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## CERTIFICATE OF ATTENDANCE

THIS IS TO CERTIFY THAT

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HAS ATTENDED AS

*Speaker*

## 5<sup>th</sup> INASCRS BIENNIAL MEETING 2019

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**Chairman**  
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INASCRS

# SMALL PUPIL PHACO WITHOUT IRIS RETRACTOR : CAN WE HANDLE IT?

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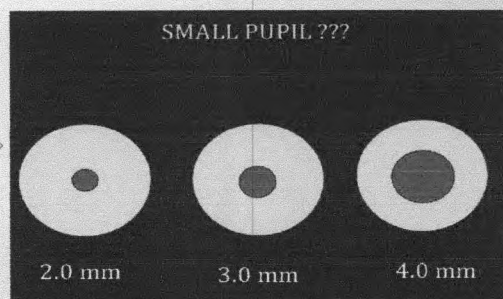
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## INTRODUCTION

### SMALL PUPIL CATARACT

A relatively common problem experienced during cataract surgery

Defined as pupil  $< 4$  mm in diameter  $\rightarrow$  Prevalency 2 %



## SMALL PUPIL

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• Major challenge → Lack of visualization

Difficult CCC

Sculpting

Segment removal

Cortical clear up

IOL Implantation

## COMPLICATION

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• Posterior Capsule Rupture

• Corneal endothelial cell loss

• Vitreous loss

• Dropped nuclei

• Iris trauma, damage

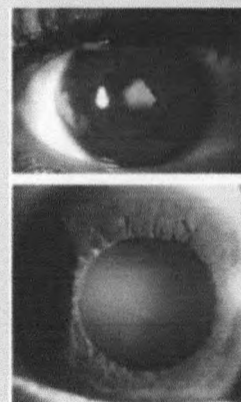
• Capsular phimosis

## TECHNICAL CHALLENGES OF SMALL PUPIL PHACO

- Reduced red reflex
- Increased risk of iris damage
- Iris bleeding
- Problems in ensuring in-the-bag IOL placement
- Iris prolapse from wound
- Incomplete evacuation of the cortical material
- Small anterior capsulorhexis size

## COMMON CAUSE OF SMALL PUPIL

- Post uveitis cataract (posterior synechiae)
- Pseudoexfoliation syndrome
- Diabetic patients
- Floppy iris syndrome (when on alpha blocker drugs)
- Prolonged miotic therapy
- Neurological conditions



## CLASSIFICATION OF SMALL PUPIL

### FUNCTIONAL

(Hyporeactive, lazy pupil)



Pupil dilate under pharmacological effect

- High hyperopes
- Constantly medicated eyes
- Elderly

### ANATOMICAL

(Fixed pupil)



Not dilate to mydriatic drugs :

- Inflammatory (post uveitis)
- Traumatic
- Neurological disease
- Chronic miosis (iatrogenics)

## FUNCTIONAL SMALL PUPIL

### Pharmacological treatment

- Phenyleprine 10 %
- Tropicamide 1%
- Ketorolac 5 % ( NSID)
- Intracameral adrenalin : 0,5 ml adrenaline 1:1000
- Heavy viscoelastic

### Mechanical Treatment

- Iris hook
- Bheeler pupil dilator
- Keuch pupil dilator

## FIXED PUPIL/ ANATOMICAL

### Mechanical treatment

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- Nylon hook
- Stretch pupiloplasty
- Iris rings
- Malyugin pupil dilator

### Incisional treatment

- Spinctectomy
- Iridotomy
- Iridectomy

### PUPILS THAT DO NOT RESPOND ADEQUATELY :

#### • **Patients with pseudoexfoliation syndrome :**

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- Have a higher risk for complications
- Poor pupil dilation and compromised zonular integrity

#### • **Patients with topical Medications for Glaucoma**

Permanent pupillary miosis related to synechiae

Poor dilation from hypertrophy of the pupillary sphincter muscle

#### ▪ **Diabetes**

- The pupil is smaller and less response to mydriatic agents , due to diabetic neuropathy
- Constriction of the pupil during cataract surgery is more obvious .

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**MEDICAL AND SURGICAL  
MANAGEMENT OF THE  
SMALL PUPIL**

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**TWO GOALS IN MANAGING SMALL PUPIL**

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**A. Pharmacological**

**B. surgical techniques**

**• Primary :**

- Medical pre medication for proper surgical preparation
- Achieve adequate pupil size to perform safe cataract removal

## PHARMACOLOGICAL APPROACH

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**Preoperative** → starts 2 days before surgery.

- Phenylephrine 2.5%
- Tropicamide 1 %
- Cyclopentolate 1%
- Ketolorac 0.5%

## SURGICAL TECHNIQUES

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- Posterior synechia → synechial released devices
- A high-viscosity viscoelastic is used to dilate the pupil.
- Surgical methods to enlarge the pupil can be classified into :

1. Pupil stretching



2. Iris cutting



3. Iris retaining



## **OPERATIVE**

### **INTRACAMERAL MYDRIARTICS**

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**I: 1000 (1 mg/ml) Epinephrine**

**Lidocain/ Epinephrine mixture**

**CAN WE DO CATARACT SURGERY IN SMALL PUPIL?**

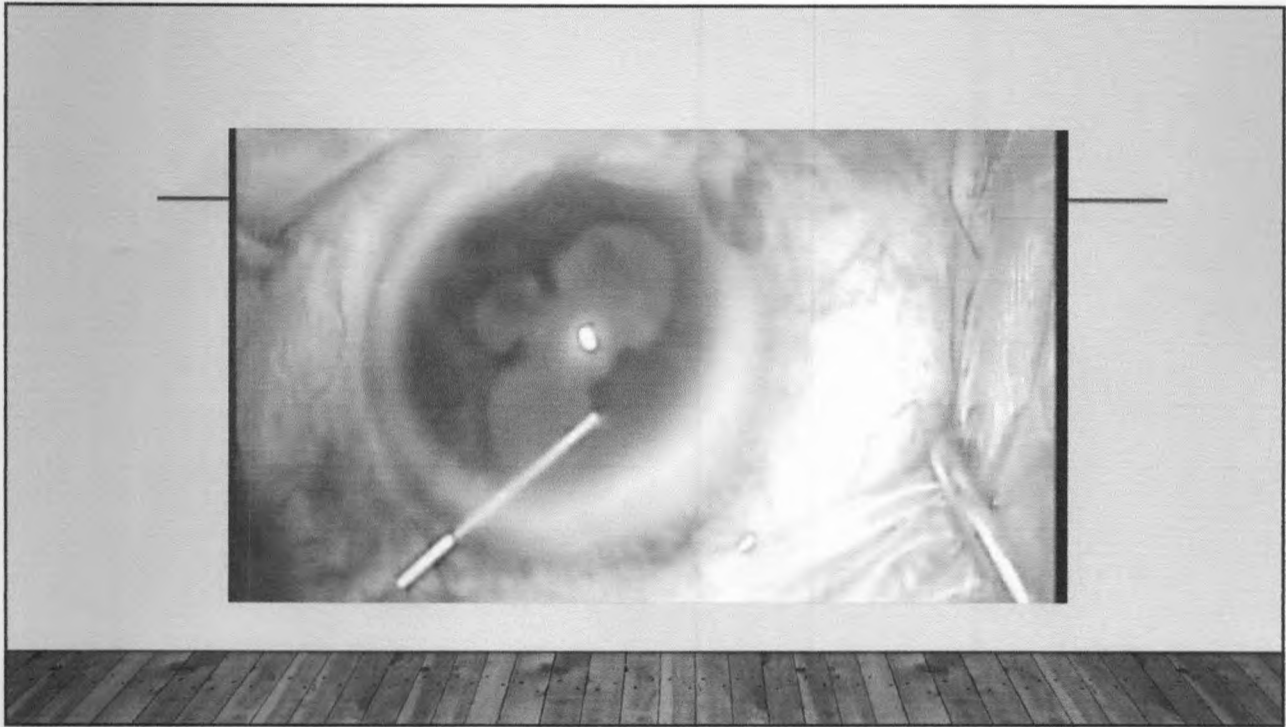
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**Without Iris-retaining devices ?**

**Pupillary mydriasis can be achieved by :**

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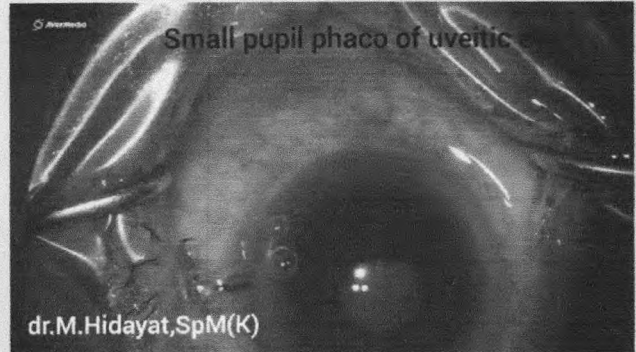
- Injection of an ophthalmic viscosurgical device
- Membranectomy
- Release of Posterior Synechiae
- Pupil Stretching



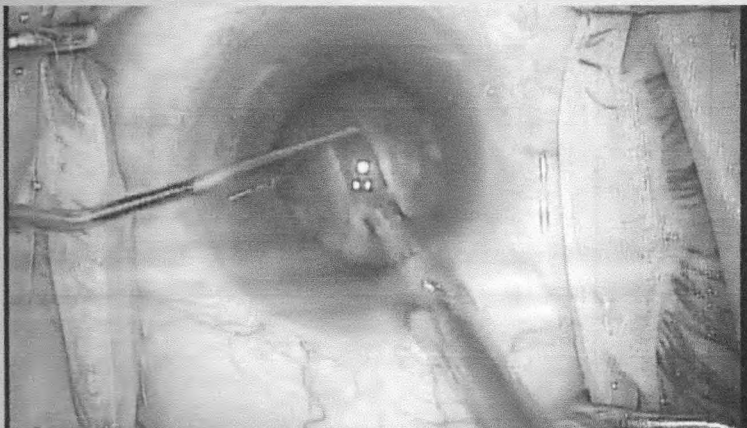
### THE PHACOEMULSIFICATION TECHNIQUE

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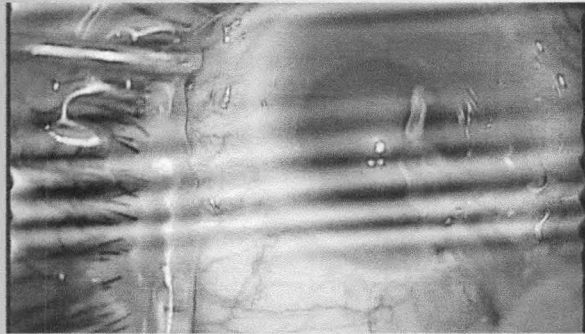
- A longer clear corneal incision
- High-viscosity viscoelastics
- The capsulorrhexis underneath the iris



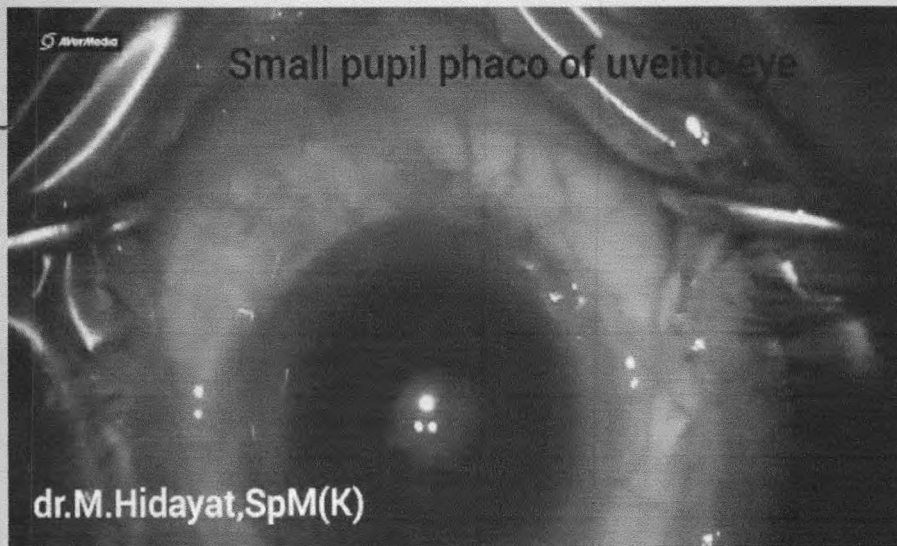
- Endocapsular vertical chopping phaco-technique



- Last piece emulsify can be done in AC
- I/A tips 45° (curve)



- IOL Implantation
- Remove VES
- All parameter lower than usual



## CONCLUSION

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- ✓ A complete medical history is critical in identification of patients with pharmacologically induced pupillary miosis.
- ✓ The use of NSAIDs preoperatively, support mydriasis and/or prevent miosis.
- ✓ **A specific techniques for small pupil must be safe, quick, effective and has same result with cataract surgery through normal pupils.**

