

A Deep Dive Into Secondary Glaucomas

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Vance Thompson Vision

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Financial Disclosures- Ibach

Disclosure Statement:
 Aeris - consultant/speaker
 Allergan - consultant
 Avellino -- consultant
 Bausch Health- consultant
 Dompe - consultant/speaker
 Equinox LLC - shareholder
 Glaukos - consultant/speaker
 Heru - consultant/speaker
 Kala - consultant
 New World Medical - consultant
 Ocular Therapeutix - consultant/speaker
 Ocuphire - consultant
 Oyster Point - consultant/speaker
 Sight Sciences - consultant/speaker
 Sun - speaker
 Zeiss - consultant

All relevant relationships have been mitigated

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Patient MA- Demographics & Entrance Testing

- 35 yo Caucasian male presents for Glaucoma Eval
- Construction worker, exercise enthusiast

MRx → -7.00-2.75x105 (20/15-)
 → -8.25-1.00x66 (20/15)

GAT → 18, TMAX 22
 → 21, TMAX 26

PACH → 547
 → 542

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Optic Nerve OCT

OS

OD

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Humphrey Visual Field

Reliable
 Inf. deviation
 Unlikely
 CMT

Reliable
 No significant
 defects

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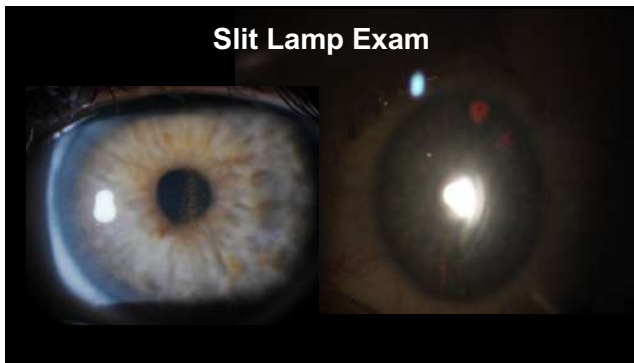
Corneal Hysteresis

RIGHT EYE
 Waveform #1 (3:12:20 PM)
 IOPg: 17.3 IOPed: 20.0 WS: 6.7
 CH: 8.1 CRF: 8.8

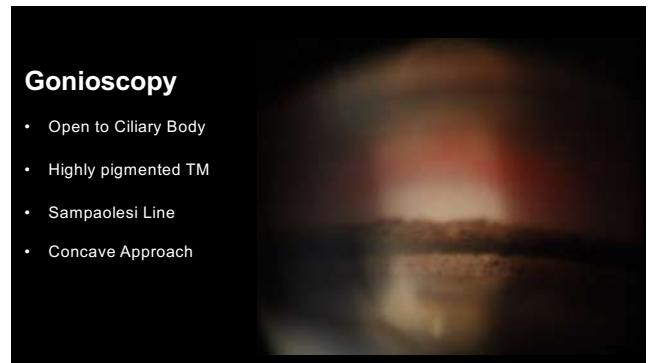
LEFT EYE
 Waveform #2 (3:11:38 PM)
 IOPg: 21.0 IOPed: 25.1 WS: 6.7
 CH: 6.3 CRF: 8.6

RETIXIME DESIGN
 BRIO DESIGN

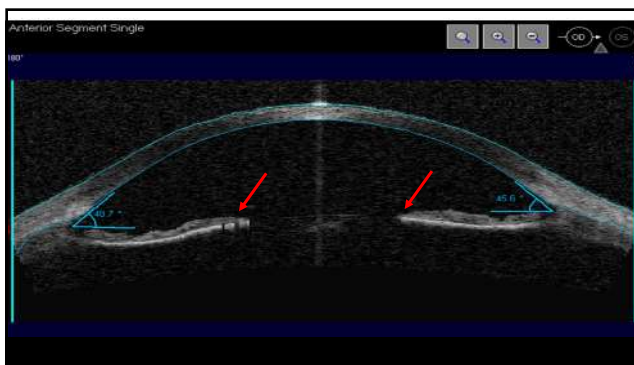
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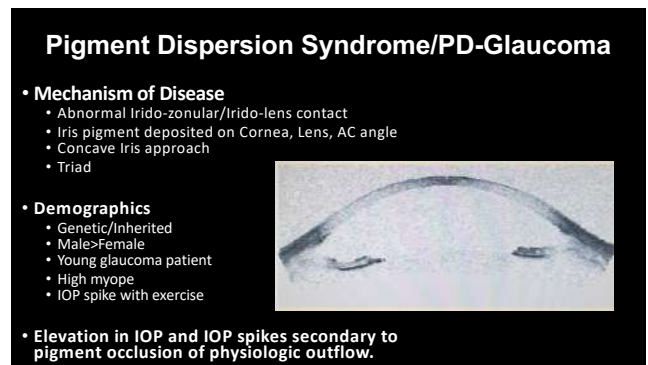
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What Is the Risk of Developing Pigmentary Glaucoma From Pigment Dispersion Syndrome?

YASMIN SIDDIQUI, MD, RICHARD D. TEN HULZEN, MD, I. DOUGLAS CAMERON, MD, DAVID O. HODGE, MS, AND DOUGLAS H. JOHNSON, MD

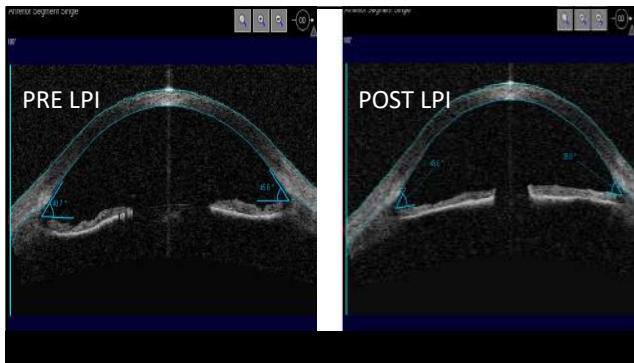
- **CONCLUSION:** The risk of developing pigmentary glaucoma from pigment dispersion syndrome was 10% at 5 years and 15% at 15 years. Young, myopic men were most likely to have pigmentary glaucoma. An IOP greater than 21 mm Hg at initial examination was associated with an increased risk of conversion. (Am J Ophthalmol 2003;135:794-799. © 2003 by Elsevier Inc. All rights reserved.)

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Treatment

- A. Refer for Selective Laser Trabeculoplasty (SLT)
- B. Continue Travatan Z QHS OU
- C. Refer for Laser Peripheral Iridotomy (LPI)
- D. Drop holiday/stop medication


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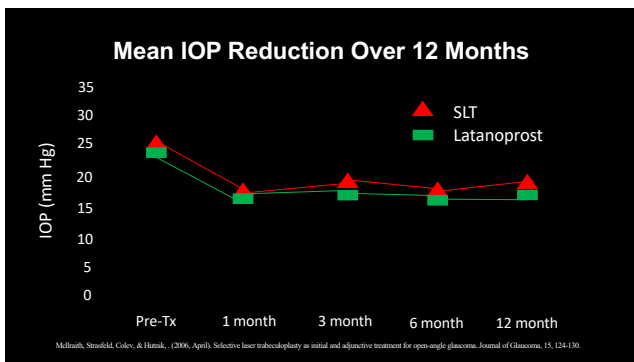
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SLT OD

- Selective Laser Trabeculoplasty
 - Selectively targets and laser burns pigmented TM cells
 - PDG and Pseudoexfoliative Glaucoma (PXG)
 - High number of pigmented TM cells
 - ?? More effective.




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iDOSE OS

- iDOSE travoprost implant (Glaukos®)
 - iDose drug delivery device slowly releases travoprost to increase Uveoscleral outflow
 - Sustained release glaucoma treatment
 - Reduces non-compliance issues
 - Spares conjunctiva
 - Resides in AC angle, anchored behind TM



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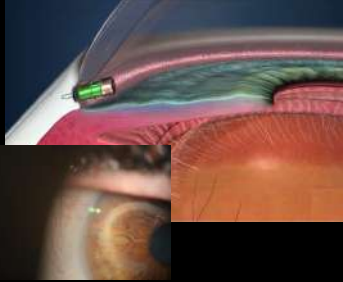
First iDose implant in the U.S. performed by Dr. John Berdahl M.D. in Sioux Falls SD, Vance Thompson Vision on March 29, 2016



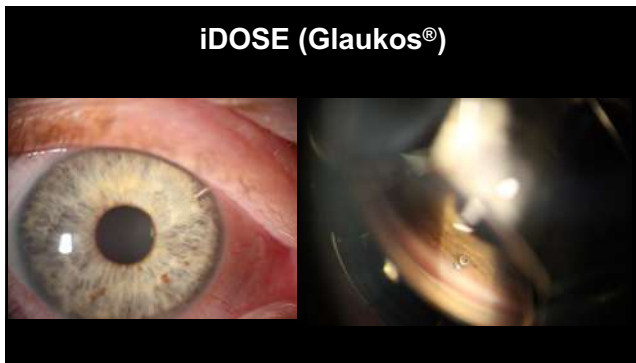
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iDOSE (Glaukos®)

- iDOSE FDA Trial
 - ≥ 18 years of age
 - +/- glaucoma medications
 - IOP ≥ 21 and ≤ 36 mm Hg
 - Mild to moderate open-angle glaucoma (PXG & PDG)
 - Ocular HTN



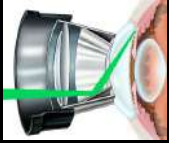

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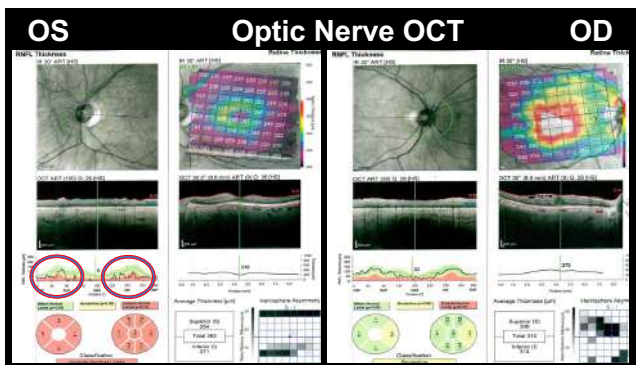
Patient DW- Demographics & Entrance Testing

- 64 yo Caucasian female Glaucoma/Cataract Eval
- Blurred vision x 6 months
- BCVA
 - (20/40) BAT < 20/400
 - (20/40) BAT < 20/400
- GAT
 - 13, TMAX ↑ 20's
 - 15, TMAX ↑ 20's
- PACH
 - 492
 - 493 APD OS

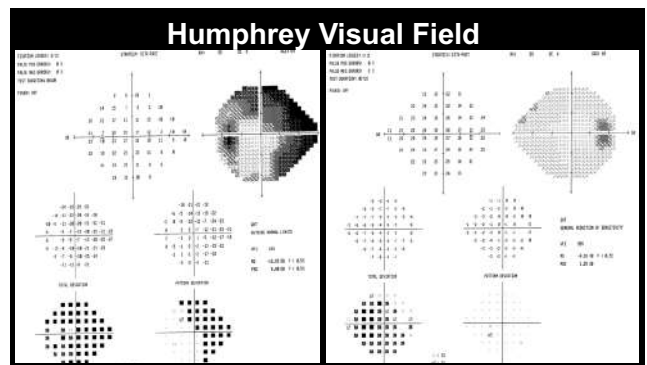



<http://glaucomaassociates.com/user-treatment-for-glaucoma/selective-laser-trabeculoplasty-for-glaucoma/>

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Pseudoexfoliation Syndrome/PXG-Glaucoma

- **Mechanism of Disease**
 - Unknown Etiology
 - Ocular and Systemic condition
 - Excessive gray/white protein fiber-like material
 - Iris, lens/zonules, endothelium, ciliary body, Tm
- **Demographics**
 - Increases with age, >50
 - Caucasian/Scandinavian patients
 - Bilateral in time
 - #1 cause of Secondary Glaucoma
 - Aggressive Glaucoma
- **Elevation in IOP and IOP spikes secondary to PseudoX mechanical rubbing and deposition in TM.**



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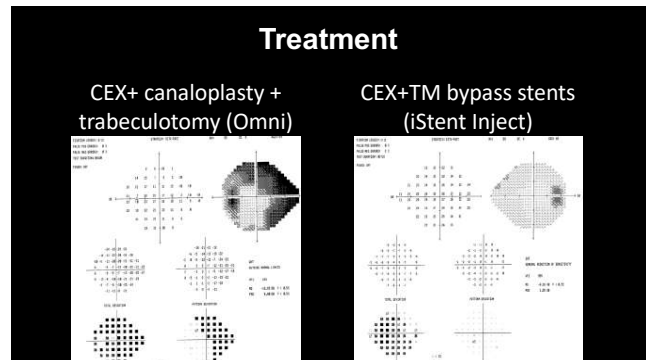
Retrobulbar hemodynamics and aqueous humor levels of endothelin-1 in exfoliation syndrome and exfoliation glaucoma

Vascular Component to PXG?

Parameters	Control (n=14)	XPX (n=12)	XPX (n=12)	Multiple regression analysis
	Pre-OP	Post-OP	Post-OP	Final
ET-1	8.99±2.9	13.91±2.8	8.76±1.7	<0.001
CEX	16.24±1.1	17.24±1.1	17.24±1.1	<0.001
CEX-ET-1	0.04±0.1	0.04±0.1	0.11±0.1	0.001
CEX-ET-1	0.17±0.03	0.17±0.03	0.17±0.03	0.001
CEX-ET-1	0.17±0.03	0.17±0.03	0.17±0.03	0.001
CEX-ET-1	0.17±0.03	0.17±0.03	0.17±0.03	0.001
CEX-ET-1	0.17±0.03	0.17±0.03	0.17±0.03	0.001
CEX-ET-1	0.17±0.03	0.17±0.03	0.17±0.03	0.001
CEX-ET-1	0.17±0.03	0.17±0.03	0.17±0.03	0.001
CEX-ET-1	0.17±0.03	0.17±0.03	0.17±0.03	0.001

Note: The correlation coefficient (r) is shown. The statistically significant difference (p < 0.05) is indicated by asterisks. CEX, central exfoliation syndrome; ET-1, endothelin-1; IOP, intraocular pressure; P, postoperative; Pre-OP, preoperative; Post-OP, postoperative.

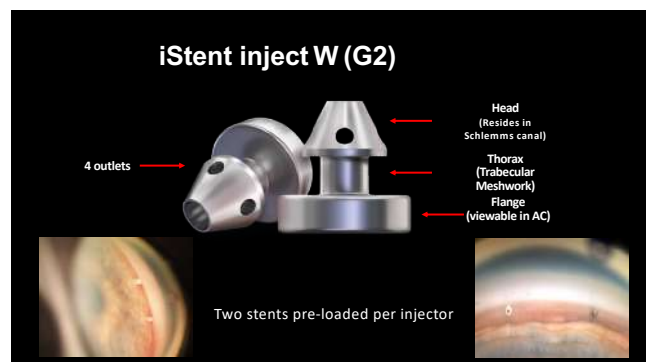
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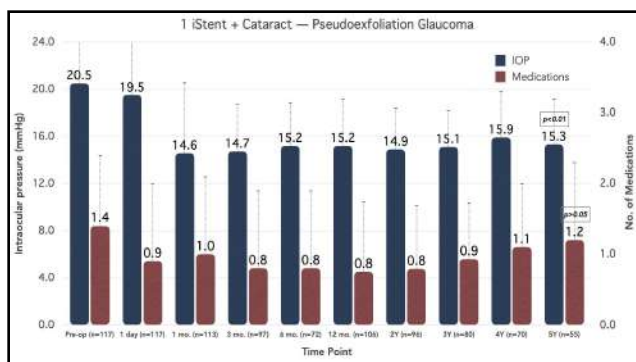
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- ### Concerns with CEX in PXF patients?
- A. Weak zonules
 - B. IOP spikes
 - C. Dilate poorly
 - D. All the above
 - E. I HAVE CONCERNS WITH YOUR WHOLE PLAN!

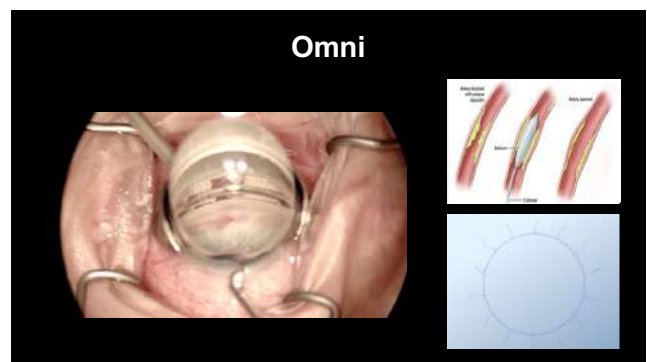
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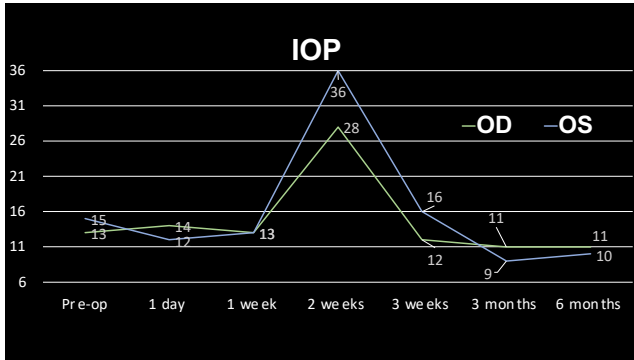
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Steroid Response Glaucoma

- Mechanism of Disease**
 - Steroids over time deposit and clog TM
 - Deposition of GAGs & extracellular material in TM
 - Loss of Phagocytic activity in TM
- Demographics**
 - 15-30% of population
 - Higher in glaucomatous eyes, high axial length
 - Intravitreal > oral > topical.
 - TriMoxi- Out of the eye 35 days, (3-4months)
 - 10 days to 3 weeks for resolution

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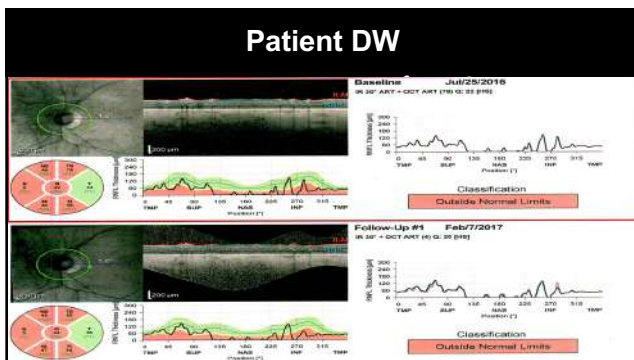
What is the first step in Tx'ing steroid induced glaucoma?

- SLT
- Remove the steroid
- Topical prostaglandin analogues
- Incisional glaucoma surgery

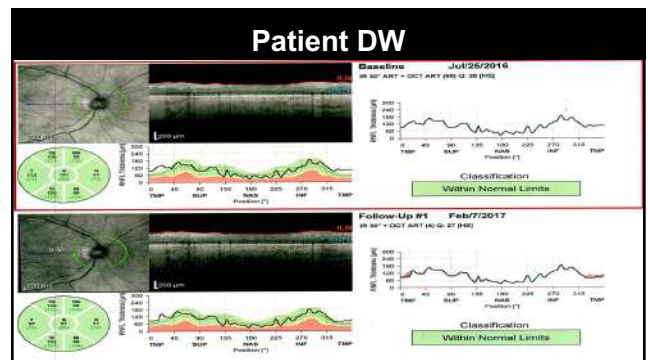
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Steroid Response Glaucoma Treatment

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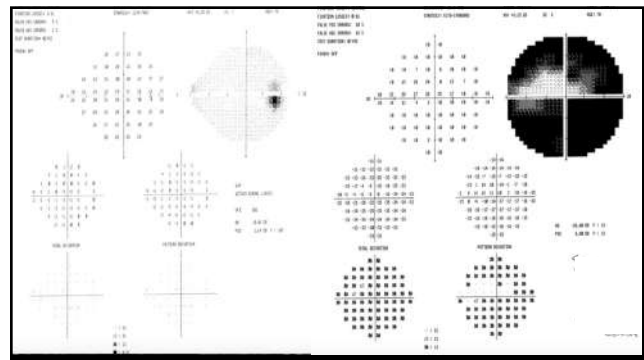
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Patient SM

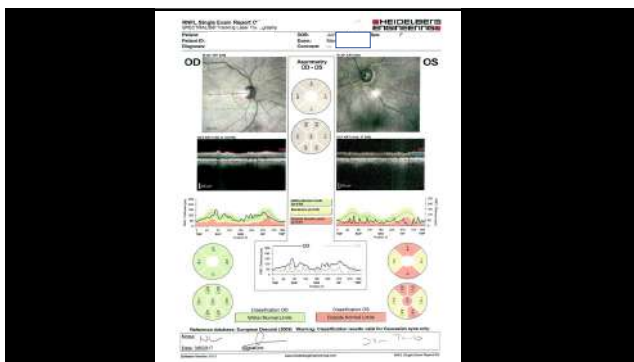
- 74 year old female
- CC: "My VA has decreased in my left eye. It always seems smoky and I seem to be sensitive to light."
- BCVA: 20/20 OD
20/80 OS
- IOP: 13 OD, 28 OS Meds: Cosopt BID OS
- Pachymetry: 530 OD, 535 OS
- ONH Eval: 0.45/0.45 OD, 0.90/0.90 OS
- Gonio: Open to CB in all angles



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Uveitis

"Hot" eye

Injection
Low / High IOP
AC reaction
Photophobia
Acute iridocyclitis

"Quiet" eye

No Injection
High IOP
AC reaction
Comfortable
Chronic iridocyclitis





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Uveitis and Uveitic Glaucoma

Mechanisms of the Disease

- Severe inflammation of Choroid, Iris, Ciliary Body
- Inflammatory cells, protein, fibrin in outflow path
- Chronic inflammation = stickiness.
- Peripheral Ant. Synechiae (PAS) & Post. Synechiae (PS)





IOP Elevation due to TM outflow blockage (open angle), pupillary block angle closure (PS), angle closure without block (PAS)

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Uveitic Glaucoma Treatment

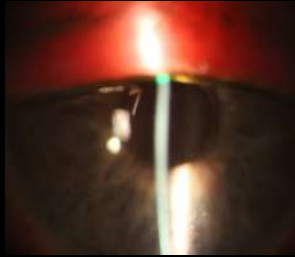
1. Aggressively reduce inflammation
2. Cycloplegia
 - Comfort
 - Prevent Synechiae
3. Medical Treatment
4. Surgical Treatment
 - Break Synechiae
 - Drainage implant



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Glaucomatocyclitic Crisis / Posner-Schlossman

- Unilateral Acute trabeculitis w/ high IOP (40-65)
- Mostly quiet eye, minimal A/C cell
- Stellate KP
- No ant. or post. synechiae



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Treatment for Posner-Schlossman

- A. Glaucoma drops only
- B. Glaucoma drops and steroid
- C. Steroid only
- D. Refer for glaucoma surgery

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Patient HK

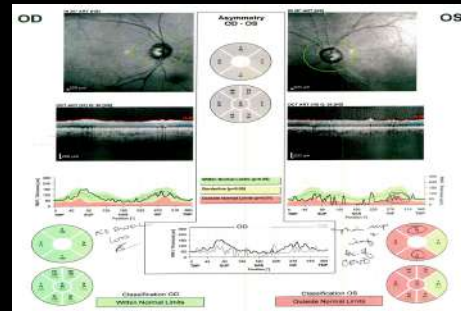
- 79 year old male
- CC: Very blurry OS, vessel blocked OS
- BCVA: 20/40 OD, 20/70 OS
- IOP: 18 OD, 27 OS
Meds: Combigan x2 OU, latanoprost x1 OU
- Pachymetry: 517 OD, 520 OS
- ONH Eval: 0.4V OD, 0.90V, collateral vessels OS
- Gonio: Open to CB in all angles, no NVA



Kaiser, P. K. (2014). *The Massachusetts Eye and Ear Infirmary Illustrated Manual of Ophthalmology* (4th ed., p. 341). N.p.: Elsevier Health Sciences.

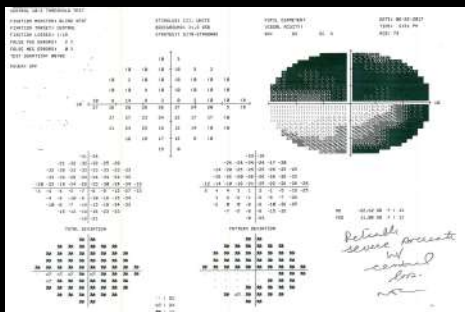
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Patient HK



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Patient HK



Retinal vessels severe of central area

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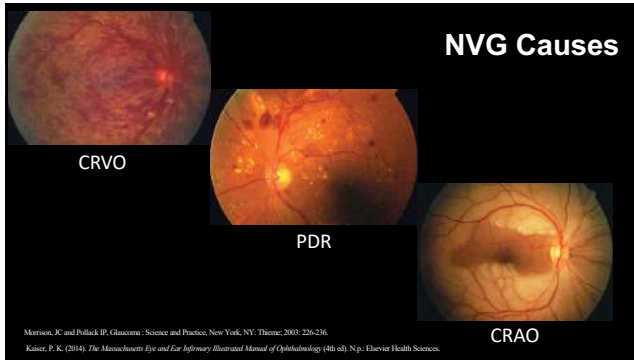
Neovascular Glaucoma

- Ischemia - iris, angle, ONH, retina
- Neovascularization → unhealthy and leaky blood vessels
- Angle Closure Glaucoma – fibrovascular tissue, neo-vessels, inflammatory cells
- Acute painful eye, K-edema, IOP>40

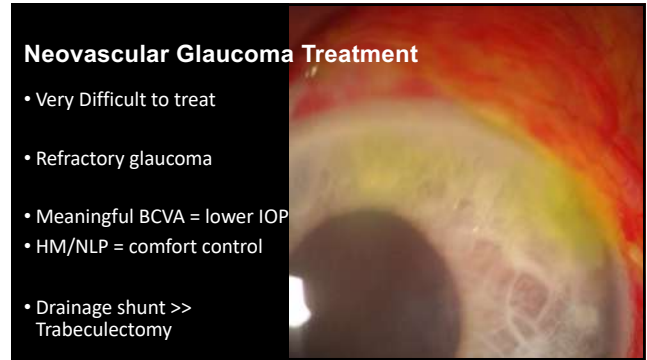


Kaiser, P. K. (2014). *The Massachusetts Eye and Ear Infirmary Illustrated Manual of Ophthalmology* (4th ed., N.p.: Elsevier Health Sciences.

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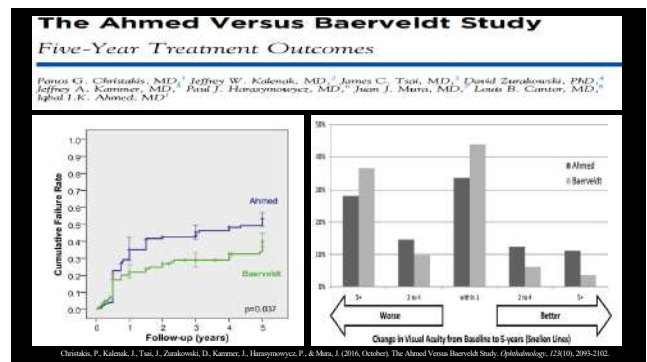
Comparing MIGS procedures vs. Tubes/Trabs
TVT → 5 year data

- Treatment Option Challenges
 - Incisional Glaucoma Surgery
 - Risks associated with surgery and healing
 - Failure rates
 - Costs to patients/system

	Tube	Trab
IOP	14.4	12.6
# of Meds	1.4	1.2
Failure Rate	30%	47%
Complications-Post op	39%	60%
Complications-Surgical	22%	27%
Reoperation	9%	29%

Goldie, S. J., Schiffman, J. C., Fauer, W. J., Hendon, L. W., Brand, J. D., Budenz, D. L., Tube versus Trabeculectomy Study Group. (2012). Treatment outcomes in the Tube Versus Trabeculectomy (TVT) Study after five years of follow-up. *Investigative Ophthalmology and Visual Science*, 53(20), 3762-3770.

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- PDG triad
- Mechanism: posterior bow to iris, Irido-Lens contact
- PXG- more aggressive glaucoma, prevalent in our area
- Mechanism: (Systemic) Fibrillar protein deposited in TM, obstructs outflow
- TX: Remove the abnormal rubbing/touch → Lens (PXG), Iris bowing (PDG)
- Steroid Resp. Glaucoma: Remove the steroid, resolution 10-21 days

Decoding Glaucoma when it's Not Primary

AGENT: Mitch Isaac

WILL COWBOYS RELEASE OWENS?

GUINNESS

0:00
RUNDOWN
OWENS
BIG FINISH
PAUL
BOLDIN
RAIDERS
SAINTS
CELTICS
AUSIE OPEN
HOOPS

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