



Eye-1-1: Ocular Emergency & Trauma Grand Rounds

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Disclosures:

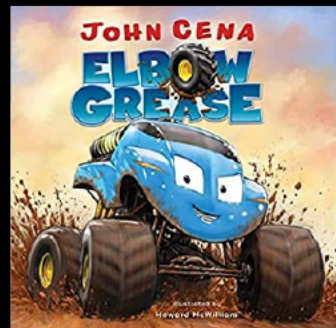
- Paid consultant/speaker for:
 - Carl Zeiss Meditec
 - Regeneron Pharmaceuticals
 - Iveric Bio (Astellas)
 - Apellis Pharmaceuticals
 - Optomed
- Paid advisory board member for LENZ Therapeutics, Notal Vision, Ocuterra, Topcon, Tarsus, Genentech

All relevant relationships have been mitigated



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"if you only stick with what you're good at, you'll never learn anything"

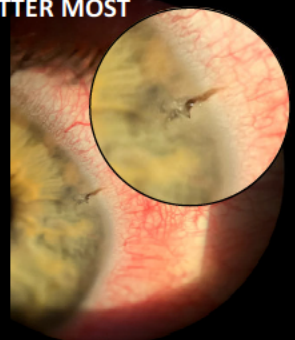


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WHEN THE LITTLE THINGS MATTER MOST

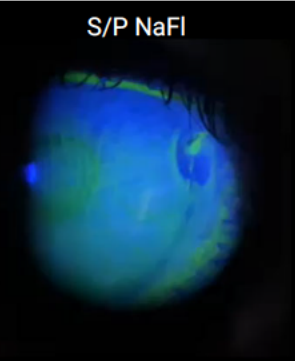
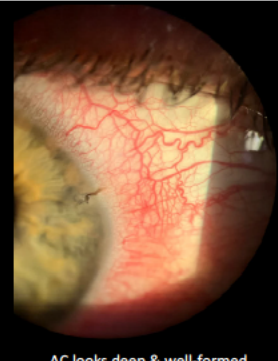
25yo Native American male – **Saturday 4:30pm ER Call**

- Piece of "slag or flux" hit OD while welding @ 2:30pm earlier same day
- Flushed out a large metal portion immediately after injury
- Reports wearing safety glasses at time of injury
- (+) redness, (+) light sensitivity, (+) epiphora, (+) mild blur
- Past Oc & Med Hx: Unremarkable, LEE 10+ yrs ago
- VAs @dist:
 - OD 20/125, PH 20/60; OS 20/30
- Entrance testing: all WNLs
- **SLE OD: Limbal FB 3' clock, 2+ pigmented AC cells, TIO pupillary margin 3' clock**
- IOPs (icare): OD 6/ OS 10 mmHg



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S/P NaFl





AC looks deep & well-formed



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WHEN THE LITTLE THINGS MATTER MOST

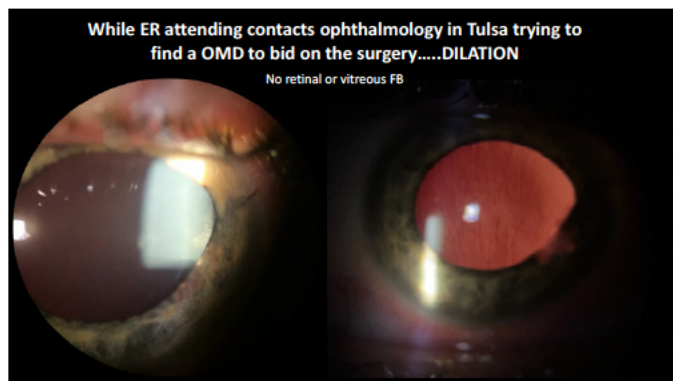
WHAT WOULD YOU DO?



- Place a BCL on the eye & punt to OMD?
- Pull it out?
- Place a fox shield on the eye & punt to OMD?
- Get a CT scan or US?
- Punt him to the closest ER...but wait, this is the ER

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Assessment

- **Penetrating injury with retained intraocular FB**

Plan

- In office moxifloxacin given
- Fox shield placed
- Discussed possible need for lens extraction
- Transported by ambulance to Tulsa hospital (1hr 15min) where he was met by on call OMD
- Refrain from drinking/eating

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WHEN THE LITTLE THINGS MATTER MOST

Underwent same day FB removal, AC reformation with visco, wound closed with 2 limbal sutures

3 day post op

- Pred 1% qid, moxi qid
- VA 20/20 -1
- IOP 20 mmHg
- Continue moxi qid, taper pred to tid
- FU 1 week- No show!

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WHEN THE LITTLE THINGS MATTER MOST

Features Suggestive of Penetrating Trauma

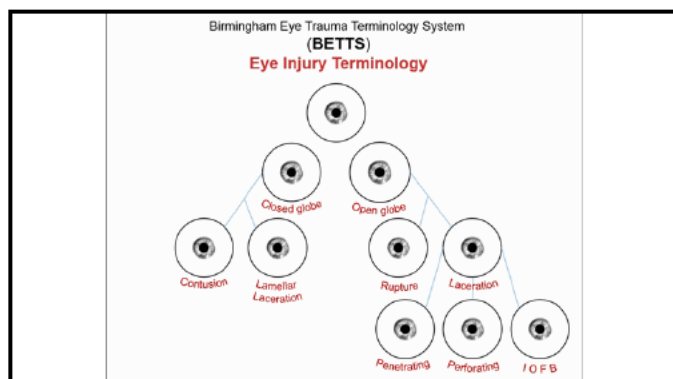
Peaked pupil

Full thickness corneal wound

Collapsed/shallow AC

- Hypotony
- Iris TIDs
- Lens defect/opacity
- (+) seidel sign

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PENETRATING OCULAR INJURIES MANAGEMENT

- Usually referral is emergent but depends on situation
- Intraocular FB present (40% of penetrating injuries) = more urgent, esp if toxic material
- Dilate to look for intraocular FB esp if hx suggests high velocity impact (ex. hammering or grinding metal)
- Consider CT or B-scan US (MRI contraindicated until metallic intraocular FB excluded)
- Broad spectrum antibiotic prophylaxis
- Recommend 'nil by mouth' status in preparation for surgery
- Update tetanus prophylaxis
- Shield/BCL
- Careful documentation

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REACTIVITY OF INTRAOCULAR FBs

Materials causing severe inflammatory rxns:

- Iron, steel (magnetic)
- Copper (nonmagnetic)
- Organic & vegetative matter

Materials causing mild-moderate rxns:

- Nickel (magnetic)
- Aluminum, Mercury, Zinc (nonmagnetic)

Inert:

- Carbon, coal, glass, lead, plaster, platinum, porcelain, rubber, silver, stone

ANY MATERIAL CAN CAUSE INFECTION, AND SYMPATHETIC OPHTHALMIA (SO) IF OPEN GLOBE INJURY!!



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AH CRUSH IT, CRUSH IT GOOD

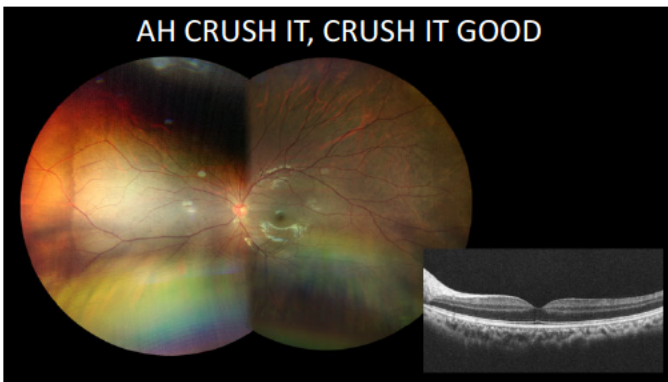
22yo male – Presents to ER complaining of “central black dot” OD following MVA yesterday

- Was seen at another ER in town but did not address VL complaint
- No seat belt & knocked unconscious
- Chest hit steering wheel, unsure if head trauma occurred
- CT head & orbits WNLs
- Med Hx: HTN
- Oc Hx: LEE <1yr ago, correctable to 20/20 OD & OS
- VAs @dist:
 - OD HM PHNI, OS 20/20
- Entrance testing: + RAPD OD & restricted inf CVF
- SLE OD: Subconj heme otherwise WNLs
- IOPs: OD 15/ OS 15 mmHg

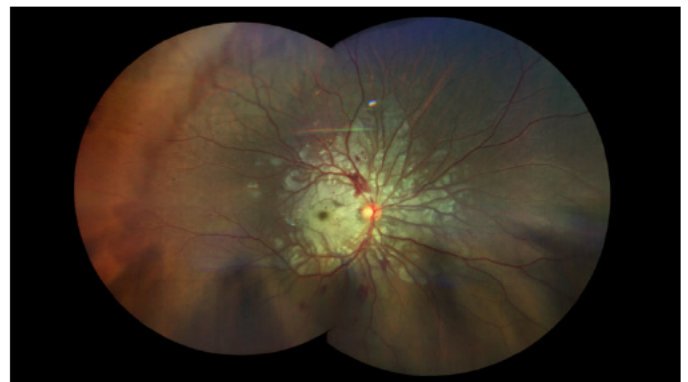


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AH CRUSH IT, CRUSH IT GOOD



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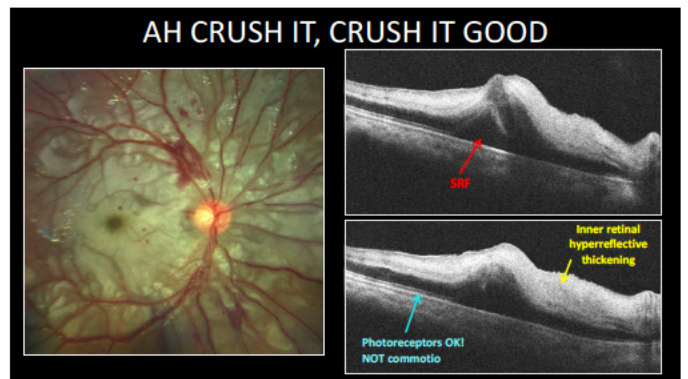
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AH CRUSH IT, CRUSH IT GOOD



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AH CRUSH IT, CRUSH IT GOOD



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PURTSCHER RETINOPATHY

AKA: traumatic retinal angiopathy

Etiology: Severe head trauma, **chest compression, crush injury**, long bone fracture

Symptoms: Acute VL within 2 days of injury


Fundus features:

- "Purtscher flecken": polygonal retinal white patches between arterioles & venules (perivascular clearing)
- CWSs & Intraretinal hemorrhages

Treatment: **Usually supportive tx**.... steroids and anti-VEGF have been tried

Prognosis: variable but usually **poor prognosis**

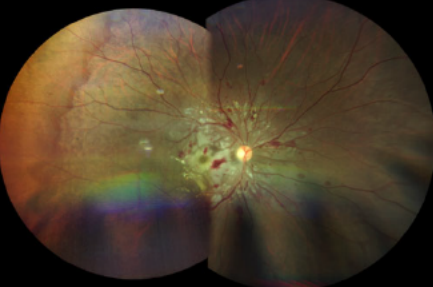
Our case: Referred to retina to see if anti-VEGF therapy warranted (recommended observation)



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AH CRUSH IT, CRUSH IT GOOD

3 week follow-up: Still hand motion OD



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Baseline 3-week Follow-up



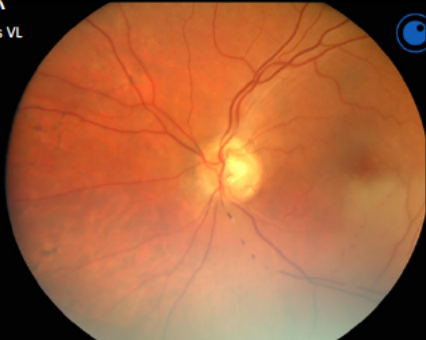
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HEART BREAKER

69yo male- sudden onset painless VL
OS ~5 hrs ago

- Inpatient being txed with IV Rocephin for bacterial endocarditis, dx 3 days prior
- VA: OD 20/30 (20/25 PH), **OS LP**
- Pupils: **APD OS**

CVA with CRAO OS due to likely shower of emboli from vegetation related to mitral valve endocarditis




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CT Head and Neck w/ & w/out IV contrast

Age-indeterminate **infarct in the left caudate head**, new from comparison

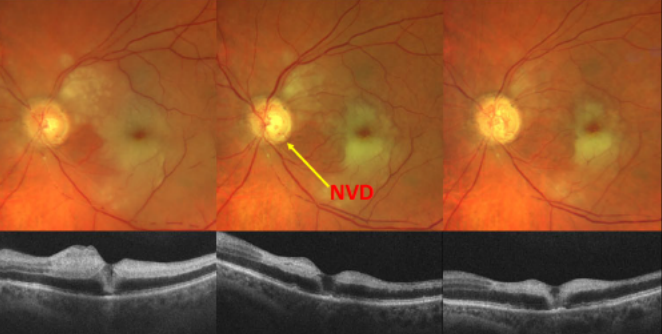
24% risk of concurrent stroke

3-6% risk of ischemic stroke during the first 1-4 weeks

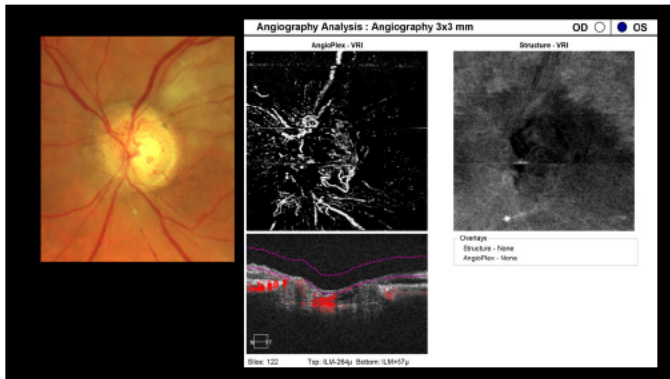


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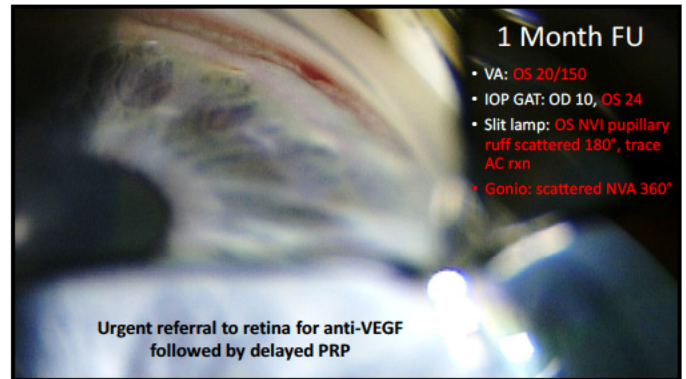
10 day FU 17 day FU 30 day FU



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CRAO: SYSTEMIC WORKUP

If acute (24hrs), symptomatic ophthalmic artery occlusion, CRAO, or BRAO (Retinal and Ophthalmic Artery Occlusions AAO PPP 2019)

- ★ **Immediate referral to the nearest stroke referral center (or ER if not available)**
 - www.strokecenter.org
- Search for associated systemic disease
- Embolic eval (carotid, cardiac), GCA studies (>50yo esp no visible embolus), hematologic labs
- Diffusion-weighted (DWI) MRI of brain
- Determine whether the pt is at risk of subsequent stroke

If retinal embolus without infarction or asymptomatic, newly diagnosed CRAO/BRAO/OAO recommend prompt eval (AAO PPP)

- If TIA symptoms, multiple emboli, etc. send straight to nearest stroke center
- If asymptomatic coordinate with cardio, neuro, and/or PCP

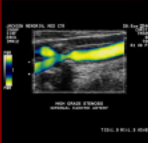



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CRAO: SYSTEMIC WORKUP

Retinal Arterial Emboli Work up

- **General WU for risk factors/associated conditions**
 - DM, HTN, hypercholesterolemia, smoking, cardiovascular disease, stroke
- **Carotid eval**
 - MRI/MRA and/or CT/CTA (head, neck, and thorax)
 - Doppler Duplex Ultrasound- limited resolution, does not evaluate the extension of the artery into the skull & thorax
 - Poss arteriography
- **Cardiac eval**
 - Electrocardiogram (EKG)
 - Transthoracic echocardiography (TTE)
 - Transesophageal echocardiography (TEE)
 - Thorough evaluation for cardiovascular disease
 - Check BP and pulse in office
 - Poss Holter monitoring

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DIFFUSION WEIGHT IMAGING (DWI) MRI

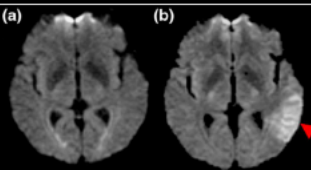
Acute ischemic brain lesions via MRI DWI are found in ~ 25% of CRAO pts!!!

Advanced pulse sequences

- **DWI (Diffusion Weighted Imaging)**
 - Ideal for acute infarction (hyperintense)
 - Detects cerebral ischemia within minutes
 - Should be requested if an acute stroke is suspected

3 hour stroke MRI FLAIR without DWI and with DWI

(a) (b)



Lee L, et al. Co-occurrence of acute CRAO and acute ischemic stroke: DWI MRI study. Ann J Ophthalmol. 2014

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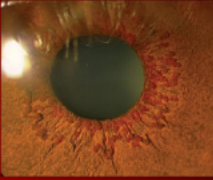
CRAO: OCULAR MANAGEMENT

Treatment is generally ineffective

- Lack of prospective, randomized clinical trials
- Recommended that conventional treatment be given in office if a patient presents within 24 hours after the onset of visual loss
 - Digital ocular massage
 - Medical IOP reduction
- Newer txs: Hyperbaric oxygen treatment, Nd: YAG Embolysis
- **The most important thing is to initiate a systemic work-up!!!**

Follow-up:

- Every 2 weeks at the least for the first 4 months
- Perform gonio to look for NVI/NVA (occurs in ~18%)




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YOU'LL SHOOT YOUR EYE OUT!!!

17yo male – ER Visit with mom, Friday 8pm

- Shot in OS with a BB from a CO2 Airsoft gun
- (+) blur, redness, & swelling
- Unable to open the eye

VAs @dist:

- OD 20/20, OS 20/40, PHNI

Entrance testing: all WNLs

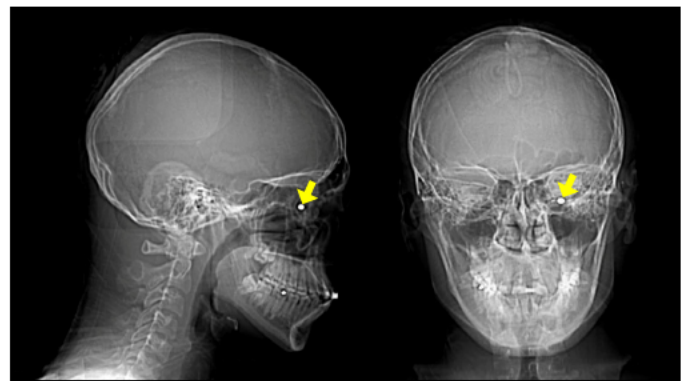
SLE: OS Severe periorbital edema, conjunctival hyperemia, mild proptosis

IOPs: OD 13/ OS 45 mmHg

DFE: OS possible Berlin's edema

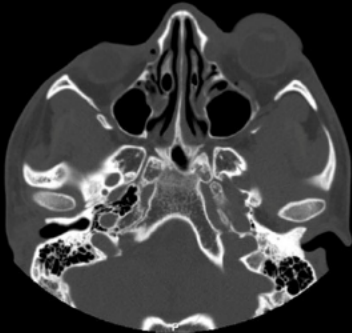


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- Left intraconal metallic FB at the inferior aspect of the medial rectus
- Air at the orbital apex
- Small periorbital hematoma ~2.2 x0.6cm
- Prominent soft tissue swelling




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You'll Shoot Your Eye Out!!!!

ASSESSMENT: Retained left intraconal metallic BB w/ ocular hypertension

PLAN:

- Consulted with oculoplastics –will see him Monday
- ↓ IOP in office with several rounds of cosopt & brimonidine
- RX dorzolamide bid and brimonidine bid – IOP check next day
- PO broad spectrum antibiotic, acetaminophen PRN
- Cold compresses



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You'll Shoot Your Eye Out!!!!

1 day FU

- VA 20/25⁻²
- IOP 29, ↑ dorzolamide to TID


2 day FU

- IOP 21mmHg

Oculoplastic consult 2 weeks later

- VA 20/25⁻⁴
- IOP off meds 11mmHg
- Recommends against removal of BB

SMALL, INERT AND DEEPLY LODGED METALLIC ORBITAL FBs ARE GENERALLY WELL TOLERATED!!



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ANOTHER FIRST FOR OKLAHOMA!

52yo male – Presents to the ER after being punched OD 3 hrs prior

- (+) diplopia followed by total VL and inability to open the eye
- (+) taking clopidogrel and ASA for hrt dz

VAs @dist:

- OD LP PHNI, OS 20/30


EOMs: OD near complete ophthalmoplegia

Pupils: OD poorly reactive, 3+ Indirect RAPD OD

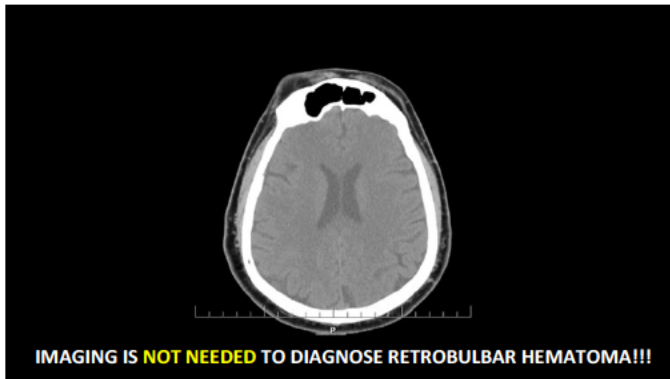
SLE: OD subconj hyperemia, AC rxn

IOPs: OD 67 mmHg/ OS 16 mmHg

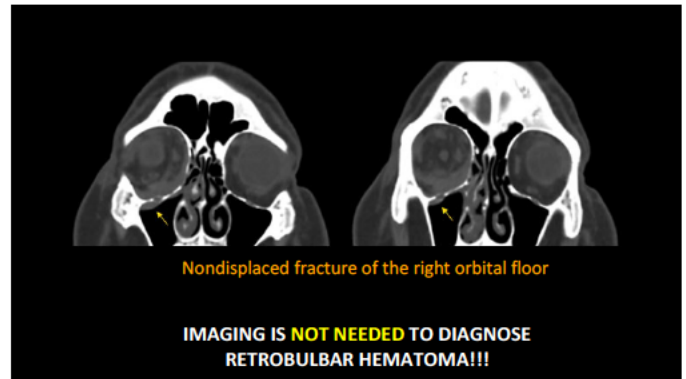
DFE: WNLs



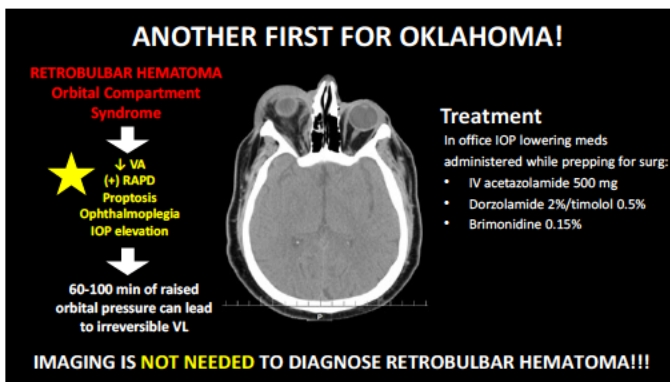
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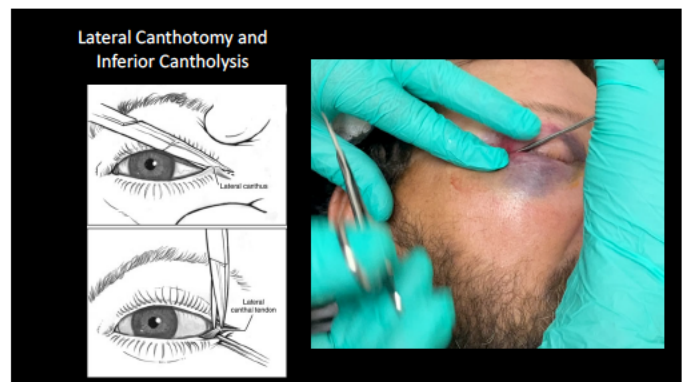
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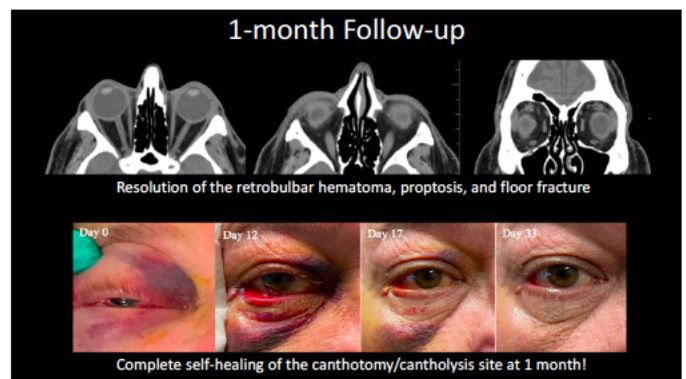
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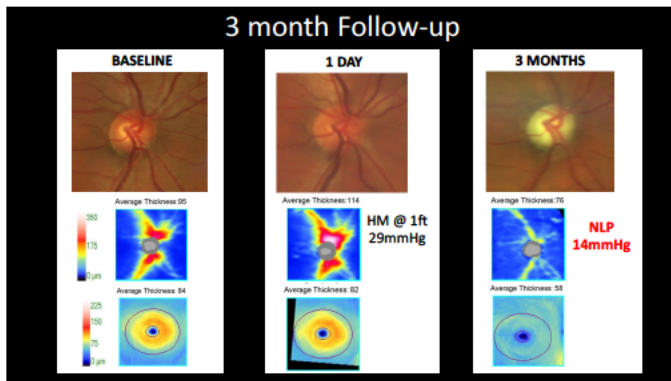
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THE 5TH DIAGNOSIS IS THE CHARM!

37yo female- Optometry walk-in sent over from PCP due to eye redness/suspected conjunctivitis

Past medical conditions:

- Anxiety/depression
- Chronic migraine
- Hypercholesterolemia
- Smoker

Ocular HX: LEE 6mo ago WNLs, no trauma or surg

- Red swollen eye and eyelid OD
- Acute onset right-sided radiating HA, periorbital & facial pain/burning sensation & vertigo noted upon awakening 3 days ago
- Reports falling 3 times since symptom onset

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THE 5TH DIAGNOSIS IS THE CHARM!

Digging deeper into the history.....

- 1st ER visit day of onset- DXed with **neck spasm** & given muscle relaxers
- 2nd ER visit 3 days later- DXed with **migraine** & given Toradol and meclizine
- Unsatisfied with ER visits pt immediately goes to PCP who diagnoses maxillary **sinusitis** & gives pt augmentin

- Distance VA's (sc):
 - OD: 20/20-2
 - OS: 20/25
- EOM and CVFs: WNLs OU
- IOPs: **OD 11mmHg**, OS 15mmHg
- SLE: **mild ptosis, periorbital swelling, and diffuse conj injection OD**

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THE 5TH DIAGNOSIS IS THE CHARM!

- Pupils: direct, consensual, and accommodative responses brisk OD & OS

Bright

Dim

What other pupillary feature should you look for to help clinch the diagnosis?

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Horner Syndrome

DILATION LAG

- When the lights are turned off, it takes longer for the Horner's pupil to dilate
- Anis is most obvious within the first ~5 sec of darkness!!!

Diagnostic drop testing?

Disjuncta Lag (Examples)

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THE 5TH DIAGNOSIS IS THE CHARM!

30min S/P 1gtt 0.5% apraclonidine OU

Is this a positive test??

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Horner Syndrome

Classic triad of ipsilateral.....

- 1. Ptosis (88%): 1-2mm**
- 2. Miosis**
 - Typically $\leq 1\text{mm}$ ↓ in dia of the affected pupil
 - Pupillary light and near reflexes WNLs
 - Dilation lag
- 3. Facial anhidrosis**
 - Pre-gang (1st or 2nd order) - whole half of face & neck
 - Post-gang (3rd order) - medial aspect of forehead & side of nose

Do not need all 3 to be present for diagnosis!

Lesser acute signs: Harlequin sign (ipsilateral absence of facial flushing), **acute conj hyperemia** and IOP ↓

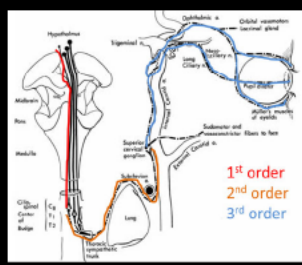



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Horner Syndrome

Etiology

- Overall 30-40% of cases are idiopathic
- 1st order**
 - Least common type
 - Lateral medullary stroke is the most common cause of 1st order Horner's**
- 2nd order**
 - Most common type (~ 50% of HS cases)
 - Thoracic (lung and mediastinal) and neck tumors, brachial plexus or radicular injury, and iatrogenic trauma are the most common causes
 - Pancoast tumor
- 3rd order**
 - Carotid or CS disease, cluster HA, small vessel ischemia
 - Carotid artery dissection**



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Carotid Artery Dissection

- Can be caused by trauma, or can be spontaneous
- Significant cause of Ischemic stroke in all age groups**

Ocular involvement

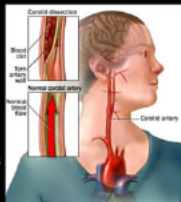
- 50% have eye S/S as a presenting feature
 - 44% Painful Horner syndrome (face, head, neck)
 - 28% Transient vision loss
 - Retinal arterial occlusion/insufficiency

Systemic involvement

- Ipsilateral headache in 68%
- 20% TIA & 9% cerebral infarction (CVA) **contralateral neurologic signs**
- Cranial nerve palsies

~ 1/3RD OF PTS PRESENTING WITH TVL SUBSEQUENTLY HAVE A NONREVERSIBLE STROKE (MEAN OF 5-6 DAYS FROM THE FIRST EPISODE OF TVL)!!

NEED TO CONSIDER IN EVERY PAINFUL POSTGANGLIONIC HORNER'S!!




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Horner Syndrome

High risk features that necessitate systemic work-up in adults

- Acute onset
- Arm/shoulder pain
- Neck/head/eye pain
- TIA
- Ocular ischemia
- H/O malignancy
- H/O neck/head trauma
- H/O smoking

IF STROKE/ CAROTID ARTERY DISSECTION IS SUSPECTED REFERRAL IS EMERGENT!!!



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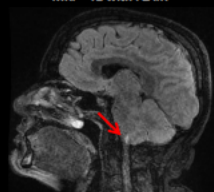

Assessment: Acute onset Horner syndrome OD

Plan: Called and sent patient back over to ER, recommend emergent CT/CTA to R/O carotid artery dissection

CT/CTA: WNLs (NO CAROTID DISSECTION)

MRI: Infarction of the right lateral medulla due to vertebral artery dissection

MRI – T2 with FLAIR

Plan:

- Outside time window for TPA
- Clopidogrel 75mg & ASA 81mg
- Encourage tight BP/cholesterol control & smoking cessation
- Refer to physical therapist & cardiology

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Horner Syndrome

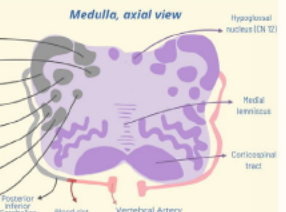
Lateral medullary stroke = Wallenberg Syndrome

- Most common cause of 1st order Horner syndrome
- Vertebral artery/PICA (posterior inferior cerebellar) infarct

CLINICAL FINDINGS:

- Nausea/vomiting/vertigo/nystagmus — Vestibular nucleus (CN 8)
- Agosia — Solitary nucleus/tract
- Ipsilateral ataxia — Inferior cerebellar peduncle
- Ipsilateral facial numbness — Trigeminal nucleus (CN 5) tract
- Ipsilateral Horner's Syndrome — Sympathetic pathway
- Contralateral loss of pain/temperature — Spinothalamic tract
- Palatal myoclonus — Central tegmental tract
- Hoarseness/dysphagia — Nucleus ambiguus — CN 9, 10

Medulla, axial view



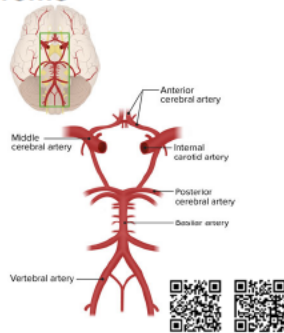
IPSI LATERAL HORNERS (75%), Ipsilateral facial/corneal numbness (trigeminal spinal nucleus and tract), possible skew deviation, nystagmus, defective saccades/overshoots

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Horner Syndrome

Vertebral Artery Dissection

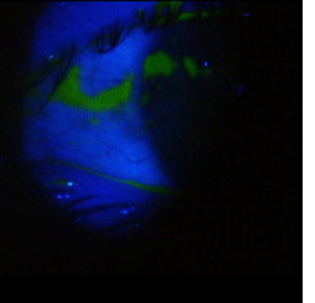
- Vertebral artery/PICA (posterior inferior cerebellar) infarct
- Following neck trauma, sudden neck movt, or spontaneous
- Assoc S/S- **Wallenberg syndrome**, **Vertigo**, **transient binocular VL** (homonymous usually), **transient diplopia**, difficulty walking/speaking, dysarthria, drop attack



BLUNT TRAUMA

20yo male – Walk-in complaining of foreign body sensation following trauma OS

- Was mowing while coworker was edging a bush, edger threw a rock that hit OS
- (+) Blur and 9/10 pain OS
- (-) flashes or floaters
- Past Oc & Med Hx: Unremarkable
- VAs @dist:
 - OD 20/20, OS 20/40 PHNI
- Entrance testing: all WNLs
- SLE OS: Nasal LLL edema, 3+ bulbar conj/episcleral injection, **nasal bulbar conj abrasion that extends ~ 4mm onto cornea**
- IOPs: OD 15/ OS 17 mmHg



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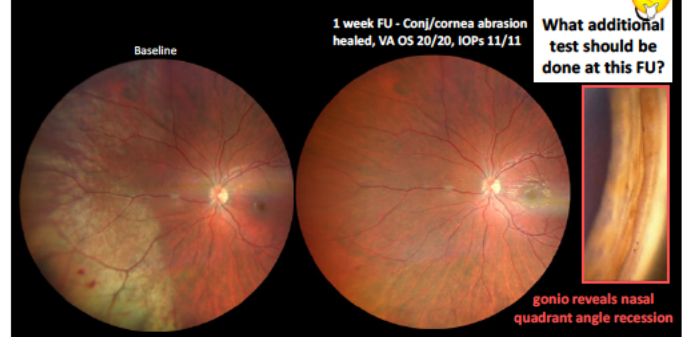
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BLUNT TRAUMA

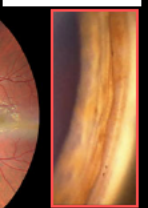


RX moxifloxacin QID x 5 days and ATs q2hr OS, Edu on S & S of retinal tear/RD– FU 1 week

BLUNT TRAUMA



What additional test should be done at this FU?



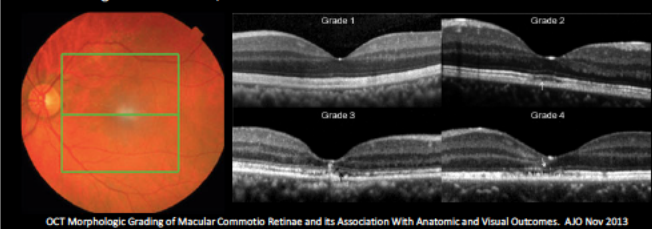
gonio reveals nasal quadrant angle recession

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COMMOTIO RETINAE

- **Concussion/swelling of the photoreceptors due to contrecoup forces of blunt trauma**
- Macular involvement = Berlin's edema
- **Differentiate from RD/ Rule out retinal break**
- Management: monitor; resolution in ~6 weeks



OCT Morphologic Grading of Macular Commotio Retinae and its Association With Anatomic and Visual Outcomes. AJO Nov 2013

A GRAVE PROGNOSIS

52yo female – Routine DM exam

- Oc Hx: Cat surg and blepharoplasty
- **Med Hx:** Type 2 DM x 12 yrs (last A1c 8.6%), HTN, hrt disease, kidney disease, hypercholesterolemia, sleep apnea, COPD, smoker
- BCVAs @dist:
 - OD 20/20, OS 20/20
- Entrance testing: all WNLs
- SLE: PCIOL OU
- IOPs: 12 OD/OS
- **BP:**
 - 187/118 @ 8:45AM
 - 189/112 @ 9:07AM

Reports good compliance with all 6 RXed HTN meds!

1. Spironolactone
2. Metolazone
3. Clonidine
4. Hydralazine
5. Losartan
6. amlodipine

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A GRAVE PROGNOSIS



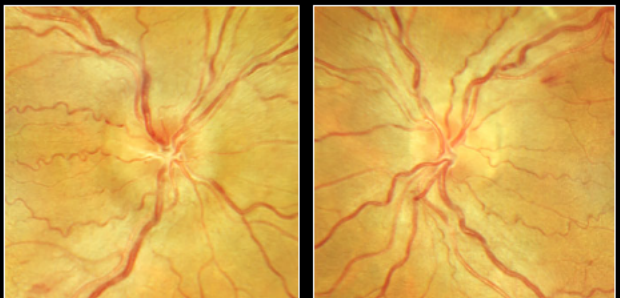
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A GRAVE PROGNOSIS



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A GRAVE PROGNOSIS



Any other questions you want to ask? What is your next step?

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A GRAVE PROGNOSIS

ASSESSMENT:

- Suspect asymmetric papilledema secondary to malignant HTN (stage 4 HTN retinopathy)
- Moderate NPDR w/o DME OU

PLAN:

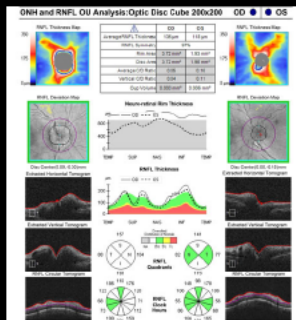
- Called primary care clinic – said they would see patient immediately and lower BP in office
- FU optometry 1 month to ensure ONH swelling resolves with BP ↓

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A GRAVE PROGNOSIS

1 month FU

- **HAS daily since last visit**, last most of the day, 6/10
- Taking OTC Excedrin, ibuprofen, and Tylenol
- Uncorrected VAs @dist:
 - OD 20/30, PH 20/20
 - OS 20/50, **PH 20/25**
- Entrance testing: all WNLs
- SLE: PCIOU OU
- IOPs: 12 OD/OS
- BP:
 - 182/91
 - Did not take BP meds today since BP "bottomed out" yesterday
 - Fundus appearance unchanged OU
- Recommend pt go to PC clinic upstairs or urgent care- pt refused



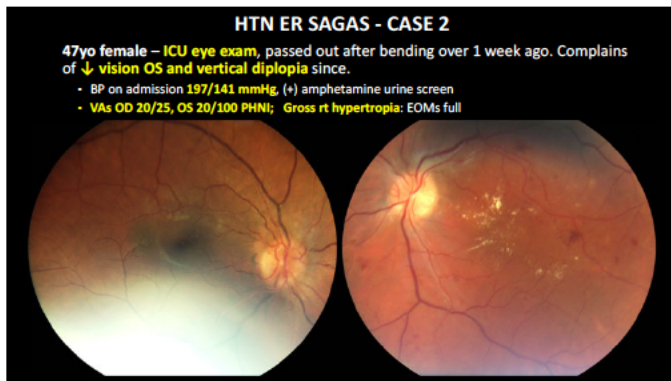
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A GRAVE PROGNOSIS

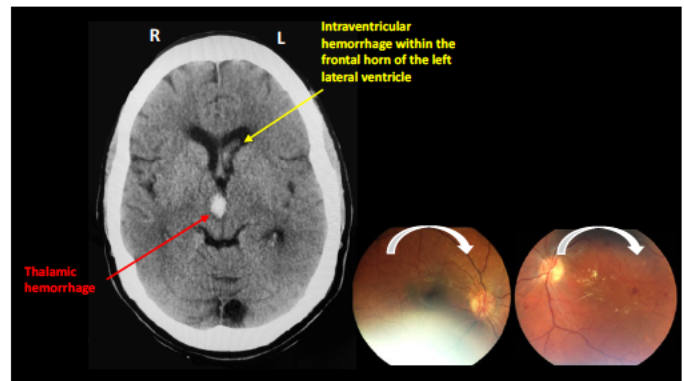
Presents to ER 1 month later with abdominal pain

- DX: Acute kidney injury / CKD stage VI (??) due to cardiorenal syndrome and poor PO intake
- ER offered pt hemodialysis –declines
- Discharged on hospice & dies 10 days later

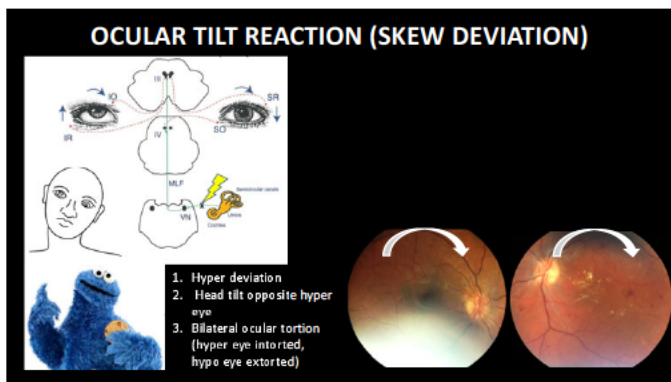
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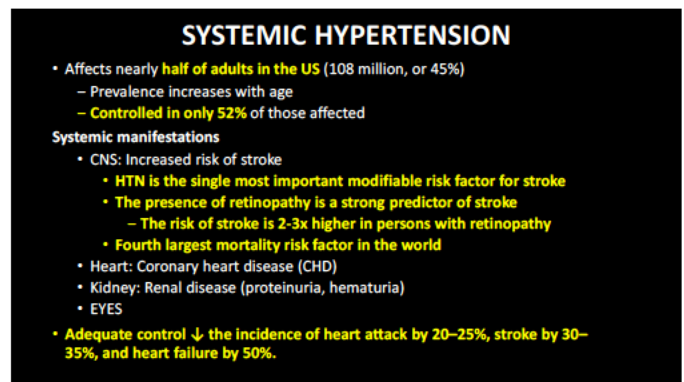
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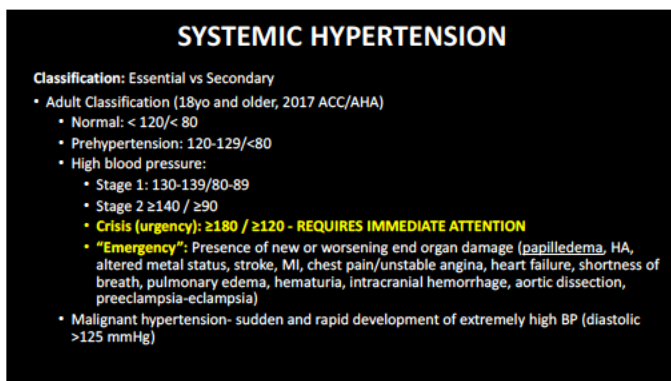
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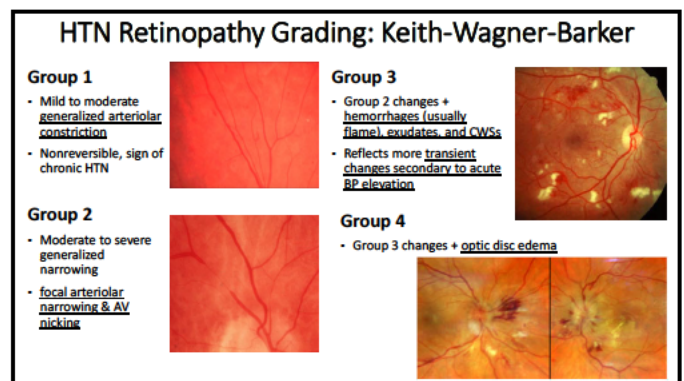
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THE TIP OF THE ICEBERG

53yo female – Walk-in complaining of blur, flashes & floaters OU x 2 days



- Oc Hx: Unremarkable, LEE 1.5 yrs ago (20/20 OD/OS)
- Med Hx:
 - HTN, asthma, sleep apnea, tension headaches
 - Diagnosed with inherited thrombocytopenia at birth (thrombocytopenia absent radius syndrome)
 - Gets platelet transfusions 2-3xs per week & monitored closely by a hematologist
 - Platelet count earlier that same day was $1 \times 10^3/\mu\text{L}$ (normal 150-450 $\times 10^3/\mu\text{L}$)
- VAs @dist:
 - OD 20/25⁻², OS 20/25⁻²
- Entrance testing: all WNLs
- SLE: trace NS cat OU
- IOPs: OD 16/ OS 16 mmHg
- BP: 115/75



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THROMBOCYTOPENIA ABSENT RADIUS (TAR) SYNDROME

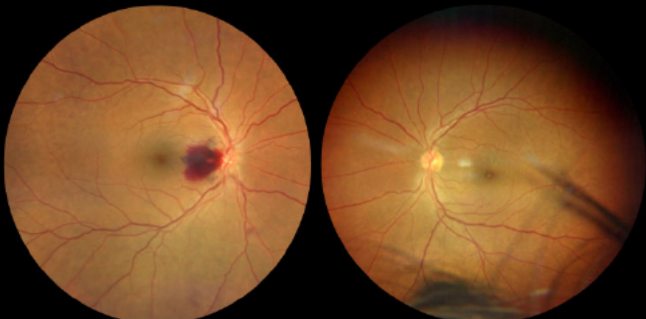
- Rare congenital disorder affecting <1 in 100,000 newborns
- Caused by AR mutation in the RBM8A gene
- Characterized by:
 - Thrombocytopenia (\downarrow platelets, $<150 \times 10^3/\mu\text{L}$)
 - Aplasia/absence of the radii bones of the forearms, ulna may also be underdeveloped
 - Occasionally accompanied by hrt and kidney malformations
 - Risk for life-threatening internal/intracranial hemorrhage esp during 1st year of life

Asadi, S. The Role of Genetic Mutations in Gene RBM8A in TAR Syndrome. J Genet Genome Res 2019


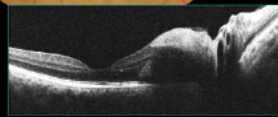
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THE TIP OF THE ICEBERG



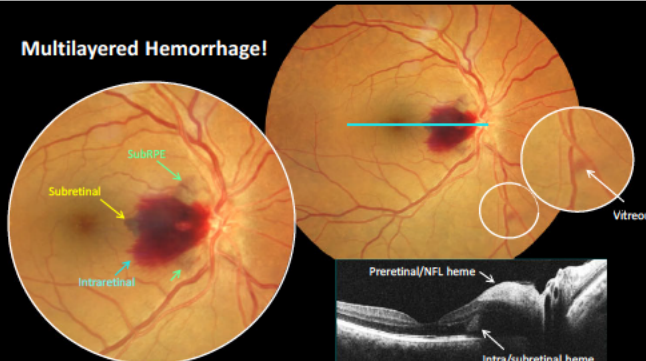

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Where is the heme located?

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Multilayered Hemorrhage!

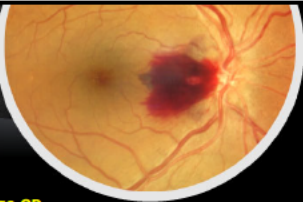
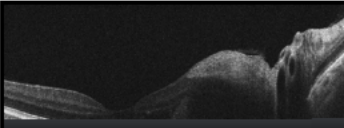




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Assessment

- Peripapillary multilayered hemorrhage OD

Where did the blood come from???

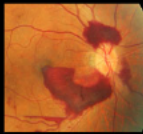
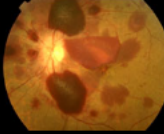




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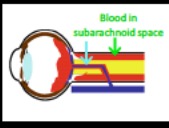
THE TIP OF THE ICEBERG

Terson Syndrome

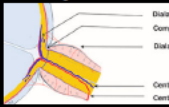
- Unilateral or bilateral intraocular hemorrhage (any layer) associated with subarachnoid or intracerebral hemorrhage (trauma/aneurysm rupture)
- Occurs in 8-19% of subarachnoid hemorrhages

Theory 1: Subarachnoid blood transmitted forward directly through the ON sheath or perivascular space around the central retinal vessels within the ON



Theory 2: Sudden ↑ in ICP distends the subarachnoid space surrounding the retrobulbar ON compressing the CRV



Labels: Dilated Retinal Vein with hemorrhage, Compressed Optic chorioid anastomosis, Dilated Optic sheath, Central Retinal vein, Central Retinal Artery

Rabli A, et al. Terson's syndrome, the current concepts and management strategies. Clinical Neurology and Neurosurgery 2021.
Sakamoto M, et al. MR findings of Terson's syndrome suggesting a possible vitreal mechanism. Japanese Journal of Ophthalm 2009.

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THE TIP OF THE ICEBERG


Assessment

- Peripapillary multilayered hemorrhage OD

Plan

- Discussed findings with PCP/hematologist and recommended urgent CT scan to rule out intracranial hemorrhage.
- Same day CT unremarkable.

Where did the blood come from???

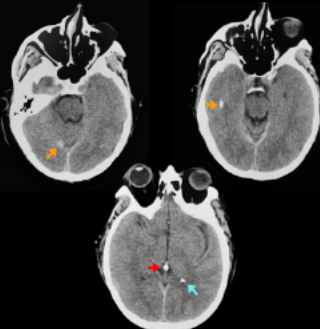



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THE TIP OF THE ICEBERG

2 days later presents to ER with severe HA, nausea & vomiting.....

- Repeat CT showed subdural & subarachnoid hemorrhages
- Mild posterior parafalcine & right tentorium cerebelli subdural hemorrhages
- Mild left parietal lobe subarachnoid hemorrhage
- Pt was life-flighted to Hospital in Tulsa, OK
- Hospitalized in ICU for close observation without surgical evacuation

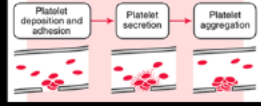
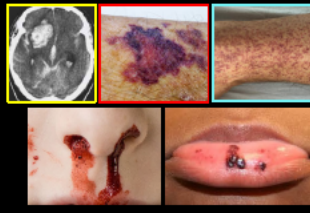
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THE TIP OF THE ICEBERG

Platelet cell function: Regulate hemostasis & thrombosis

Thrombocytopenia

- Definition:** platelet count $<150 \times 10^9/\mu\text{L}$
- Common causes:**
 - Chemo/radiation
 - Bone marrow disease (leukemia, aplastic anemia, lymphoma, myelodysplasia)
 - Immune thrombocytopenia (aka idiopathic thrombocytopenic purpura)
- Systemic signs/complications:**
 - Internal & intracranial bleeding (platelet count usually $<10 \times 10^9/\mu\text{L}$)
 - Purpura (easy bruising) & petechiae
 - Nose & mucosal bleeding
 - Prolonged bleeding from cuts

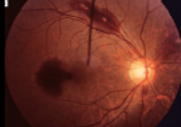
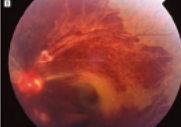
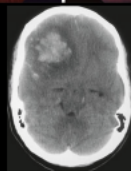



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THE TIP OF THE ICEBERG

Similar case report (Shah P, et al 2005):

- Previously healthy 26yo female with blur x 5 days
- VA OD 20/30, OS CF
- 2 days later presented to ER with HA & confusion
- Platelet count $33 \times 10^9/\mu\text{L}$, diagnosed with immune thrombocytopenia
- CT- large right frontal intracranial hemorrhage
- Underwent emergent neurosurgical hematoma evacuation & blood and platelet transfusion, IV immunoglobulin, dexamethasone

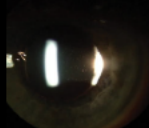
Shah PA, Yang SS, Fung WE. Idiopathic Thrombocytopenic Purpura With Massive Subretinal Hemorrhage. Arch Ophthalmol. 2005

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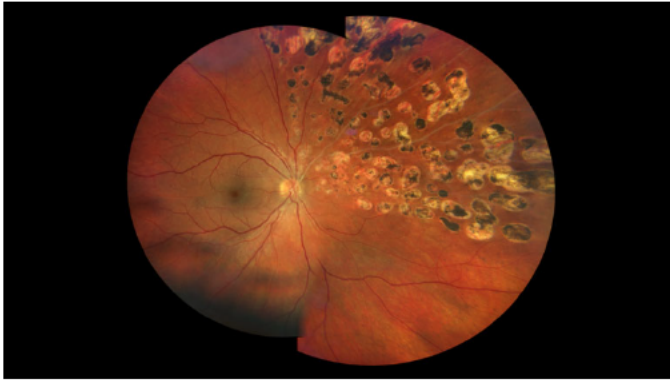
THE GREAT MASQUERADER

45-year-old female

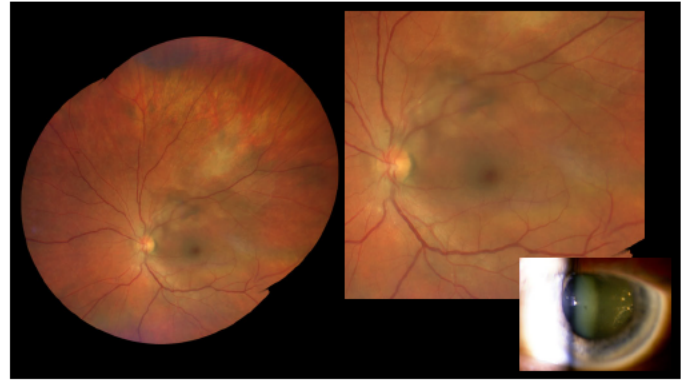
- CC: Walk-in visit sent from the ER, Central blur/missing vision OS x 4-5 days
- Systemic Hx:
 - DM type 2, HTN, anxiety, hx of stimulant dependence and meth use
- Ocular Hx: Sectoral PRP for ischemic BRVO OD 2 years ago
- VAs @ dist cc:
 - OD 20/20
 - OS 20/40 PH 20/30 (previously 20/20)
- SLE: Trace AC cell & flare OS only
- IOPs: OD 15mmHg, OS 14mmHg



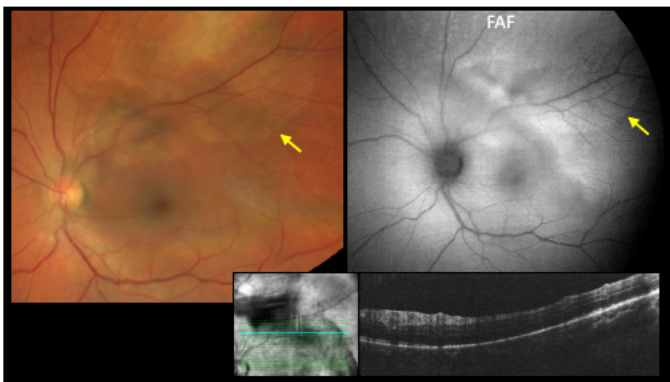
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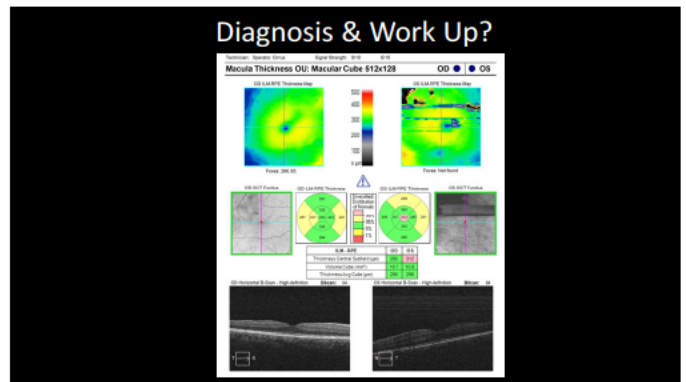
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PANUVEITIS

- Generalized inflammation of Iris, CB, and choroid (ant + post seg inflammation)
 - Often affects not only the uvea but also the retina & vitreous
- Often bilateral and severe
- Diagnosis:
 - AC cells
 - Vitreous cells
 - Choroidal and/or retinal inflammation (choroiditis, choroid granuloma, retinal vasculitis, necrotizing retinitis, neuroretinitis)

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PANUVEITIS

Systemic etiologies & evaluation (always workup!!)

- Sarcoidosis (ACE, serum lysozyme, Chest X-ray or CT)
- Syphilis (FTA-abs, RPR)
- TB (QuantIFERON-TB Gold/PPD, Chest X-ray or CT)
- Tick-borne illness (Lyme/tick panel)
- VKH (HLA-DR1, HLA-DR4)
- Sympathetic ophthalmia
- Lens-induced uveitis
- Behcet disease (HLA-B51)
- Other tests: CBC with diff & platelet count, ESR, ANA, Toxoplasma antibody titers, ANCA panel

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TWO CASES....ONE SYSTEMIC DISEASE

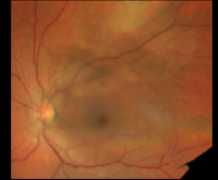
Blood Lab	Results
ESR	60 (high)
ANCA	negative
RF	<14.0 (normal)
Lyme IgG/IgM Ab	neg
RMSF IgG, IgM	Negative
FTA-ABS	Reactive
RPR	Reactive
RPR, Qnt	1:128
HIV scr 4 th gen	Non-reactive
QuantIFERON	Negative
ACE	<5 (normal)
Serum lysozyme	10.2 (normal)
Toxoplasma IgG/IgM	<7.2, <8 (normal)
ANA	Positive 1:320 dense fine speckled pattern
HLA-B51	Negative

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Diagnosis: Panuveitis with Posterior placoid Chorioretinitis OS secondary to neurosyphilis

Treatment:

- Contact tracing: patient was Ed on contacting all past sexual partners and advising them to get tested
- Referral to Infectious Disease clinic
- Infectious Disease reported to the local Public Health Agency
- Admitted and started on IV infusion penicillin G 24 million units daily x 10 days

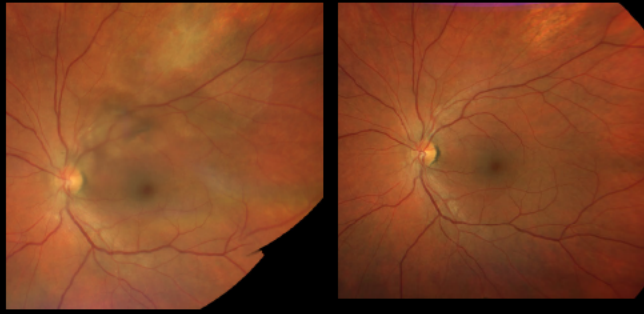


Perform LP in all pts with ocular manifestations
****Ocular syphilis should be managed according to treatment recommendations for neurosyphilis**

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Baseline
20/40 PH 20/30

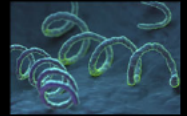
4 months post syph tx
20/25+



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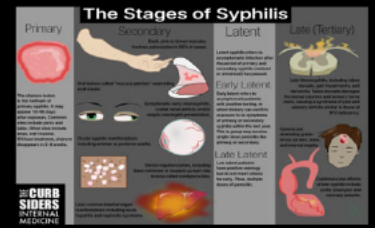
Syphilis

- STD caused by bacterial infection with spirochete *Treponema pallidum*



Clinical Stages:

- Primary
- Secondary
- Tertiary
- Latent

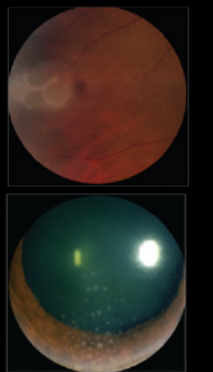


- Ocular syphilis is always treated as if it is neurosyphilis (IV PCN), & LP should be performed

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Syphilis- Ocular Manifestations

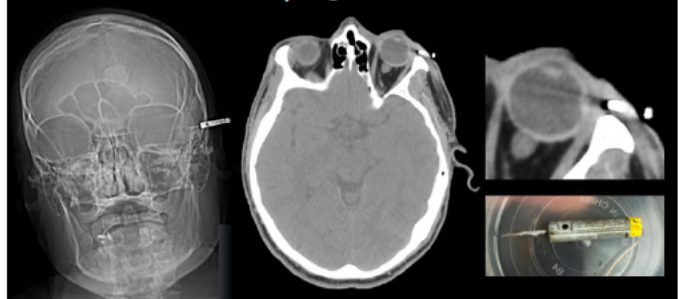
- **One of the great masqueraders!**
- Uveitis
 - Posterior uveitis, panuveitis most common
 - May or may not be granulomatous
 - Retinitis, vitritis possible
- Chorioretinitis
 - Typically multifocal and associated with heavy vitritis
- Vasculitis
- Papillitis/optic neuropathy
- Interstitial keratitis
- Conjunctivitis
- Episcleritis or scleritis
- CN palsies
- Argyll Robertson pupils



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THANK YOU!

Majcher@nsuok.edu



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