



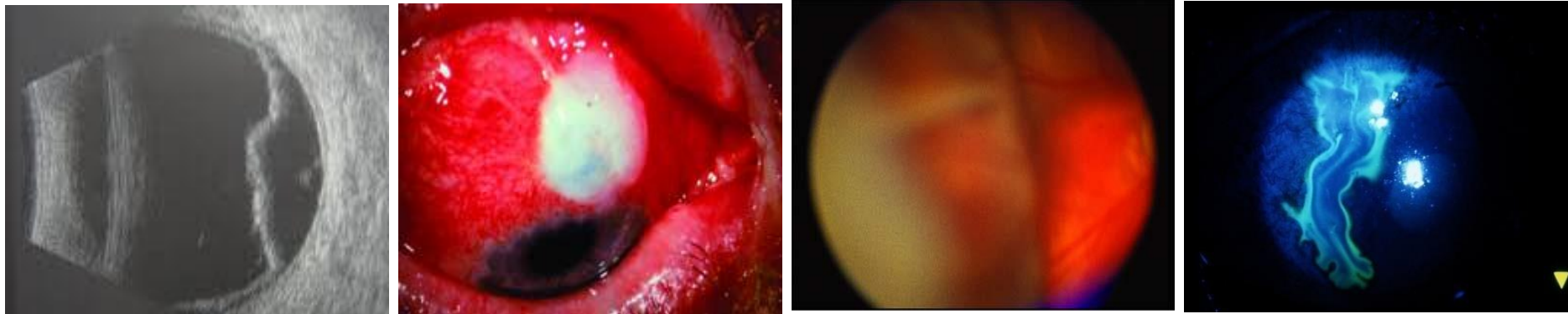
**EFFICACY AND SAFETY OF
CANALOPLASTY IN SAUDI PATIENTS
WITH UNCONTROLLED OPEN ANGLE
GLAUCOMA**

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SAUDI ARABIA**

INTRODUCTION

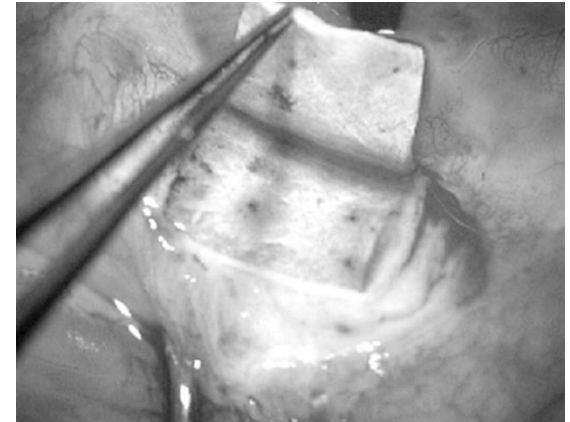
Trabeculectomy, first described in 1967, was based on the principle : **guarded filtration under guarded flap**. The initial success rates were 37-85% depending on the patients population & series. *Englart et al 1999*

MMC was introduced in 1983, but it's application was not popular until 1991. Since that time, it increased the success rate to about 67-100% but also the rate of vision threatening complications increased. *Beck et al 2003*



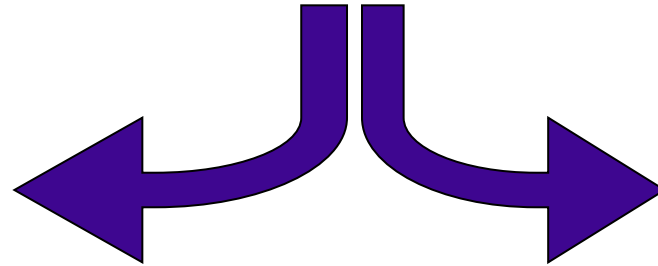
INTRODUCTION

In the 1980s, Fyodorov, Kozlov & Zimmerman took the next step in the evolution of glaucoma surgery by modifying the NPGD to have a scleral flap.

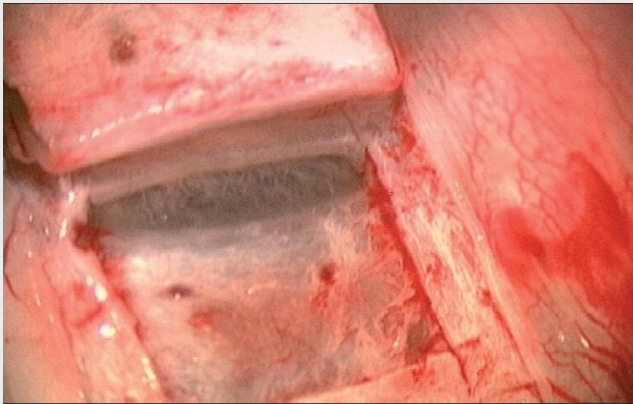


NPGS

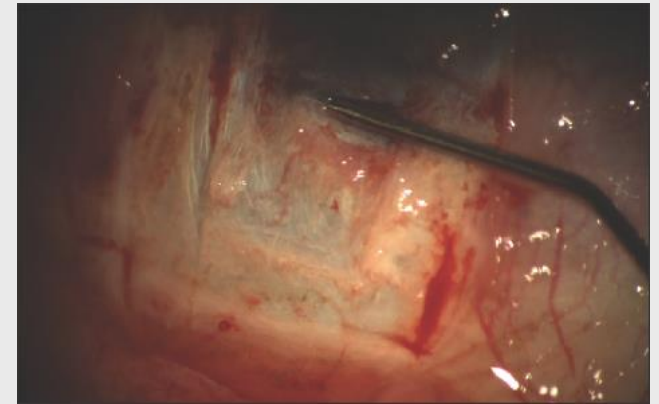
TRABECULO-DESCEMET
WINDOW



DEEP SCLERECTOMY



VISCOCANALOSTOMY



**THE QUEST CONTINUE FOR A MORE PREDICTABLE & PHYSIOLOGIC
GLAUCOMA PROCEDURE WITH GREATER MARGIN OF SAFETY**

INTRODUCTION

Canaloplasty is a non-penetrating glaucoma surgery that increases aqueous flow from the anterior chamber, through the trabecular meshwork & descemet's window, into & around the Schlemm canal, & out through the collector channels, thereby reducing the intra-ocular pressure (IOP). Thus, canaloplasty restores the natural aqueous outflow system & avoids the presence of blebs & their complications.

Lewis et al .Canaloplasty: Circumferential viscodilation & tensioning of Schlemm canal using a flexible microcatheter for the treatment of open-angle glaucoma in adults; Two-year interim clinical study results. J Cataract Refract Surg 2009;35:814-824

INTRODUCTION

It involves catheterization & controlled viscodilation of the entire circumference of schlemm canal – unlike standard viscocanalostomy which involves only a section of it – in conjunction with placement of trabecular tensioning suture facilitated by a flexible microcatheter coupled to ophthalmic viscosurgical device source (OVD)

Lewis RA: Canaloplasty: A Thorough Overview. Ophthalmology Management 2008;December :46-47

INTRODUCTION

INDICATIONS :

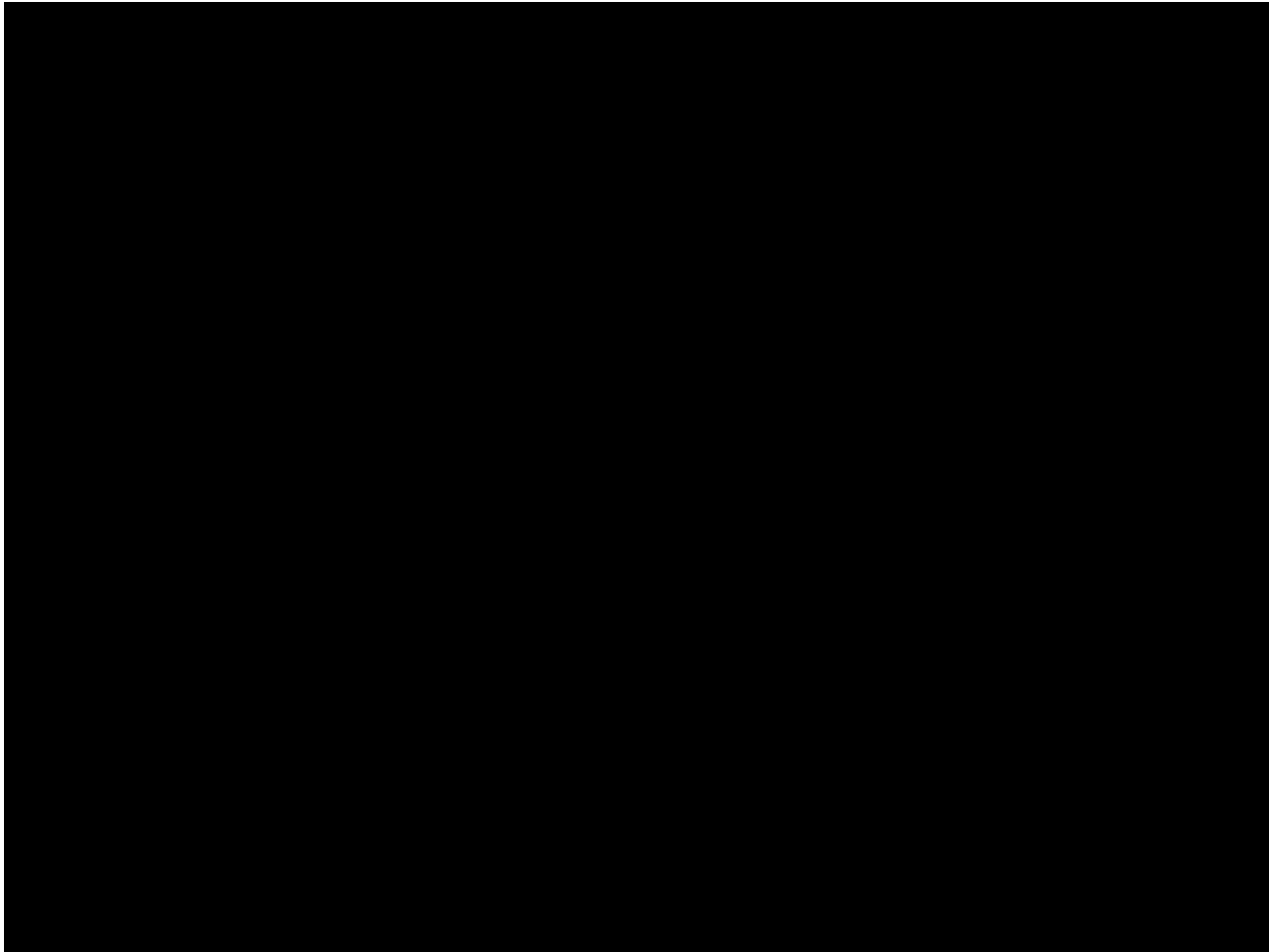
- Patients with open angle glaucoma

CONTRAINDICATIONS :

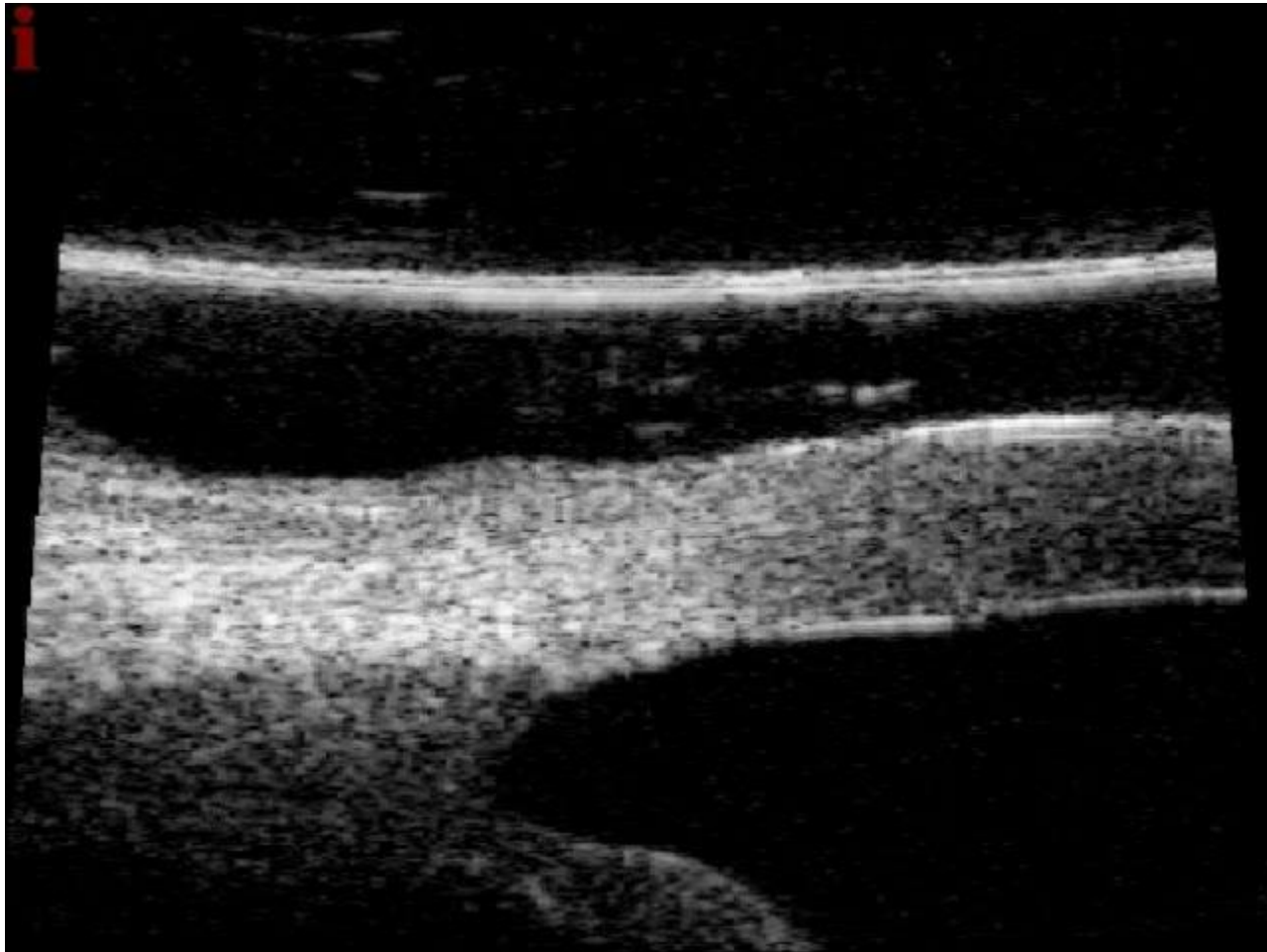
- Neovascular glaucoma
- Chronic angle closure
- Angle recession
- Narrow angle
- Narrow approach with plateau iris
- Previous surgery preventing 360 degree catheterization of Schlemm's canal



INTRODUCTION



INTRODUCTION



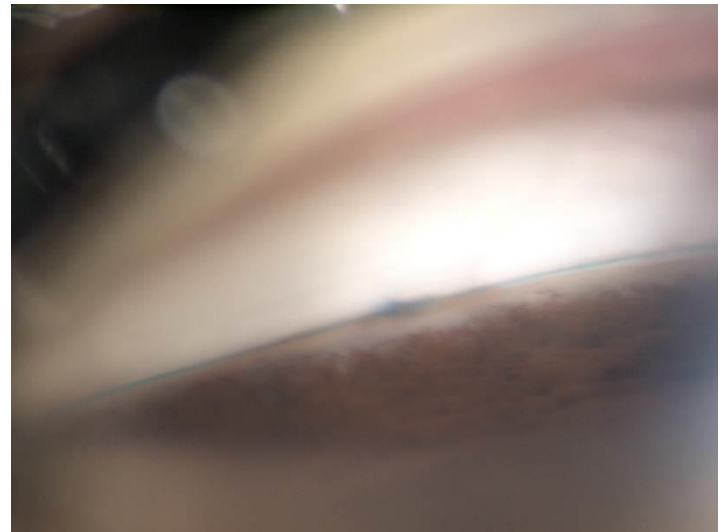
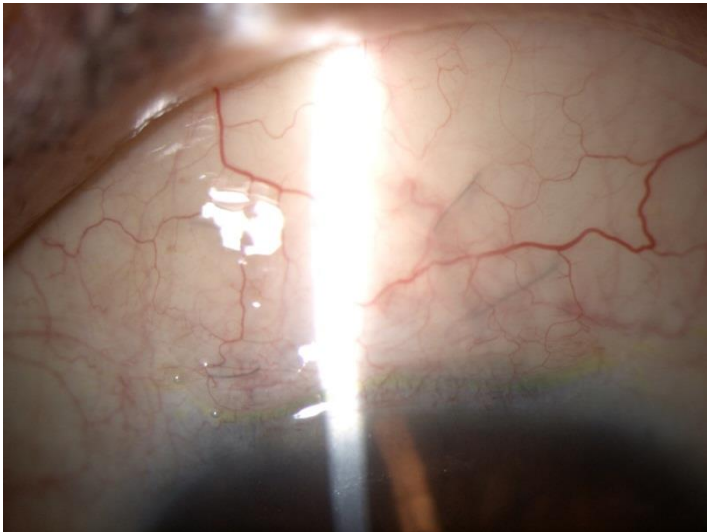
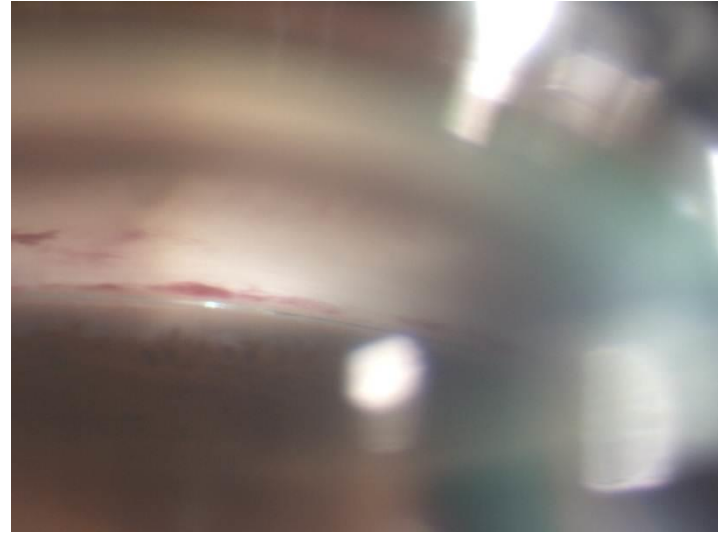
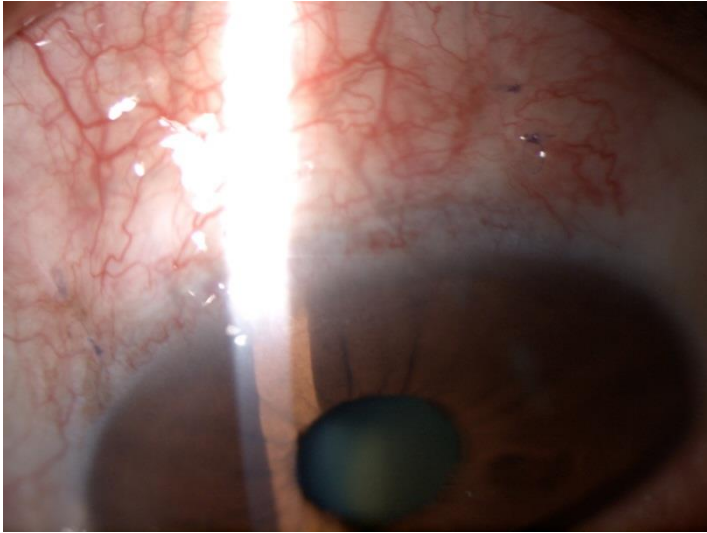
INTRODUCTION

POSTOPERATIVE CARE :

- Postoperative ophthalmic evaluation
- Topical antibiotics
- Topical steroids
- Might have transient borderline to moderately high IOP



INTRODUCTION



INTRODUCTION

Complications are few & mostly non vision-threatening:

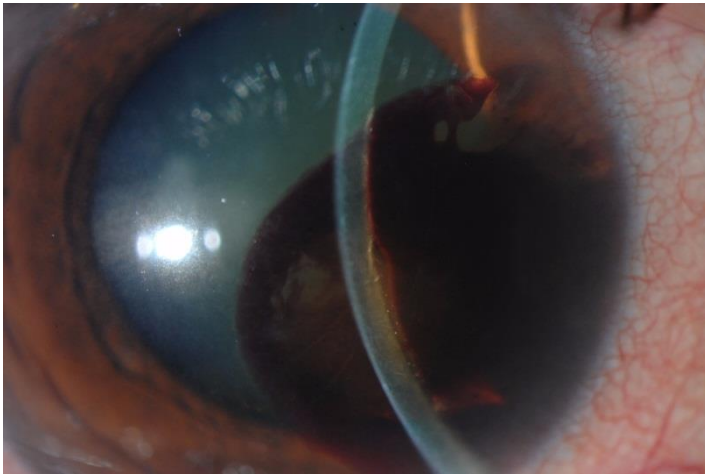
- Microhyphema-Hyphema
- Early elevated IOP (0 - 3 months postop)
- Blebs at 24 months
- Late elevated IOP (> 3 months postop)
- Wound Hemorrhage
- Descemet membrane detachment
- Suture extrusion through TM
- Hypotony

Lewis et al .Canaloplasty: Circumferential viscodilation & tensioning of Schlemm canal using a flexible microcatheter for the treatment of open-angle glaucoma in adults; Two-year interim clinical study results. J Cataract Refract Surg 2009;35:814-824

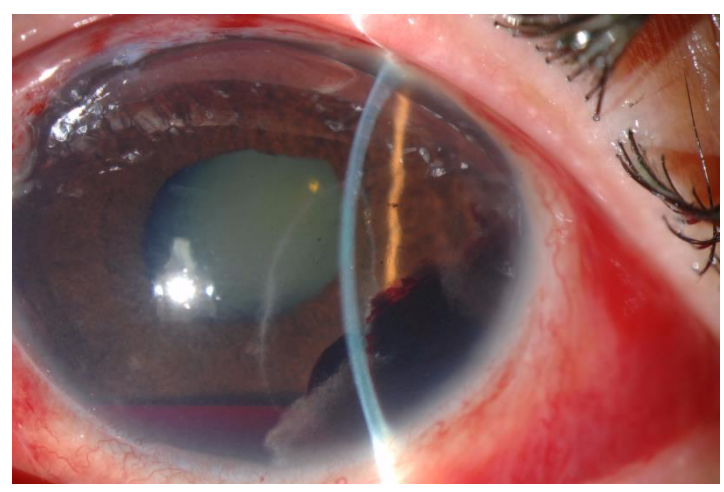
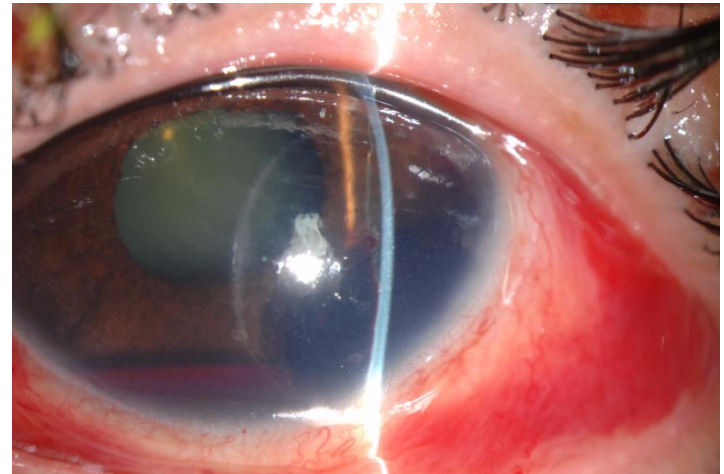
- Intracorneal hematoma (new reports)

INTRACORNEAL HEMATOMA

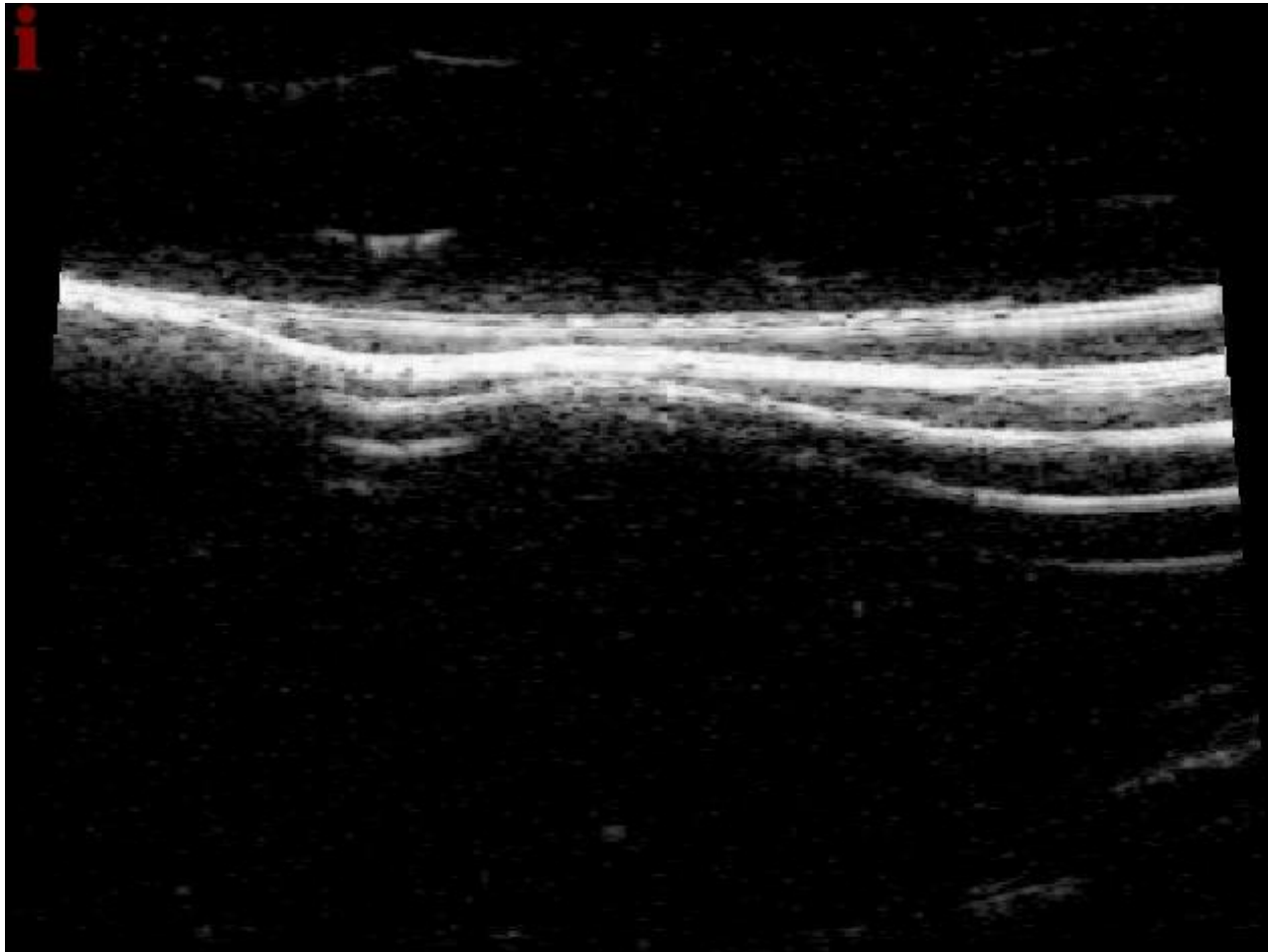
Patient A

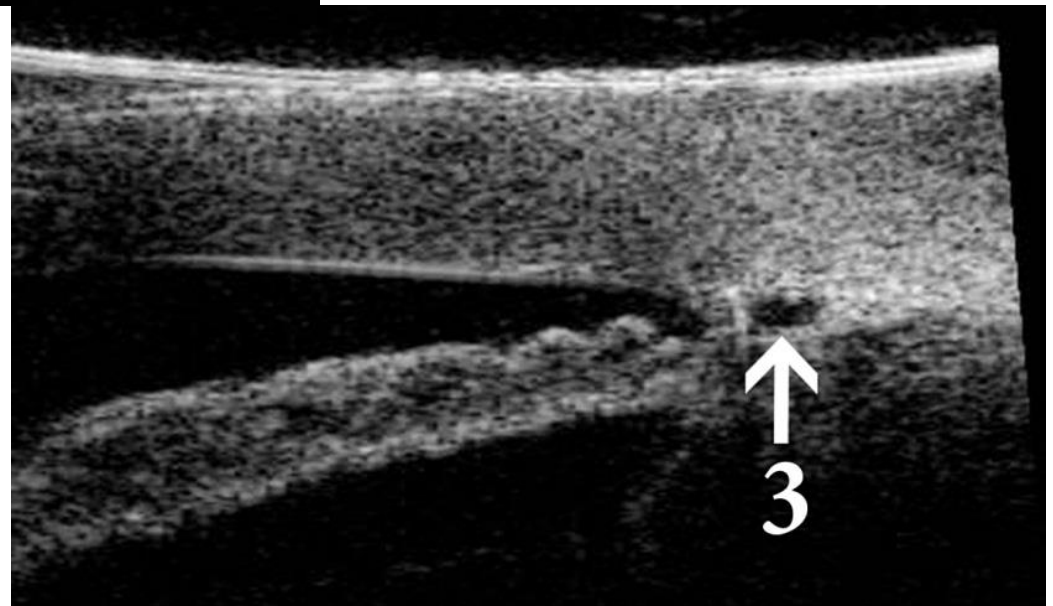
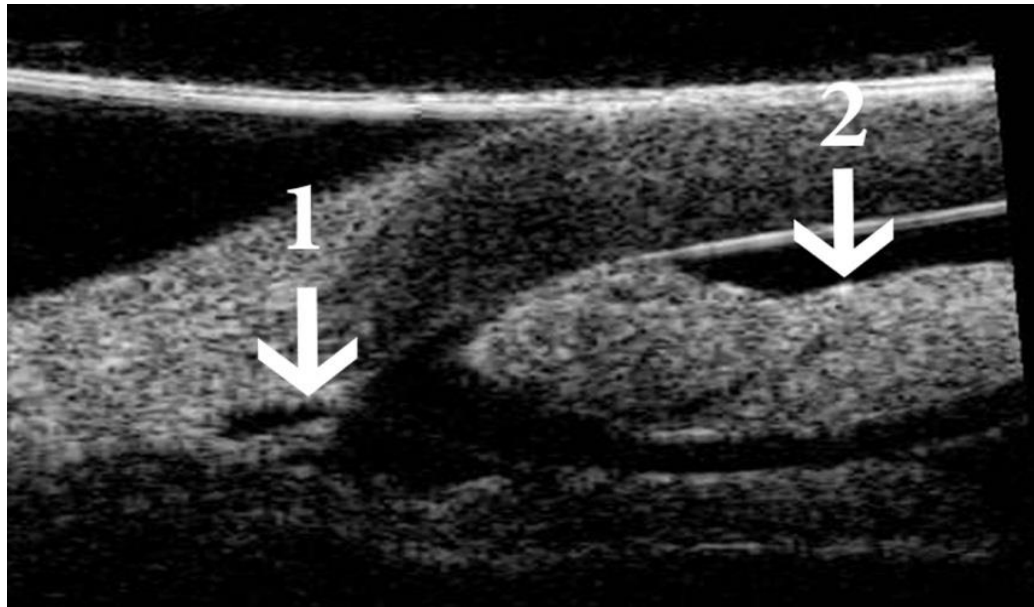


Patient B



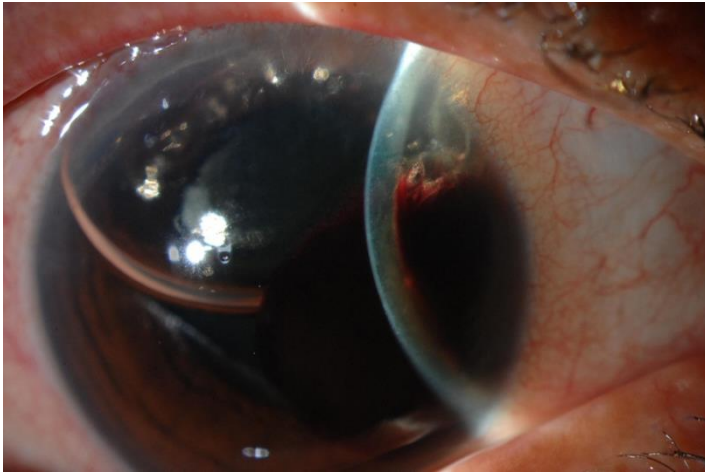
*80 MHz UBM WAS DONE INTRAOPERATIVELY
& SHOWED A RUPTURED INNER WALL OF
SCHLEMM CANAL AT 4 O'CLOCK POSITION*



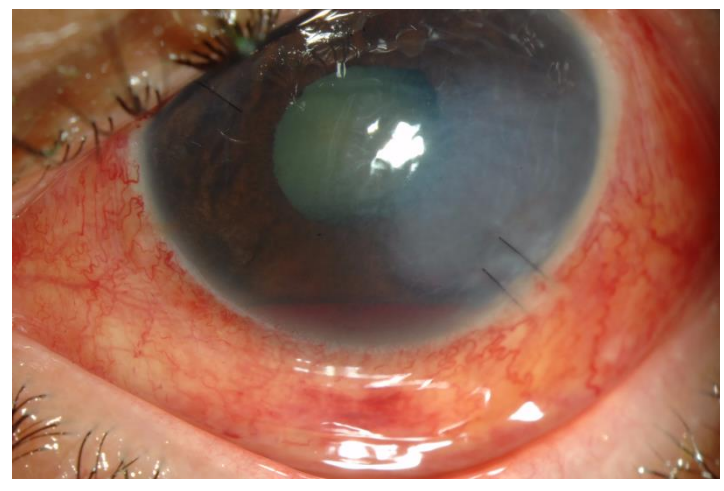
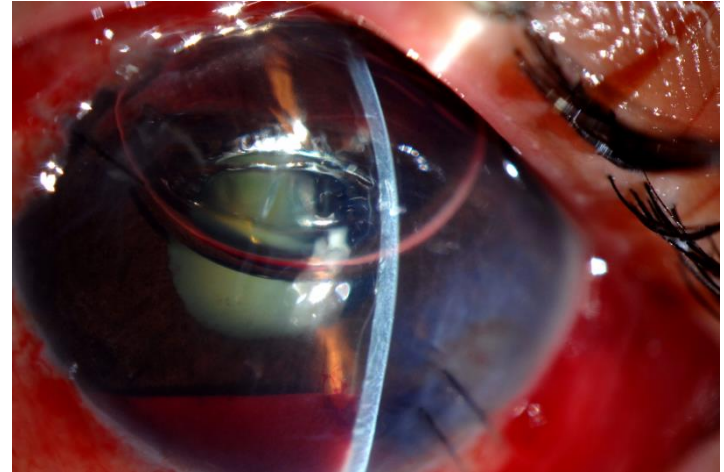


INTRACORNEAL HEMATOMA

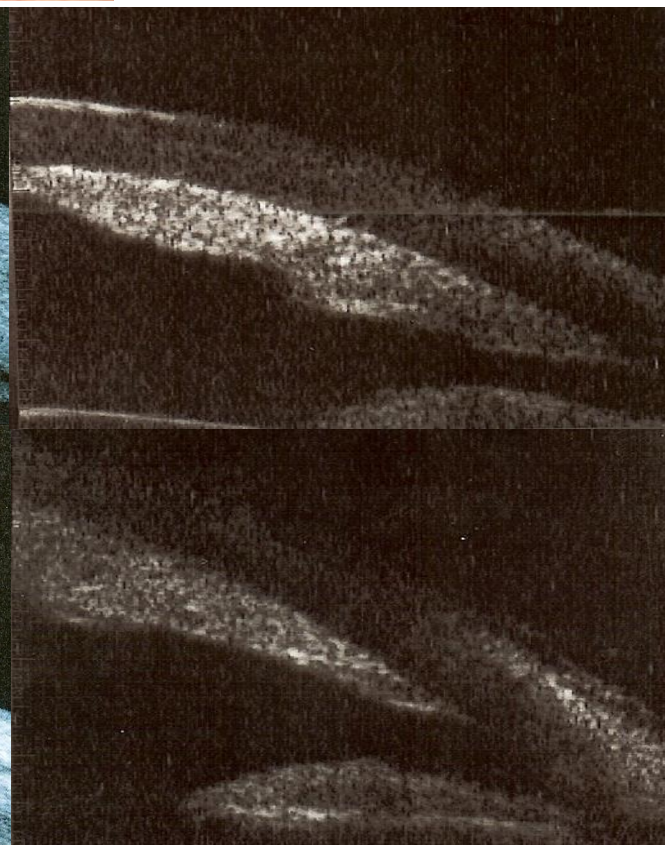
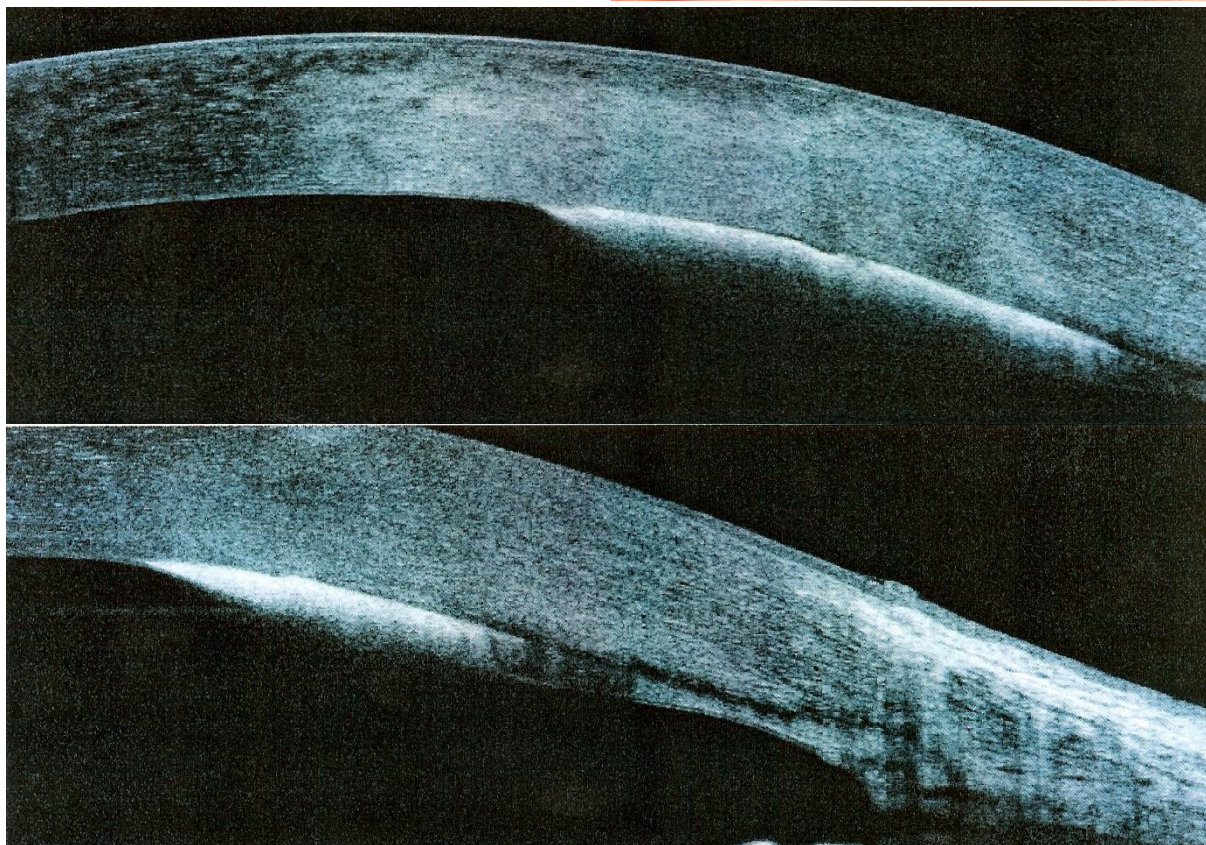
Patient A



Patient B

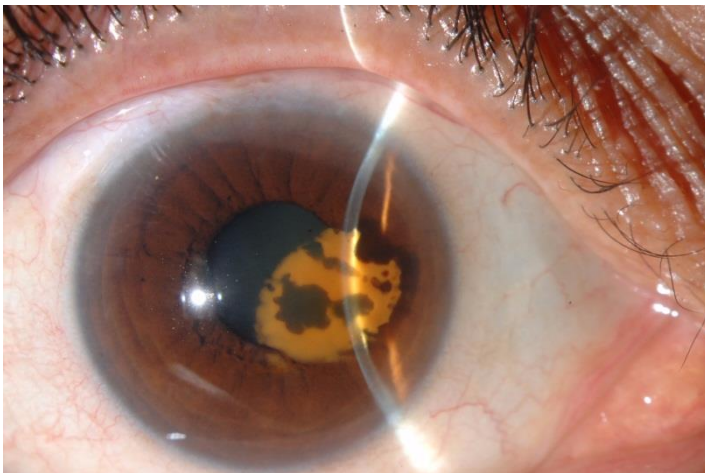
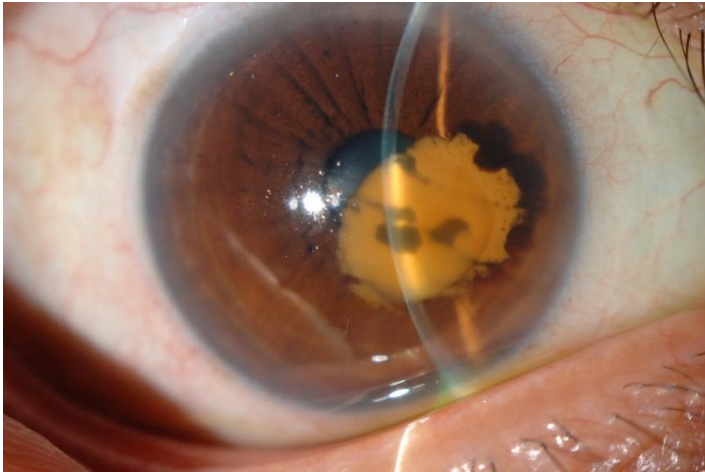


OCTAS + UBM:

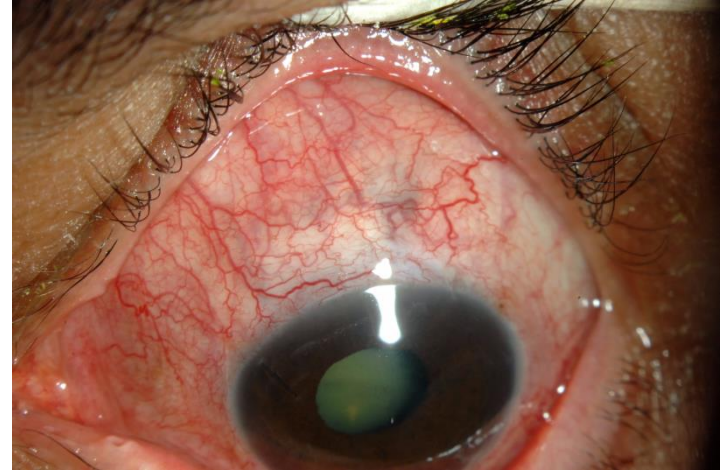
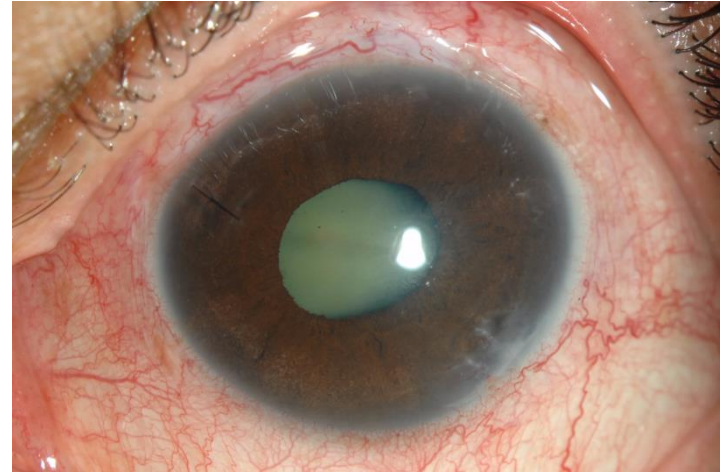


INTRACORNEAL HEMATOMA

Patient A



Patient B



REASONS



1-VISCODILATION :

The entry of the high –weight viscoelastic substance through the ruptured inner wall of sclemm canal with reflux of blood was due to high pressure in the high-weight viscoelastic substance injection process which lead to descemet detachment by the OVD & reflux bleeding from the sclemm canal with subsequent entrapement of the hematoma by the surrounding high-weight OVD



2-MICROCATHETER:

A false passage of the microcatheter can rupture the inner wall of sclemm canal causing bleeding which could dissect through the descemet membrane

MANAGEMENT & PROGNOSIS

The management options are determined by the location , size & visual impairment.

1-MEDICAL:

medical management awaiting the spontaneous reabsorption of the hemorrhage which could take up to 6 months is reasonable option in cases with small hematomas , peripherally located or those with preserved BCVA

Luke C et al .Intracorneal inclusion of high-molecular-weight sodium hyaluronate following detachment of descemet's membrane during viscocanalostomy. Cornea. 2000;19:556-7

2-SF 6:

SF6 20% injection in the presence of peripheral hematoma

Ocakoglu O et al. Repair of descemet's membrane detachment after viscocanalostomy. J Cataract Refract Surg. 2002;28:1703-6

3-ENDOTHELIAL MICROPUNCTURE:

Endothelial micropuncture to facilitate the drainage of the entrapped OVD with the hemorrhage coupled with SF6 20% injection to push the hematoma to the AC can be useful in hematomas that affect the visual axis (size ?)

Pinazo RG, Sanchez EL, Montiel JM. Hemorrhagic descemet's membrane detachment after viscicanalostomy. Arch Soc Esp Oftalmol. 2010;85(3):110-113

4-PARTIAL THICKNESS CORNEAL INCISION:

a partial thickness pre-descemet corneal incision to evacuate the hematoma can facilitate the spontaneous drainage but over longer time (risk of corneal stain ?)

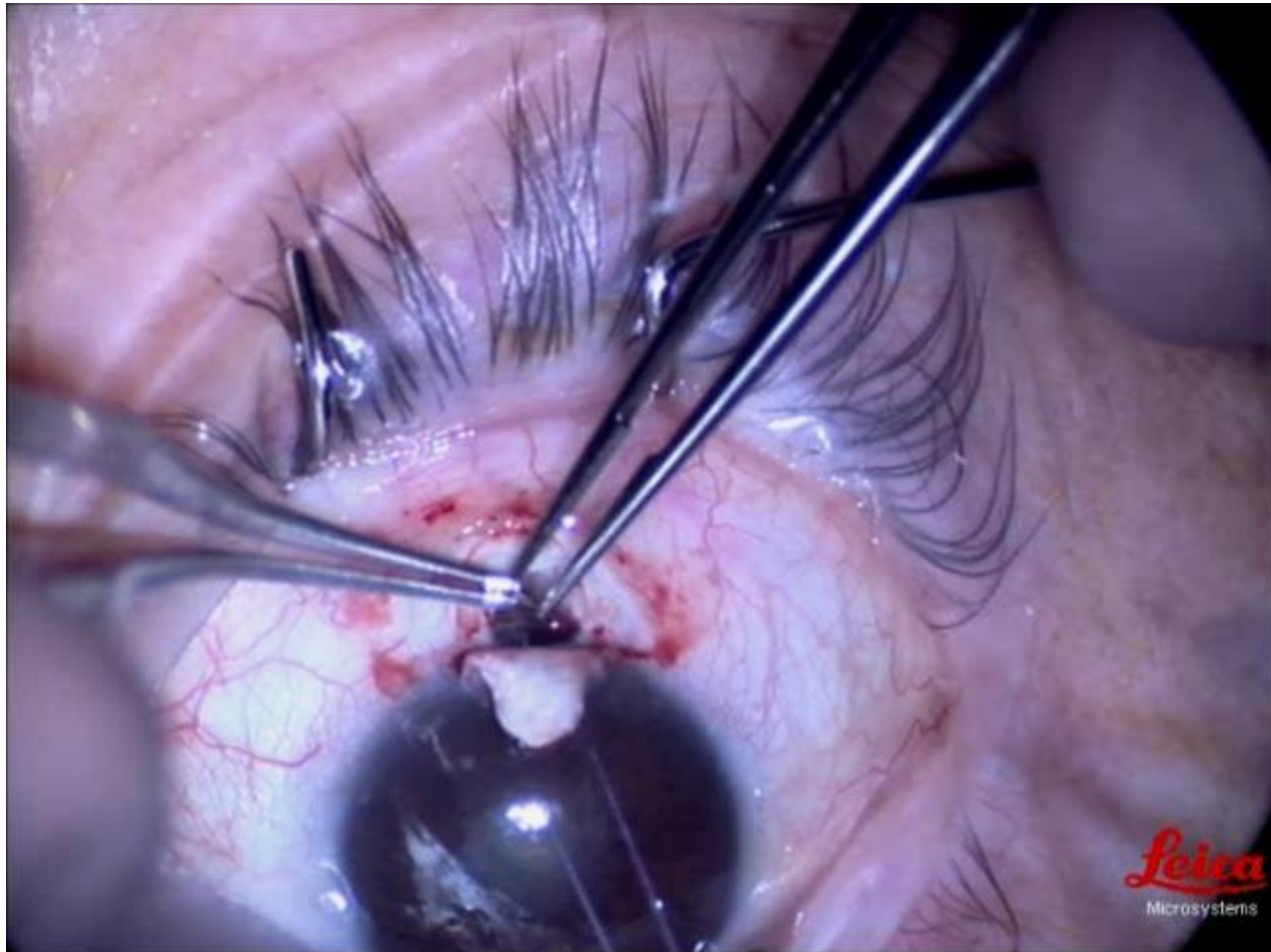
Sharma PS ET AL. Corneal blood staining secondary to hemorrhagic descemet membrane detachment. Cornea. 2007 Dec;26(10):1273-4

5-PRE-DESCEMET INCISION WITH TAMPONAD:

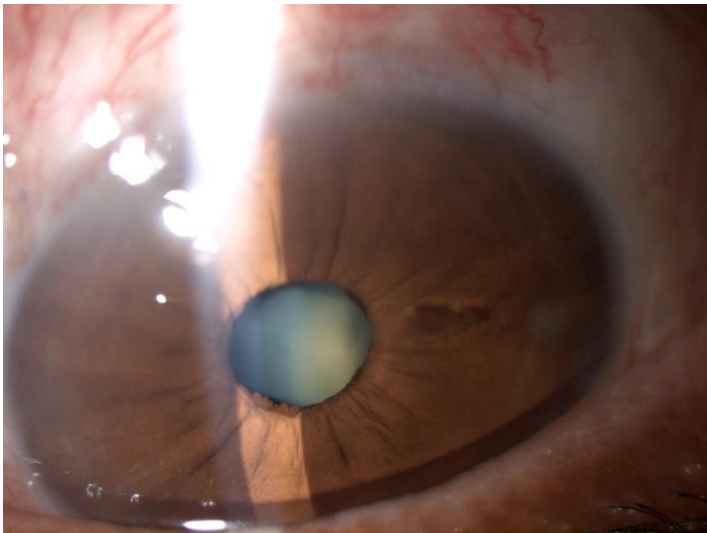
A partial thickness pre-descemet incision with the injection of OVD in the anterior chamber through another paracentesis then using the Rycroft blunt canula to wash the OVD & hematoma & then washout the OVD from the AC & injecting air bubble to reattach the descemet membrane is a useful option for large hematomas involving the visual axis . Thus , the risk of staining is less & the visual prognosis is better

Gismondi M et al : Intracorneal hematoma after canaloplasty in glaucoma. Cornea.2010:1-2

Which patient will develop such complication ?



**No clear answer till now ,could be
overdilation of the canal or just a
week wall**



EFFICACY AND SAFETY OF
CANALOPLASTY IN SAUDI PATIENTS
WITH UNCONTROLLED OPEN ANGLE
GLAUCOMA



بن رشد التخصصي للعيون
Binrushd Ophthalmic Center

B

Purpose: To evaluate the outcome of Saudi patients with open angle glaucoma with uncontrolled IOP

Design: Prospective study.

Inclusion criteria were:

- Open angle
- Vergin eyes
- Uncontrolled IOP &/or progressive visual field deterioration with possible non-compliance to medications

Exclusion criteria were:

- Closed, narrow or narrow inlet angle
- Previous glaucoma surgery

VARIABLES

Mean age (months) (\pm SD)

At time of surgery 46.8 (16.3)

Mean follow-up

4.2 (2.7) range (3-9 months)

Gender (n= 38 eyes , 32 patients)

Male 19 (59%)

Female 13 (41%)

Diagnosis

POAG 14(63.6%)

NTG 2 (9.1%)

Pigmentary 2 (9.1%)

PXF (open angle) 1 (4.5%)

Juvenile open angle 3 (13.6%)

Preoperative (\pm SD)

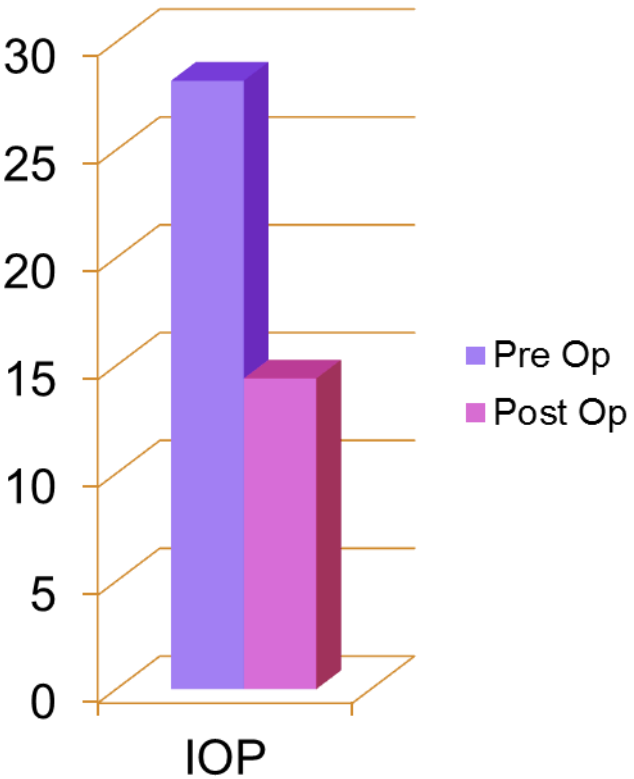
- IOP 28.2 (8.1)
- Medications 2.7 (0.95)
- Cup/Disc Ratio 0.9 (0.3)
- Visual Acuity (LogMAR) 0.5 (0.7)

RESULTS

VARIABLE	PREOP. MEAN (SD)	POSTOP. MEAN (SD)	%REDUCTION / IMPROVEMENT	P VALUE
IOP	28.2 (8.1)	14.4 (4.9)	48.9 %	< 0.0001
NUMBER OF MEDICATIONS	2.7 (0.95)	0.05 (0.21)	98.1 %	< 0.0001
VISUAL ACUITY (LogMAR)	0.5 (0.7)	0.3 (0.6)	40 %	0.157

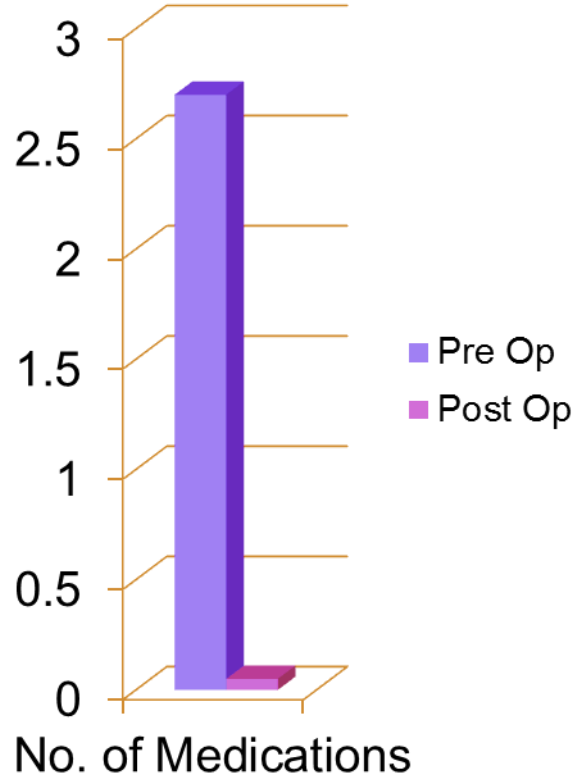
RESULTS

P < 0.0001



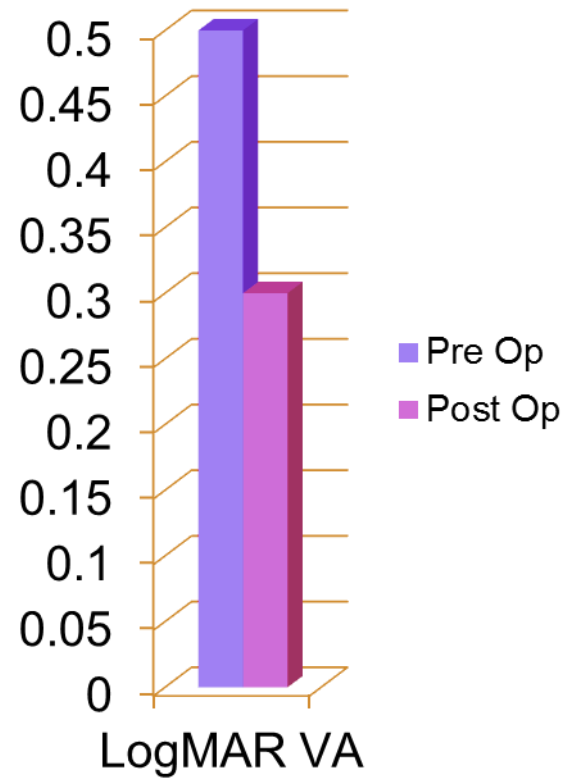
**REDUCED
48.9 %**

P < 0.0001



**REDUCED
98.1 %**

P = 0.157

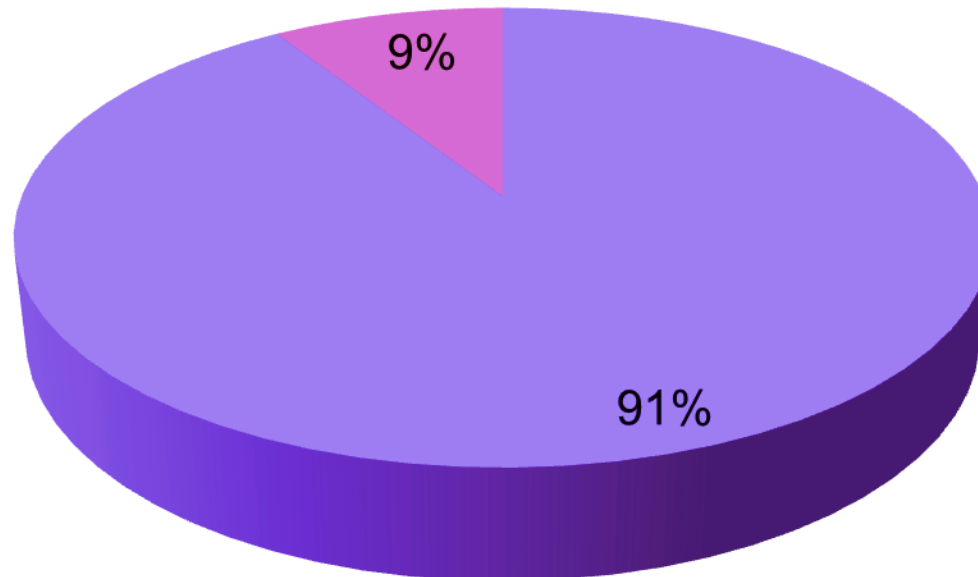


**IMPROVED
40 %**

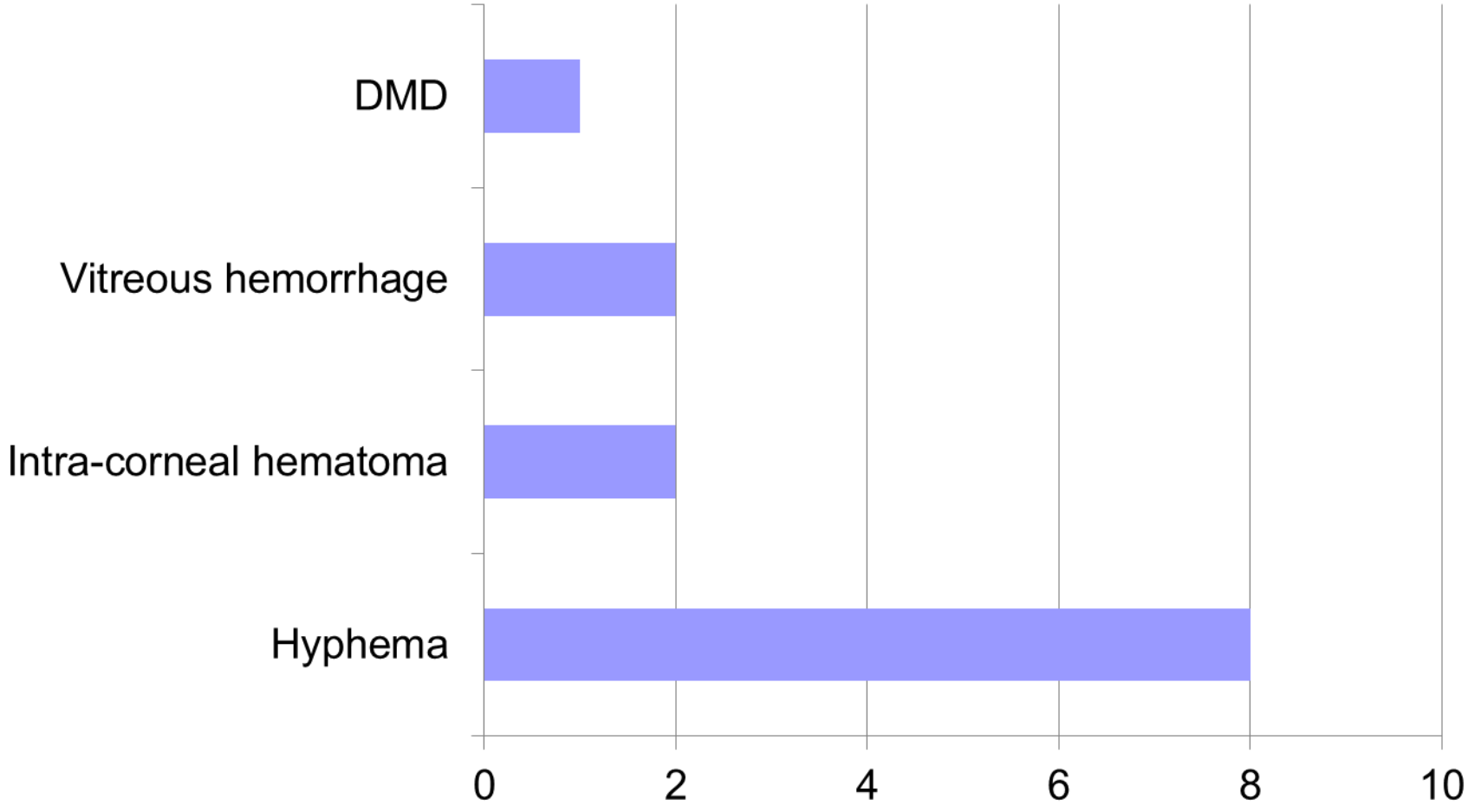
RESULTS

Only 2 cases failed : one at the first month & the second at the second month

■ Complete Success ■ Failure



RESULTS



DISCUSSION

- ❖ A major advantage of canaloplasty surgery is the ability to have a low IOP by restoring the physiologic pathway & thus, avoids the presence of blebs & their related complications.
- ❖ Klink et al showed that blebs occurs rarely after canaloplasty & were not detected clinically in one eye out of 20 *Journal of Glaucoma 2011*
- ❖ In a retrospective comparative study, Ayyala et al showed a comparable IOP reduction in both canaloplasty & trabeculectomy group *Ophthalmology 2011*

DISCUSSION

- ❖ Shingleton et al reported transient IOP elevation followed by hyphema as the most encountered in a 54 eyes study population who underwent combined Phaco-canaloplasty & the IOP at 12 months was 13.7 (4.4) which is comparable to our results

J CATARACT REFRACT SURG 2007

- ❖ Grieshaber et al reported a success rate of 81.6 % at 36 months & a higher rate at 12 months which is comparable to our study & a low rate of complications mainly DMD *BJO 2010*

DISCUSSION

- ❖ Bull et al reported an IOP of 15.1 ± 3 mmHg at 3 years follow-up compared to 23.4 ± 3 mmHg preoperatively in canaloplasty alone & 13.8 ± 3.2 mmHg at 3 years follow-up compared with 24.3 ± 6 mmHg preoperatively in combined cataract-canaloplasty. *Graefes Arch Clin Exp Ophthalmol 2011*
- ❖ Lewis et al reported an IOP of 15.2 ± 3.5 mmHg at 3 years follow-up in canaloplasty alone compared with 23.8 ± 5 mmHg preoperatively & 13.6 ± 3.6 mmHg at 3 years compared to 23.5 ± 5.2 preoperatively in combined cataract-canaloplasty. The complications were cataract (12.7 %), transient IOP elevation (6.4 %), & partial suture extrusion through the trabecular meshwork (0.6 %) *J Cataract Refract Surg 2011*

CONCLUSION

- ❖ Canaloplasty can offer a low IOP by restoring the normal physiologic aqueous pathways.
- ❖ Being independent on subconjunctival outflow, it avoids the presence of blebs & their related complications.
- ❖ Canaloplasty complications are rare, mostly transient & if visually significant, should be dealt with early.
- ❖ Intermediate-term outcomes are encouraging. However, further long-term studies are needed.



Thank you