

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 dys-

Holladay JT, Zhao H, Reisin CR. Negative dysphotopsia: the enigmatic penumbra. J Cataract Refract Surg. 2012 Jul;38(7):1251-65. doi: 10.1016/j.jcrs.2012.01.032

DYSPHOTOPSIA

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DYSPHOTOPSIA

Positive

Arcs, Streaks Rings or Haloes on the retina –
Central retina
(Not in the periphery)

Negative

Temporal crescent shaped shadow
(absence of light reaching the retina)

Holladay JT, Zhao H, Reisin CR. Negative dysphotopsia: the enigmatic penumbra. J Cataract Refract Surg. 2012 Jul;38(7):1251-65. doi: 10.1016/j.jcrs.2012.01.032

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

1. Coroneo MT, Pham T, Kwok LS: Off axis edge glare in pseudophakic dysphotopsia. J Cataract Refract Surg 2003;29:1969-1973

2. Davison JA: Positive and negative dysphotopsia in patients with acrylic intraocular lenses. J Cataract Refract Surg 2000; 26:1346-1355.

Positive Dysphotopsias

MOST COMMONLY
ACCEPTED
THEORY

Comparison of intensity of reflected glare images from 4 IOL edge designs¹



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

1. Holladay JT, Lang A, Portney V. Analysis of edge glare phenomena in intraocular lens edge designs. *J Cataract Refract Surg* 1999; 25:748-752

Negative Dysphotopsias

PROPOSED THEORIES

- 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

Holladay JT, Zhao H, Reisin CR. Negative dysphotopsia: the enigmatic penumbra. *J Cataract Refract Surg*. 2012 Jul;38(7):1251-65. doi: 10.1016/j.jcrs.2012.01.032

Negative Dysphotopsias

IOL Related Factors¹

- 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 prevalence²

1. Holladay JT, Zhao H, Reisin CR. Negative dysphotopsia: the enigmatic penumbra. *J Cataract Refract Surg*. 2012 Jul;38(7):1251-65. doi: 10.1016/j.jcrs.2012.01.032

2. Bournas P, Drazinos S, Kanellas D, Arvanitis M, Vaikoussis E: Dysphotopsia after cataract surgery: comparison of four different intraocular lenses. *Ophthalmologica*. 2007;221(6):378-83.

Negative Dysphotopsias

Why temporal crescent?



Nasal retina may extend farther anteriorly than the temporal retina



Light nasally may be blocked by the nose



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



Results in a crescent-shaped shadow noted in the temporal field of vision

Mamalis N. Negative dysphotopsia following cataract surgery. *J Cataract Refract Surg*. 2010 Mar;36(3):371-2

“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

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

⚠ Negative dysphotopsia is not related to preoperative or postoperative ametropia

⚠ 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

When to treat?

Impossible to predict who may get these symptoms

- Severe symptoms...
- Does not decrease with time...

Options

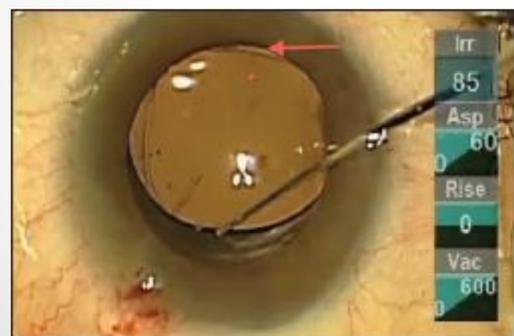
- Reverse optic capture (ROC)
- Implant a piggyback IOL in the ciliary sulcus
- In the bag/ sulcus placed IOL exchange
- Iris suture fixation



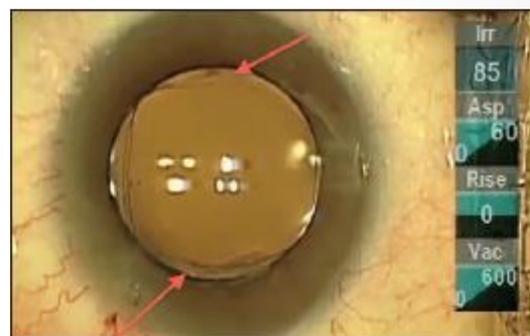
Gentle blunt dissection and viscodissection of the anterior capsule from the underlying optic



A Sinskey hook and blunt spatula are used to elevate the nasal optic edge over the capsule.



Opposite temporal edge of the optic is elevated over the anterior capsule edge



Nasal optic capture has been completed

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

<http://www.opthalmologymanagement.com/articleviewer.aspx?articleID=106604>

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

Ernest PH. Severe photic phenomenon. J Cataract Refract Surg. 2006;32:685-686



SULCOFLEX



Prudent Option as a piggy back lens due to its wide range of power options in apheric, toric and multifocal platform

TYPE	POWER RANGE
Sulcoflex aspheric	-10.00 to 10.00 D in 0.50 D increments
Sulcoflex toric	-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
Sulcoflex multifocal	-3.00 to 3.00 D of sphere (including plano) with 3.50 D near add.

Other treatment modalities

- Paradoxical results with **miotic** agents: Symptoms increasing with miotic agents and decreasing with mydriatic agents
- Neodymium:YAG laser anterior capsulectomy**

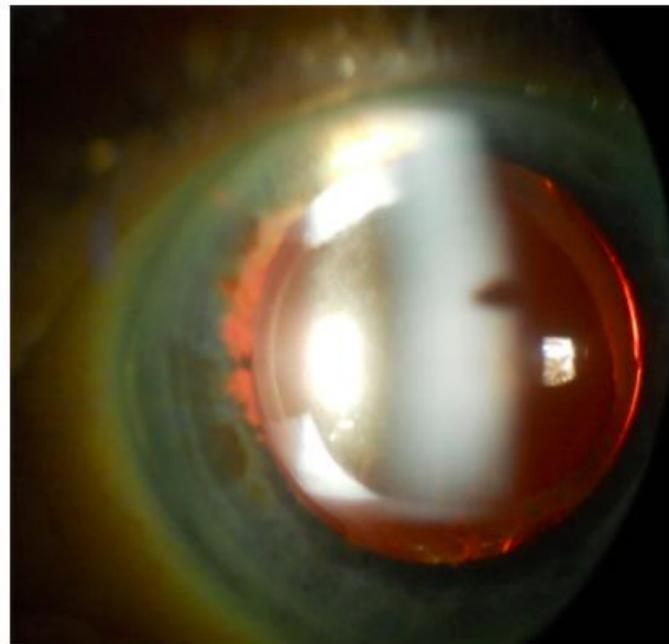


Figure 5. Anterior capsule following a secondary Nd:YAG laser anterior capsulectomy to remove the residual anterior capsule tag.

Folden DV. Neodymium:YAG laser anterior capsulectomy: surgical option in the management of negative dysphotopsia. J Cataract Refract Surg. 2013 Jul;39(7):1110-5. doi: 10.1016/j.jcrs.2013.04.015

ARTICLE

Pseudophakic negative dysphotopsia: Surgical management and new theory of etiology

Samuel Masket, MD, Nicole R. Fram, MD

J Cataract Refract Surg 2011; 37:1199–1207 © 2011 ASCRS and ESCRS

RESULTS: Twelve eyes of 11 patients with negative dysphotopsia had surgical treatment. All 10 patients who had piggyback IOL implantation or reverse optic capture had partial or complete resolution of symptoms by 3 months. No patient who had in-the-bag IOL exchange (n = 3) or iris suture fixation of the capsular bag-IOL complex (n = 1) improved despite alteration of IOL material or edge design in the case of IOL exchange or UBM confirmation of posterior chamber collapse in the case of iris suture fixation of the capsular bag-IOL complex.

New Lens prototype to combat negative dysphotopsia..

Awaiting approval

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.

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



<http://www.eyeworld.orgwww.eyeworld.org/printarticle.php?id=6727>

THANK YOU

