Anterior and Posterior Segment Case Presentations

"Enough Pearls to Make a Necklace"

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Western Pennsylvania Optometric Society
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Disclosure Statement (next slide)

Disclosures- Greg Caldwell, OD, FAAO

- Will mention many products, instruments and companies during our discussion
  - I don't have any financial interest in any of these products, instruments or companies
- Pennsylvania Optometric Association –President 2010
  - POA Board of Directors 2006-2011
- American Optometric Association, Trustee 2013-2016
  - Thank you to the members and those who join
- I never used or will use my volunteer positions to further my lecturing career
- Lectured for: Shire, BioTissue, Optovue, Alcon, Allergan, Aerie
- Advisory Board: Allergan
- Envolve: PA Medical Director, Credential Committee
- Optometric Education Consultants- Scottsdale and Quebec City, Owner

Learning Objectives

- Emphasize clinical diagnosis of anterior and posterior segment disease.
- Strengthen clinical treatment of anterior and posterior segment disease.
- Heighten the clinician's comfort level when treating disease with topical and/or oral medications.
- Gain confidence in ordering and interpreting diagnostic and laboratory tests.
- Gain confidence in making a sub specialty referral

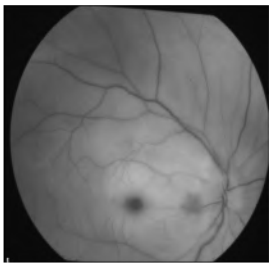
Optometric Public Service Announcement

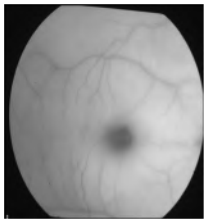
Pay Very Close Attention

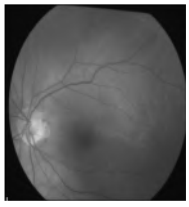
80 year old man

- Reports a sudden loss of vision OD
- Vision is count fingers at 2 feet OD and 20/25 OS
- APD OD grade 4
- Fundus photos OU

Photos OU







CRAO Treatment/Work-Up/Follow-Up?

- Anterior chamber paracentesis (less than 24 hours)
- STAT blood work
  - 2-10% of all CRAOs are caused by thrombosis from Giant Cell Arteritis (GCA)
  - Sed-rate
  - C-reactive protein
    - Qualitative or quantitative?
  - CBC with diff
- Monitor for neovascularization, every 3-6 weeks

CRAO, BRAO, TIA (amaurosis fugax)

- Acute Stroke Ready Hospital
  - Certification recognizes hospitals that meet standards to support better outcomes for stroke care as part of a stroke system of care
  - Developed in collaboration with the Joint Commission (TJC), eligibility standards include:
  - Dedicated stroke-focused program
  - Staffing by qualified medical professionals trained in stroke care
  - Relationship with local emergency management systems (EMS) that encourages training in field assessment tools and communication with the hospital prior to bringing a patient with a stroke to the emergency department
  - Access to stroke expertise 24 hours a day, 7 days a week (in person or via telemedicine) and transfer agreements with facilities that provide primary or comprehensive stroke services.
  - 24/7 ability to perform rapid diagnostic imaging and laboratory testing to facilitate the administration for IV thrombolytics in eligible patients
  - Streamlined flow of patient information while protecting patient rights, security and privacy
  - Use of data to assess and continually improve quality of care for stroke patients
- Warn hospital if suspicion for GCA
- 20% of stroke or heart attack within 3 years
- However of those who experienced CVA or MI
  - 80% were within 24-48 hours; those remaining
  - 50% occurred in 2 weeks
  - Majority within the next 90 days
- Not PCP, not retinologist, just the Acute Stroke Ready Hospital!

Case 1

25 year old man

- Patient has been to 3 ophthalmologists and 1 optometrist in the past year
- Patient complains of a "ghost image" OS
- Has had 4 dilated exams in past year, and no diagnosis yet
- He is very passionate that his vision is clear OD and "ghosty"OS. He wants to know why.

"Ghost Image" OS

Va 20 / 20
cc / 20

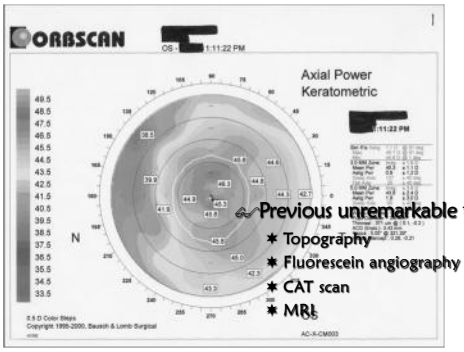
Current Correction
R -2.50-1.00 x 180
L -3.25-1.00 x 180

EOMS: full, unrestricted
CT: ortho D/N

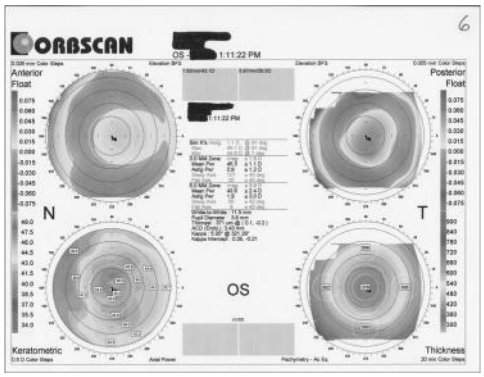
PERRL (-)APD
CF: full by FC OU

- SLE-unremarkable
- Fundus-unremarkable
- Previous unremarkable tests
  - Topography
  - Fluorescein angiography
  - CAT scan
  - MRI

Any Thoughts About "Ghost Images"?



- Previous unremarkable tests
  - Topography
  - Fluorescein angiography
  - CAT scan
  - MRI



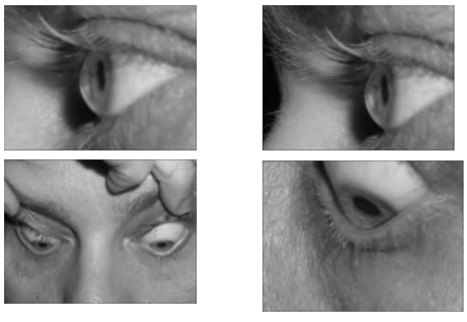
How I felt when I finally realized keratoconus starts posteriorly

Forme Fruste Keratoconus

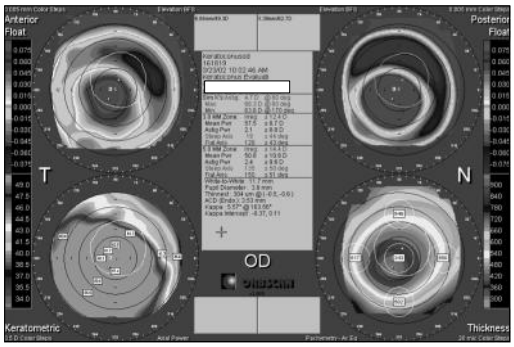
- Treatment
- RGP lens in office and trial frame over refraction
  - Eliminated "ghost image"
- Patient currently only in spex
  - Not interested in RGP lens
- RTC 1 year, BVA and topographies

Case 2

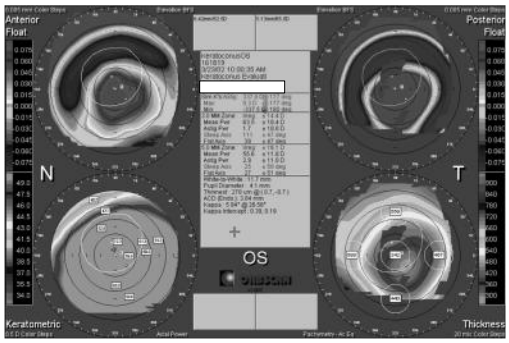
Advanced Keratoconus



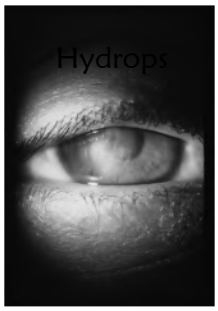
Topography OD



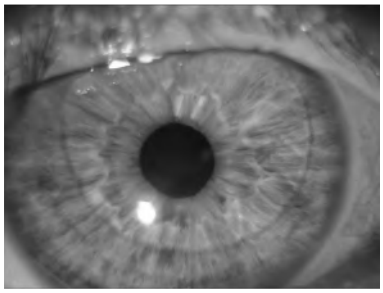
Topography OS



What happens when the posterior cone gets too steep and Descemet's membrane ruptures?



Descemet's Stripping Endothelial Keratoplasty DSEK



Case 3

28 year old man

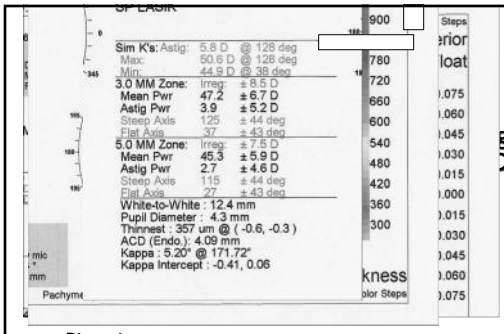
- Had LASIK 14 months ago
- His right eye is now very blurry
- He tried calling for an appointment the center is now closed

Va 20 / 40
cc / 20

Current Correction
R +0.50-7.00 x 040
L -0.25 sphere

EOMS: full, unrestricted PERRL (-)APD
CT: ortho D/N CF: full by FC OU

- SLE-trace fibrosis at flap edges, no stain
- SLE-few multi-directional striae OD>OS
- SLE-clean interface OU
- Fundus-unremarkable



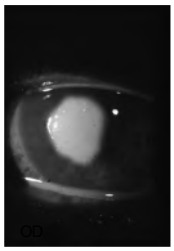
- Diagnosis:
  - Keratectasia 2° LASIK
- RGP OD 20/20-2
  - This lasted for about 3 months
  - Multiple RGPs later due to progression of astigmatism to 8.5 D (BVA 20/50-2)
  - Finally PKP was done Jan 2006

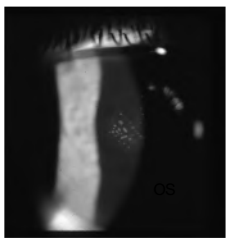
Case 4

43 year old man

- Called your office today
- Eye pain in the right eye since this morning
- OD 20/80 OS 20/20
- Externals: normal
- Review of Systems: unremarkable

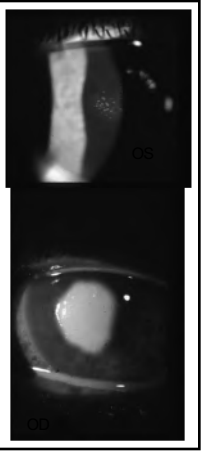
Slit Lamp Evaluation





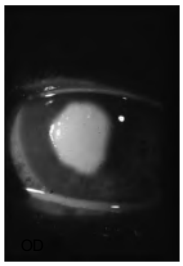
43 year old male further history reveals

- Fourth time in past 24 months
- Uses Muro 128
  - Gtts qid
  - Ung qHS
- Diagnosis:
  - Recurrent Corneal Erosion secondary to Epithelial Basement Membrane Dystrophy (EBMD)

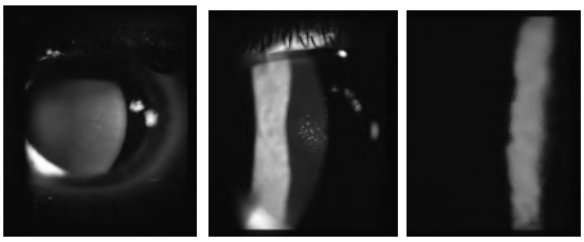


Treatment

- Antibiotic, Vigamox tid
- Pain management
  - Depending on severity
    - Bandage contact lens
    - Oral ibuprofen (200 mg) (1⅙)
      - Maximum 3200 mg daily
    - Oral acetaminophen (500 mg) (⅙)
      - Maximum 3000* mg daily
    - Oral narcotic (need DEA number)
      - Lortab (500/5)
      - They provide good pain relief
      - A degree of sedation
      - Tend to minimally impact the digestive system and kidneys
      - It's not that they're dramatically more potent than OTC analgesics like aspirin, acetaminophen, ibuprofen or naproxen
    - Topical NSAID



Review of Map-Dot-Fingerprint

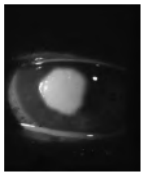


Treatment Options
(Once Abrasion Resolved, to Help Prevent Recurrence)

- Medically
  - Hypertonics
    - Gtts
    - Ung
  - Bandage contact lens
    - Nocturnal
  - Doxycycline/Minocycline
  - Amniotic membrane (PROKERA™)
- Surgical/Procedures
  - Anterior stromal micropuncture
  - Debridement
    - Chemically
    - Mechanically
      - Beaver blade/diamond burr
  - Excimer phototherapeutic keratectomy (PTK)

When is it time for surgical procedure?

Answer: medical treatment failure



The Basics of Amniotic Membrane

biotissue

The Amniotic Membrane

- The amniotic membrane is the innermost lining of the placenta (amnion)
- Amniotic membrane shares the same cell origin as the fetus
  - Stem cell behavior
- Structural similarity to all human tissue

biotissue

biotissue

The CRYOTEK™ Method

- Patented and proprietary cryopreservation
- Ensures key active components of the Extracellular Matrix (ECM) are retained
- The **only** method that retains both:
  - The integrity of the tissue structure
  - The key active (ECM) components
- Safe and effective
  - Supported by over **300** peer-reviewed articles
  - Over **100,000** implanted
- Bio-Tissue Cryopreserved Amniotic Membrane is the **ONLY** AM granted wound healing indication by the FDA.

Technology Highlights

Impressive regenerative **platform** that possesses natural growth factors and optimal scaffolding properties within a complex extracellular matrix that are:

- Anti-inflammatory
- Anti-scarring
- Anti-angiogenic

Therapeutic actions:

- Promotes Stem Cell Expansion
- Suppresses pain
- Promotes cellular migration
- Expedites recovery

PROKERA®: BIOLOGIC CORNEAL BANDAGE

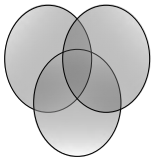
- PROKERA® utilizes the proprietary CryoTek™ cryopreservation process that maintains the active extracellular matrix of the amniotic membrane which uniquely allows for regenerative healing.
- PROKERA® is the only FDA-cleared therapeutic device that both reduces inflammation and promotes scar less healing
- PROKERA® can be used for a wide number of ocular surface diseases with severity ranging from mild, moderate, to severe

PROKERA®: Biologic Corneal Bandage
An Active Amniotic Membrane

PROKERA® | Slim	PROKERA®	PROKERA® | PLUS
		
Mild to Moderate	Moderate to Severe	Severe
▪ (Microbial, HSV) ▪ Recurrent Corneal Erosions ▪ Corneal Abrasions / Wounds	▪ Neurotrophic PED ▪ Severe Infectious Keratitis ▪ Post DSEK for Bullous Keratopathy ▪ Corneal Wounds	▪ Chemical Burns ▪ Stevens Johnson Syndrome ▪ Severe Corneal Ulcers ▪ Corneal Wounds

Excimer Phototherapeutic Keratectomy (PTK)

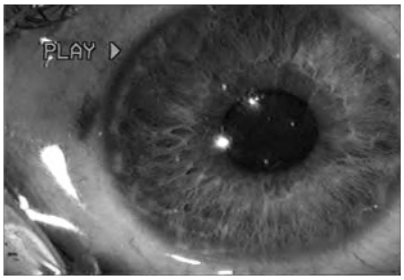
- Corneal Opacities
  - Scarring
  - Granular dystrophy
- Surface Irregularity
  - Saltzman nodules
- Surface Breakdown
  - Epithelial basement membrane dystrophy



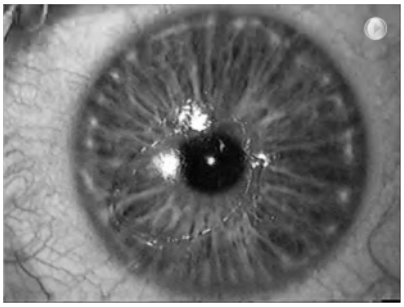
PTK Procedure

- Removal of epithelium
- Manual debridement
- Polish with excimer

PRK



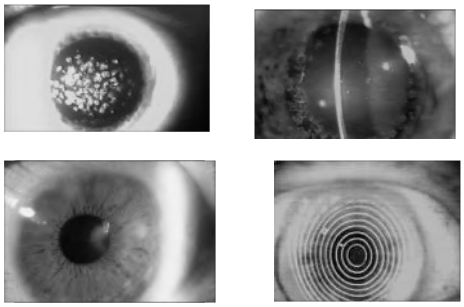
PTK



Post op Regimen

- Vigamox and Pred-Forte q2°
  - Until wound is closed
- Bandage contact lens (BCL)
- Vitamin C, 1000 mg/day x 1 month
- NP-artificial tears
- Sunglasses in any UV

Before & After

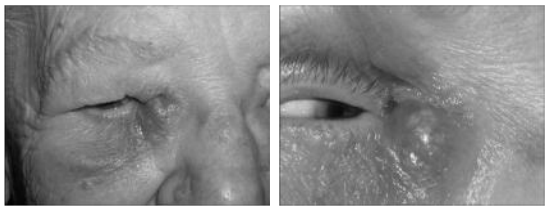


Case 5

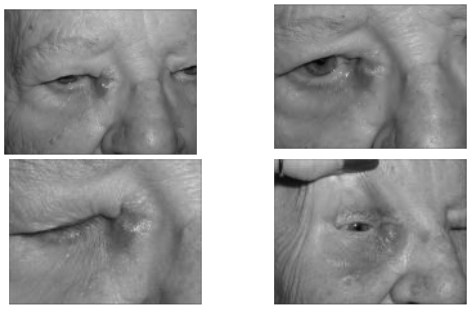
84 year old woman

- Right eye red and painful
- Started about 10 days ago
- See photos for discussion

Diagnosis?
Treatment?



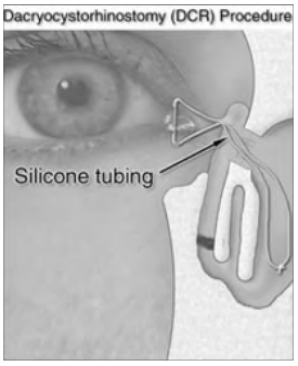
1 Week Later



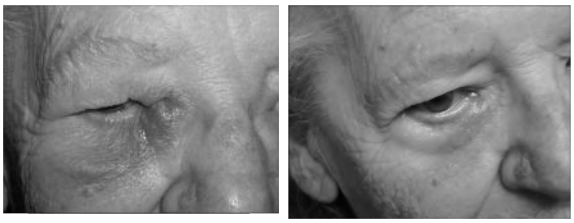
Treatment Plan?

Reminder 1 week ago

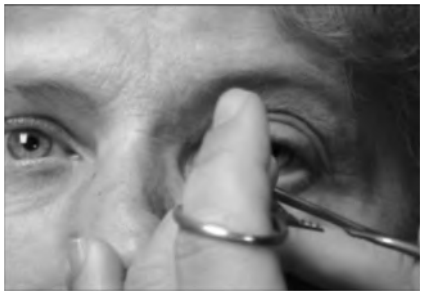
- Continue with topical and oral antibiotics
- Surgical consult for dacryocystorhinostomy (DCR)



After Dacryocystorhinostomy (DCR)



Tube Removal



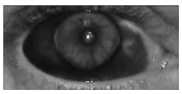
Case 6

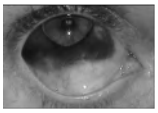
35 year old man

- Wants another opinion due to "hemorrhage on my right eye"
- Happened 3 days ago after vomiting
  - Claims food poisoning from chicken Caesar salad
  - Still feels a little nauseated
- Saw ophthalmologist 3 days ago, told he had a bruise on his eye and it should go away in 1-2 weeks

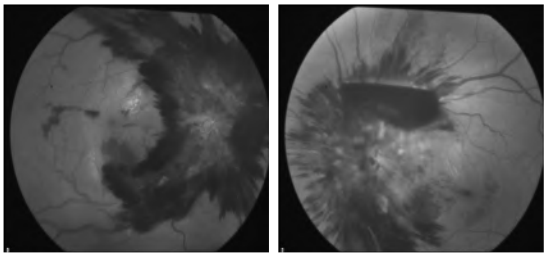
35 year old man

- BVA 20/100 OD, 20/70 OS
  - Hx of amblyopia OD
  - Current Rx OD +5.50 OS +4.50
- Any concerns?
- Patient noticed blurry vision OS
  - Started 2 weeks ago
  - Did not mention because he is more concerned about the blood on his right eye
- Headaches for 2 weeks, decrease if patient stands up
- ROS: unremarkable
- Decide to dilate OU





Retinal Findings Discussion



Differential Diagnosis

- Hypertensive retinopathy
- Blood dyscrasia
- Terson's syndrome
- Valsalva retinopathy
- Purtscher's retinopathy
- Shaken baby syndrome

Terson's Syndrome

- Terson's syndrome originally was defined by the occurrence of vitreous hemorrhage in association with subarachnoid hemorrhage.
- Terson's syndrome now encompasses any intraocular hemorrhage associated with intracranial hemorrhage and elevated intracranial pressures.
- Intraocular hemorrhage includes the development of subretinal, retinal, subhyaloidal, or vitreal blood.
- The classic presentation is in the subhyaloidal space.

Treatment

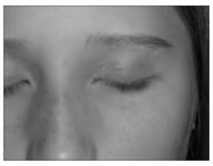
- Emergency referral to neurologist due to high suspicion of intracranial hemorrhage and elevated intracranial pressure
- Intracranial hemorrhage confirmed with MRI
- Patient later diagnosed with Hairy Cell Leukemia and cryptococcal meningitis

Case 7

8 year old girl

- Mom noticed the left eyelid has become red and has pimples
- Started two days ago
- Slowly getting more pimples on the eyelid
- Globe not affected

Slit Lamp Evaluation



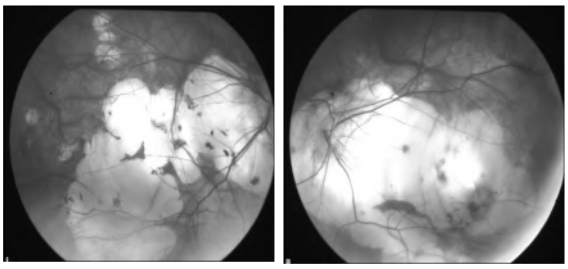
- Diagnosis
  - Herpes simplex blepharitis
- Treatment
  - 400 mg Acyclovir 5x/day
  - Call to pediatrician

Case 8

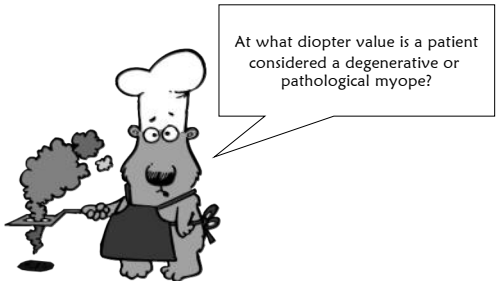
58 year old woman

- VA OD 20/200 OS 20/400
- Longstanding history of macular degeneration
- Anything suspicious here?
  - ?? Longstanding AMD in 58 year old??
- History of cataract surgery OU
- Glasses Rx OD -1.00 OS -1.00

Axial length 29.85 mm



OD -18.00 OS -18.50 prior to cataract surgery



Degenerative Myopia

- Differs from refractive myopia
  - There is an alteration of globe structure that is progressive
  - Primary alteration is a posterior elongation of eyeball as a result of progressive thinning of sclera
    - Posterior staphyloma

Degenerative Myopia

- Findings
  - Lacquer cracks
  - Posterior staphyloma
  - Fuch's spot
  - RPE and choroidal atrophy
  - Scleral crescents
  - Vessel straightening
  - Disc tilting
  - Peripheral retinal changes

Can be found in refractive and degenerative myopes

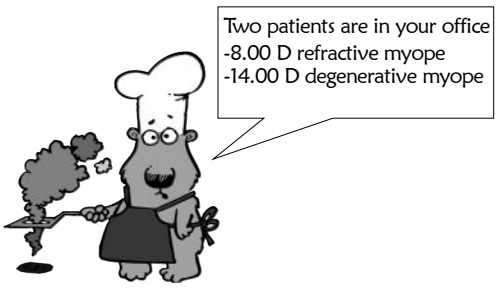
Conditions Associated With Degenerative Myopia

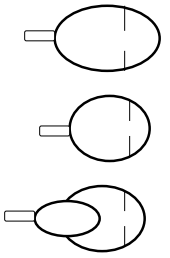
- Fetal Alcohol Syndrome
- Ocular albinism
- Down's Syndrome
- Low birth weight
- Infantile glaucoma
- Retinopathy of Prematurity
- Marfan's Syndrome

Treatment

- BVA with glasses/contact lenses
- Education regarding trauma and possible eye hazards
- Monitor for neovascularization and peripheral retinal changes
- Follow-up at least yearly

Which patient is at higher risk of retinal detachment?



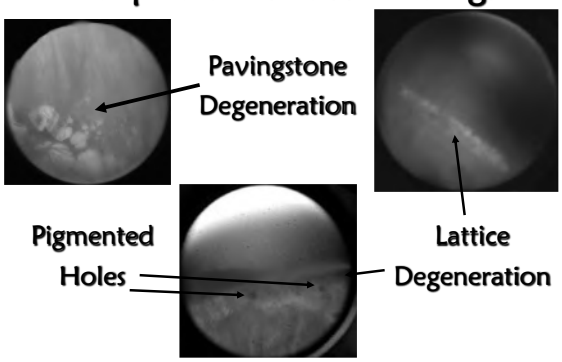


- Refractive myopia
  - Peripheral retina concerns
- Degenerative myopia
  - Posterior pole concerns

Clinical Pearl

- Refractive myopia
  - Peripheral retina is general concern
- Degenerative/Pathological myopia
  - Posterior pole is general concern
    - Posterior staphyloma

Peripheral Fundus Findings



Case 9

88 year old man
I see faces of friends that I have not seen for years, wheels of cars and at times pine trees

BVA
Count fingers at 2 feet OU

Current Correction
R plano
L -1.00 sphere

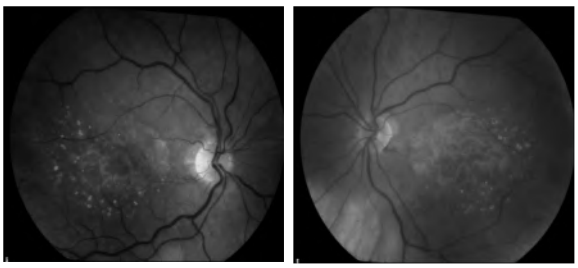
EOMS: full, unrestricted
CT: ortho D/N by Hirschberg

PERRL (-)APD
CF: central defect OU

Recommend psyche consult?

- Alert and Oriented x 3
  - Person
    - Knows who he is, who is with him
  - Place
    - Knows where he is, knows where he lives
  - Time
    - Knows what month, day, date and year

Diagnosis and Treatment?



Charles Bonnet Syndrome

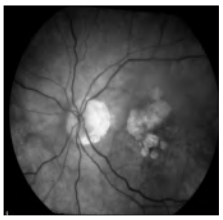
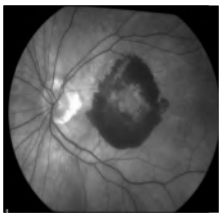
"Release Hallucination"

- Visual hallucinations
  - Irritative (brief)
    - Epilepsy
    - Migraine
  - Release (continuous)
    - Stroke
    - Sensory deprivation

Treatment

- Reassurance
  - That this is normal for patient with severe vision loss to experience hallucinations


Clinical Pearl
Is there a difference between
Geographic Atrophy and Disciform Scar

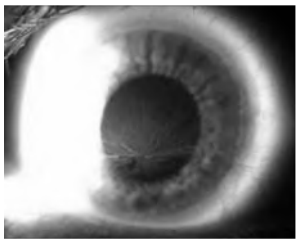



Case 10

65 year old woman

- Referred by an optometrist due to corneal edema and map-like anterior opacities. Impression is EBMD versus corneal degeneration.
- Patient reports decreasing vision over past 6-9 months. Especially at near
- Vision 20/50 OU

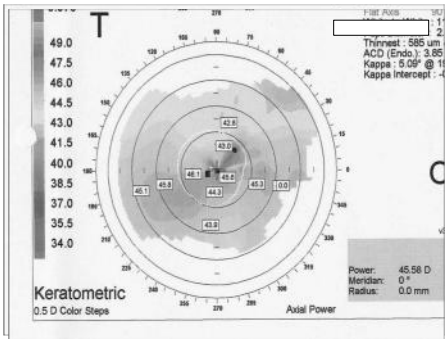
Cornea OD



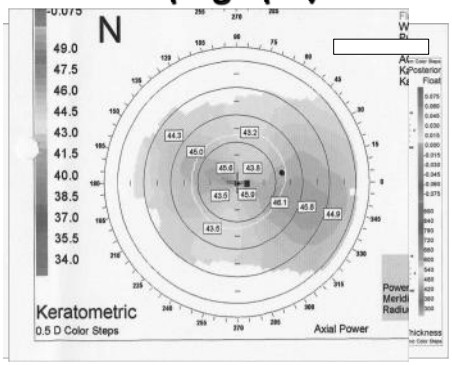
Patient's Medications

- Baby ASA
- Lanoxin
- Synthroid
- Glucophage
- Pravochol
- Amiodarone
- Neurotin
- Zoloft
- Vitamin E

Topography



Topography

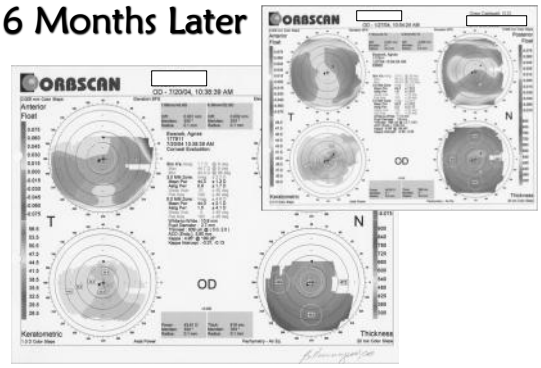


Called Primary Care Physician to Discuss Findings

- D/C amiodarone
- Primary Care Physician switches patient to diltiazem

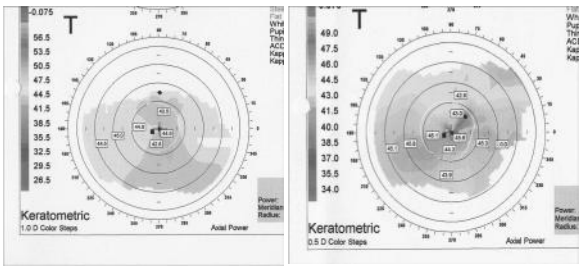
Class	Action	Drugs
I	Sodium channel blockade	Quinidine, Procainamide, Disopyramide, Lignocaine, Mexiletine, Tocainide, Flecainide, Phenytoin
II	ß-adrenergic blockade	Propranolol, Acebutolol, Carvedilol, Esmolol …
III	Prolong repolarisation	Amiodarone, Bretylium, Sotalol, Difetilide, Azimilide
IV	Ca2+ antagonism	Verapamil, Diltiazem, Semotiadil

6 Months Later

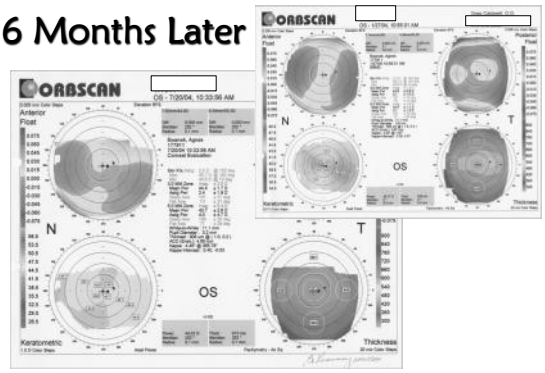


20/25 BVA

OD

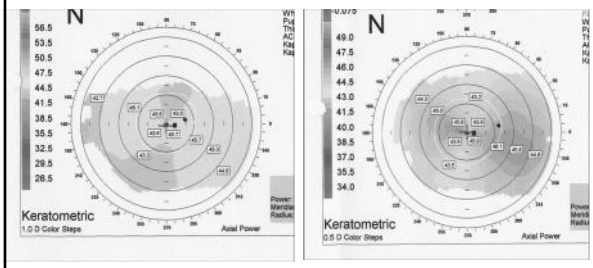


6 Months Later



20/25 BVA

OS



Amiodarone Ocular Side Effects

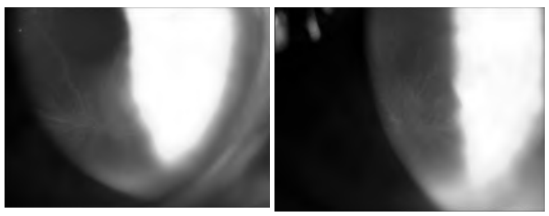
- Halos and colored lights, reported symptoms
- Corneal opacities
  - Epithelial basal cell layer
  - Bilateral, dose and duration related
  - Reversible
  - Dot, Linear, cornea verticillata (whorl like pattern found later)
- Conjunctiva, lens, retina and optic nerve deposits
- Optic neuropathy has been reported
  - Unilateral and bilateral cases

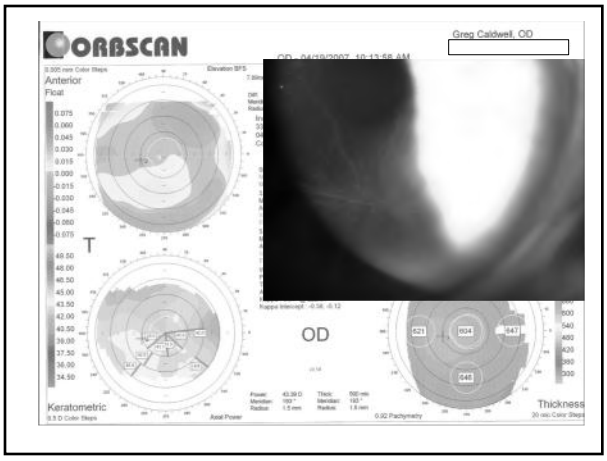
http://www.optometry.co.uk/articles/20020517/patel20020517.pdf

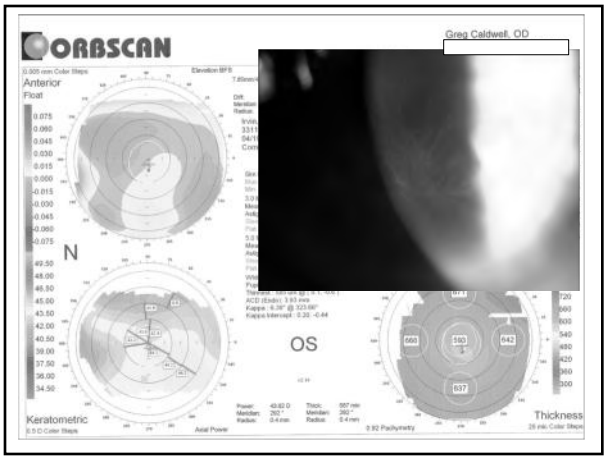
Cornea Verticillata (Whorls)

- **Drug-induced**
  - **Amiodarone**
  - **Chloroquine/hydroxychloroquine**
  - **Tamoxifen**
  - **Chlorpomazine**
  - **Indomethacin**

Another Patient Complaining of Blurry Vision Taking Amiodarone



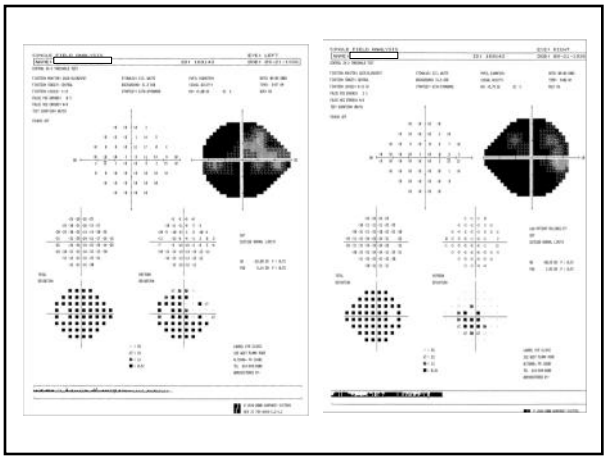




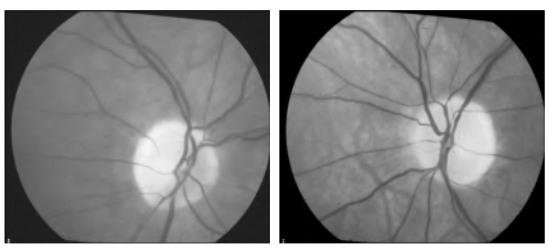
Case 11

67 year old man complains of vision slowly deteriorating over the past 8 months

- History of NA-ION 10 months ago OD
- Patient sees family physician for physical due to recent NA-ION
  - Patient has not been to PCP for 35 years
  - Patient started Cardarone
  - VA 20/80 OD 20/25 OS (9 months ago)
- VA 20/400 OD 20/200 OS (today)
- CF: severe constriction OU
- SLE: vortex corneal whorls OU



Amiodarone Optic Neuropathy



Case 12


Thank-You
and
Hope You Enjoyed
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