The Dysphotopsia Mystery

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Cataract Surgery
Cataract Surgery
Desirable Traits Foldable Lens

Inert (non reactive) with a memory

Thin – folds tight and goes through a smaller incision

Square edge – reduces early, heavy capsule clouding
Contributions to Visual Quality

Index of Refraction

Human lens 1.41

Higher indices spread white light across a spectrum causing chromatic aberration
Chromatic Aberration

- White light is separated into its component wavelengths upon bending by a lens.
- The shorter, blue rays come to a focus closer to the lens than the longer, red rays.
Duochrome Test
Contributions to Visual Quality

Index of Refraction

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Reflectance
Contributions to Visual Quality

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Reflectance

Shape – Thinner and flatter, acts like a mirror
Contributions to Visual Quality

Index of Refraction
Human lens 1.41
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Reflectance

Shape – Thinner and flatter, acts like a mirror

Square Edge – Can cause internal reflections
Impossible to Predict

- Patient is unhappy
- Takes up chair time
Positive Dysphotopsia

- Patient has “added” visual images

  Shimmering or pulsing lights (scintillations)
  Rings
  Arcs
  Central Flashes
  Streaks
Number of Patients

- 1 in 10 will notice some type of dysphotopsia
- Few will complain
True dysphotopsia comes from the lens implant, but check other possible sources...

Check the C’s

Cornea - Dystrophy, dry, irregular
Cylinder – Astigmatism
Capsule
Clouds – Vitreous strands or floaters
CME – Macular edema
Do a careful refraction

Treat the residual sphere and cylinder
What the patient sees

Shimmering or pulsing light (scintillations)

This usually caused by backscatter from the IOL combined with short eye movements.

Seen more in high refractive index IOL. Size of the IOL does not matter.
What the patient sees

Arcs
Patient perceives the edge of the IOL, usually only at night

Usually resolves over time if the capsule edge overlaps the IOL.
What the patient sees

Flare or streaks

This is a night time symptom. Correcting minimal astigmatism with glasses often fixes it. Also making the pupil a little smaller.
What the patient sees

Central flash

Caused by a peripheral light source reflecting off the internal edge of the IOL. Rounding the edges or milling the edge will reduce this.
The Perfect Surgical Result
What the patient sees

Haloes

Usually caused by a multifocal IOL which produces halos around lights from IOL transition zones. Also seen with corneal irregularity (RK).

May be seen with large pupils and small optic IOL.

Most patients adapt. Miotics help.
How the patient reacts

We can’t eliminate all unwanted images, but we don’t have to.

Reassure the patient that he is not crazy.
Do not get angry.
Follow a plan.
How the patient reacts

Neuroadaptation is our friend. Time is on our side.

Our brain is great at eliminating visual perceptions…

our blind spot
backscatter off our natural lens
irregular pupils
retinal blood vessels
new glasses
How the patient reacts

The variable gain theory, and how we can minimize it.
Managing Dysphotopsia

Create accurate expectations before surgery instead of excuses afterward.
Warn of a healing process.
Warn of unwanted images as a part of the healing, but they will go away over time. This allows them to “turn down the gain”
Managing Dysphotopsia

Managing the problem surgically
Match the IOL to patient
Pupil
Cornea
Surface curvature
Edge design
Center the IOL
Capsule over the IOL edge
Managing Dysphotopsia

Try night time pupil constriction
Alphagan P
Pilocarpine
Managing Dysphotopsia

Careful with the capsule

Won’t solve true dysphotopsia
Makes IOL exchange very dangerous
IOL Exchange

- Consider the size of the capsulorhexis
- Consider the edge design, go rounded
- Consider low index of refraction, rounded surface IOL. Silicone material
Negative Dysphotopsia

- Associated only with perfect surgery
- Temporal darkness or temporal black shadow
- The most common type of dysphotopsia
Negative Dysphotopsia

- Most believe it is caused by the IOL edge
- Some believe it is the edge of the anterior capsule
- A few believe it may be due to a ring scotoma
Negative Dysphotopsia

1. Associated with many types of PC IOL’s, all well centered and in the capsular bag.
2. Does not happen with poorly centered implants.
3. Does not happen with implants placed in ciliary sulcus or anterior chamber.
4. Stimulated by temporal light source and goes away when the light is removed.
5. Normal visual fields
6. Symptoms present early usually go away
Negative Dysphotopsia

7. Dilate the pupil, problem resolves
8. Constrict the pupil, problem worsens
9. No medical therapy seems to work, however surgical management can help
Treatment

The first 6 months…

Observe and reassure. We know what is happening and most likely it will go away.

Glasses with thick temporal frame can block light and reduce symptoms.
Treatment

After 6 months…
Surgical solutions are considered

Piggy back a second, low powered IOL

Displace the optic to in front of the anterior capsule

Primary optic capture
Treatment of Negative Dysphotopsia: Reverse Optic Capture
(click link above to watch)