

# Intracameral phenylephrine to prevent floppy iris syndrome during cataract surgery in patients on tamsulosin

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## Abstract

**Purpose** To describe the use of intracameral phenylephrine to prevent the floppy iris syndrome seen in patients who are on the drug tamsulosin for benign prostatic hypertrophy, during cataract surgery.

**Setting** Prince Charles Eye Unit, King Edward VII Hospital, Windsor, Berkshire, UK.

**Method** Seven patients who were on systemic tamsulosin for benign prostatic hypertrophy received intracameral phenylephrine before capsulorexhis during their cataract surgery.

**Results** There was a significant reduction in the amount of mobility of the iris, reduction in the expected fluttering, and sustained papillary dilatation.

**Conclusion** Intracameral phenylephrine is a simple and effective tool to prevent the effects of floppy iris syndrome in those patients undergoing cataract surgery who are on systemic tamsulosin.

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**Keywords:** intracameral; phenylephrine; tamsulosin; floppy iris; cataract surgery; small pupil

## Introduction

The intraoperative floppy iris syndrome (IFIS) is a recently described syndrome<sup>1</sup> in patients who are on systemic tamsulosin (Flomax, Boehringer Ingelheim GmbH, Germany) for the treatment of lower urinary tract symptoms in patients

suffering from benign prostatic hypertrophy (BPH).

This syndrome is a recently observed phenomenon in which there is excessive billowing and fluttering of the iris during phacoemulsification. There is also an increasing tendency for the iris to prolapse out through the side port incisions. These pupils do not dilate well either and progressively constrict during the course of the surgery.<sup>1</sup>

Conventional methods of preventing complications from floppy iris and poorly dilated pupils include use of iris hooks<sup>2</sup> and spincterotomy<sup>3</sup> among others.

We describe the use of intracameral phenylephrine at the beginning of the operation to prevent the occurrence of the floppy iris syndrome. This avoids the use of the more traumatic measures listed above, saves intraoperative time, and reduces complications.

## Tamsulosin hydrochloride

Tamsulosin hydrochloride is a systemic sympatholytic, which acts by selectively antagonizing alpha-1-a receptors.<sup>4</sup> The drug relaxes the smooth muscle in the bladder neck and prostate, improving urinary flow in patients with symptomatic BPH. It is ultraselective (uroselective) for the alpha-1 receptors in the prostate.<sup>5</sup>

## Phenylephrine hydrochloride

Phenylephrine hydrochloride is a synthetic sympathomimetic structurally similar to epinephrine that acts predominantly on alpha-1 receptors.<sup>5</sup> After topical or intracameral

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No.	Age (years)	Pre-ICP pupil	Post-ICP pupil	Reduction in floppy iris	IP
1	79	3.8	4.5	Yes	No
2	80	4	4.8	Yes	No
3	67	5.2	5.9	Yes	No
4	75	3.7	4.7	Yes	No
5	76	2.8	3.9	Yes	No
6	69	4.9	5.6	Yes	No
7	77	5.5	6.1	Yes	No
Average	74.7	4.27	5.07		

application, phenylephrine acts directly on the alpha-1 receptors to produce contraction the dilator muscles of the pupil, which produces papillary mydriasis (without significant cyclopegia). Maximal mydriasis from a single application of topical drug takes 60–90 min and recovery takes 5–7 h. Intracameral application acts immediately.

### Patients and methods

Seven consecutive male patients who were on systemic tamsulosin for urinary symptoms due to BPH and were noted to have small pupils preoperatively (a significant sign of IFIS) were selected to receive phenylephrine intracamerally during cataract surgery.

Intracameral phenylephrine was prepared using 0.25 ml of minims phenylephrine hydrochloride 2.5% (with sodium metabisulphite, sodium edentate, and purified water) mixed with 1.0 ml balanced salt solution. These were mixed into a 2 cm<sup>3</sup> syringe.

The selected patients were given intracameral lignocaine 1% prior to phenylephrine injection to prevent pain. About 0.5–1.0 ml of intracameral phenylephrine preparation was then injected into the anterior chamber through the paracentesis incision site before injection of viscoelastic.

The effect on pupillary dilatation and the behaviour of the iris throughout the operation were noted. All cases were video recorded. The pupil size was measured from the video recordings in comparison with a standard 2.8 mm keratome as described by Lundberg and Behndig.<sup>6</sup>

### Results

All seven patients had significant reduction in the signs of floppy iris syndrome.

A sustained pupillary dilatation was also noted in all cases. No case developed iris prolapse. None of the patients required any further measures like iris hooks, etc. None of the patients required repeat injections in our study.

All patients had been on tamsulosin for greater than 6 months duration. We did not discontinue tamsulosin in any of the patients prior to surgery.

### Discussion

It is suggested that tamsulosin causes blockage of the alpha-1 receptors in the dilator muscle of the iris.<sup>1</sup> This prevents the iris from dilating and accounts for its unstable nature intraoperatively.

Phenylephrine in its intracameral application saturates the alpha-1 receptors in the iris, causing it to dilate, and remain dilated throughout the surgery. It also reduces the tendency of the iris to prolapse.

This significantly reduces the need for more traumatic procedures, which are conventionally recommended for such cases, without any long-term effects. It also reduces intraoperative time and complications from surgery.

This study does have its limitations. It is a nonrandomized, noncomparative, nonblinded observational and interventional study. It also suffers from having a small sample size and observer bias. Furthermore, extensive studies need to be carried out to fully evaluate this method.

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