

# Post cataract refractive surprise

MOSTAFA M SALAH. MD  
RESEARCH ISTITUTE OF OPHTHALOMOLOGY

## Post cataract refractive surprise

- ▶ A refractive surprise is the failure to achieve the intended post- operative refractive target.
- ▶ It can cause anisometropia or dominance switch and is a source of patient dissatisfaction due to unmet expectations.
- ▶ **Benchmark standards for cataract surgery dictate that :**
- ▶ 85% of eyes should be within 1D
- ▶ 55% within 0.5D of target spherical equivalent refraction following surgery.

## Post cataract refractive surprise

### ▶ Preventing refractive surprise

The best way to manage refractive surprise is to prevent it.

- ▶ Accurate biometry, A-constant optimisation,
- ▶ intraocular lens (IOL) formula selection
- ▶ avoiding wrong lens implant errors.

## Post cataract refractive surprise Identifying the cause of refractive surprise

- ▶ 1. **A formal subjective refraction is essential.**
- ▶ 2. **A thorough dilated examination to identify surgical causes :**
  - fight corneal sutures , placement of the IOL in the sulcus or subluxation.
  - a distended capsular bag due to retained viscoelastic that can cause a **myopic shift**.
  - The presence of corneal pathology : corneal scarring or oedema can influence the refractive outcome.
  - Post-operative cystoid macular oedema can cause a **hyperopic shift**.

## Post cataract refractive surprise Identifying the cause of refractive surprise

- ▶ **3. Review the refractive history as well as the biometry, the IOL selection process and the surgical records.**

Wrong patient biometry, transcription errors, selecting the lens from the ACIOL column, incorrect A-constant or incorrect formula

## Identifying the cause of refractive surprise

- ▶ **4. Check the axial length** by repeating the biometry.
- ▶ **5. Check for abnormal keratometry.**  
The presence of high Ks or astigmatism can indicate pre-existing undiagnosed keratoconus.
- ▶ **6. If there has been no error, the refractive surprise can be attributed to**  
**effective lens position** & a similar error may occur in the fellow eye.

## Post cataract refractive surprise

### Clinical management of refractive surprise

▶ **Explain the error openly and offer an apology.**

This is not a declaration of guilt but an acknowledgment that you have not achieved the desired target refraction.

▶ **Offer a second opinion.**

This in itself can help diffuse a confrontational situation and allow meaningful dialogue to take place.

## Post cataract refractive surprise management

### Doing nothing is always an option

- Many refractive surprises do not require further surgery.
- Low myopia may give useful monovision and the ability to read unaided.
- A patient who has worn glasses all their life may be willing to continue wearing them,.
- The benefits and risks of further intervention should be explained.

## Post cataract refractive surprise management

- ▶ correcting these surprises depends on the comfort of the surgeon, which IOL was used, and how long it has been since the lens was implanted.

## Post cataract refractive surprise management

- ▶ **Retained viscoelastic**

Early laser capsulotomy can disperse the viscoelastic and allow the anteriorly displaced IOL to move posteriorly.

## Post cataract refractive surprise management

### Corneal Refractive Surgery

- ▶ **Not before 1-3 months**

For small amounts of residual error or to finesse the results, PRK or LASIK may be the best choice.

- ▶ **In terms of optical outcomes,**

PRK and LASIK are the same.

- ▶ **in the older patients,**
- ▶ **PRK IS BETTER** because there are fewer dry-eye problems.
- ▶ **For younger patients, I usually offer a LASIK enhancement."**

## Post cataract refractive surprise management

- ▶ **Ablation profile**
- ▶ It has been reported that wavefront-guided treatments may provide better outcomes than conventional LASIK
- ▶ However, some authors have expressed concern about the accuracy of Shack-Hartmann aberrometers in eyes with multifocal IOLs
- ▶ Jendritza et al evaluated the outcomes of wavefront-guided treatment with iris registration after implantation of different multifocal IOLs in 27 eyes of 19 patients and they found **good results with diffractive multifocal IOLs but not with refractive multifocal IOLs.**

Jendritza BB, Knorz MC, Morton S: Wavefront-guided excimer laser vision correction after multifocal IOL implantation. J Refract Surg. 2008, 24 (3): 274-279.

## Post cataract refractive surprise management

- ▶ **LASIK seems to be safe in eyes with previous (YAG) capsulotomy.**
- ▶ Once YAG capsulotomy has been performed, IOL exchange becomes more difficult and has greater risks.
- ▶ Once the LASIK flap has been established, additional optical adjustments can be performed successfully whenever necessary

Pñero DR, Ayala Espinosa MJ, Alió JL: LASIK outcomes following multifocal and monofocal intraocular lens implantation. J Refract Surg. 2010, 26 (8): 569-577. 10.3928/1081597X-20091030-02.

## Post cataract refractive surprise management

- ▶ **LVC. has some limitations,**
- ▶ high refractive error,
- ▶ small corneal stromal thickness
- ▶ and limited availability of excimer laser for cataract surgeons.
- ▶ EXTRA COST

## Post cataract refractive surprise management

- ▶ **Lens-based procedures** (*IOL exchange or piggyback IOLs*)
- ▶ effective in reducing high degrees of spherical error
- ▶ do not alter the anterior corneal surface and do not change the corneal refractive power.
- ▶ There is no need for special settings such as those required for laser refractive surgery.

## Post cataract refractive surprise management

- ▶ **ADD-ON sulcus IOL**
- ▶ A sulcus IOL inserted as an additional (piggyback) lens to the original IOL
- ▶ As this corrects the manifest refractive error, the power of the original IOL does not need to be known.
- ▶ Piggyback lenses are less accurate than laser refractive surgery but good for higher degrees of refractive error
- ▶ avoid the risks of IOL exchange as well as those with ocular surface disease where laser is not suitable.



## Post cataract refractive surprise

- ▶ **ADD ON IOL,,**
- ▶ **Piggybacking a lens is the easiest surgery,**

### DISADVANTAGE

- ▶ it is possible to get pigmentary dispersion.
- ▶ Additionally, there is the cost of the extra lens.

## ADD ON IOLS.

## SULCO FLEX

*Sulcoflex Aspheric (653L)*



*Sulcoflex Multifocal (653F)*



*Sulcoflex Toric (653T)*



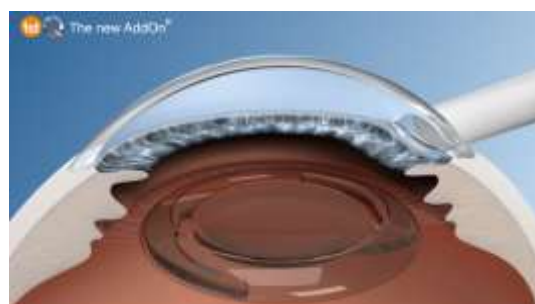
*Sulcoflex Multifocal Toric (653Z)*

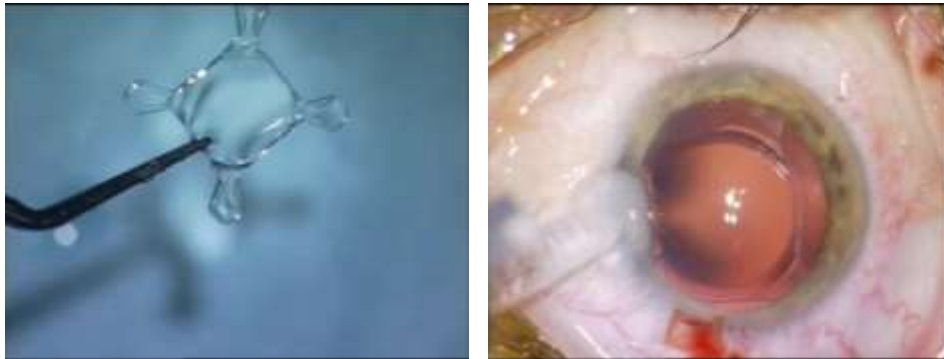


ADDON IOLS

1<sup>ST</sup> Q

**Figure 1** Design (A) and sulcus location (B) of the AddOn® secondary IOL.  
**Notes:** (A) AddOn IOL, toric marks visible. Haptics are designed for rotational stability in the sulcus. (B) Convex-concave optic design avoids IOL touch, reduce





## CONCLUSION

- ▶ **LVC** has been shown to be a viable, noninvasive and accurate procedure to correct ametropia after cataract extraction with IOL implantation.
- ▶ **Lens-based procedures** (IOL exchange or piggyback lens implantation) are also possible alternatives.
- ▶ **Piggyback IOLs**
- ▶ technically easier and more accurate than IOL exchange
- ▶ better indicated in cases with extreme ametropia, corneal abnormalities, or when there is no available excimer laser platform.



**Thank you**