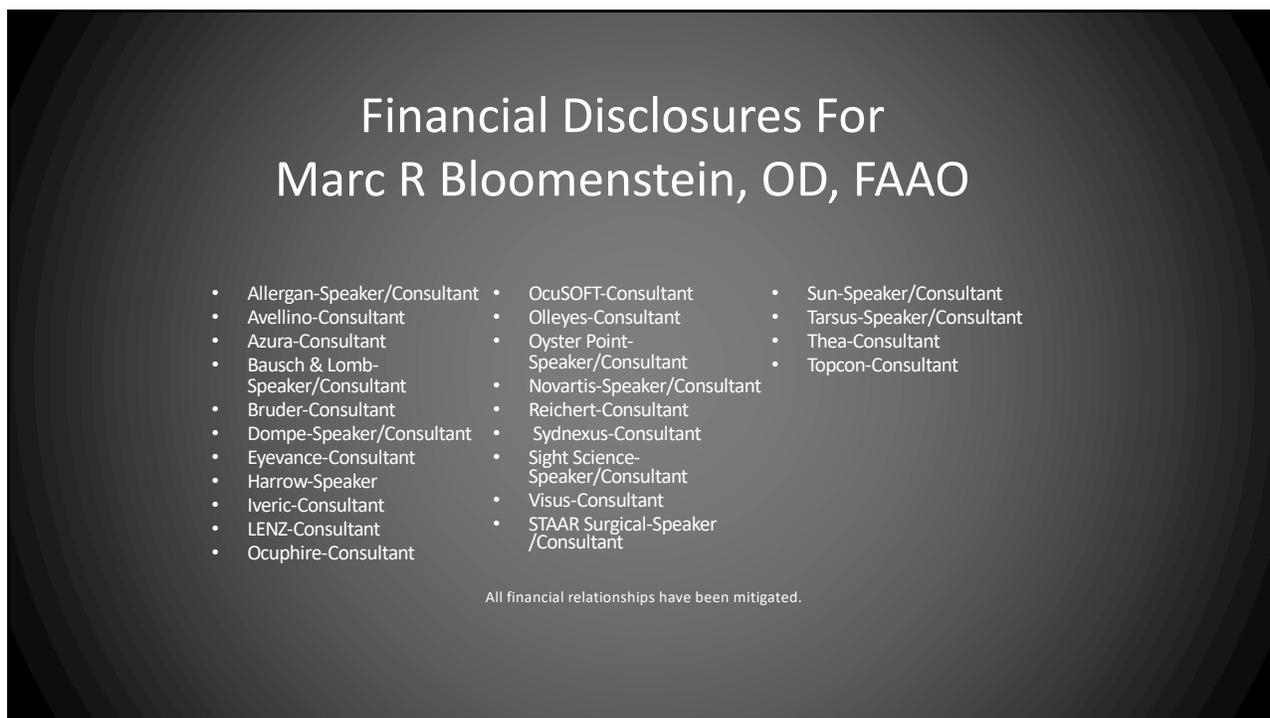
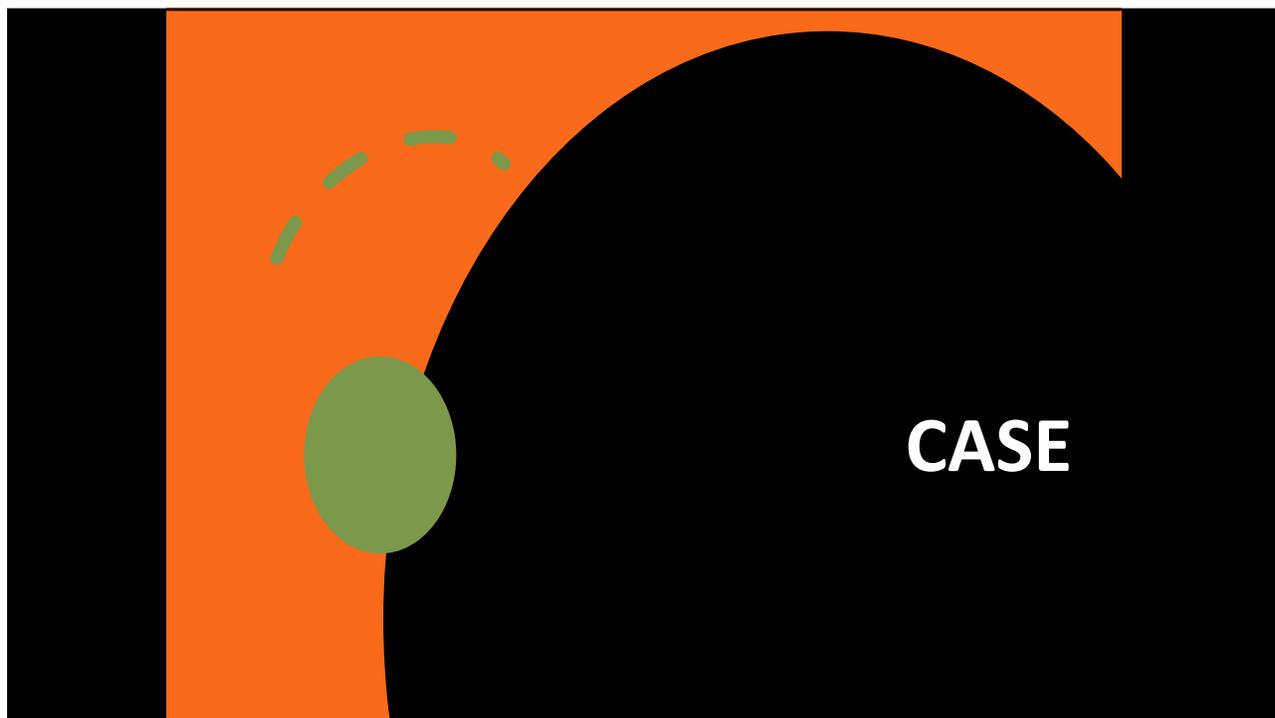


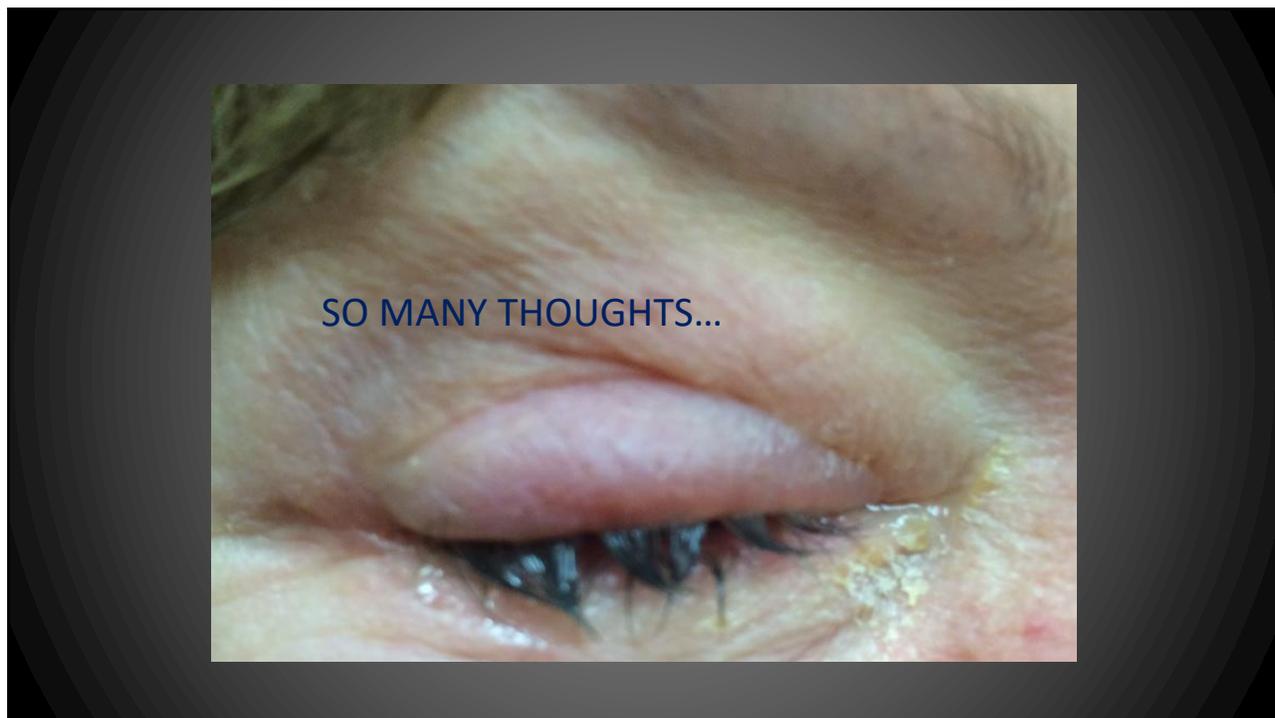
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2



3



4

## DIFFERENTIAL

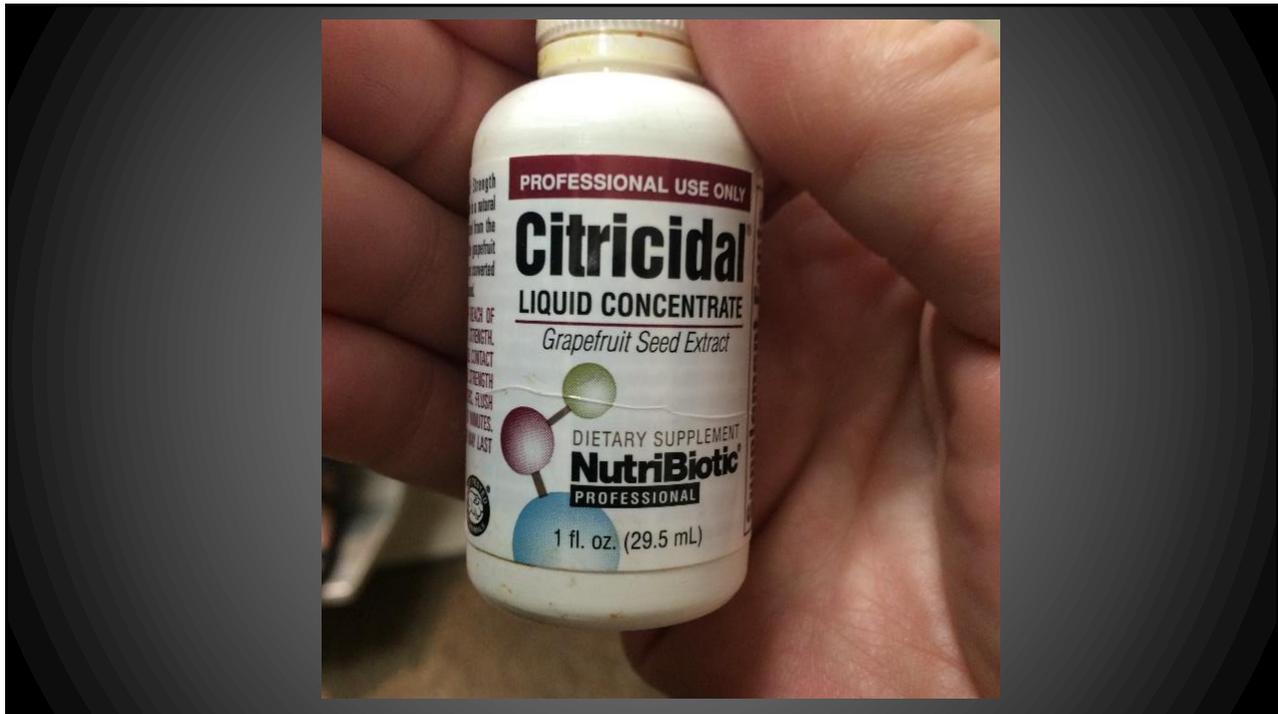
- Allergic Conjunctivitis
- Bug Bite
- Bacterial Conjunctivitis
- Viral Conjunctivitis
- Preseptal Cellulitis
- Cellulitis
- Corneal Ulcer
- Foreign Body
- Hot tub
- Trauma



5



6



7

## 3 Types of Eye Burns

- **Alkali Burns:** These burns involve high pH chemicals, and thus are the most dangerous. They are powerful enough to penetrate the eye, and cause damage to its vital inner components. In the worst cases, they can lead to conditions like cataracts and glaucoma and may cause vision loss or blindness.
- **Acid Burns:** Lower pH burns that are less serious than alkali burns, but still dangerous. These burns are unable to penetrate the eye, but still may cause significant damage to the cornea, with the potential to cause vision loss.
- **Irritations:** These burns are neutral in pH

8

## Symptoms of Chemical Burns

- Eye redness
- Eye irritation
- Eye pain
- Swelling of the eye
- Blurred vision
- Inability to open the eye
- Feeling of foreign objects in the eye

9

## Telephone Triage Tips

- Irrigation process begins on site before the patient seeks care.
- Use shower or hose if outside work place
- Attempt to determine the type of chemical that entered the eye(s).
- Attempt to determine if the patient is wearing contact lenses. Irrigation should not stop in an effort to remove contact lenses.
- A minimum of 20 to 30 minutes before the patient is brought to the office.
- When the patient is ready to make the trip to the ER or office, remind them to bring the container that held the offending chemical. Important information may be obtained from the labeling.
- If the injury occurred in the workplace, ask the patient to bring the MSDS (material safety data sheet) if available.
- If the injury occurred where there is no or limited access to water for irrigation, refer them to the nearest emergency room or your office, whichever is closer.
- Assist with dispatching emergency services as needed.

10

## Treatment

- Assess the cornea and conjunctiva
  - Cornea intact-mild SPK
    - Prophylactic Antibiotic
    - Topical Steroid (Lotemax Gel)
    - Preservative Free Tears
    - Cycloplege for Pain
  - Cornea haze/Necrotic
    - All the above
    - Consider debridement
    - Sodium ascorbate drops (10%) Q1H while awake
    - Vitamin C-1000mg/day
    - Prokera



11

More???

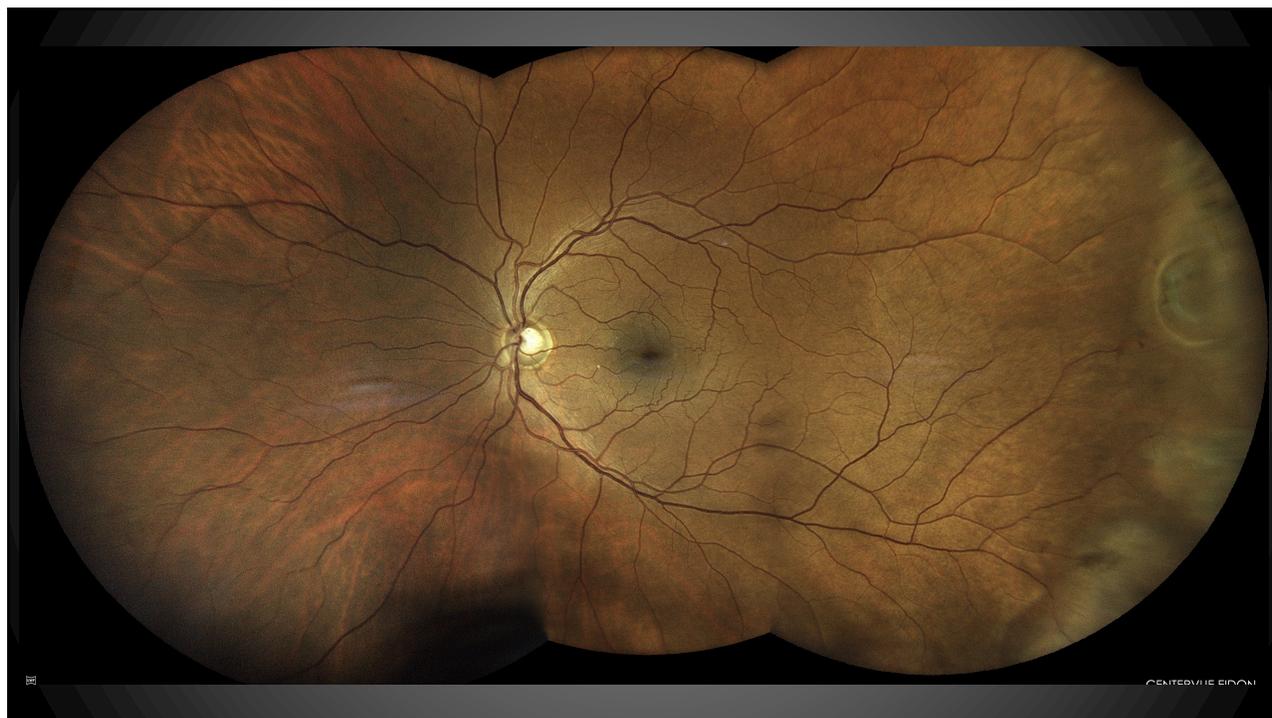
12

## Case MB

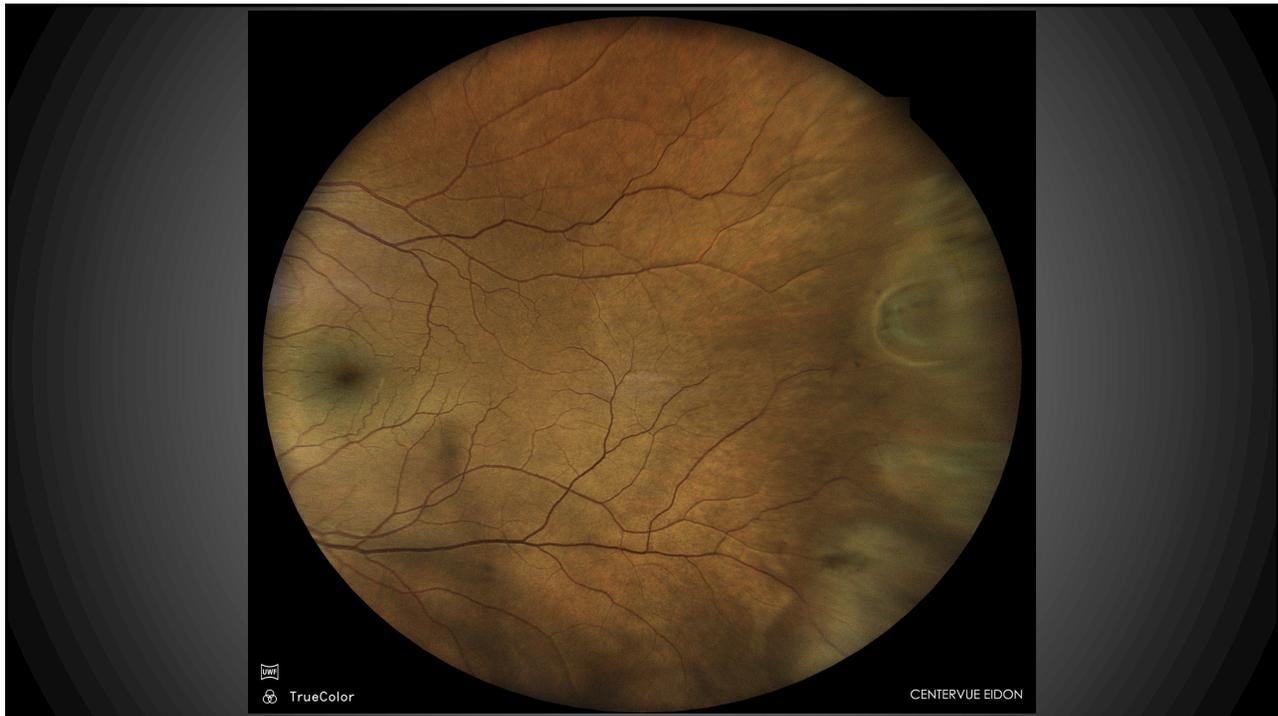
- 60 ish yo OD
- National Lecturer
- Not as funny as he thinks he is
- Notes flashes floaters OS x 3-4 days
- Tells me during lecture at vee in NYC
- Oc Hx;
  - low myope
    - Wearing 30 year old prescription
  - H/o lattice x 30 years
- Med Hx: unknown
- Meds (probable): Viagra, Cialis



13



14



15

## MB

### assessment

- Symptomatic HST OS

### plan

- Laser Upon return to PHX
- *Eventually* goes to retinal specialist
  - Immediate Laser os x 3
  - Prophylactic Laser OD secondary to lattice ODx2

16

## Retinal Breaks

Occur in 3 to 7% of adult population

*Usually* asymptomatic

30-50% of *symptomatic* HST progress to detachment if untreated

≈5% of *asymptomatic* HST progress to detachment if untreated

Risk factors include lattice degeneration, high myopia, atrophic holes, aphakia/pseudophakia, and trauma

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## Horseshoe tears

- Common locations
  - Near lattice
  - Near pigment clumps
  - Near chorioretinal scars
- Worst locations
  - Superior
  - Near equator
  - Close to posterior pole

18

## Treatment

**prompt treatment for *symptomatic* HST advised**

- Reduces risk of RD to <5%

Treatment of *asymptomatic* HST advised unless clear signs of chronicity

- Even still most retinal MDs recommend treatment

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## Treatment

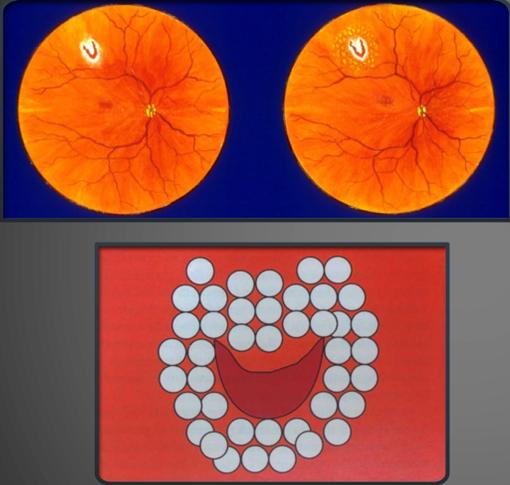
Laser treatment is used to seal the break by creating adhesion between the retinal tissue and underlying RPE

Provides barrier to continued enlargement from vitreo-retinal traction and prevents accumulation of subretinal fluid

Adhesion present 24 hours after surgery, and strengthens over several days

- Provides barrier to continued enlargement from vitreo-retinal traction and prevents accumulation of subretinal fluid
- Adhesion present 24 hours after surgery, and strengthens over several days

20



Procedure

- Typically Topical or rarely retrobulbar anesthesia
- Entire lesion should be enclosed by at least 3 rows in a honeycomb pattern

The slide features two fundus photographs at the top, each showing a white lesion in the superior retina. Below them is a diagram of a honeycomb laser grid, consisting of a grid of white circles with a red shaded area in the center, representing the laser treatment pattern used to enclose the lesion.

21



22

Follow-up

- RTC 1-2 weeks after treatment
- Then 4-6 weeks
- Then 3-6 mos
- Then annually

If untreated, must be followed closely with proper patient education

AAO : Posterior vitreous detachment, retinal breaks and lattice degeneration Preferred Practice Pattern , 2019

23

## Complications

Few complications

- inadequate burn intensity, causing ineffective adhesion
- possible CNVM
- intraretinal hemorrhage
- vitreous hemorrhage
- ERM formation

More theoretical than actual

Between 5-14 % of pts with initial break will develop additional breaks in future

- Cataract surgery is risk factor for new breaks

24

## Operculated holes

- Round, red hole with overlying free operculum attached to vitreous
  - Operculum often appears smaller than hole
- Minimal risk as no traction
- Treatment sometimes
  - High myopia
  - Aphakia
  - h/o RD in the fellow eye
  - Other factors



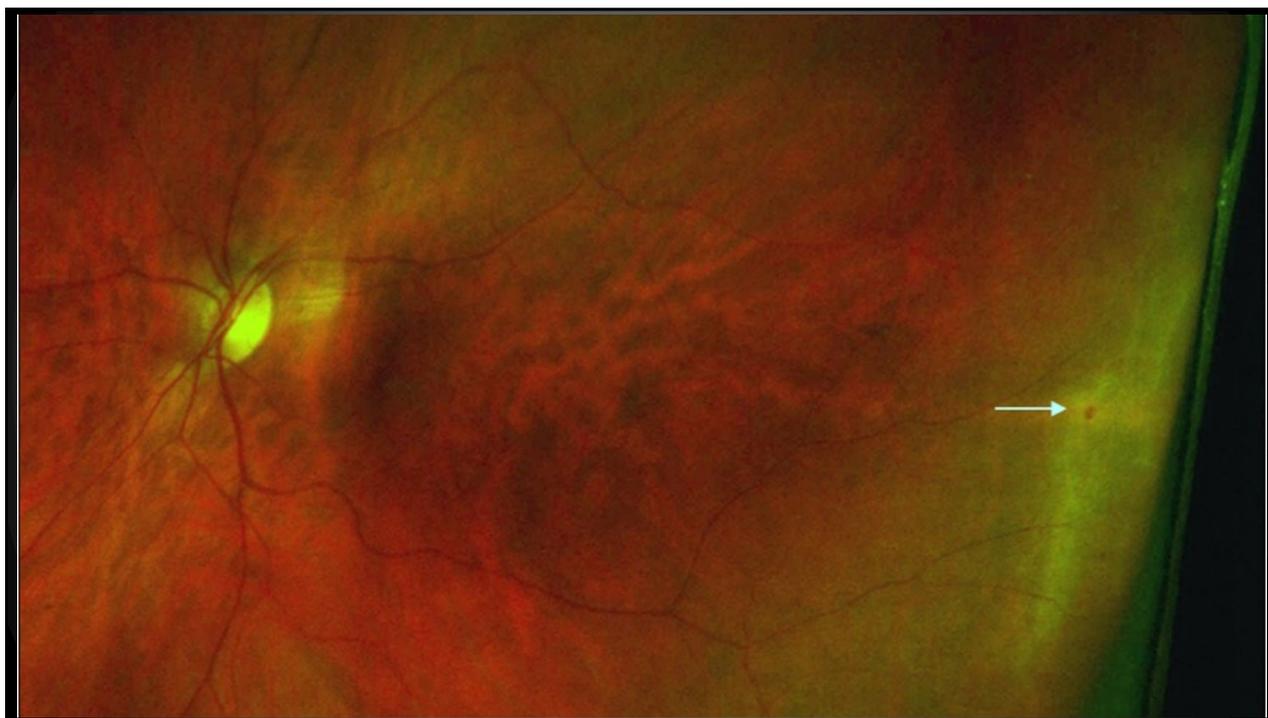
25

## Atrophic Retinal Holes

- Small round, red hole w/o operculum
  - May have surrounding pigment
  - Occasional edema
- 2-3% of general population
- Most often in vitreous base
- Found in atrophic retina, perhaps 2<sup>o</sup> to vascular insufficiency
- Rarely treated



26



27

HST

-  HST, especially symptomatic, are an optometric urgency/emergency
-  Require quick if not immediate referral to Rs
-  Almost always treated as risk of RD if untreated relatively high

28

Batter Up!-Let's Go Dodgers (2026)  
No REALLY PLEASE Win The WS!



Baseball is life... but it can hurt.

29

Batter  
Up!-  
Let's Go  
Dodgers

---

20-year-old collegiate  
baseball player was hit in the  
right eye when the ball was  
deflected off the bat.

---

The athlete bled from the  
nose, and the right eye  
swelled shut from eyelid  
edema.

---

Initial nasal hemorrhage was  
controlled

30

Patient Presents to you...



31

## Hyphema

*Microhyphema* is the term used when RBCs are in the anterior chamber but haven't settled inferiorly

*Hyphema* is the name given once blood settles inferiorly in the anterior chamber

Most commonly the result of blunt trauma to the globe

- Force causes blood vessels of the iris or ciliary body to break

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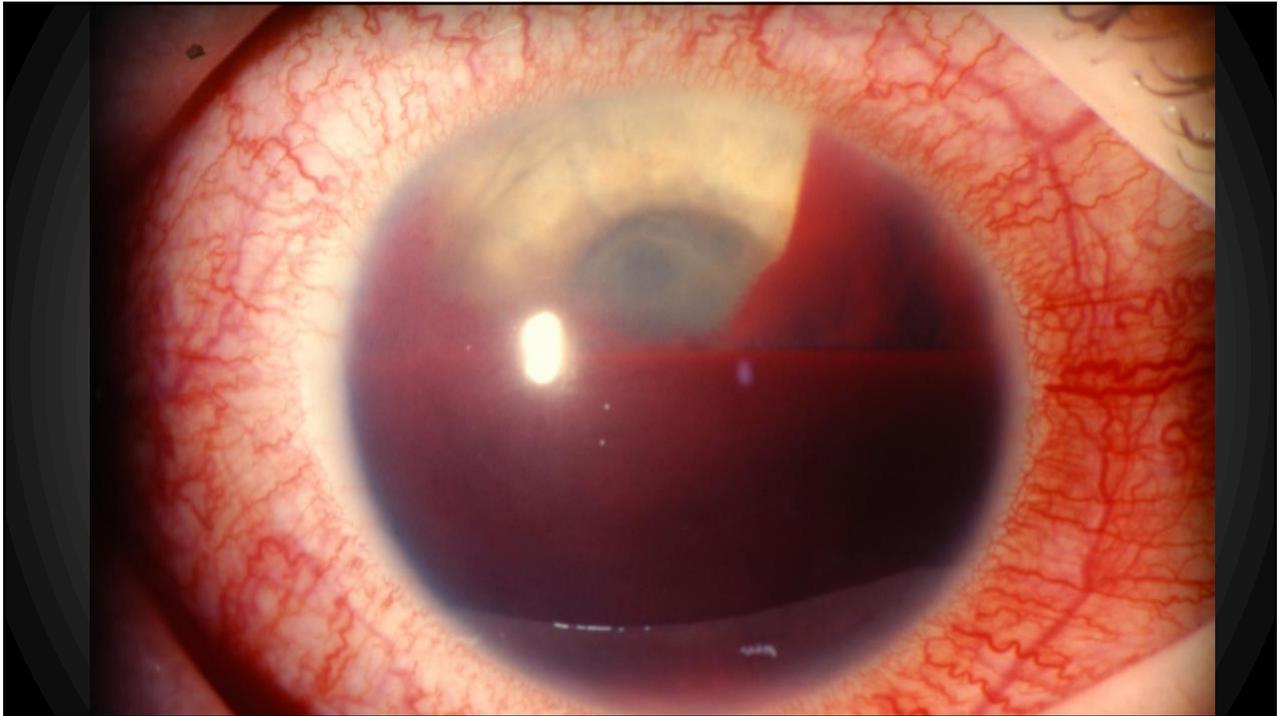


33

## Traumatic Hyphema

- Check periorbital area and globe for injuries
  - Vision, anterior chamber depth, Seidel's sign, IOP, broken facial bones, EOMs, APD, lens, iris, retina, etc.
  - May need CT of orbit/face, B-scan, retinal consult
- Any sign of an open globe is an emergency requiring placement of shield and immediate referral

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Hyphema  
Management

- Watch daily until resolved/controlled
- Start steroid q2h to qid
- Homatropine/cyclogel bid to tid
- Control IOP if elevated to avoid corneal blood staining
  - Larger hyphema = larger risk of increased IOP
  - Use brimonidine, beta-blockers first-line
  - Avoid CAIs if risk/known sickle cell
  - Avoid prostaglandins when possible

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## Hyphema Management

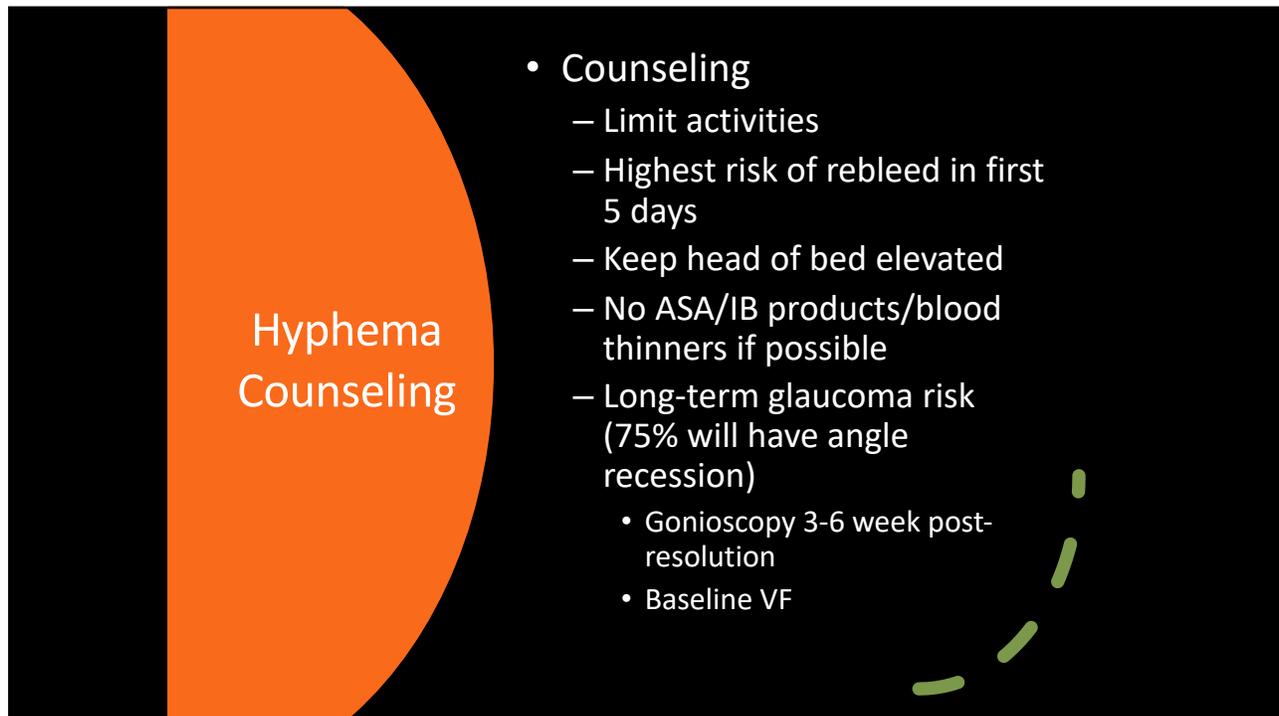
### Consider referral if:

- Unable to control IOP
- Corneal blood staining develops
- Continued bleeding without clotting
- Sickle cell patient
- Spontaneous hyphema of unknown etiology

### Surgical treatment

- Anterior chamber washout most common
- Paracentesis for IOP control
- Trabeculectomy with AC washout
- Yag PI if pupillary block develops

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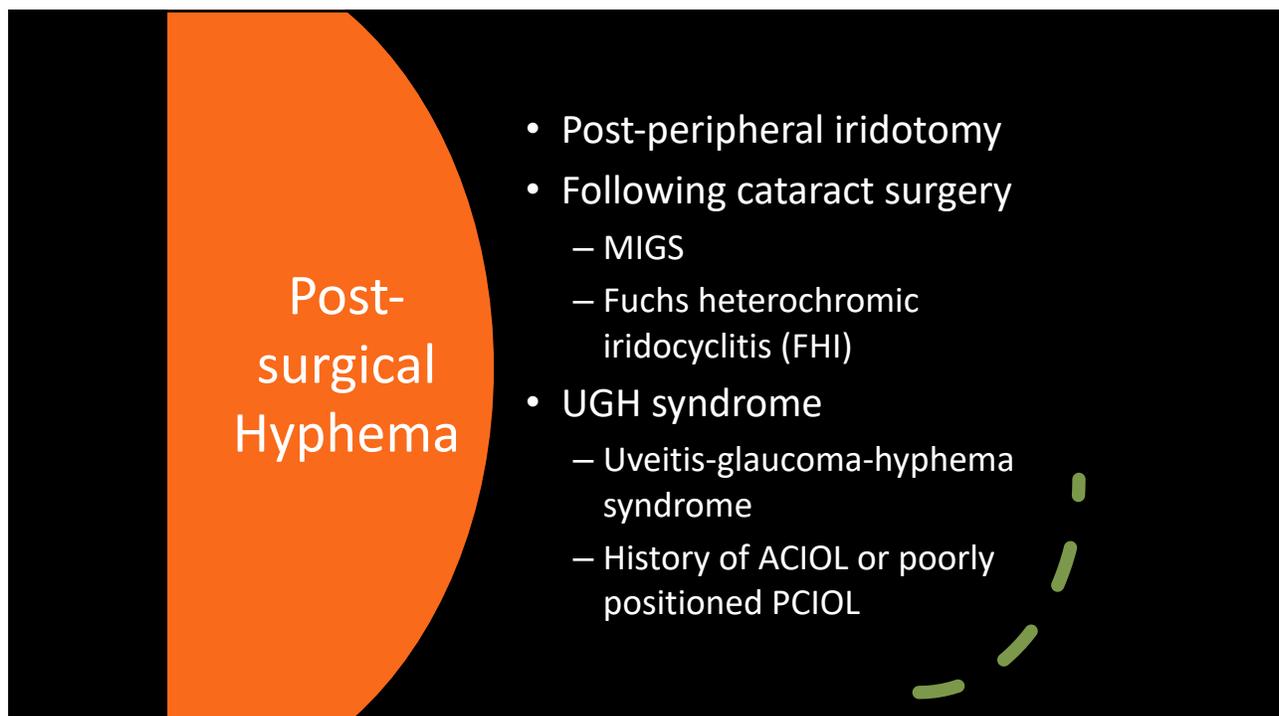


The slide features a black background with a large orange semi-circle on the left side. The text 'Hyphema Counseling' is written in white inside the orange area. To the right, a bulleted list provides counseling points. A decorative green dashed line is located in the bottom right corner.

## Hyphema Counseling

- Counseling
  - Limit activities
  - Highest risk of rebleed in first 5 days
  - Keep head of bed elevated
  - No ASA/IB products/blood thinners if possible
  - Long-term glaucoma risk (75% will have angle recession)
    - Gonioscopy 3-6 week post-resolution
    - Baseline VF

39

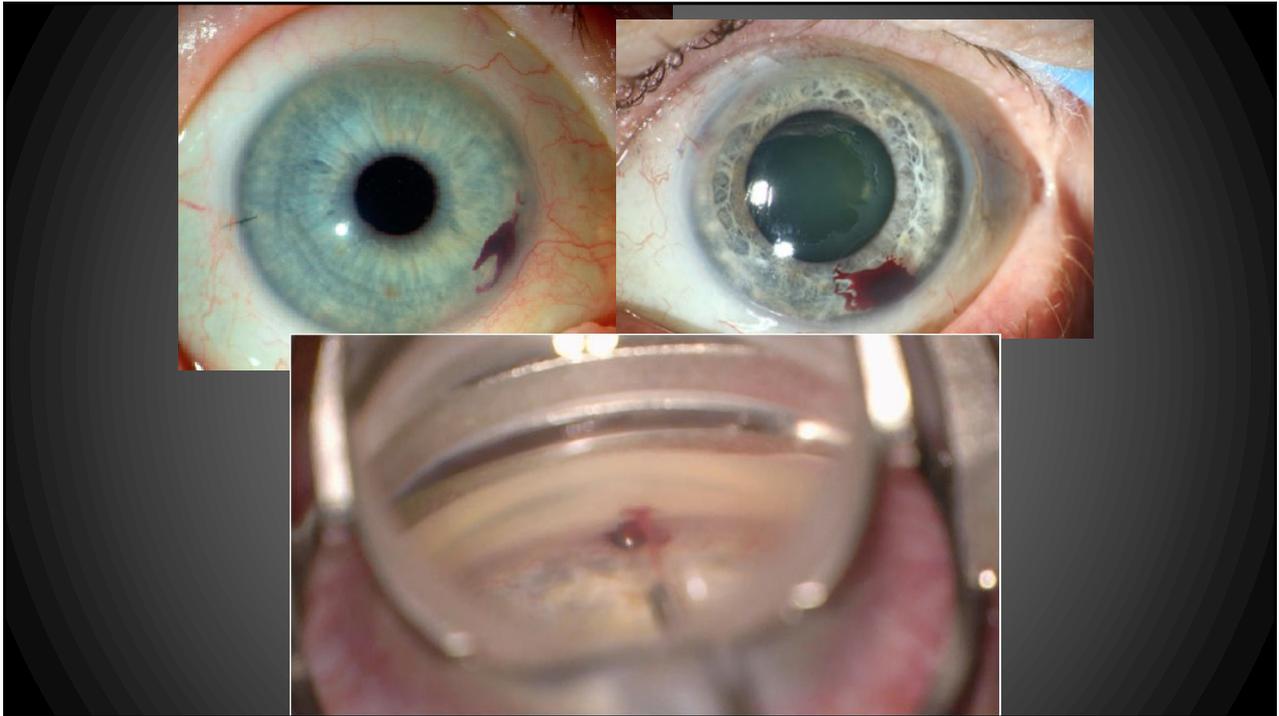


The slide features a black background with a large orange semi-circle on the left side. The text 'Post-surgical Hyphema' is written in white inside the orange area. To the right, a bulleted list provides information on post-surgical hyphema. A decorative green dashed line is located in the bottom right corner.

## Post-surgical Hyphema

- Post-peripheral iridotomy
- Following cataract surgery
  - MIGS
  - Fuchs heterochromic iridocyclitis (FHI)
- UGH syndrome
  - Uveitis-glaucoma-hyphema syndrome
  - History of ACIOL or poorly positioned PCIOL

40



41

Spontaneous Hyphema

- Neovascularization of the Iris
  - PDR/Ocular Ischemic Syndrome (OIS)
- Sickle Cell disease and Sickle Cell Trait
- Ocular Melanoma/Retinoblastoma
- Herpetic uveitis/FHI
- Leukemia/hemophilia
- Anticoagulant use
- Others

42

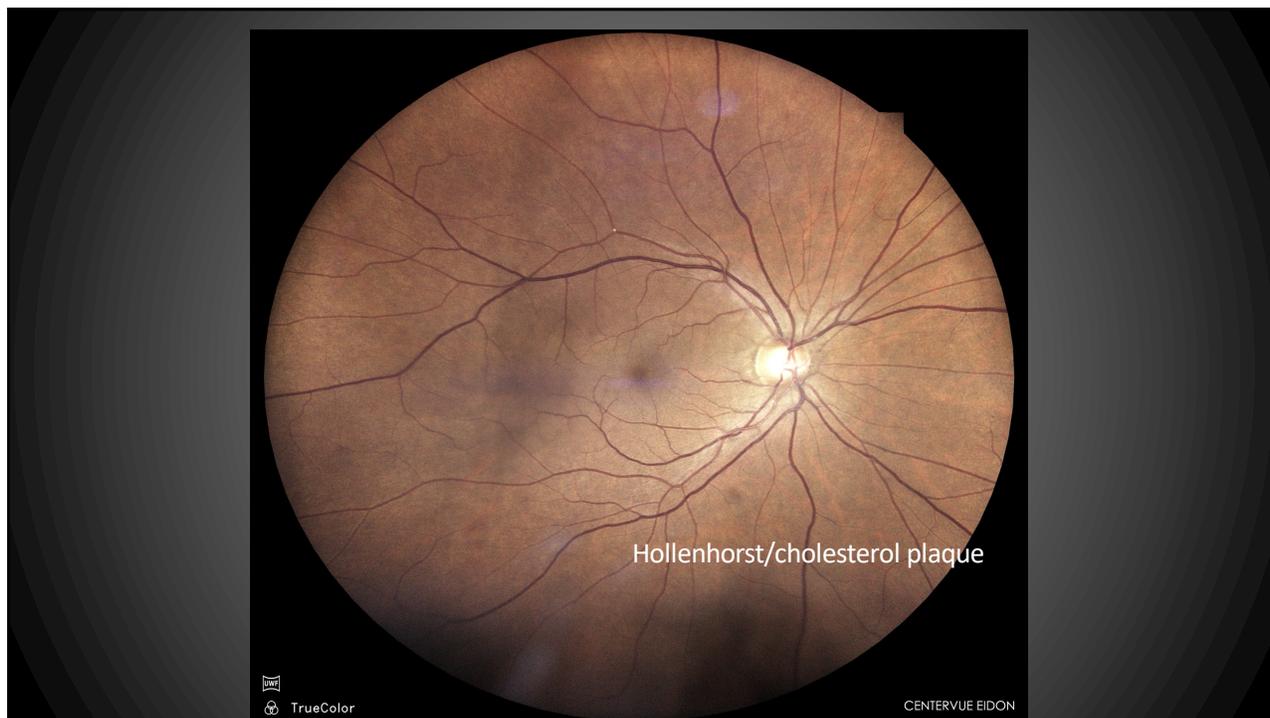


43

hm

- 59 yo male
- Feels like he needs updated Rx
- LEE: 8 years, unremarkable
- Med hx: unknown. Last physical 10 years plus
- Meds: viagra

44



45

# Mh: Labs

Cholesterol panel			
• Total chol	206 h	range	>200
• Tri	83 wnl	range	40-160
• Hdl	32 l	range	>40
• Ldl	152 h	range	<130
• Chol/hdl	6.3 h	range	2.8-5.0

CBC: unremarkable

A1c: 5.4 wnl

BP 155/84

BMI 32.4

Carotid: pt moved before performed

46

## RETINAL PLAQUES

Several different types of plaques can often be visualized in the retinal vasculature

Often totally asymptomatic and found on routine exam

Three different types of plaques, but all share strong association to significant cardiovascular disease

- HOLLENHORST PLAQUE (CHOLESTEROL)  
80% > FIBRINO-PLATELET 14% > CALCIFIC 6%

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## RISK FACTORS

- Age
- HTN
- Vascular disease
- Past vascular surgery
- SMOKING
- High TOTAL cholesterol
- Men > women

48

Prevalence

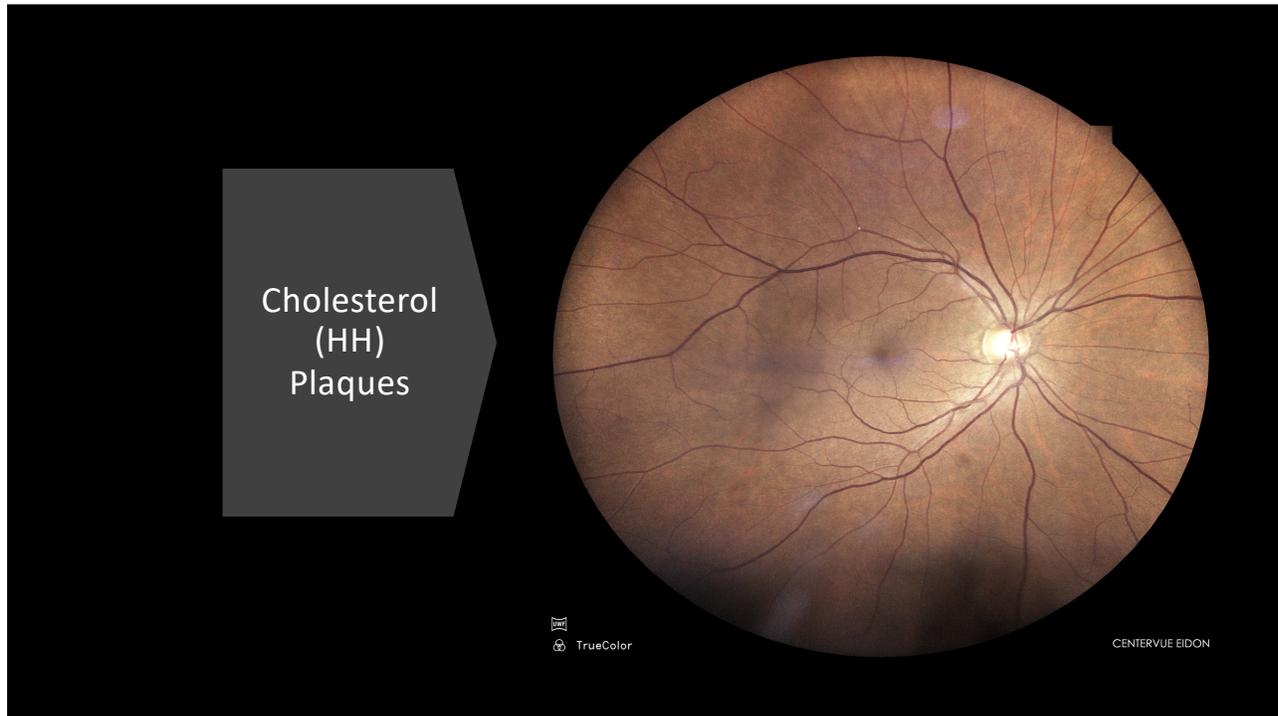
- Beaver Dam Eye Study: 1.3%
  - smoking, HTN and DM
  - 9x more likely after age 75 vs. 43-54
    - after 75, 3.1% prevalence
    - Equates to 1.2 million people with emboli 43-86
      - » 450,000 are 75-86
    - Fatal stroke 3x as likely over 8 years in pts with emboli, adjusting for other factors
  - OD>OS
  - Bilateral very infrequently

49

Prevalence

- Blue Mountain Eye Study 1.4%
  - HTN, smoking, Vascular disease
- LA Latino Eye Study: 0.4%
  - Smoking, CAD, h/o MI, HTN
- Singapore Eye Study: 0.6%
  - Smoking, high cholesterol, h/o angina

50



51

Retinal  
Plaques

- Cholesterol (Hollenhorst) plaque
  - Most common
  - shiny yellow-orange in appearance
  - from plaque in the ipsilateral carotid artery
  - Rarely causes occlusion, unless multiple
  - Typically occurs at bifurcations
  - Mobile in nature

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53

## Retinal Plaques

- Fibrino-platelet
  - Appear as dull white to gray, long plugs
  - Typically, within arterioles, not at bifurcations
  - May break-up and dissolve with time
  - May lead to BRAO or CRAO
  - Often associated with carotid disease or mitral valve insufficiency

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## Calcific Plaques



55

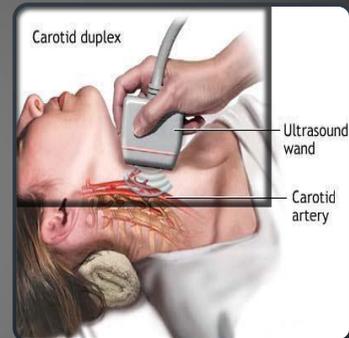
## Retinal Plaques

- Calcific
  - Appears more whitish than HH
  - Dull, non-reflective, white
  - Classically within arteriole, not at bifurcation
  - Typically, immobile
  - Most dangerous, as often cause BRAO
  - Often from cardiac aethromas of heart valves

56

## Retinal Plaques: Work up

- Assess risk factors with PCP
  - DM, HTN, LIPID PANEL
- Carotid auscultation in clinic for bruit
- Carotid ultrasound/Duplex
  - Identifies flow rate and % stenosis OF Common, internal, and external carotid arteries
  - **ORDER WITHIN TWO WEEKS!!**



57

## Work up, cont.

- TEE: trans esophageal echocardiogram
  - invasive, probe into esophagus to image heart valves
    - Helpful with calcific
- CTA: Computed Tomographic angiography
  - CT scan of arteries construct 3D images
    - Useful for atypical /confounding findings or if surgery indicated

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## treatment

- <50% stenosis: medical management with blood thinner/antihyperlipidemics
  - Aspirin, clopidogrel , warfarin, statins
- >70% stenosis: Surgical intervention
  - CEA: Carotid endarterectomy
  - Carotid angioplasty
- 50-69% stenosis: Depends on other risk factors if medical or surgical
 

ONLY 7-20% of Asymptomatic retinal plaques have significant stenosis

59



60

# Oh for F-sake!

61

## What the F?

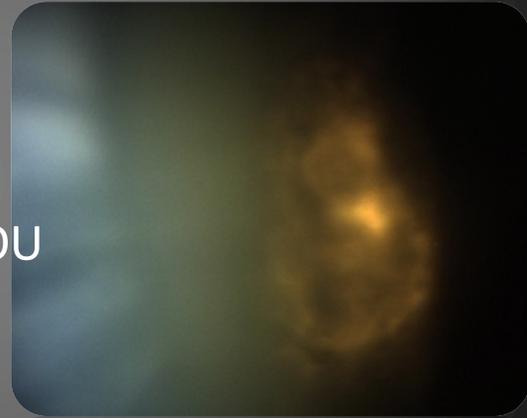
- 67 year old WM
- “My vision is not good...I have blurred vision. My eyes cry a lot too. They cry all the time.”
- +NIDDM (diet controlled 15 years)
- NKMA
- History of skin lesion removed from cheek



62

## What the F?

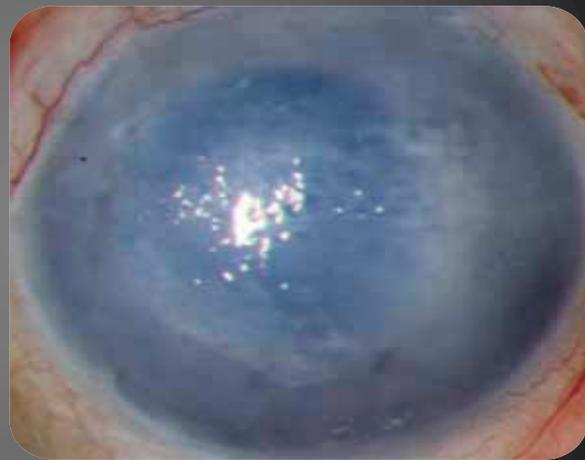
- VACC
  - 20/30 (PH-20/20) OD
  - 20/100 (PH-20/70) OS
- SLEX
  - 2+ guttata-OU
  - Mild pigment on endo-OU
  - 1/2+ NSC/Tr PSC-OD
  - 2+NSC/2+ PSC-OS



63

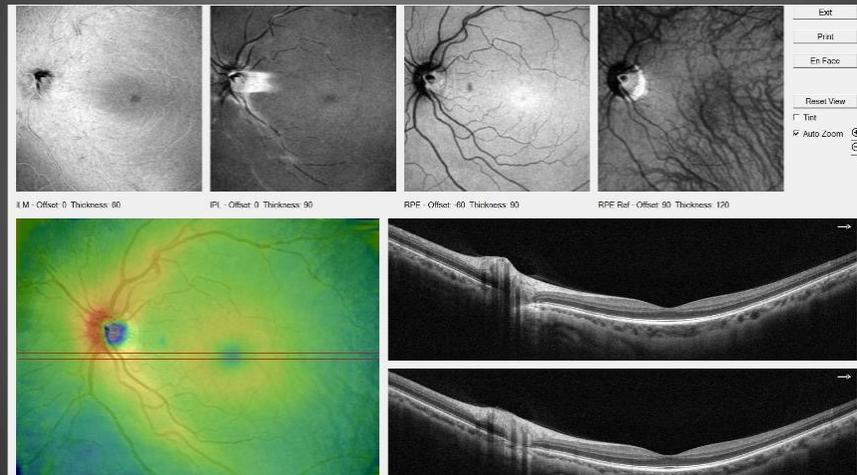
## Cataract Surgery OS

- VASC
  - 20/100
  - 2-3+ Striae
  - 3+ POME
  - 1+ cells
  - Lens centered
  - IOP
    - 14 mmHg (ORA)



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## Optovue Avanti-OS



65

## Fuch's Dystrophy

- Autosomal dominant inheritance
- Bilateral / Asymmetry
- Late onset > 50 y.o.
- Females affected 3 times more than males
  - 5.7 % develop edema
- Characterized
  - Corneal guttata
    - Excessive accumulation of abnormal endothelial secretions
    - Appears in 30-40<sup>th</sup> year of life

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## Fuch's Dystrophy

- Characterized
  - Corneal Guttata
    - Small refractile “drops” on corneal endothelium
    - Affects the “pump” action of the endothelium
  - Edema
    - Greater in the AM
    - Desiccates as day goes on
    - Long standing edema may lead to corneal scarring
    - RCE's common



67

## What the F?

- 6 months PO
  - VACC
    - 20/30-OS
    - Slex
      - Well centered lens
      - 3+ guttata
      - Mild pigment endo
  - IOP
    - 15 mmHg (ORA)



68

## What the F?

- 13 months later
  - Patient calls....
  - “Sorry to bother you on a Sunday, but my eye is blurry today and it hurts alittle.”
  - “I have seen the corneal surgeon recently and he said my cornea looked good.”
  - “I was 20/30. Today it is not so great..”
  - SO.... I head into see patient...

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“Just when  
I thought I  
was out  
they pull  
me back  
in”

**The Godfather  
Part III  
(we skipped II)**

70

## The Godfather II

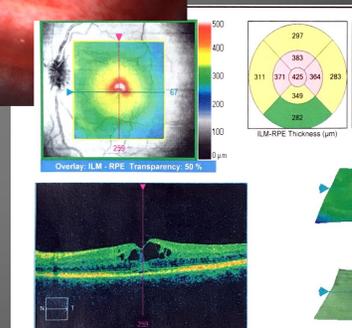
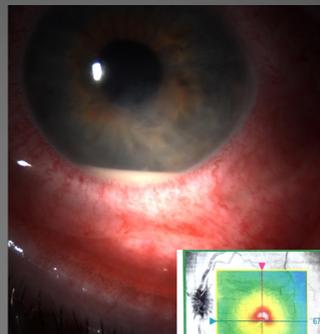
- 3 months later
  - Patient calls....
  - “Sorry to bother you on a Sunday, but my eye is blurry today and it hurts a little.”
  - “I saw the corneal surgeon a month ago and he said my cornea looked good.”
  - “I was 20/30. My VA was getting a little blurry but today it is not so great..”
  - “Really light sensitive and my eye is red”
  - “My wife thinks she can see my lens in my eye”
  - “And it hurts..did I mention the pain?”
  - SO.... I head into see patient

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## CASE STUDY

### VAsc

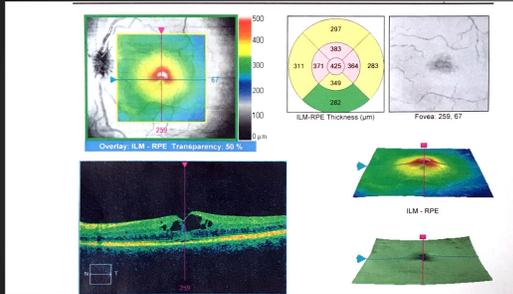
- OD 20/50 and OS HM
- IOP
  - 14 OD and 31 OS with ORA
- SLEX:
  - OD: A/C-D&Q; Iris round; 1+NSC/1+PSC
  - OS: 3+ conjunctival injection, 3+Cells/flare; 12.5% hypopyon;; centered IOL
- OCT:
  - OS: CME



72

# Why???

## “What did you do?”



73

## Patient's Medical Hx

- NIDDM-diet controlled
- No corneal ulceration
- No Viral Infections
- No auto-immune or inflammatory conditions
- Patient states:
  - “I feel the eye just has never been right since cataract surgery”
- Blood Results

74

## Lab Work

	PURPOSE	NORMAL VALUES	RESULT
Erythrocyte Sedimentation Rate (ESR)	Inflammation	≤ 30 mm/hr	Elevated (110 mm/hr)
C-Reactive Protein (CRP)	Inflammation	<6 mg/L	Elevated (19.35 mg/L)
White blood cells	Inflammation	$4 \times 10^9$ to $1.1 \times 10^{10}/L$	Mild leukocytosis ( $13.1 \times 10^9/L$ )
Human Leukocyte Antigen B27 (HLA-B27)	Specific protein strongly associated with spondyloarthropathies	Negative	Positive
Herpes Simplex Virus (HSV) IgG	Herpes simplex virus-specific antibody	Negative	Positive
Herpes Simplex Virus (HSV) IgM	Herpes simplex virus-specific antibody	Negative	Positive
Angiotensin-Converting Enzyme (ACE)	Sarcoidosis	Negative	Negative
Toxoplasma	Toxoplasmosis	Negative	Negative
Treponema Pallidum Antibody (FTA-ABS)	Syphilis	Negative	Negative
Rapid Plasma Regain (RPR)	Syphilis	Negative	Negative
Varicella-Zoster Virus (VZV) titer	Varicella zoster virus antibodies	Negative	Negative

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## What to look for?

In a retrospective study in AJO 2016:

Persistent iritis

Increased IOP

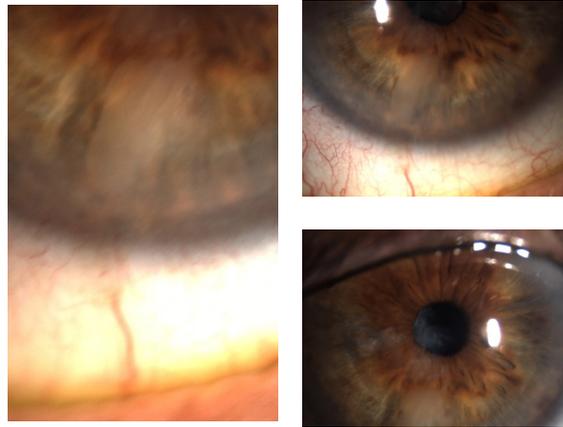
Corneal edema

**Retained Lens material**

Study concluded that delay in cataract diagnosis was the most common factor

76

## Retained Nucleus



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## Referred Patient to Retina

Called my personal retinal specialist

Danesh: 'Hey when are you coming in to get more laser?'

Me: Danesh, I can't hear you. Must be a bad connection

Patient was seen:

Posterior Uveitis

B-scan demonstrated multiple refractile particles in the vitreous-retained lens nucleus

Patient under PPV next day

Removed lens material

Culture was negative for aerobic or anaerobic organisms

Triamcinolone injection; Pred Forte q2h; ketorolac qid -OS

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## Most Common Causes of Hypopyon

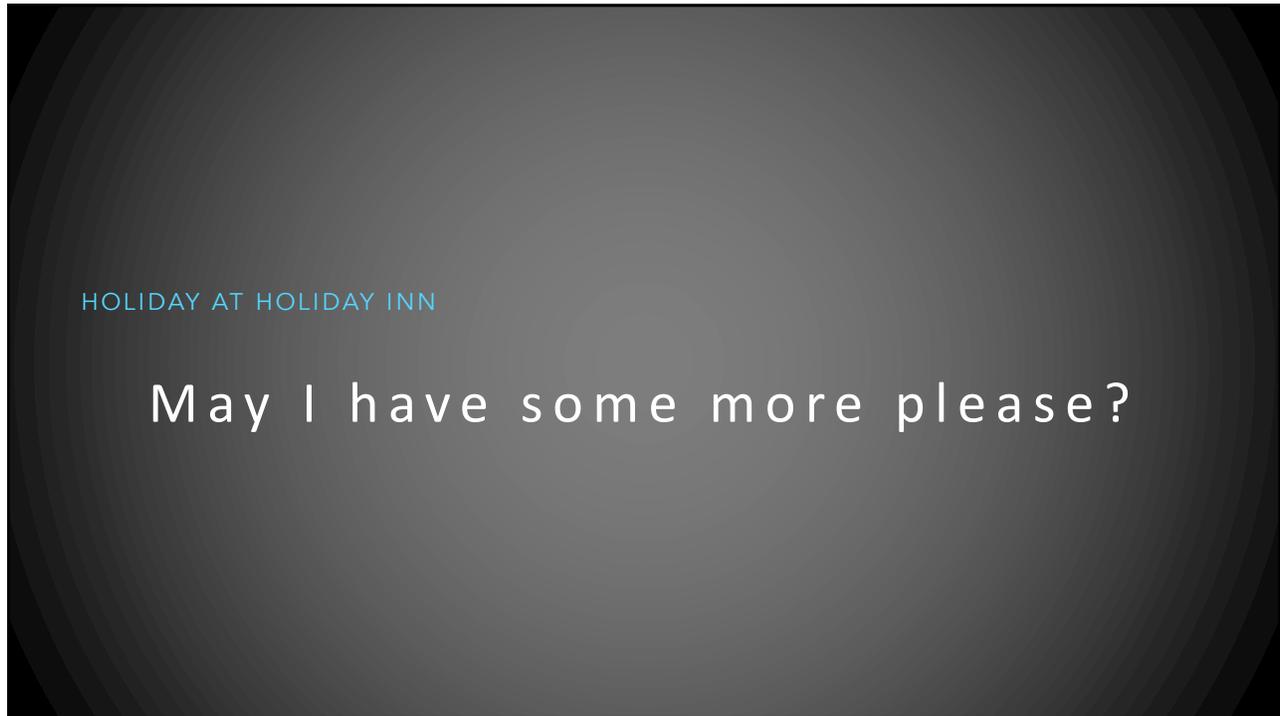
- HLA-27 Positive Patients
  - Bechet's
  - Ankylosing spondylitis
  - Reactive arthritis (Reiter's)
    - 50% of cases
    - 3X's more common in males
- Corneal Ulcer
- Endophthalmitis
- Toxoplasmosis
- Keratitis
- Iatrogenic/Trauma
- Syphilis
- HSV

79

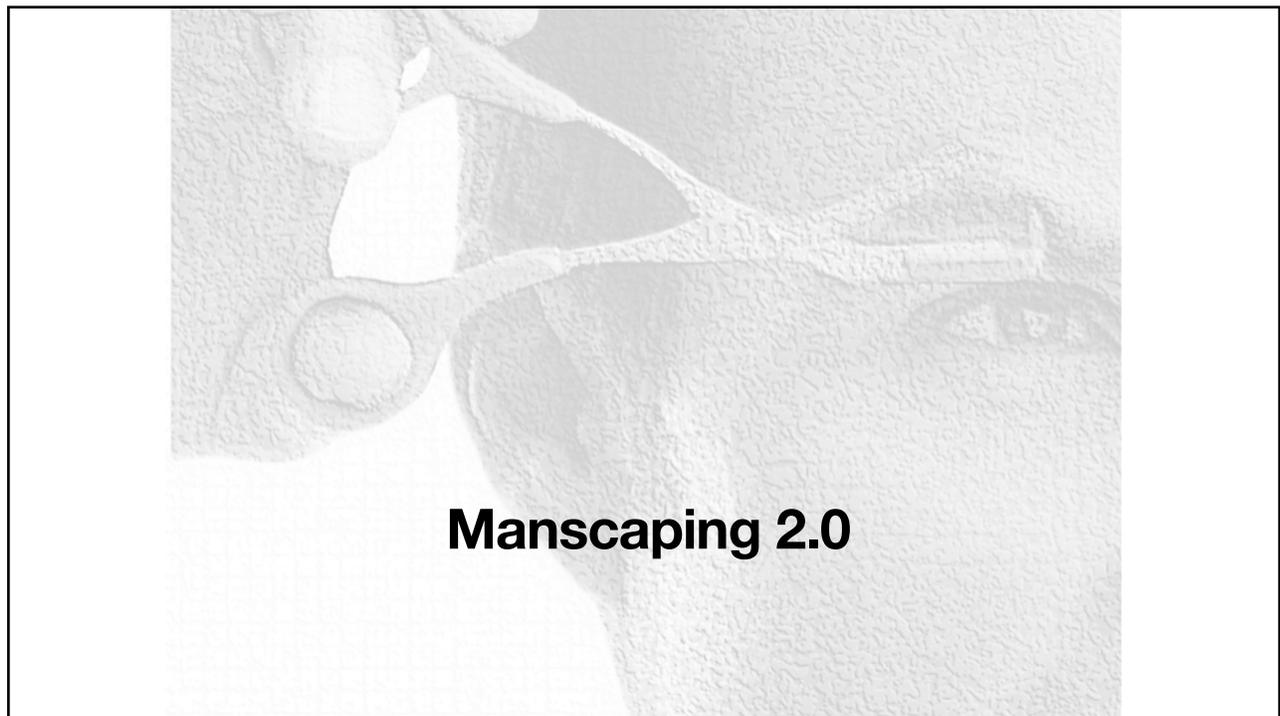
## Typical Treatment

- Referral to rheumatologist with HLA 27 diagnosis
- Topical steroid and NSAID treatment
- Systemic steroid
- Intraocular steroid injections
- Patient:
  - After 6 weeks his VA returned to 20/30
  - He told me "What the Fuch's? This eye!"

80



81



82

## Manscaping 2.0

- 77 yo HM
- “My primary doctor has been on my ass to get an exam. So, here I am!”
- Smokes and “Don’t tell me I can’t drink my beers”
- NIDM
  - Metformin 8.5ml/day
- NKMA
- Ohx-Negative

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## Manscaping 2.0

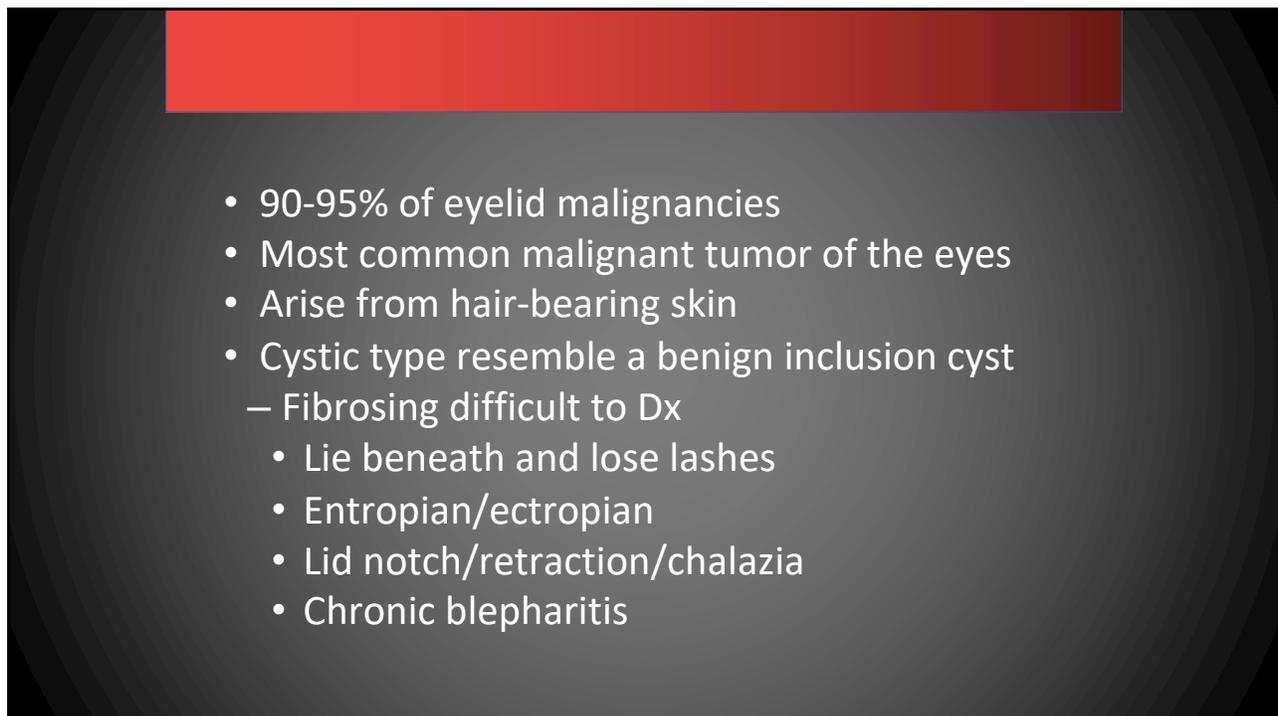
- Vasc
  - 20/40 ph 20/20
  - 20/25
- IOP
  - 13 mmHg OU
- Slex
  - OD: Grade2 demodex, MGGS 3, PCIOL (open capsule)
  - OS: Grade 3 demodex, MGGS 2, PCIOL (open capsule)
- Dilated Fundus Exam
  - C/D 0.35/0.40
  - Peripheral retina flat, NNOH/NNE, No Tears or holes.



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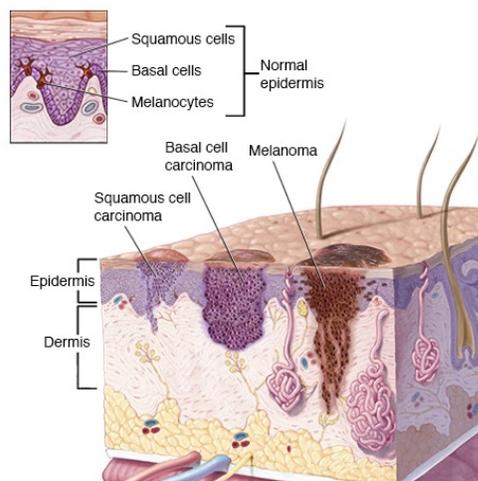
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## Basal Cell Carcinoma (BCC)

- ▶ Location
  - ▶ LL: 50-60%
  - ▶ MC: 25-30%
  - ▶ UL: 15%
  - ▶ LC: 5%
- ▶ Hx: fair skin, sun exposure, smoking, prior BCC
- ▶ Forms: nodular, morpheaform
- ▶ Rarely metastasize
  - ▶ Recurrent or neglected may invade orbit and need exenteration

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## Basal Cell Carcinoma (BCC)



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## Ulcerated lid margin lesion



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## Final & Definitive Diagnosis

### BIOPSY

- Incisional – when we suspect a malignant lesion
  - Shave Bx
  - Punch Bx
- Excisional - ideal when we suspect a benign lesion
  - Margins are not checked



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**After Excision**



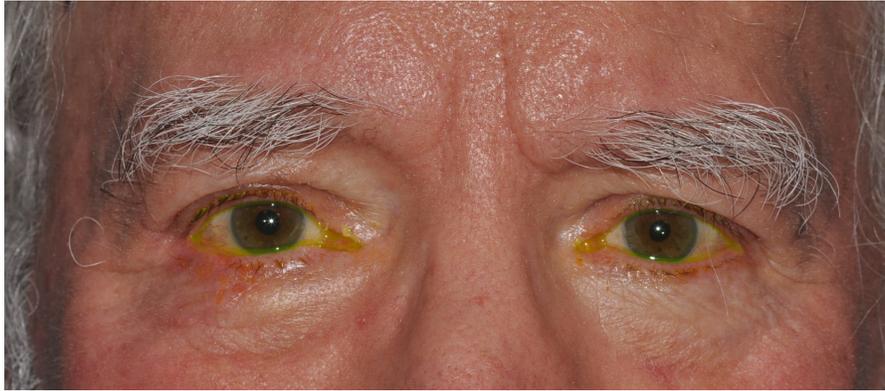
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**2D PO**



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## 2M PO



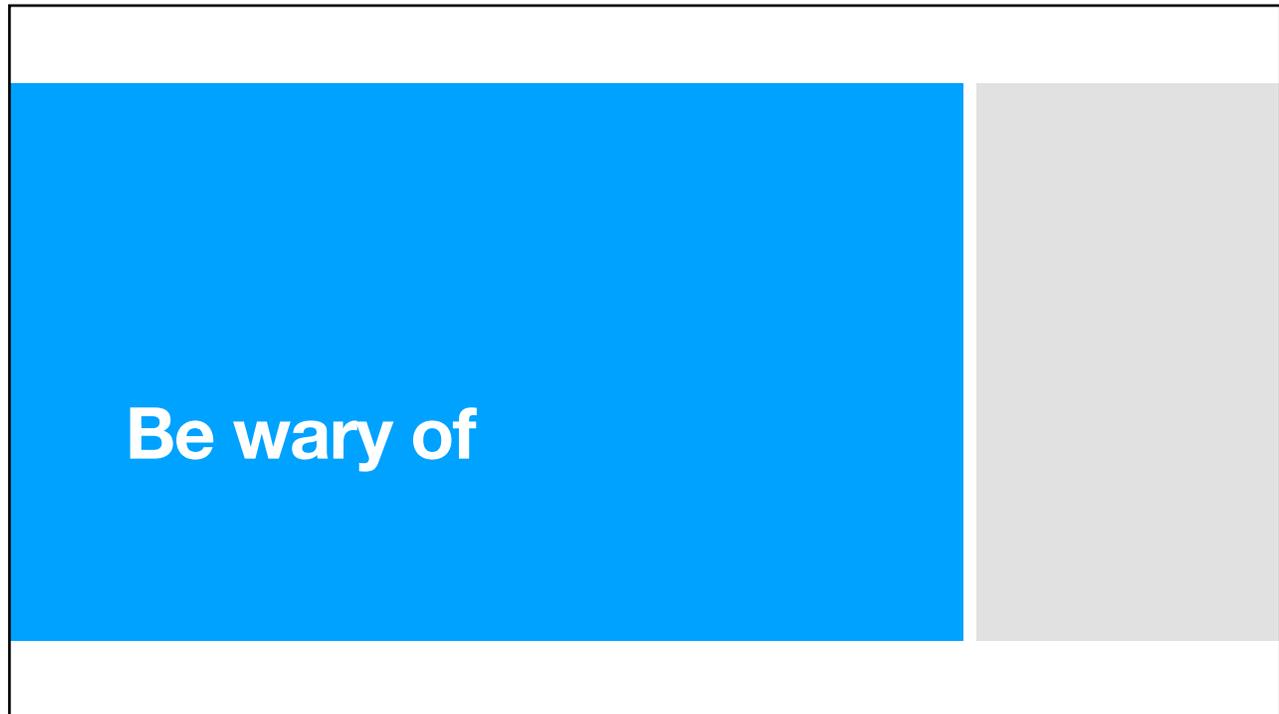
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## Polling Question #3

Which of the following is not a sign when considering retained lens materials?

- a. Iritis
- b. Edema
- c. Vitreous wick
- d. Increase IOP

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### Eyelid Neoplasms

- May arise from epidermis, dermis or eyelid adnexal structures
  - Keratinizing epidermis
  - Prominence of sebaceous glands and blood vessels
- Epidermal origin most common
- Main goal: identify and diagnose malignancy

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Most periocular epithelial lesions non-malignant

Clinical judgment < 100% accurate

Whenever in doubt -> BIOPSY:

- absolutely necessary for the definitive Dx

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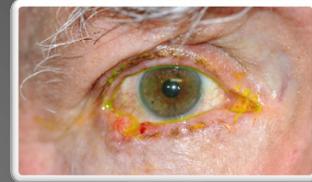
Clinical Evaluation:  
History

- Hx prior cancer
- Sun exposure
- Past radiation
- Smoking
- Skin type

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## Clinical Signs

- Slow painless growth
- Ulceration, bleeding, crusting
- Irregular pigmentary changes
- Destruction of normal architecture
  - Lash loss, meibomian orifices
- Pearly edge, central ulceration
- Telangectasia
- Loss of cutaneous wrinkles



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## Other Clinical Signs

Palpable induration:  
infiltration into dermis,  
subcutaneous tissue

Lesions near punctum:  
possible lacrimal  
invasion

Fixation to deeper  
tissues/bone

Lymph nodes

Restricted EOM,  
proptosis: orbital  
invasion

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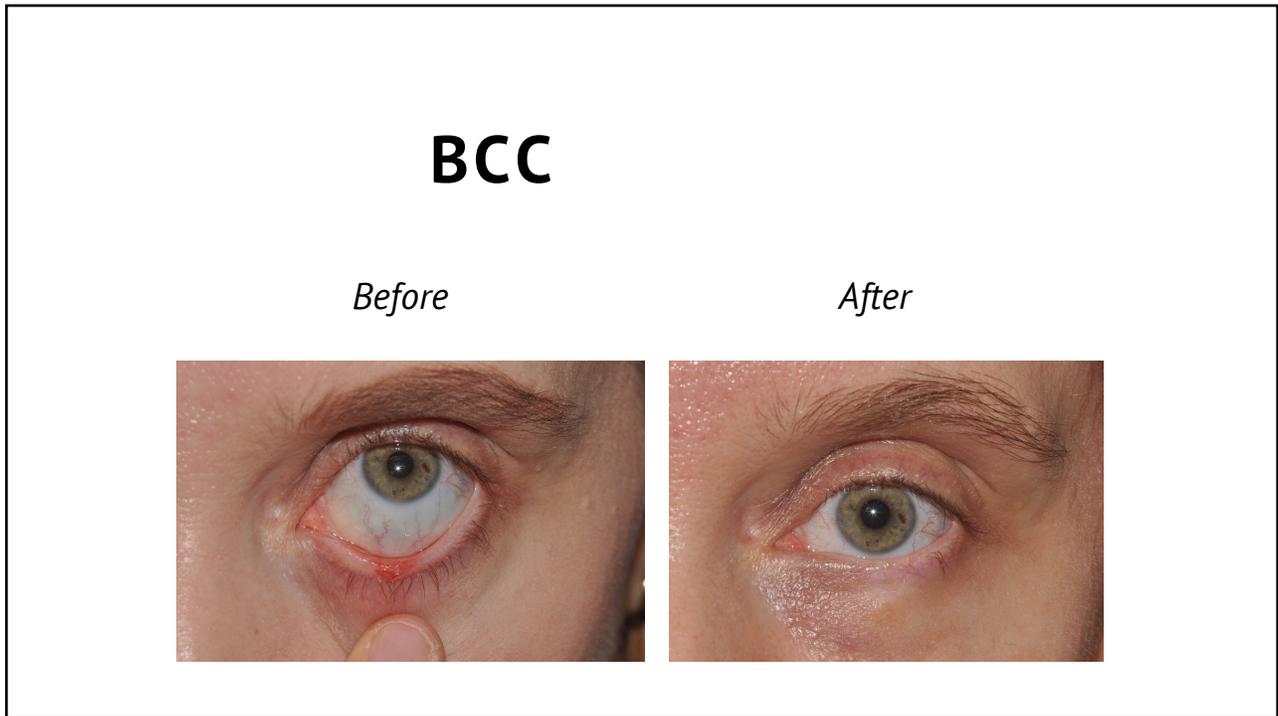
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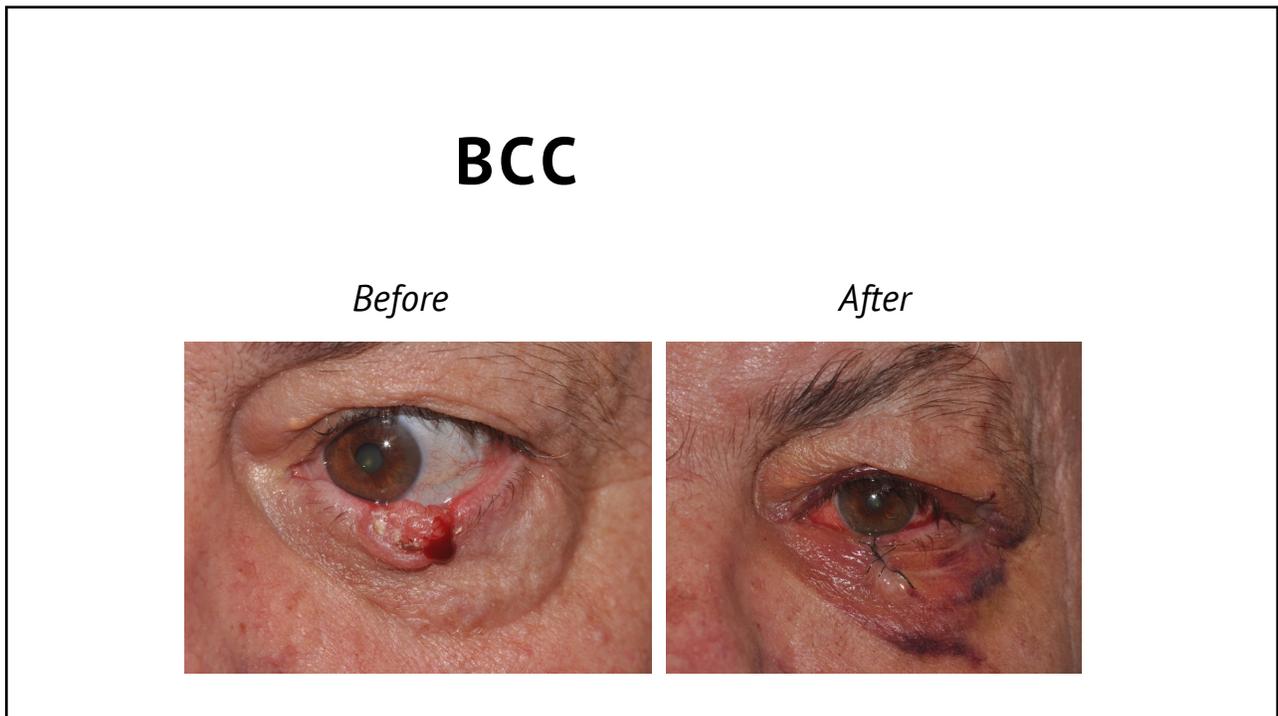
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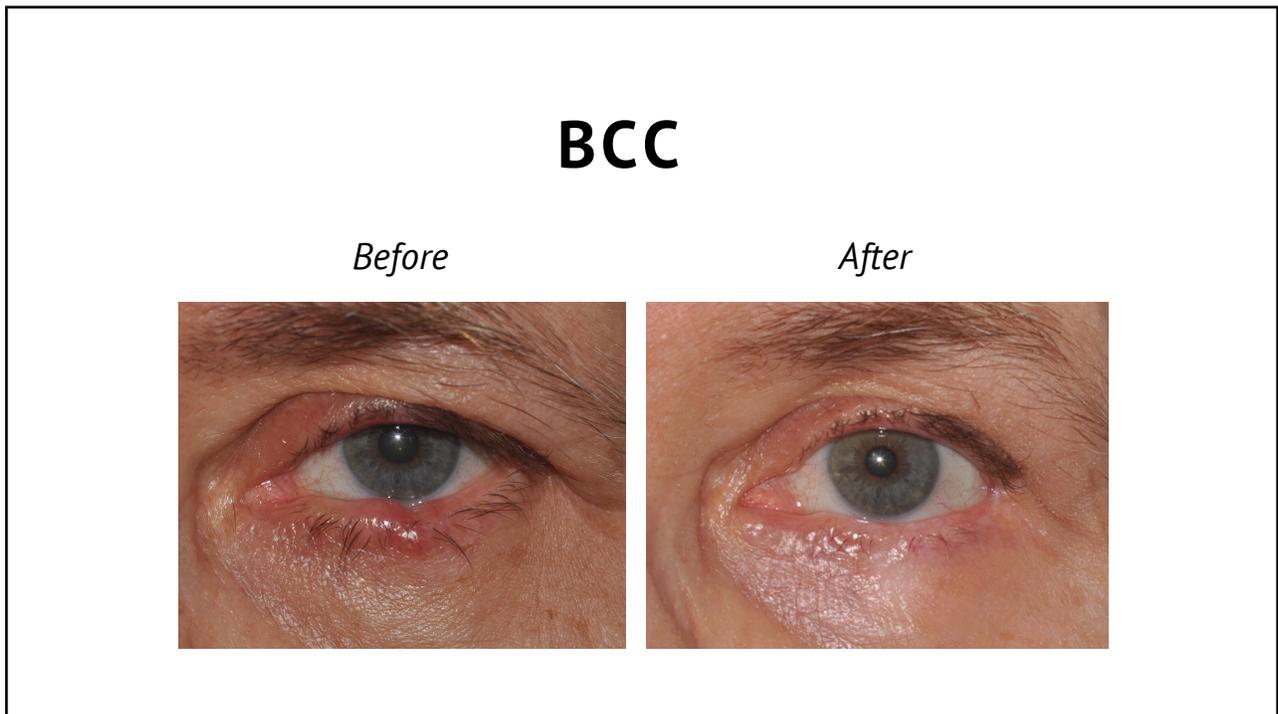
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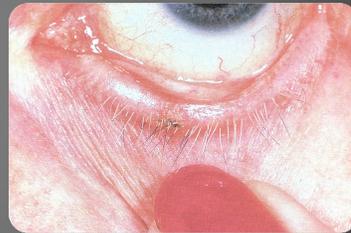
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## Other Carcinomas

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## Squamous Cell Carcinoma

- 40x less common than BCC for the lid
- More common epithelial malignancy of the conjunctiva
- More aggressive
- Solar injury
- In areas of actinic keratosis,



Actinic Keratosis

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## Squamous Cell Carcinoma

- Potentiated by immunodeficiency
- May resemble various benign inflammatory lesions
  - Pseudoepitheliomatous hyperplasia
  - Inverted follicular keratosis
  - Keratocanthoma
- Metastasis by lymphatic, blood, direct extension (along nerves)

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## Squamous Cell Carcinoma



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# Squamos Cell Carcinoma



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# Squamous Cell Carcinoma

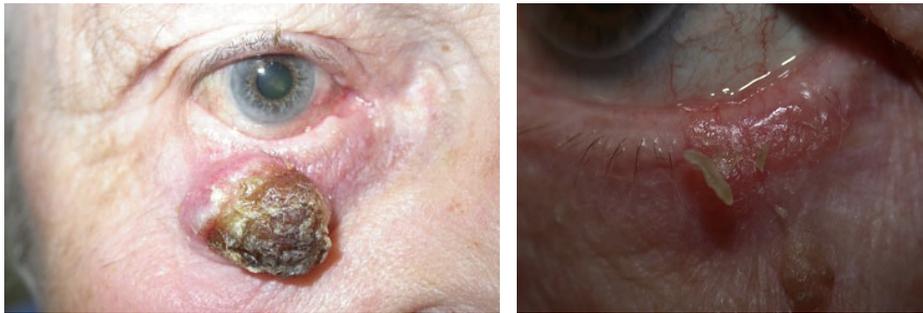


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# Squamous Cell Carcinoma



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## Treatment of SCC

- Aggressive surgical excision
- Recurrences may require orbital exenteration

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## Sebaceous Adenocarcinoma

- Rare malignancy
  - 1-5.5% of eyelid malignancies in U.S.
  - 33% of eyelid malignancies in China
- Highly malignant, lethal
- Sebaceous gland origin: meibomian, Zeis, caruncle, eyebrow or facial skin

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## Sebaceous Adenocarcinoma

- F>M
- UL>LL
- Multicentric origin common

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## Sebaceous Adenocarcinoma



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## Sebaceous Adenocarcinoma



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## Presentation

- Patients commonly > 50 y/o
- Yellowish coloration
- Often masquerades as chalazion, chronic blepharitis, SLK, pannus associated w/ adult inclusion conjunctivitis
  - Misdiagnosis is delayed by average of 3 yrs.

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## Key Point

- Beware of the “chalazion” that later causes loss of eyelashes and destruction of meibomian gland orifices

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## Malignant Melanoma

- 5% of all skin cancers
- <1% of eyelid malignancies
- UV, genetic predisposition, mutagens
- Arise de novo, from nevi or lentigo maligna
- Acquired pigmented lesion >20-30y/o

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## Malignant Melanoma

- Appearance: variable pigmentation, irregular borders, may ulcerate and bleed
- Forms
  - Lentigo maligna melanoma\*
  - Nodular melanoma\*
  - Superficial spreading melanoma
  - Arco-lentiginous melanoma

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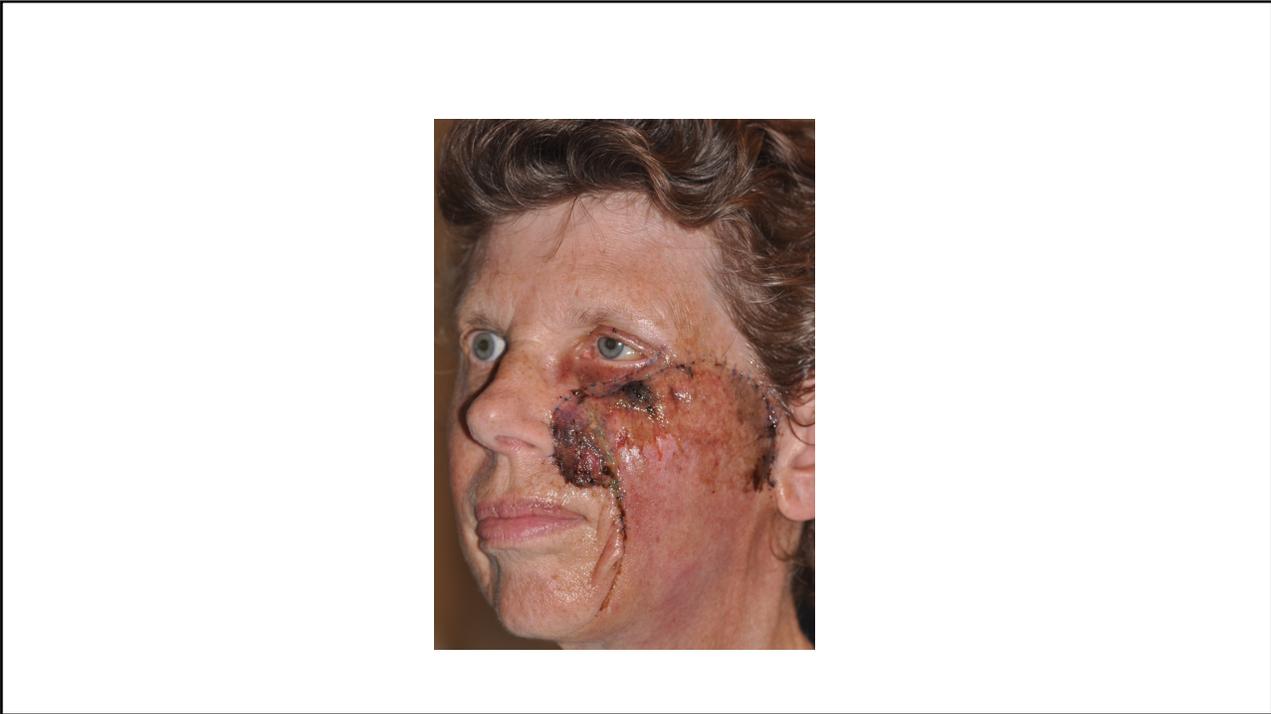
## Treatment of MM

- Depth of invasion affects prognosis
- Preop metastatic workup
- Regional lymph node dissection

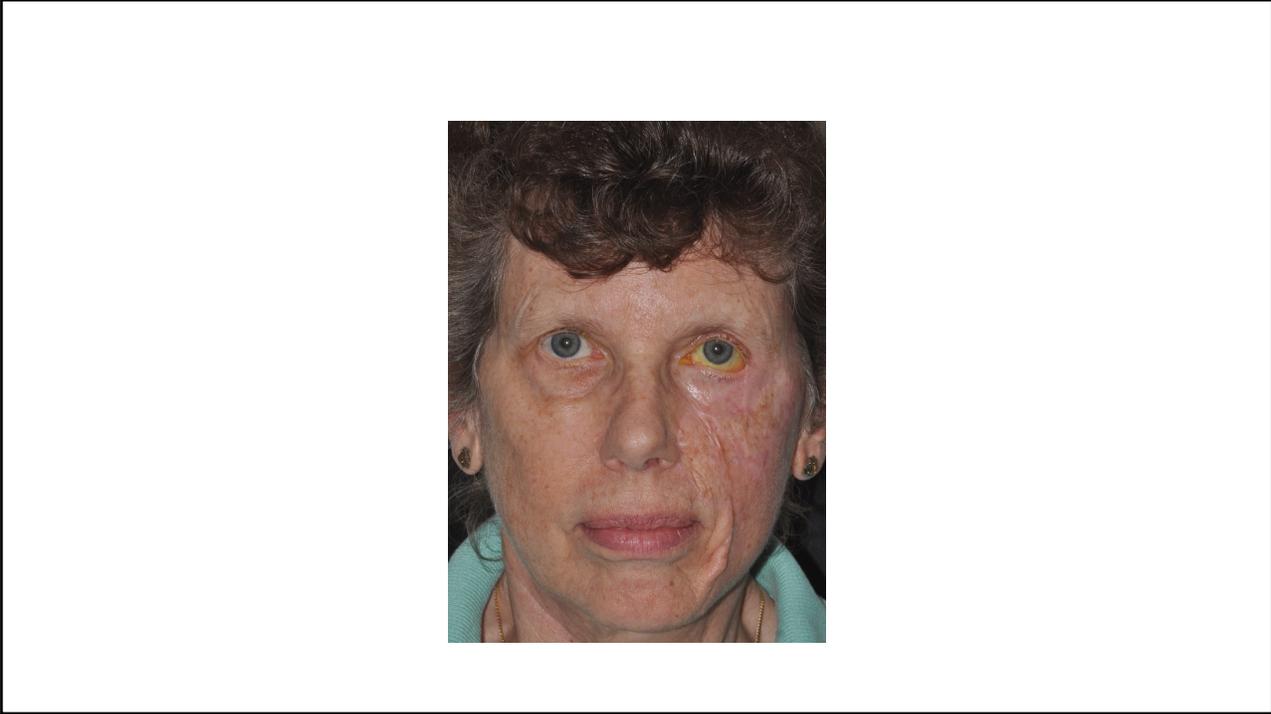
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# Melanoma

*Before*



*After*



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Thanks!

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