DEFINITION

- **Masket et al...first reported in 1993**
  Photic phenomenon after PCIOL implantation

- Term “DYSPHOTOPSIA” coined by **Tester et al**

Unwanted optical images can arise after the implantation of intraocular lenses (IOLs). These include dysphotopsia, defined as unwanted patterns on the retina that can be positive or negative. Positive dysphotopsia includes arcs, streaks, rings, or haloes on the retina, which are central retina (not in the periphery). Negative dysphotopsia includes temporal crescent-shaped shadow formations, indicating absence of light reaching the retina.

PREVALENCE

- Prevalent in 7-90% who undergo IOL implantation¹
- Severe phenomenon occur in only 0.2%²

Positive Dysphotopsias

Comparison of intensity of reflected glare images from 4 IOL edge designs\(^1\)

\[\downarrow\]

Sharp or truncated optic edge most significant factor in positive dysphotopsia due to scattering and internal reflection of light


Negative Dysphotopsias

IOL Related Factors\(^1\)

- Optics with a sharp or square edge > round edge
- High Refractive Index lens
- Acrylic > Silicone /PMMA
- IOL anterior surface more than 0.46 mm from the plane of the posterior iris
- Decentered IOL
- Smaller optics have higher prevalence\(^2\)


Temporal clear corneal incision

Neural adaptation

Reflection of the anterior capsulotomy edge projected onto the nasal peripheral retina

Small pupil

Nasal location of pupil relative to optical axis


Why temporal crescent?

Nasal retina may extend farther anteriorly than the temporal retina

\[\downarrow\]

Light nasally may be blocked by the nose

\[\downarrow\]

Light from the temporal side may be deflected by the edge of the IOL/reflected internally by the relatively square edge of an IOL away from the nasal retina

\[\downarrow\]

Results in a crescent-shaped shadow noted in the temporal field of vision
Negative dysphotopsia has not been reported after surgery complicated by sulcus placed IOLs/ACIOLs associated with PCIOLs confined to bag after uneventful surgery.

Symptoms of negative dysphotopsia can be stimulated by a light source in the temporal field of the patient’s view and relieved by occluding the temporal field.

No clinical test has been useful in corroborating self-reported symptoms.

EARLY presentations generally remit. CHRONIC cases (rare) are problematic.

No medical therapy is seemingly beneficial. Surgical management may be successful.

However, some definite facts are known about this entity:

- Associated with PCIOLs confined to bag after uneventful surgery.
- Negative dysphotopsia has not been reported after surgery complicated by sulcus placed IOLs/ACIOLs.
- Symptoms of negative dysphotopsia can be stimulated by a light source in the temporal field of the patient’s view and relieved by occluding the temporal field.

When to treat?

Impossible to predict who may get these symptoms.

- Severe symptoms...

- Does not decrease with time...

“The problem with all of the proposed theories is that they are based upon cases in the literature, each of which represents an emotionally charged and very frustrating situation for the patient and the doctor.” — Steven J. Dell, MD
Options

- Reverse optic capture (ROC)
- Implant a piggyback IOL in the ciliary sulcus
- In the bag/sulcus placed IOL exchange
- Iris suture fixation

Reverse Optic Capture

Secondary surgery for symptomatic patients or as a primary prophylactic strategy
(Second eye of symptomatic patients after one eye surgery)

Pre-requisites: Anterior capsulotomy should not be too small or too thick or rigid from postoperative fibrosis

Piggyback IOL

Surgical strategies to reduce posterior chamber volume have been developed
It appears that covering the primary optic/capsule junction reduces symptoms

Prerequisites:
- First IOL surgery should be uncomplicated with a well-centered IOL within the capsule bag
- There should be no evidence of zonulopathy and the iris must be free of defects or damage from earlier surgery

**Prudent Option as a piggyback lens due to its wide range of power options in aspheric, toric and multifocal platform**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>POWER RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulcoflex aspheric</td>
<td>-10.00 to 10.00 D in 0.50 D increments</td>
</tr>
<tr>
<td>Sulcoflex toric</td>
<td>-6.00 to 6.00 D of sphere in 0.50 D increments, and 1.00 to 6.00 D of cylinder in 1.00 D increments</td>
</tr>
<tr>
<td>Sulcoflex multifocal</td>
<td>-3.00 to 3.00 D of sphere (including plano) with 3.50 D near add.</td>
</tr>
</tbody>
</table>

**Other treatment modalities**

- Paradoxical results with **miotic** agents: Symptoms increasing with miotic agents and decreasing with mydriatic agents.

- **Neodymium:YAG laser anterior capsulotomy**

**New Lens prototype to combat negative dysphotopsia.**

An annular groove on the peripheral portion of the anterior surface of the optic.

The groove receives the anterior capsulotomy,

Rim of the optic to overhang the anterior capsule edge.

The essence of the design is that it still allows any optic concept, asphericity, toricity, multifocality, and desired haptic design.

**Awaiting approval**

Samuel Masket, M.D. Jules Stein Eye Institute, David Geffen School of Medicine, University of California, Los Angeles

THANK YOU