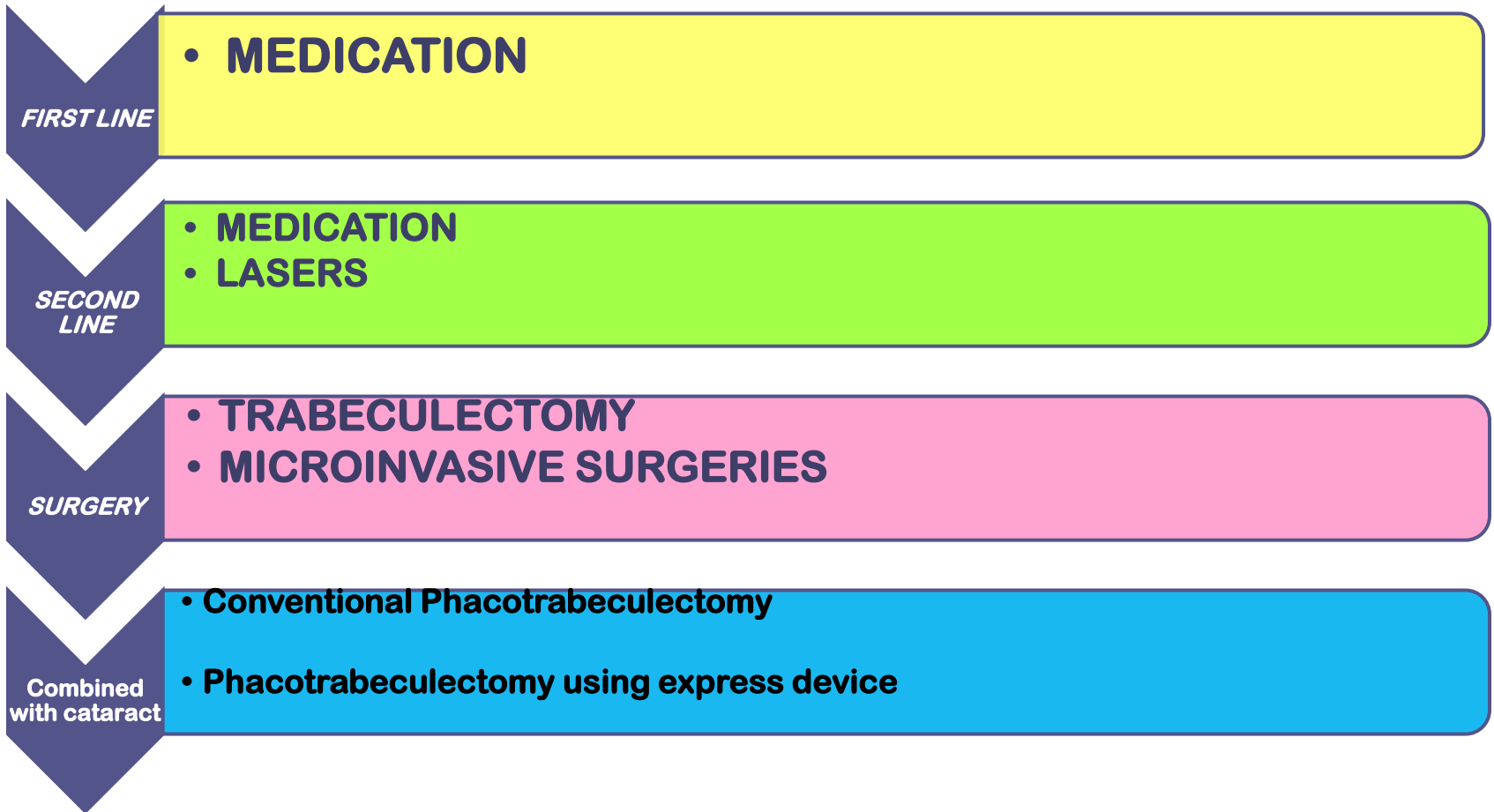
Financial Disclosure

- **Nil**

Introduction

- **Goal of glaucoma treatment in advanced cases of glaucoma : Preservation of the residual visual field and visual acuity**

Chain of events



Chain of events : Advanced Glaucoma

- **AGGRESSIVE IOP LOWERING**
- **Advanced glaucoma intervention study (AGIS), patients that did not progress had a mean IOP of 12 mm Hg**
- **Diurnal (short-term fluctuation) and long-term changes (visit to visit fluctuation)**

- **Randomized clinical trial comparing the outcomes of medical, laser and surgical interventions – Lacking**
- **National Institute for Health and Clinical Excellence guideline of UK - Recommends primary glaucoma surgery in advanced glaucoma**
- **Cochrane review of medical versus surgical interventions for open angle glaucoma**
 - **insufficient evidence to determine how well recently available medications work compared with surgery**
 - **Cost-effective option**

National Institute for Health and Clinical Excellence (NICE) Glaucoma: diagnosis and management of chronic open angle glaucoma and ocular hypertension. Clinical Guidelines CG85, UK National Institute for Health and Clinical Excellence (NICE) guidelines. Developed by the National Collaborating Centre for Acute Care. 2009 Apr
Burr J, Azuara-Blanco A, Avenell A. Medical versus surgical interventions for open angle glaucoma. Cochrane Database Syst Rev 2005. Apr 18;(2):CD004399.

Surgical Options : Cataract with Advanced glaucoma

- **Conventional Phacotrabeculectomy**
- **Phacotrabeculectomy using express device**

What Differentiates one Filter from the Next

Intraoperative

- *AC shallowing*
- *Tissue trauma*
- *Bleeding*
- *Length of procedure*

Postoperative

- *Hypotony*
- *Shallow/flat AC*
- *Choroidals*
- *Hyphema*
- *Bleb leak*
- *Bleb encapsulation*
- *Bleb dysthesia*
- *IOP control*
- *Visual recovery*
- *Postop interventions*

Evolution of the Guarded Filtration Procedure

- *Wound healing strategies*
- *Suture tension & laser suture lysis*
- *Fornix-based flaps*
- *Non-penetrating approaches*
- *EX-PRESS[®] glaucoma filtration device*

*Enhanced Safety
Predictability
Maintain efficacy*

Concern in advanced cases

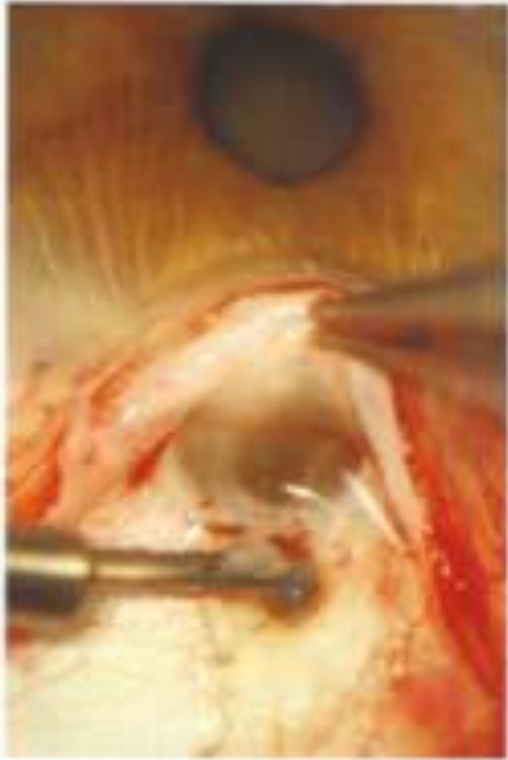
- **Wipe out phenomenon**
- **Risk factors : Postoperative hypotony, macular splitting, and a spike in intraocular pressure (IOP) just after surgery**

Aggarwal SP, Hendeles S. Risk of sudden visual loss following trabeculectomy in advanced primary open-angle glaucoma. Br J Ophthalmol. 1986;70:97-99.

Costa VP, Smith M, Spaeth GL, Gandham S, Markovitz B. Loss of visual acuity after trabeculectomy. Ophthalmology. 1993;100:599-612.

Kolker AE. Visual prognosis in advanced glaucoma: a comparison of medical and surgical therapy for retention of vision in 101 eyes with advanced glaucoma. Trans Am Ophthalmol Soc. 1977;75:539-555

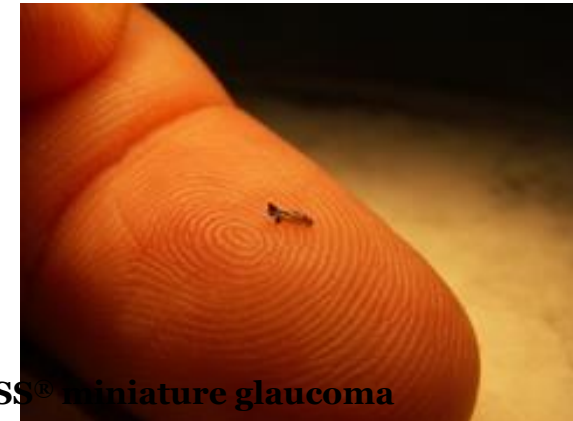
Crucial step in trabeculectomy :Internal Sclerostomy and surgical iridectomy



EX-PRESS® Glaucoma Filtration Device

A Limbal Aqueous Device

- ***Ex-PRESS stands for “excessive pressure regulating shunt system”***
- ***Made of rigid stainless steel – same as cardiac stents***
- ***< 3mm long***
- ***Internal lumen size – 50µm/200µm***
- ***Biocompatible***
- ***MRI of the head is permitted, however not recommended, the first two weeks post implantation.***



Source: EX-PRESS® glaucoma filtration device package insert

A Nyska, Y. Glovinsky, M. Belkin, and Y. Epstein. Biocompatibility of the EX-PRESS® miniature glaucoma drainage implant. *J Glaucoma*. 2003 Jun; 12(3):275-80

Purpose

- **To determine the intraocular pressure control and visual outcomes following combined phacoemulsification with express device in cases of advanced open angle glaucoma**

Design

- **Retrospective, interventional, consecutive, noncomparative case series**

Methods

- **Six eyes of 6 patients**
- **100% males**
- **Mean Age 62 ± 04 yrs**
- **Mean Preop IOP 30.66 ± 3.59 mm Hg on 3.83 ± 0.37 antiglaucoma eye drops**
-

Inclusion criteria (Patients)

- **Visually Significant Cataracts**
- **Advanced glaucoma Intraocular pressure not reaching target IOP on medical management**

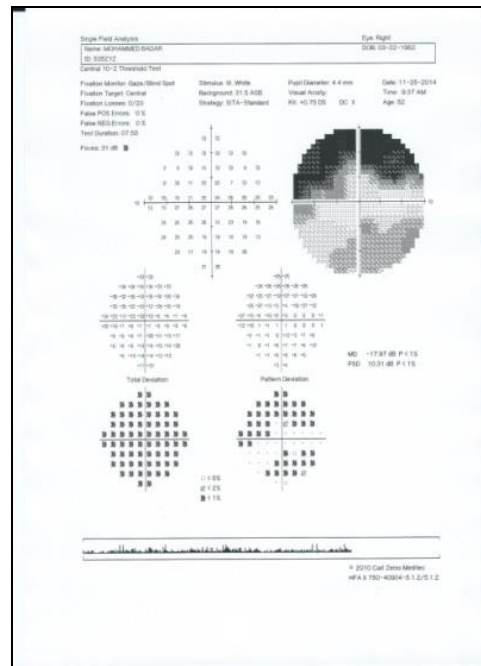
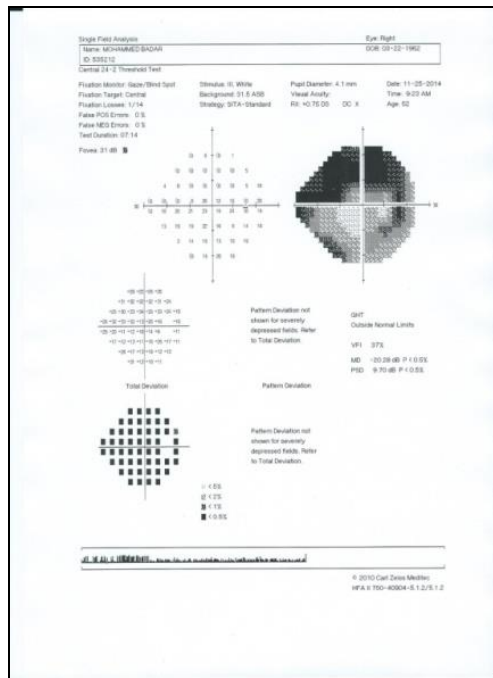
Advanced glaucoma

- **Patients were defined to have advanced glaucoma due to the presence of near total cupping of the optic nerve with or without severe visual field (VF) loss within 10° of fixation, i.e. scotoma encroaching on or splitting fixation**
- **A mean deviation of < -12 dB and a pattern standard deviation $P < 0.5\%$**
- **With or without the presence of RAPD**

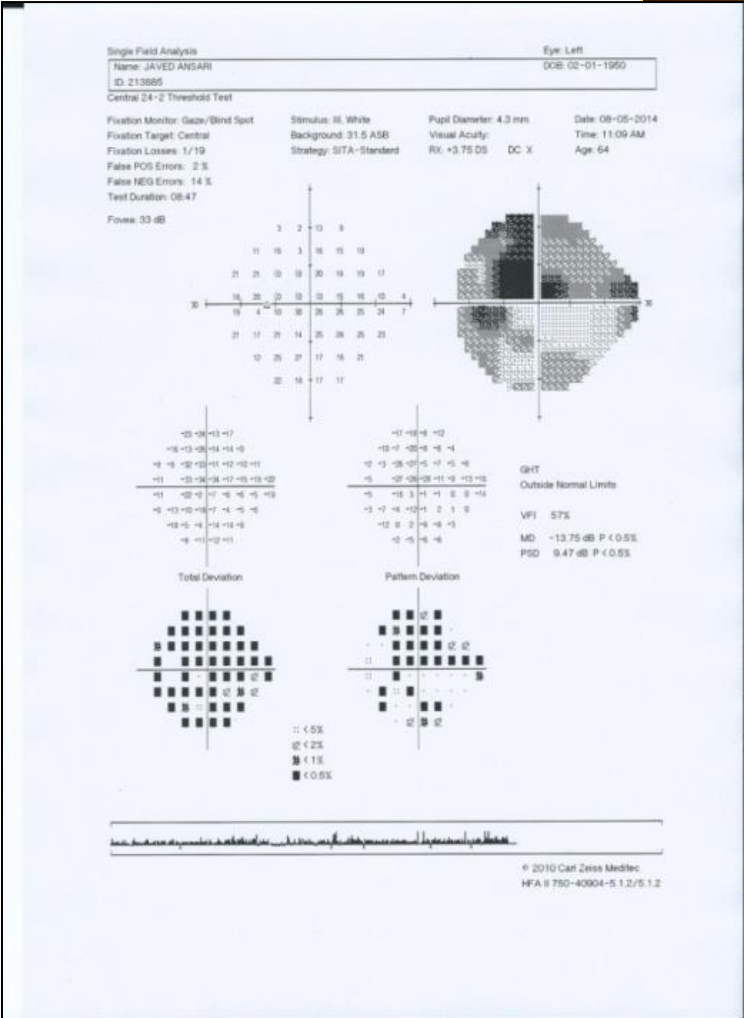
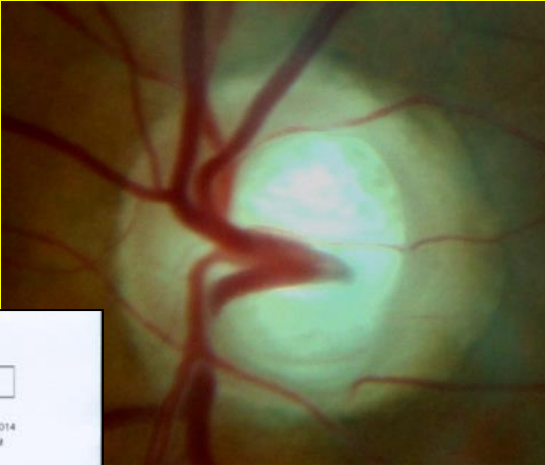
Pre Op :

<i>SERIAL NO</i>	<i>VA</i>	<i>CATARACT</i>	<i>RAPD</i>	<i>IOP</i>	<i>GLAUCOMA MEDICINES</i>
<i>Patient 1</i>	<i>0.1</i>	<i>YES</i>	<i>PRESENT</i>	<i>28</i>	<i>4</i>
<i>Patient 2</i>	<i>0.25</i>	<i>YES</i>	<i>ABSENT</i>	<i>28</i>	<i>4</i>
<i>Patient 3</i>	<i>0.16</i>	<i>YES</i>	<i>PRESENT</i>	<i>32</i>	<i>4</i>
<i>Patient 4</i>	<i>0.25</i>	<i>YES</i>	<i>ABSENT</i>	<i>36</i>	<i>4</i>
<i>Patient 5</i>	<i>0.1</i>	<i>YES</i>	<i>PRESENT</i>	<i>34</i>	<i>4</i>
<i>Patient 6</i>	<i>0.32</i>	<i>YES</i>	<i>ABSENT</i>	<i>26</i>	<i>3</i>

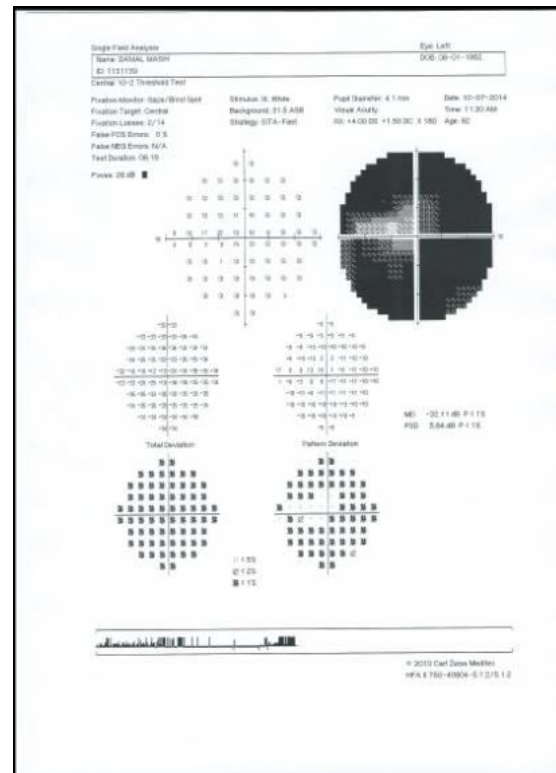
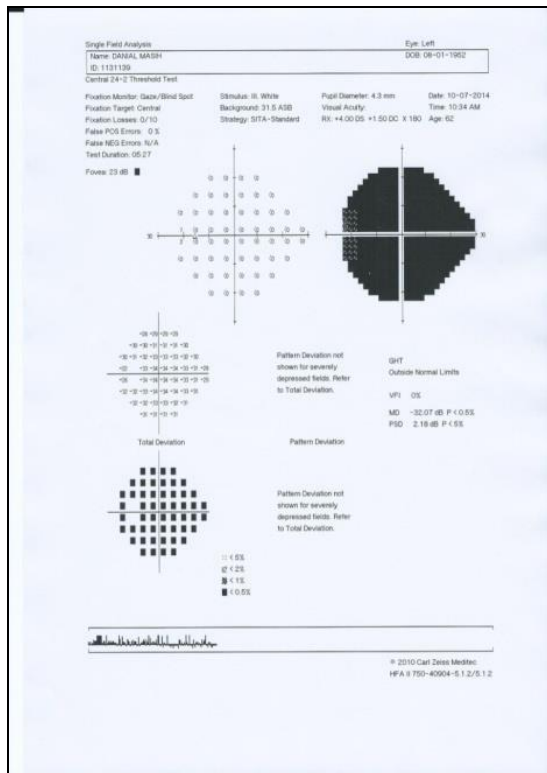
CDR 0.8 with inf near notch Sup arcuate scotoma , inferiorly evolving arcuate



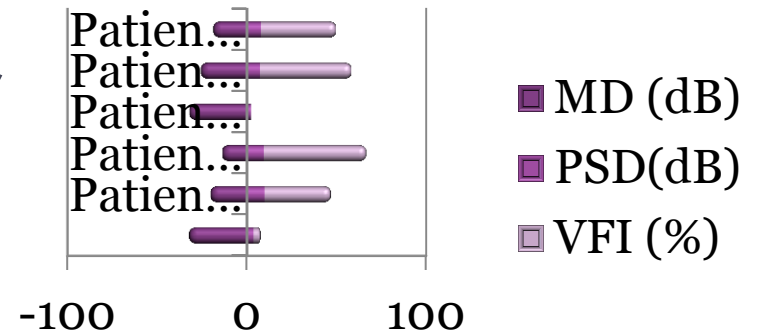
CDR 0.8 with inf near notch
Sup arcuate scotoma , inferiorly
evolving arcuate
Disc pallor + with RAPD



CDR 0.9 with bipolar notch Biarcuate scotoma Disc pallor + with RAPD



Visual field indices



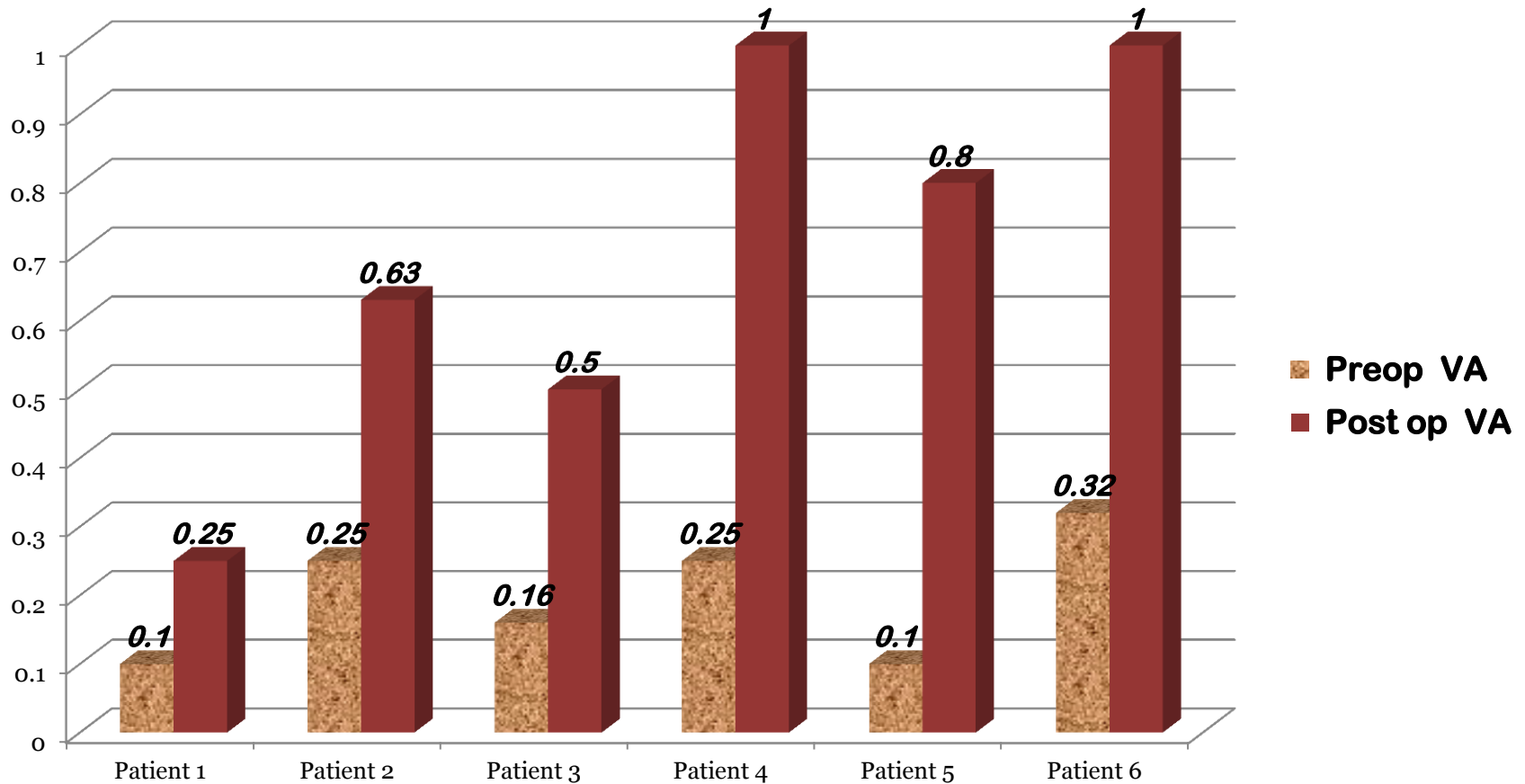
	<i>MD (dB)</i>	<i>PSD (dB)</i>	<i>VFI (%)</i>
<i>Patient 1</i>	<i>-32.19</i>	<i>3.69</i>	<i>4</i>
<i>Patient 2</i>	<i>-20.28</i>	<i>9.7</i>	<i>37</i>
<i>Patient 3</i>	<i>-13.79</i>	<i>9.47</i>	<i>57</i>
<i>Patient 4</i>	<i>-32.07</i>	<i>2.18</i>	<i>0</i>
<i>Patient 5</i>	<i>-25.68</i>	<i>7.23</i>	<i>51</i>
<i>Patient 6</i>	<i>-18.78</i>	<i>7.69</i>	<i>42</i>

Procedure

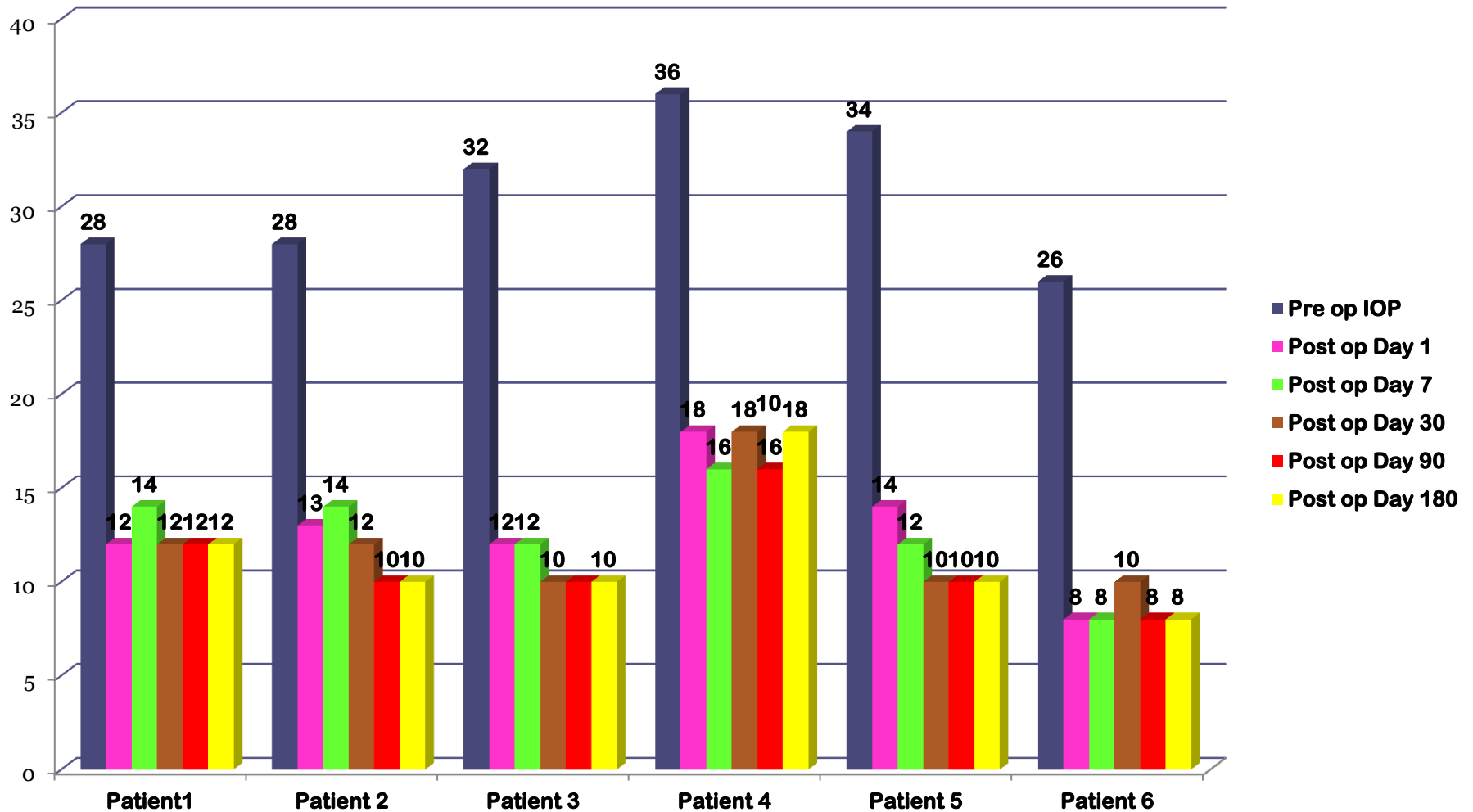
- **Two site Phacoemulsification with implantation of acrylic IOL followed by filtering surgery- Ex-PRESS miniature glaucoma shunt implantation was performed using 0.02 % MMC**



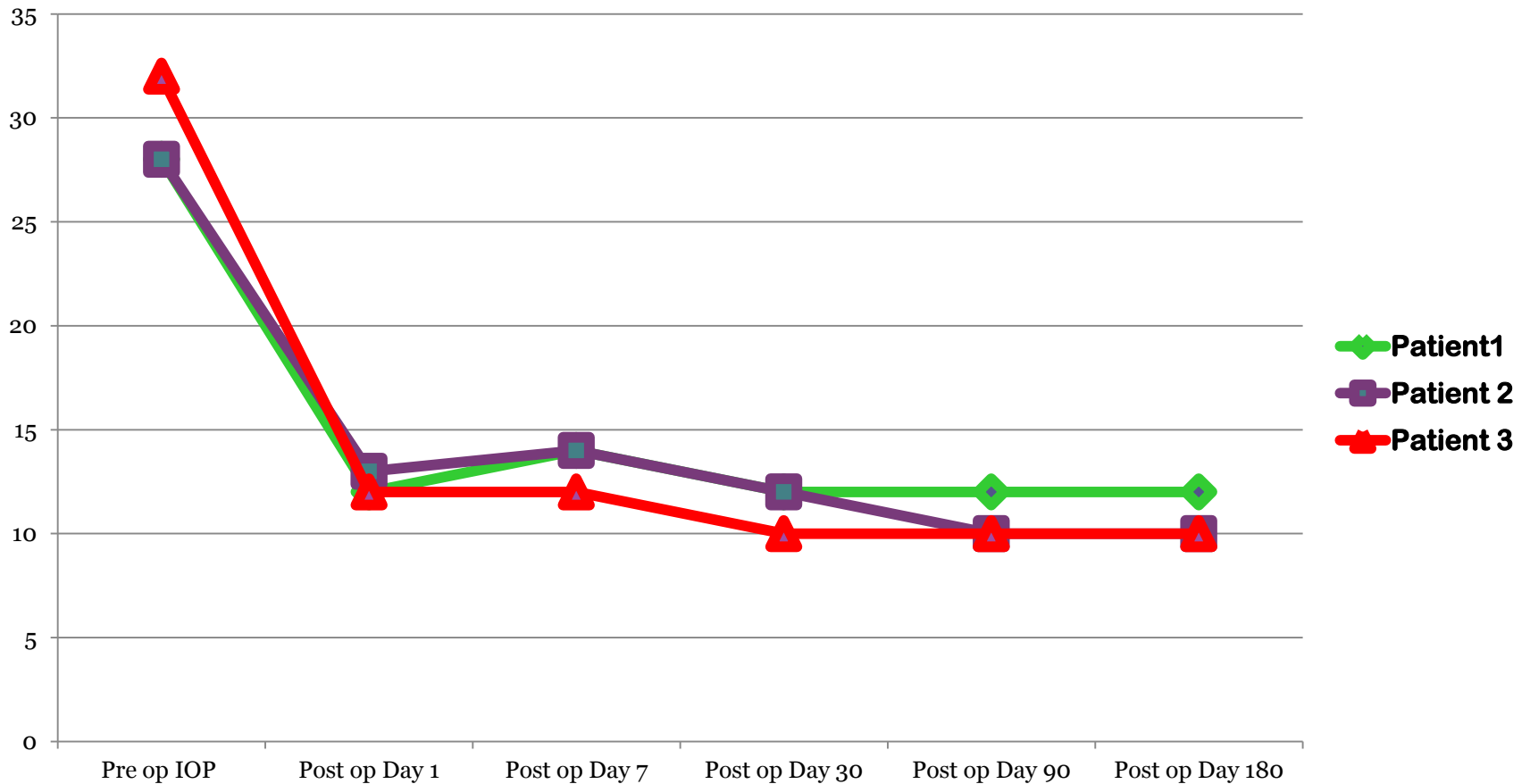
Results : Visual Acuity



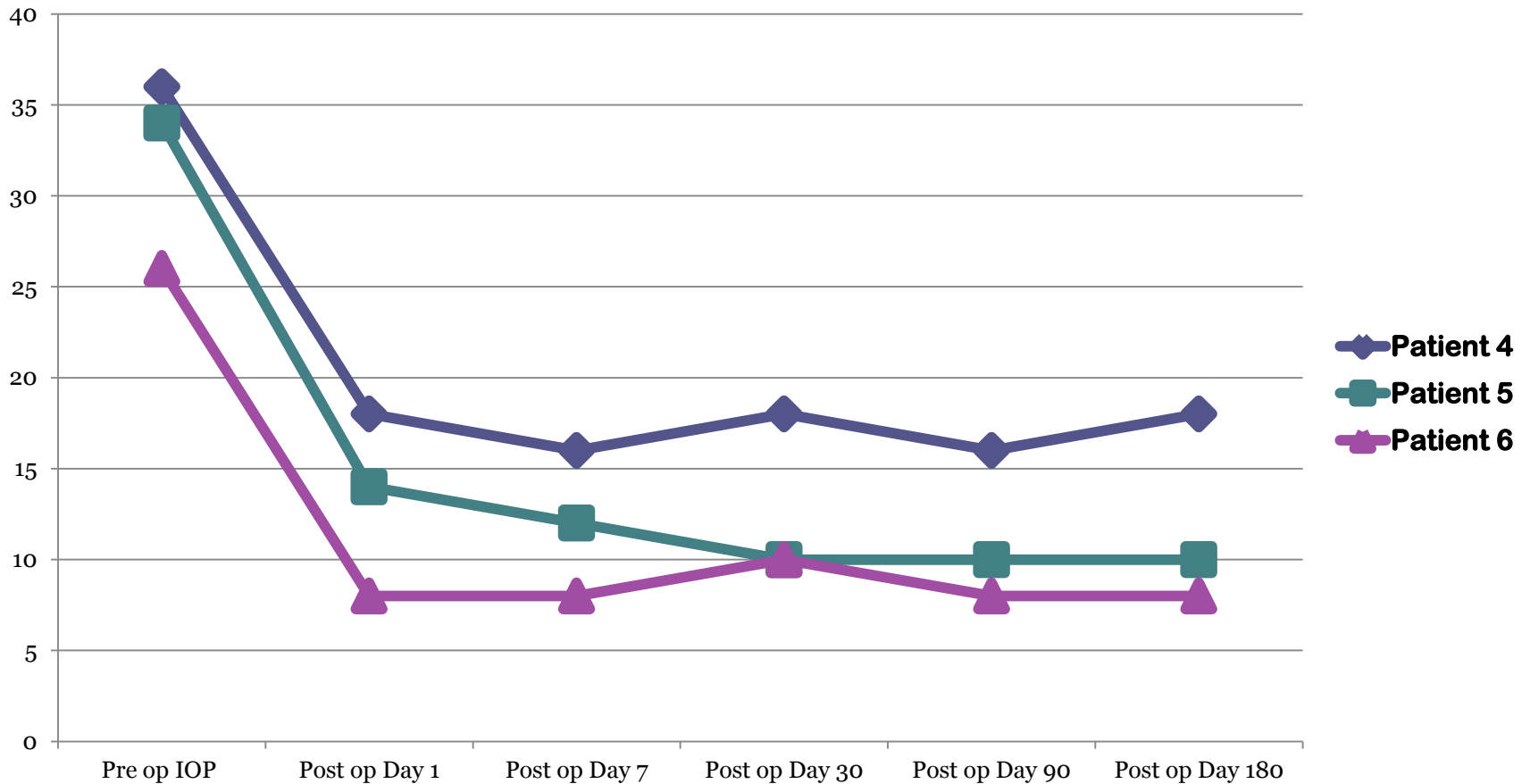
Results :Intraocular Pressure



Results :Intraocular Pressure(Contd)

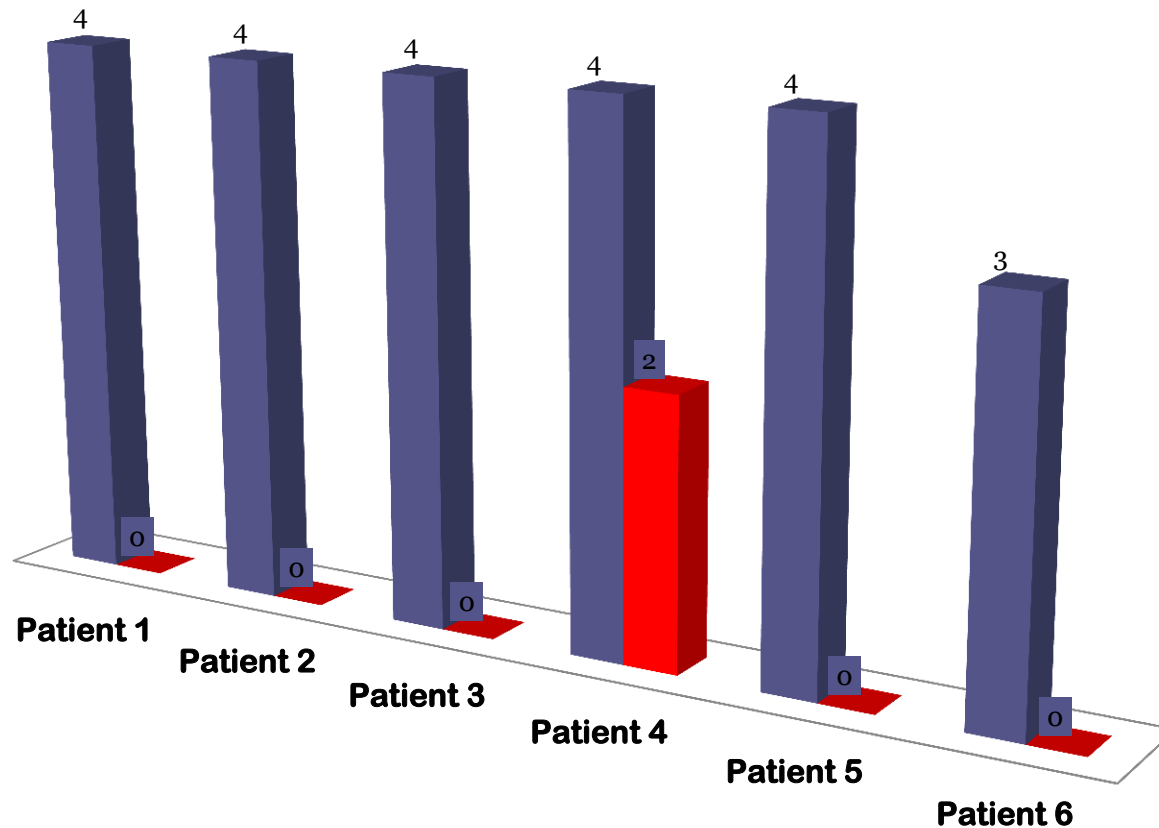


Results :Intraocular Pressure(Contd)

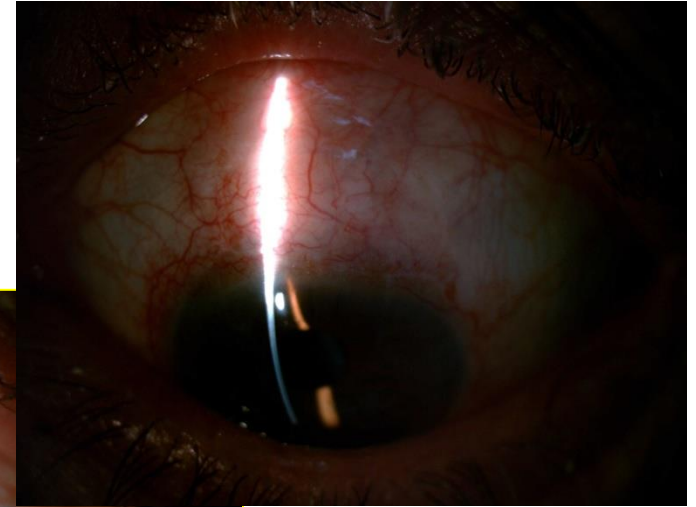
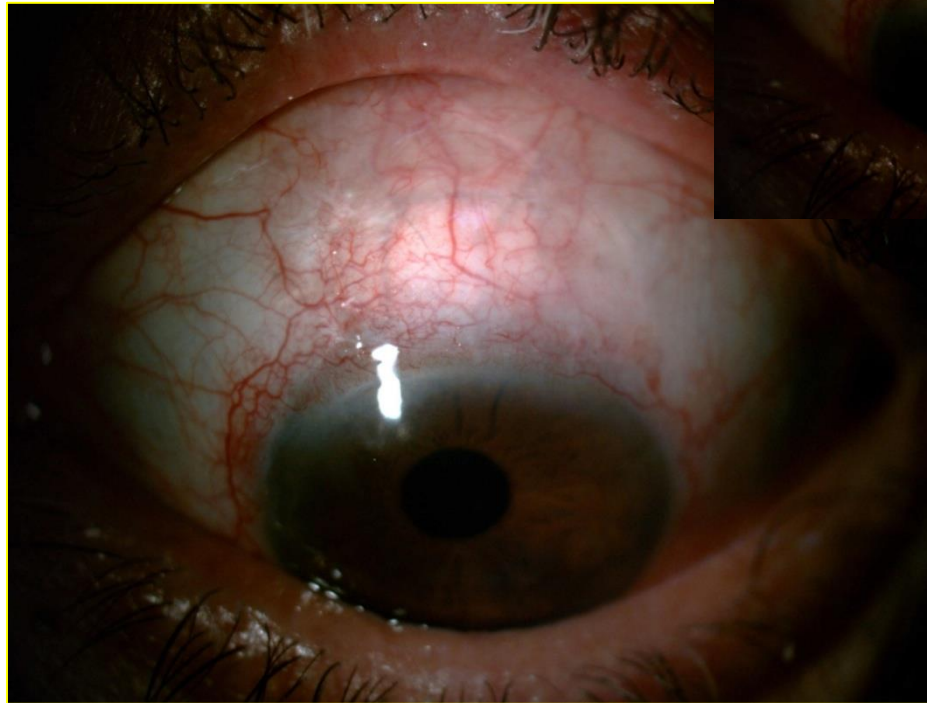


Results :Glaucoma medications

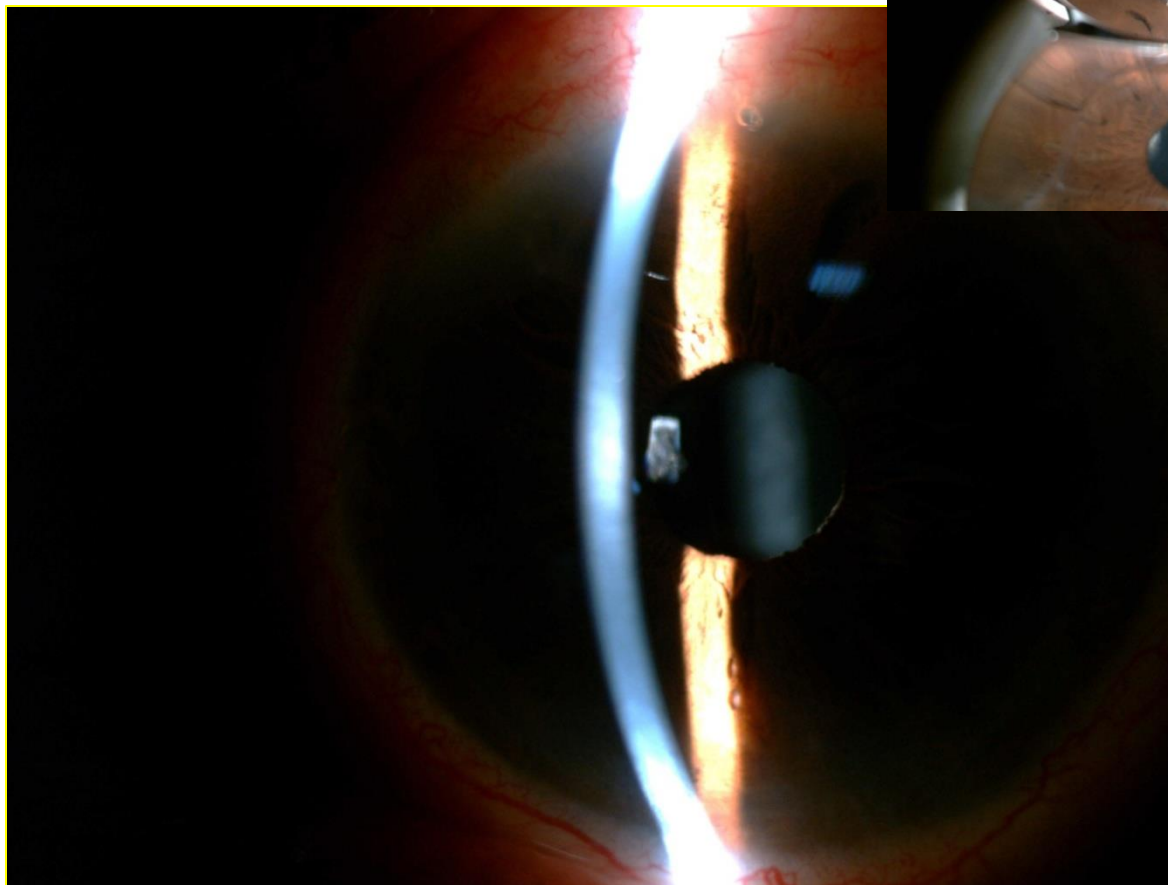
■ No of antiglaucoma drops(Preop) ■ No of antiglaucoma drops(Post op)



Results : Bleb morphology
Case 1 : H1E4V2S0

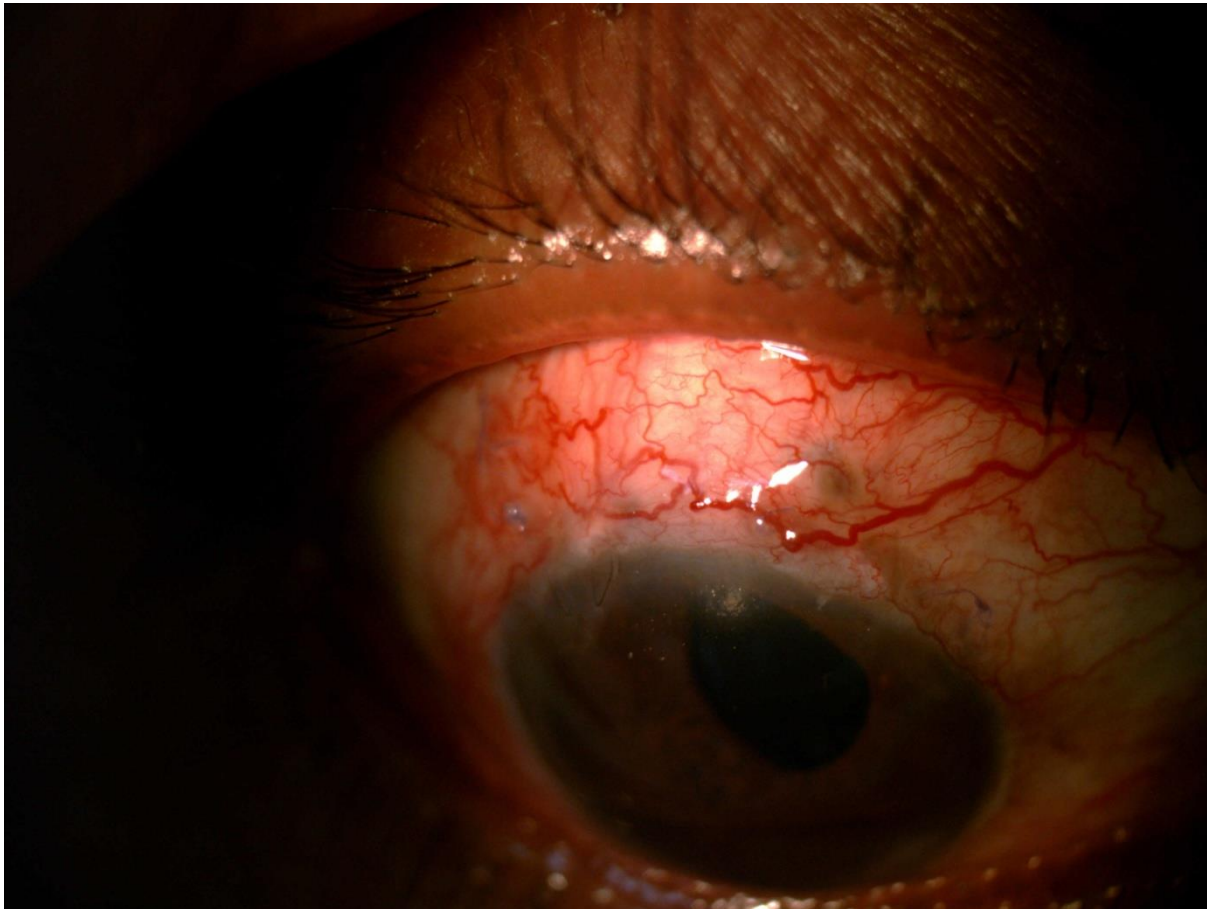


Express Device in situ

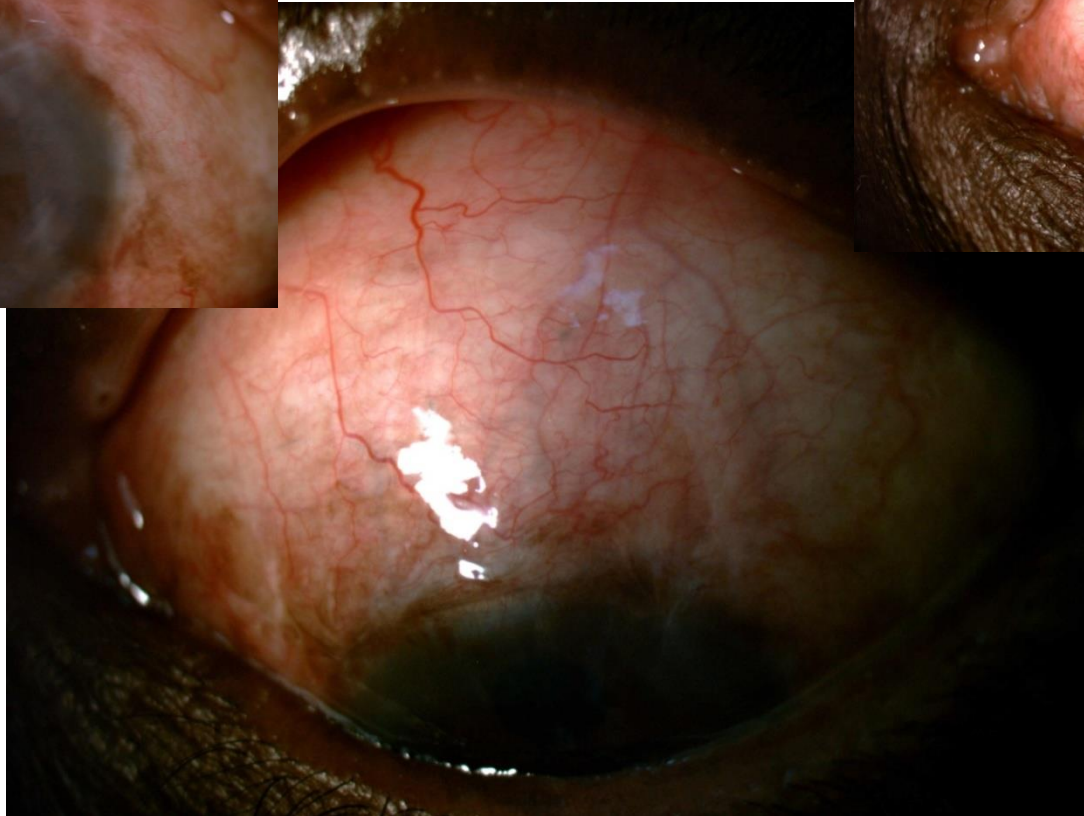
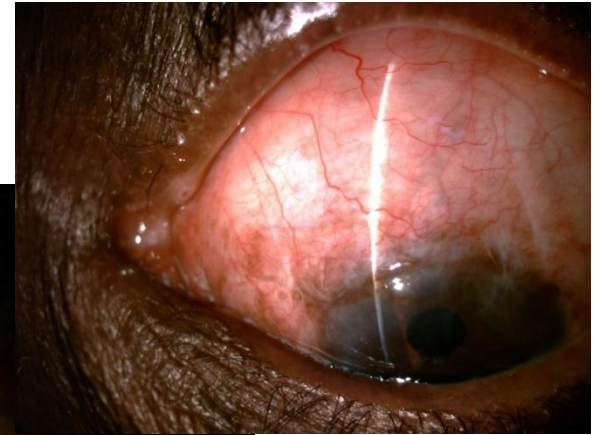
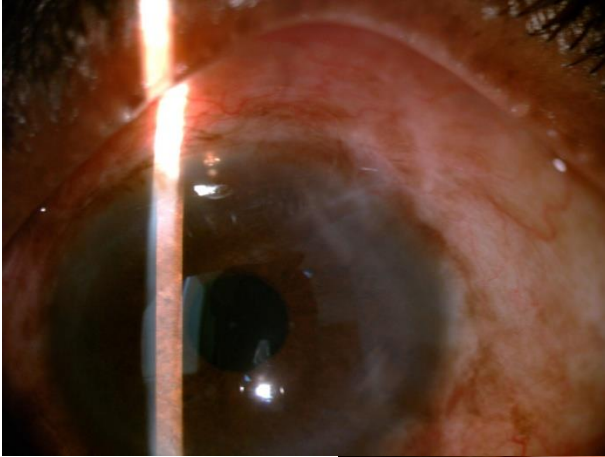


Results :Bleb morphology

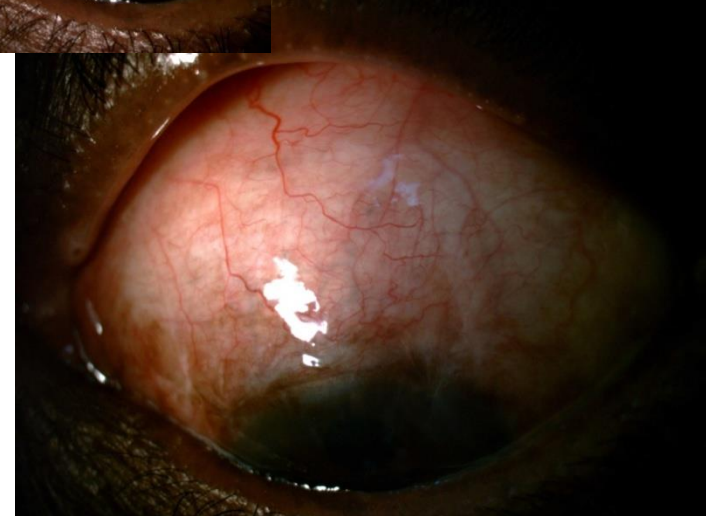
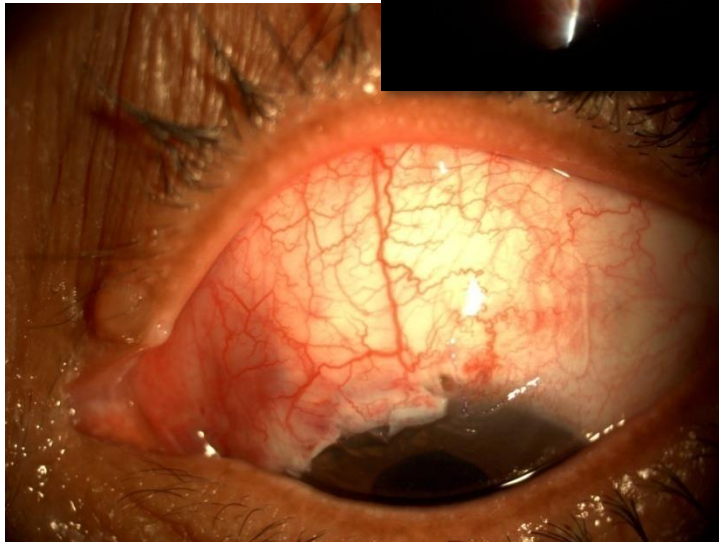
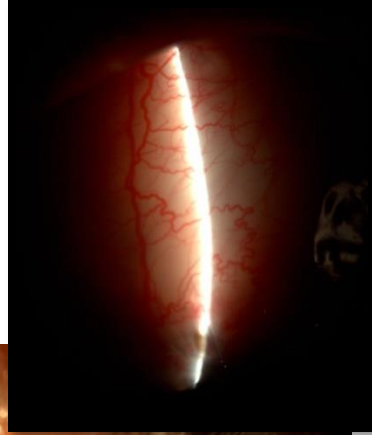
Case2 :H1E4V3 S0



Case 3 : H1E3V2S0



Phacotrab Vs Express



*Phacotrabeculectomy
without device*

*Phacotrabeculectomy
with device*

Discussion

- **Combined surgery has become the most commonly used surgical treatment for medically uncontrolled primary glaucoma with coexisting cataract**
- **Major apprehension in advanced glaucoma cases are the development of a wipe out phenomenon in the postoperative period**

- **Controlled trabeculectomy reduces the risk of wipeout**
- **Luminal Control with express device provides a uniform filtration;**
 - **uniform filtration helps to stabilize IOP during and after the procedure which means greater predictability**

Ex-PRESS Implantation Versus Trabeculectomy in Uncontrolled Glaucoma: A Meta-Analysis

Wei Wang , Minwen Zhou . PLoS One. 2013; 8(5): e63591.

- **Objective:** To evaluate the efficacy and tolerability of Ex-PRESS implantation (Ex-Press) compared with trabeculectomy (Trab) in the treatment of patients with uncontrolled glaucoma
- **Methods:** A comprehensive literature meta-analysis was performed according to the Cochrane Collaboration methodology to identify controlled clinical trials comparing Ex-Press with Trab
- **Results:** Eight controlled clinical trials meeting the predefined criteria were included in the meta-analysis. A total of 605 eyes from 559 patients with medically uncontrolled glaucoma were included. The weighted mean difference of the percentage IOP reduction from baseline was 2.33 (95% confidence interval: 22.59–7.24) when comparing Ex-Press with Trab. Ex-Press was associated with numerically greater, but nonsignificant, IOP lowering efficacy than Trab. The pooled odds ratio comparing Ex-Press with Trab were 0.93 (0.39, 2.23) for the complete success rate and 1.00 (0.39, 2.56) for the qualified success rate. **Ex-Press was associated with a significantly lower frequency of hypotony and hyphema than Trab, with pooled ORs of 0.29 (0.13, 0.65) and 0.36 (0.13, 0.97), respectively**
- **Conclusion:** Ex-Press was associated with equivalent efficacy to Trab in lowering IOP. **Ex-Press was better tolerated than Trab**

Comparison Of Trabeculectomy Versus The Ex-PRESS Miniature Glaucoma Device In The Same Patient: A Prospective Randomized Study (XVT-USF)

Comparison Of Trabeculectomy Versus The Ex-PRESS Miniature Glaucoma Device In The Same Patient: A Prospective Randomized Study

- **Purpose : To compare standard trabeculectomy to the Ex-PRESS mini glaucoma shunt implantation under a scleral flap in eyes with open-angle**
- **Design: Prospective, randomized clinical trial**

- **Participants: 15 subjects with bilateral primary open-angle glaucoma**
- **Complete (without medications) and qualified (with or without medications) successes were more common at all IOP cut-off values in Ex-PRESS eyes than trabeculectomy eyes**
- **Postoperative complications were uncommon in both groups, but trabeculectomy eyes required more postoperative interventions than Ex-PRESS eyes**

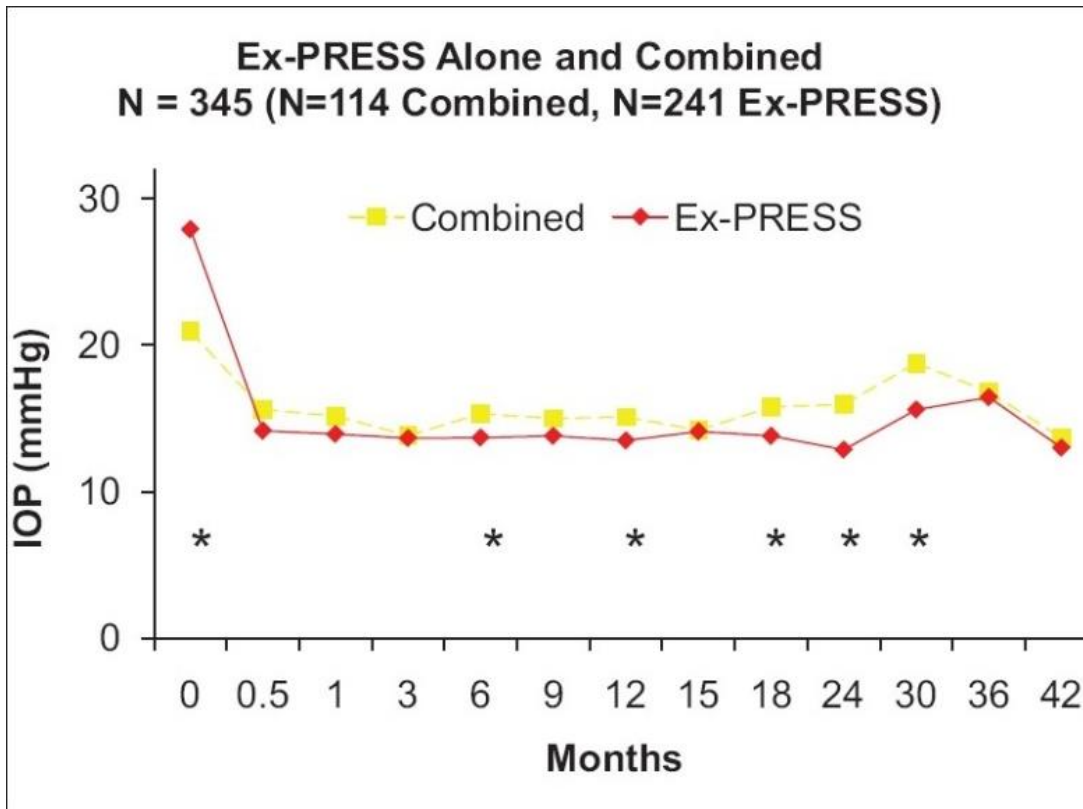
Five-year extension of a clinical trial comparing the EX-PRESS glaucoma filtration device and trabeculectomy in primary open-angle glaucoma

Leo de Jong ,Antoine Lafuma, Anne-Sophie ,Gilles Berdeaux. Clinical Ophthalmology April 2011

- **This five-year analysis confirmed and extended the results reported after one year**
- **Compared with trabeculectomy, EX-PRESS provided better intraocular pressure control in the first three years, and patients required fewer intraocular pressure medications and fewer surgical interventions during the five-year study period**

Ex-PRESS Miniature Glaucoma Device Implanted Under a Scleral Flap Alone or in Combination with Phacoemulsification Cataract Surgery

Kanner E, Netland PA, Sarkisian SR, Du H. J Glaucoma. 2009



Compared with baseline values, the postoperative intraocular pressure and number of glaucoma medications were significantly lowered in both groups

Less hypotony with Express !!!

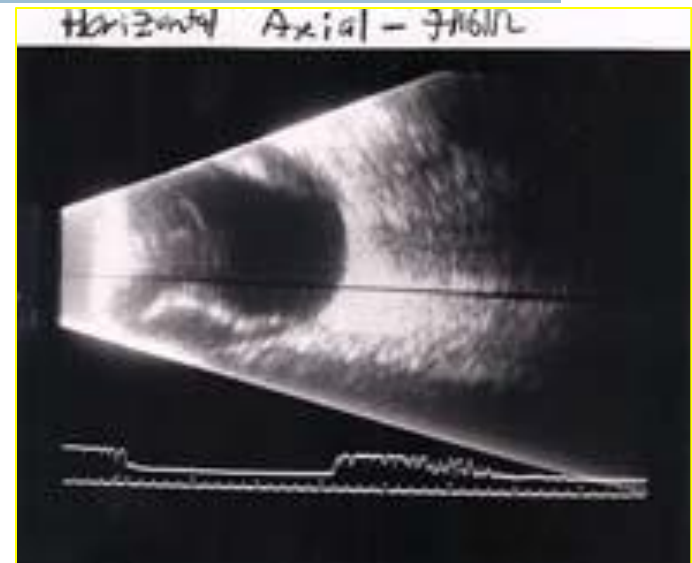
Journal of Cataract and Refractive Surgery, Volume 34, Number 1, January 2008

ExPRESS Micro-Incision Glaucoma System

TABLE 5. Postoperative Complications After ExPRESS Micro-Incision Trabeculectomy and Trabeculectomy (2004)

	ExPRESS Group	Control Group	P
Early postoperative hypotony	0.0%	44.0%	<0.001
Choroidal effusion	0.0%	22.0%	<0.001
Phacolytic glaucoma	0.0%	11.0%	<0.001
Hyphema	0.0%	11.0%	<0.001
Wound leak	0.0%	11.0%	<0.001
Endothelial	0.0%	11.0%	<0.001

From:



ExPRESS vs. Standard Trabeculectomy - Complications

Assessment of Bleb Morphologic Features and Postoperative Outcomes After Ex-PRESS Drainage Device Implantation Versus Trabeculectomy

Travis J Good, Malik y Kahook (Am J Ophthalmol 2011;151:507-513)

- **Moorfields Bleb Grading System revealed less vascularity and height but more diffuse area associated with the Ex-PRESS blebs**

Our experience :

- **Advanced cases**
- **Good IOP control till date**
- **No intraop or postop hypotony**
- **No choroidals**
- **Less no of glaucoma medications postoperatively**
- **Bleb morphology:**
 - **Low height**
 - **Posterior**
 - **Highly vascularised**



Conclusion

- **The Express Device demonstrates good IOP control in cases of advanced glaucoma with less propensity to hypotony or wipe out**

Thank You

