Managing Refractive Surprises after Cataract Surgery

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Refractive Surprises can follow

1- Monofocal IOLs.

2-Multifocal IOLs.

3-Toric IOLs.

Each of which has different characteristics.

1- Monofocal IOLS.

1. ***"Sphere"* surprises**:

-Early hyperopia within one Diopter is usually safe and due to retained OVD, usually resolves itself within 48 hours.

-Assess the patient after 2 weeks as this is late enough for refractive stability:

-Hyperopia under 3 Diopters : Lasik after 2 months to ensure wound stability.

-Hyperopia over 3 Diopters : IOL exchange.

"Sphere" surprises cont.

- **Myopia:**

More Forgiving than Hyperopia and usually better tolerated.

Can offer *monovision* up to 2 Diopters .

Can be treated earlier by surface ablation unlike Hyperopia.

Timing of Procedure: one month for surface ablation and 2 months for Lasik.

Type of Ablation

- In refractive corneal surgery after MONOFOCAL IOL implantation, the ablation should use premium profile ie., WFG if a reliable aberrometry can be obtained or a custom Q otherwise.
  - This helps in neutralizing most HOA and improves the quality of vision , especially if a non aspheric IOL was implanted.
  - These are anxious patients undergoing a second procedure.

"Cylinder" surprises

- After Monofocal IOLs ,best option is Lasik.
- Premium ablations are also recommended , especially in mixed cylinder.
- In mixed cylinder , and if the spherical equivalent is emetropia , Laser assisted PCRI can be performed.

2-Multifocal IOLs

1- "***Sphere"*** surprises:

- Hyperopic results are more tolerated.!!!
- Sometimes Hyperopic results are confusing as they mimic regular occasional complaints after MF IOLs ie., inability to read and occasional blur especially at night !.

"Sphere" surprises cont.

- **Myopia :**
- Is much easier to identify after Multifocal IOLs with inability to see distant objects.
- Surprisingly , this causes more dissatisfaction than hyperopia.

Determining the amount of spherical error after MF IOLs

- Not easy.
- Controversial , logically it will be the highest plus , or lowest minus that provides maximum far vision.
- In practice it has been found that mid range correction yields the best results ie., always keep the refraction slightly on the hyperopic side.

Type of Ablation

- After Multifocal IOLs , the preferred is always a standard or WFO ablation.
- WFG ablations are usually not recommended due to inaccuracy of aberrometry in these patients with risk of induction of HOAs.
- Custom Q is also not recommended to preserve the SA induced by the lens used in its multifocality.

"Cylinder" surprises

- Very annoying after MF IOLs.
- Increase the blur and NVCs considerably.
- The primary reason for the original phaco/laser correction package offered by many centers.
- One of the main advantages of FLACS as the pre-existing can be accurately dealt with by LPCRI and the phaco incisions being neutral.
- Ablation should not be WFG.

3-Toric IOLs

- The ***main*** refractive concern after toric iplants is residual cylinder.
- Many toric calculators are available on line .
- Mostly by manufacturers and usually accurate.
- Validation with an independent calculator is sometimes recommended.
- Barret's calculator is an on line free tool that is accurate and can be used for confirmation.

Posterior corneal astigmatism

- An issue that has been discussed lately as a possible cause for toric surprises.
- Back surface of the cornea has a WTR astigmatism of 0.5 Diopter which ***SUBTRACTS*** and does not ***ADD*** to the anterior surface WTR astigmatism because the posterior corneal surface acts as a **minus** lens.

Posterior corneal astigmatism

- This can be manually calculated and when determining the corneal astigmatism needed to be corrected by a toric implant.
- Koch has developed the Baylor nomogram.
- Barret has an online free toric calculator that takes this into consideration.

Toric IOL rotation

- Vast majority happens in the first 48 hours.
- If patient has a considerable cylinder on the first day , always dilate and check axis of the implant on slit lamp.
- If the implant is off axis , determine the amount of rotation with the slit protractor.
- In the OR , rotate the IOL by the same amount using a Mendez protractor without marking.

Recommended blue print of refractive surprises

- Always go back to the patient's file.
- Check the power of the IOL chosen against the biometry table.
- Make sure that there was no mistake like a patient or eye swap.
- Check the formula used :
  - Haigis L post refractive surgery (formerly BESSt or Shammas).
  - Holladay 2 for high myopes.

Conclusion

- Refractive surprises after cataract surgery should be avoided by proper planning .
- When they happen, the cause should be identified as surgeons are usually concerned with management.
- In spite of good planning , they can occur in post-refractive surgery patients.

Conclusion

- Stability of the refractive error is important before management as some patient groups (post RK) can take months to stabilize.
- Corneal options are always available according to the amount of error and implant type.
- They offer more finesse and accuracy than other options.


THANK YOU
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