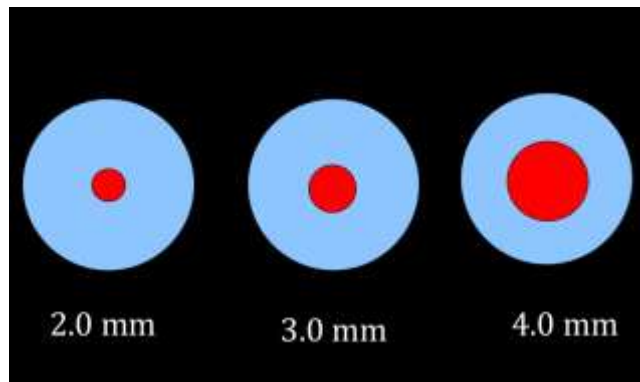


*Management of small pupil
in phacoemulsification
(personal experience)*

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Assiut University
Egypt

Small pupil



Etiology

- *PEX*
- *IFIS*
- *Diabetes*
- *Post. Synechia*
- *Trauma*
- *Age related*



Etiology

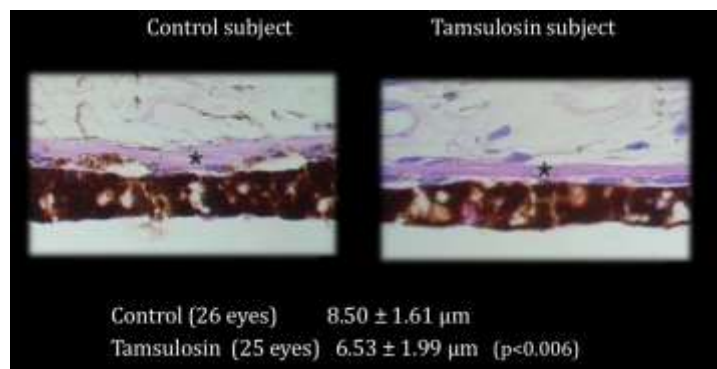
- *Fibrotic pupillary sphincter*
- *Posterior synechiae*
- *Alpha 1 antagonists*

Tamsulosin (Flomax)

- *There are several medications available for the treatment of benign prostatic hypertrophy.*
- *These medications are alpha 1 blockers and they improve the urinary outflow by relaxing the smooth muscle in the bladder neck and the bladder.*
- *Tamsulosin (Flomax) is favored by urologists because it has fewer systemic side effects than others such as doxazosin (Cardura), terazosin (Hytrin) or alfuzosin (Uroxatral).*
- *Flomax has a high affinity and specificity for the **alpha 1-A receptor** subtype, which is the predominant receptor in the prostate and the bladder.*

Intraoperative floppy iris syndrome (IFIS)

- *It has been shown that the alpha 1-A receptor is in the iris dilator muscle.*
- *The use of Flomax has led to a condition called intraoperative floppy iris syndrome (IFIS) described by Chang and Campbell.*
- *The syndrome involves a triad of findings:*
 - *First, the iris is floppy and tends to billow with the normal flow in the anterior chamber.*
 - *Second, the iris tends to prolapse into the phaco and side port incisions.*
 - *Finally, and most concerning, is the tendency toward progressive pupil constriction during surgery.*
- *This combination can lead to difficult surgery*



Informing Patients

- *Longer surgery*
- *Special steps and instruments*
- *Higher risk of complications*
- *Pupil appearance after surgery*

Challenges during small-pupil phacoemulsification surgery

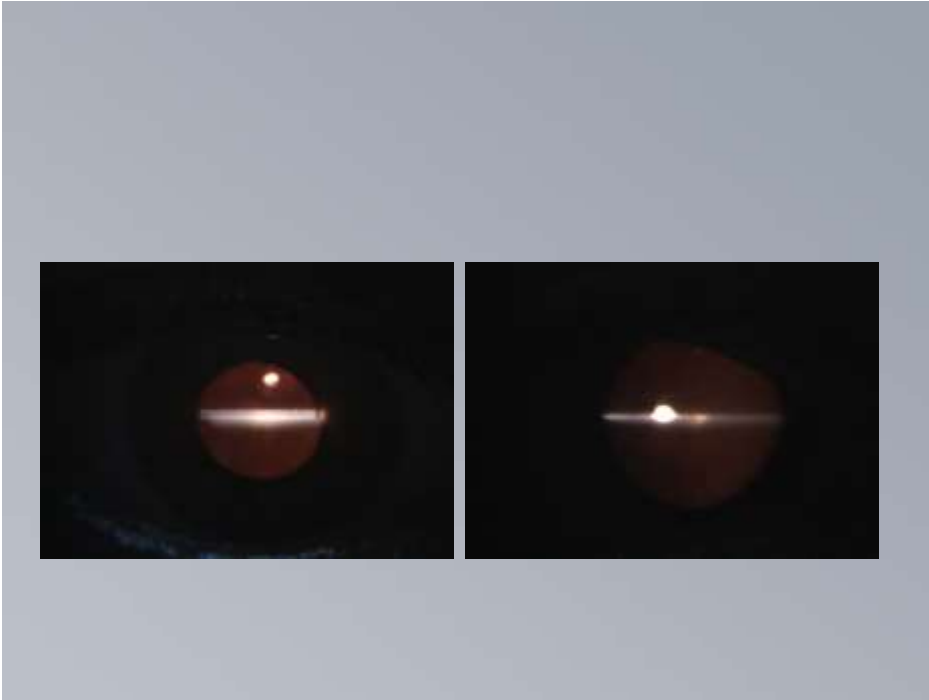
- *Red reflex (visualization).*
- *Capsulorhexis (Small).*
- *Increased risk of iris damage (inflammation and cosmesis).*
- *Iris bleeding.*
- *Iris prolapse from one or more wounds.*
- *Anterior capsule damage and capsular phimosis (visualization and small).*
- *Incomplete evacuation of the cortical material (Blind removal).*
- *Difficulties with placing and aligning the IOL in the bag (Blind insertion).*
- *Toric lenses*
- *Femtosecond cataract surgery*

Post Operative iris defects



Preoperative

- *Diagnosis (history, other eye, maximum dilation)*
- *Mydriatics*
- *Non-steroidal anti-inflammatory agent (Nepafenac)*
- *Stop prostaglandin analogues.*
- *If the patient is on miotics, stop them 2 weeks before surgery.*
- *Mannitol*
- *Be prepared to handle the iris with a variety of techniques*



The step-wise approach in managing small pupils

- *Intracameral injection*
- *Viscodilatation*
- *Posterior synechiolysis*
- *Pupil stretching technique*
- *Sphincterotomies*
- *Pupil expander devices*

Pharmacologic Dilation

- *Traditionally, the use of topical mydriatics in the form of a sympathomimetic agent combined with a parasympathetic blocker fulfilled the goal of achieving mydriasis.*
- *Adding epinephrine to the balanced salt solution (BSS) infusion has supplemented and maintained dilation.*
- *With the introduction of Ocufer (Allergan, Irvine, CA), it was realized that a nonsteroidal anti-inflammatory drug (NSAID) also contributed to maintenance of dilation by blocking the miotic effect of prostaglandins released when the iris was manipulated.*
- *Intracameral mydriatics* The instillation of 1% phenylephrine directly onto the anterior capsule has been found to be helpful in maintaining pupil size in patients with intraoperative floppy iris syndrome (IFIS) by
- *Dr. Joel Shugar advocated "Shugarcaine" using 1:1,000 bisulfite-free epinephrine that is mixed in a 1:3 dilution with three parts BSS+ and one part nonpreserved lidocaine 4%. Approximately 1 mL of this mixture is slowly injected into the anterior chamber before instillation of the ophthalmic viscosurgical device (OVD)*
- *Omidria* (phenylephrine and ketorolac 3% (Non-steroidal anti-inflammatory)

- ***Epi-Shugarcaine:***

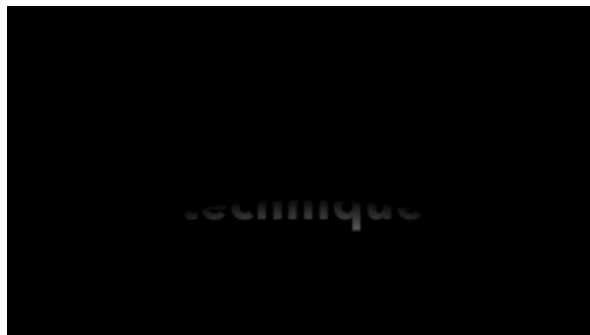
- ***Lidocaine***

- ***Epinephrine***

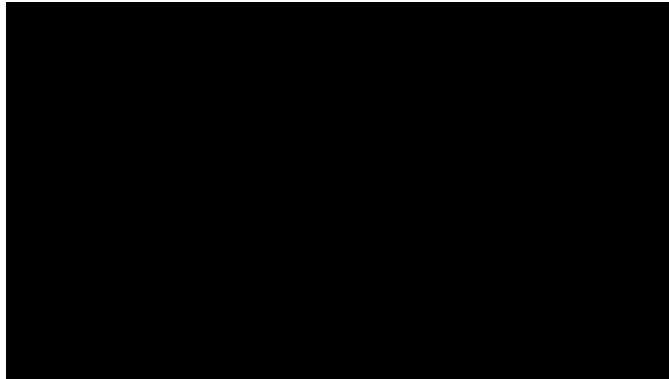
Viscodilation

- *Healon 5*
- *Soft Shell technique or tri-soft shell (Arshinoff)*

Soft shell technique (Viscodilatation)



Posterior synechiolysis and cutting of pupillary membranes



Fine's Mini-sphincterotomies

- *After the chamber is filled with viscoelastic,*
- *Six to eight equally spaced mini-sphincterotomies are performed.*
- *The incisions are made 0.5 mm into the pupillary sphincter,*

Mini-sphincterotomies

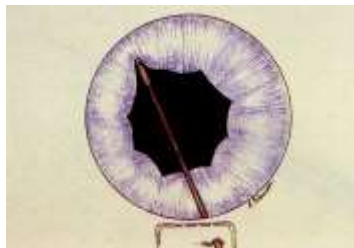
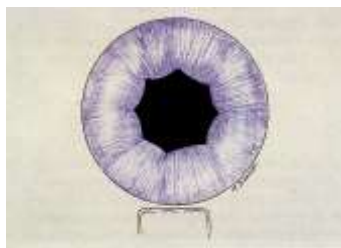
- *Cheaper*
- *Faster*
- *No extra side ports*
- *Less manipulation*
- *Permanent cure of the condition*

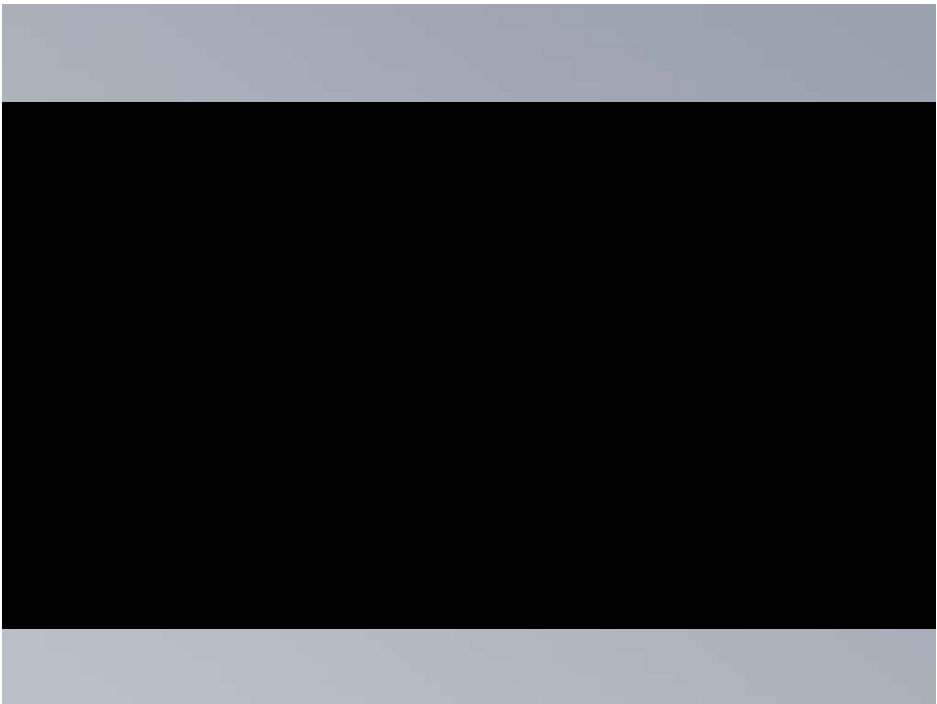
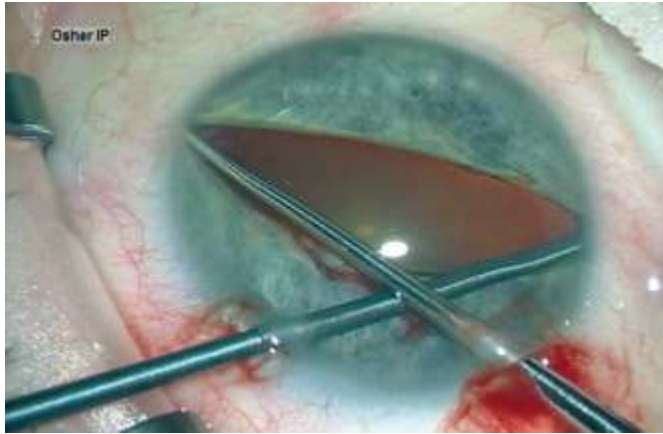
Mini-sphincterotomies (Indications)

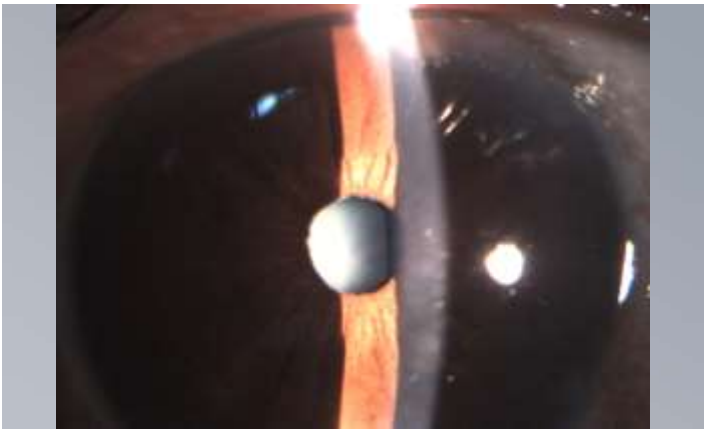
- *PEX*
- *Long standing miotics*
- *Diabetic*

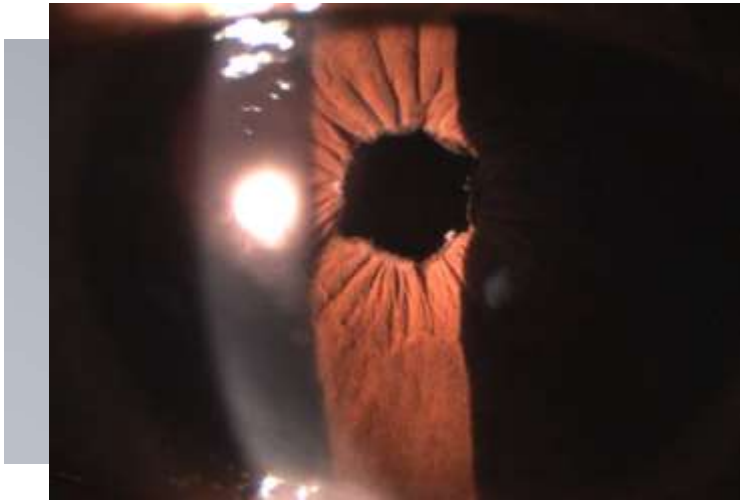
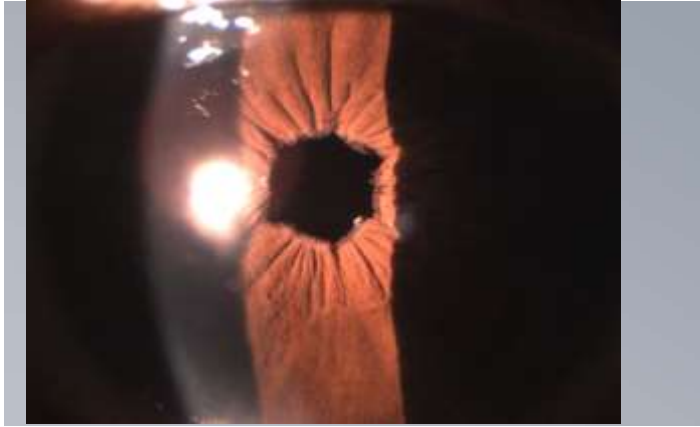
Mini-sphincterotomies (contraindications)

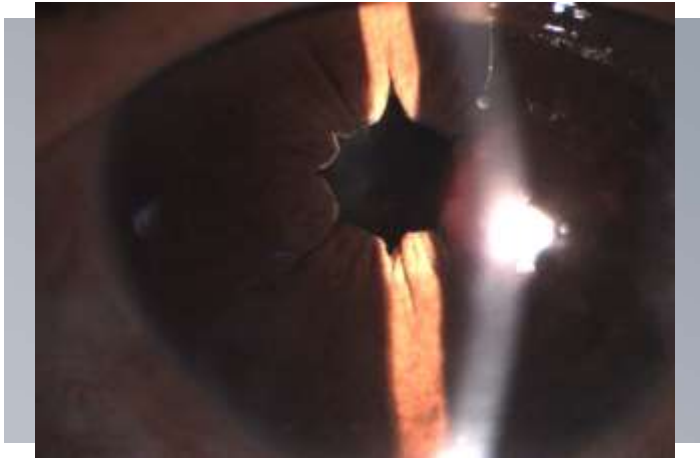
- *IFIS*
- *Rupiosis*

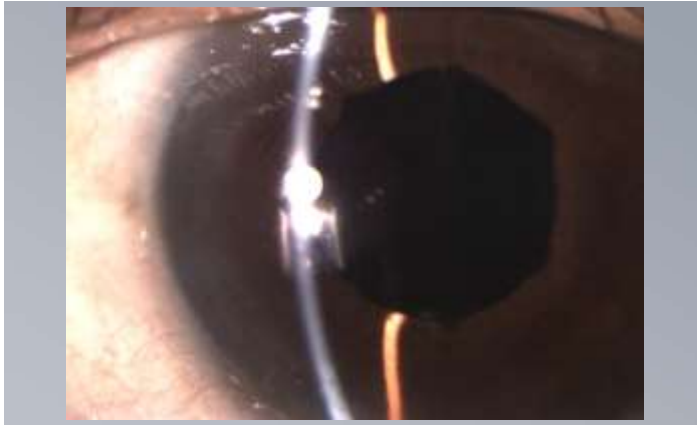












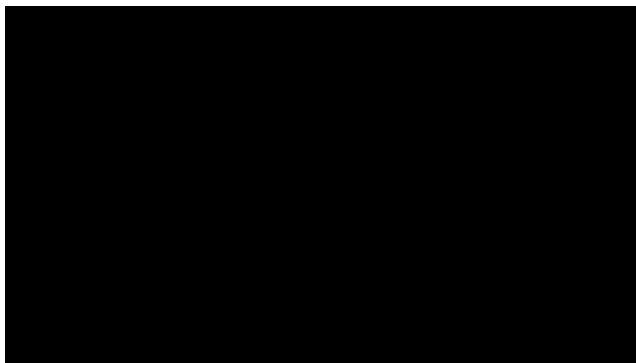
Nuclear Management in small pupil

- *Slow Motion*
- *Hydrodelineation and Hydroprolapse*
- *Prechopping*
- *Vertical chopping*
- *Lens Tilt Technique*

Slow motion phaco

- *It is necessary to change your machine parameters to low flow techniques.*
- *The bottle height should be lowered to around 70 cm.*
- *The aspiration flow rate to below 25 cc/min.*
- *The vacuum to less than 250 mmHg.*

Prechopping



Lens tilt technique



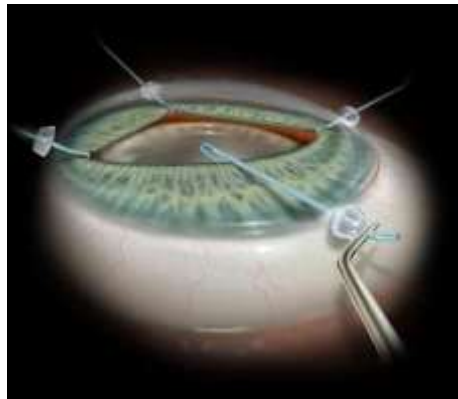
Blind I/A and IOL implantation



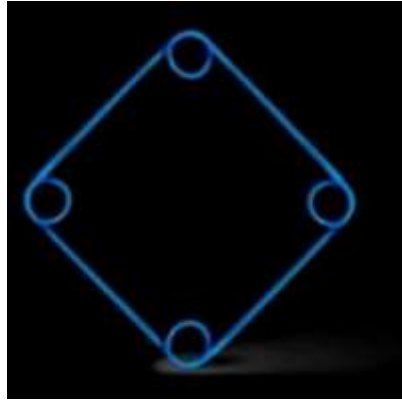
Pupil expansion devices

- *Iris Hooks*
- *Malyugin Ring*
- *The Visitec I-ring*
- *The Assia Pupil Expander*

Iris Hooks



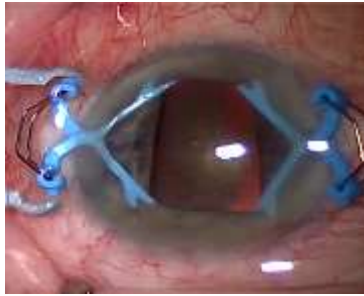
The Malyugin Ring



The Visitec I-Ring



The Assia Pupil expander



Disadvantages

- *Require additional steps.*
- *lengthening surgery time.*
- *Increasing costs.*
- *Introducing additional instruments into the eye.*

WHEN INDICATED

- ***However, preventing complications related to performing surgery in a small pupil and IFIS outweigh these disadvantages.***

THANK YOU