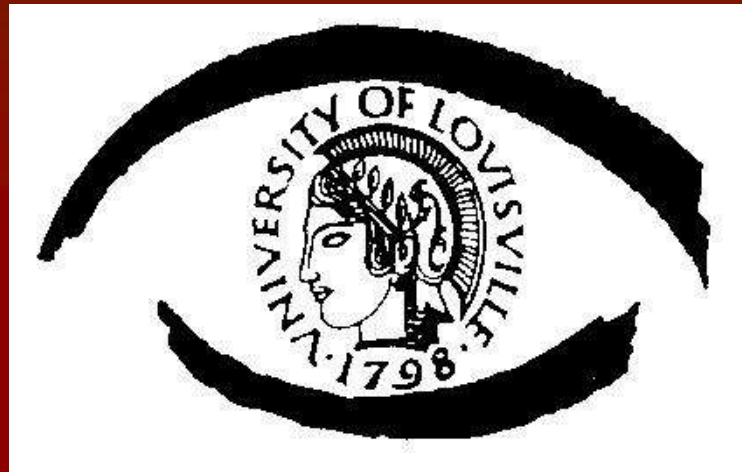


# Grand Rounds



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# Presentation

**CC:** Acute vision loss OS

**HPI:**

- 62 year old African American male
- Sudden onset of blurry vision OS since 7am
- Painless
- Gradually worsening over 4 hours
- No curtain, no flashes of lights, no jaw claudication
- Previous transient vision loss 2-3 weeks ago.  
Symptom lasted 5 minutes.

**ROS:** Occipital headache

# Presentation

**POH:** Refractive error

**PMH:**

- Uncontrolled hypertension
- Hepatitis C

**Medications:** None

Stopped metoprolol for 3 months due to non-compliance

**Allergies:** ACE Inhibitor

**SH:** Smoker, alcohol

**FH:** Non-contributory

# Examination

**Vitals:** BP: 200/120

**VA sc** OD 20/70 OS LP

**IOP** OD 17mmHg OS 18mmHg

**Pupils** OD: 4 =>3mm OS 4mm, +1 RAPD

**EOM:** Full OU

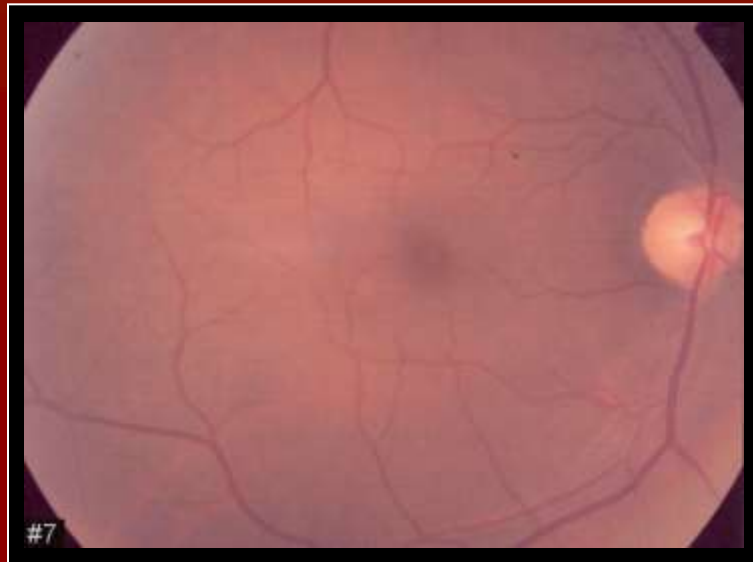
**Anterior Segment Exam:**

SPK OU

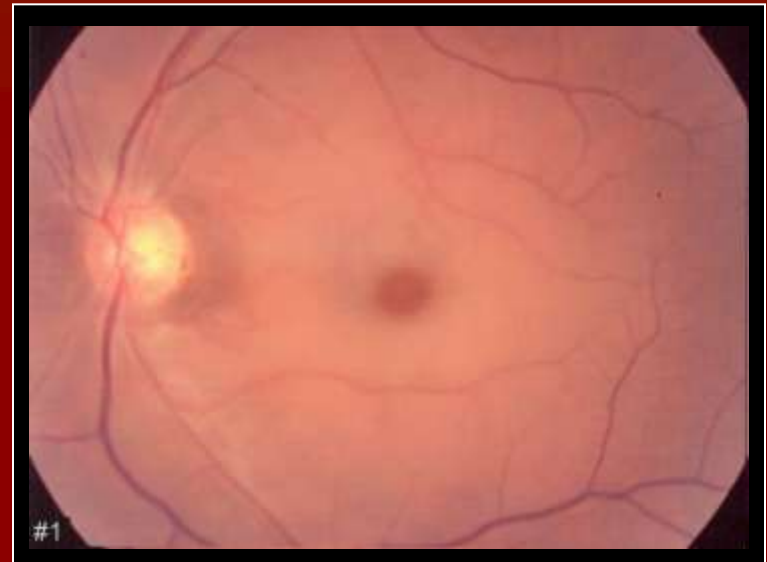
Cataracts OU

# Examination

DFE:



**OD**



**OS**

Color fundus photo of OD shows AV nicking.

Color fundus photo of OS shows diffuse retinal whitening, attenuated arteries and cherry red spot over the macula

# Workup from ER

## Lab:

Utox: +Cocaine  
+Cannabinoids

## Radiology:

CT-Head: Within Normal Limits

# Impression

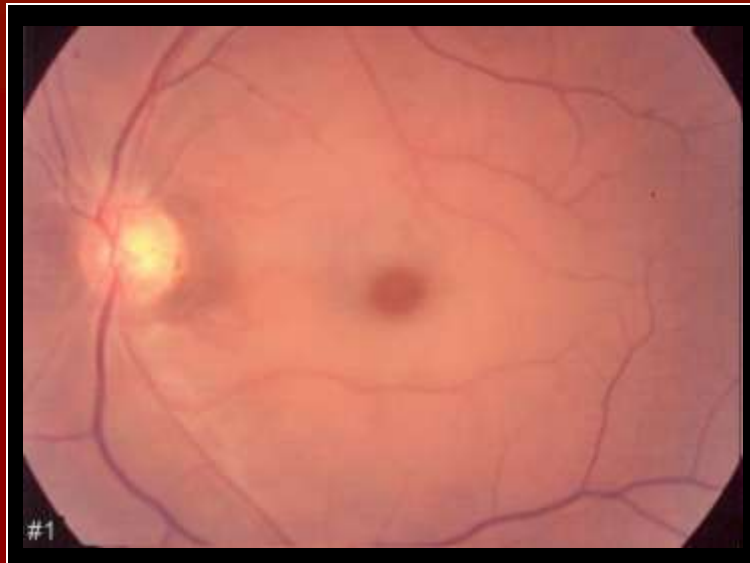
- 62 year old African American male, with acute painless vision loss OS, and exam consistent with central retinal artery occlusion (CRAO)

# Treatment/Plan

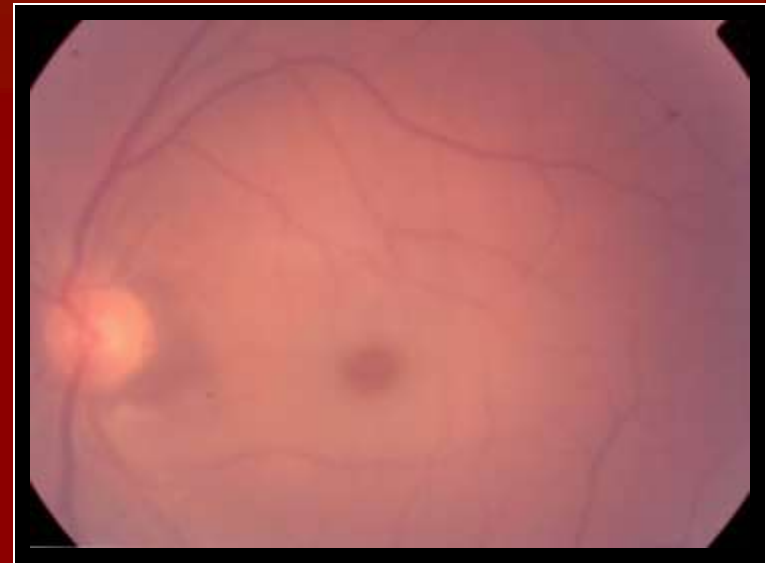
- Ocular massage OS
- Acetazolamide (Diamox) 500mg p.o.
- AC paracentesis OS
- Carotid Doppler
- Echocardiogram
- CRP, ESR
- BP control

# OS Post-Treatment

Pre-treatment



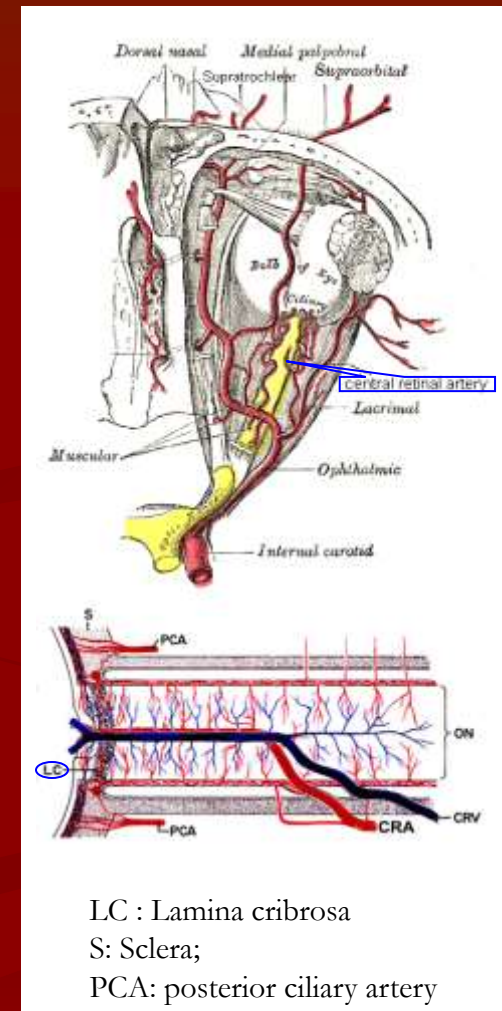
Post-treatment



Color fundus photo of OS before and after treatment. The attenuated arteries are slightly improved. The retinal whitening and macular cherry red spot are unchanged. VA after treatment is improved from LP to HM

# Central Retinal Artery Occlusion

- CRA supplies the inner 2/3rd of the retina
- Lamina cribrosa -- most common obstruction site
- Time window and damage
  - 90 minutes -- irreversible
  - > 4hours – profound



# Central Retinal Artery Occlusion

- Epidemiology
  - 1-15/10,000
  - No age, sex, race, or ethnic bias
  - Share the same risk factors as those with atherosclerotic diseases

# Central Retinal Artery Occlusion

- Etiology:
  - Atherosclerosis
  - Emboli
  - Vascular disease
  - Hematologic disease
  - Inflammatory disease
  - Trauma
  - Migraine

# Central Retinal Artery Occlusion

## ■ CRAO and Cocaine

### ■ CRAO cases with h/o cocaine abuse without other medical conditions

- Michaelides M, Larkin G.; Cocaine-associated central retinal artery occlusion in a young man; *Eye (Lond)*; 2002 Nov; 16(6):790-2.
- Sleiman I, Mangili R, Semeraro F, Mazzilli S, Spandrio S, Balestrieri GP.; Cocaine-associated retinal vascular occlusion: report of two cases; *Am J Med.*; 1994 Aug; 97(2):198-9.
- Devenyi P, Schneiderman JF, Devenyi RG, Lawby L.; Cocaine-induced central retinal artery occlusion; *CMAJ*; 1988 Jan 15; 138(2):129-30.
- Wallace RT, Brown GC, Benson W, Sivalingham A.; Sudden retinal manifestations of intranasal cocaine and methamphetamine abuse.; *Am J Ophthalmol.* 1992 Aug 15; 114(2):158-60.

### ■ Cocaine

- ↑ Presynaptic norepinephrine and dopamine release,  
↓ Norepinephrine, dopamine, serotonin reuptake
- ↑ Retinal arterial branching angle
- ↑ Venular caliber
  - Leung IY, Lai S, Ren S, Kempen J, Klein R, Tso MO, Lai HC.; Early retinal vascular abnormalities in African-American cocaine users; *Am J Ophthalmol.* 2008 Oct; 146(4):612-619

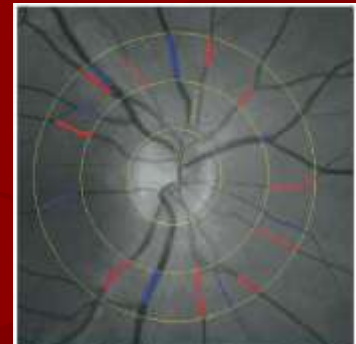


FIGURE 4. Method for determining the reproducibility of the LAAB measurement in African-American cocaine users. An overlying grid is centered on the optic disc. The color image is converted to a gray scale image. The color blue denotes venules; red denotes arterioles. All retinal vessels are annotated in a circular ring starting from 0.5 disc diameter to one disc diameter from the optic disc. Only the largest six venules and arterioles are computed, using the Kraskobson formula.<sup>23</sup>

# Central Retinal Artery Occlusion

## ■ Classification

**Table 1 Classification of central retinal artery occlusion**

Nonarteritic CRAO	'Classic' type presenting with a cherry red spot, boxcarring, and severe visual loss
Nonarteritic CRAO with cilioretinal artery sparing	Central visual acuity is relatively preserved because of the continued perfusion of the cilioretinal artery
Arteritic CRAO	In the setting of inflammatory vasculidities such as giant cell arteritis
Transient nonarteritic CRAO	Reversible visual loss lasting minutes to hours

From: Hazin, Ribhia; Dixon, James Ab; Bhatti, M Tariq; Thrombolytic therapy in central retinal artery occlusion: cutting edge therapy, standard of care therapy, or impractical therapy?

Current Opinion in Ophthalmology; 2009 May; 20(3):210-218.

# Central Retinal Artery Occlusion

- Diagnosis
  - Fundus appearance – characteristic “cherry red spot”
  - FA
  - OCT
- Underlying etiology workup
  - CRP, ESR
  - Carotid ultrasound
  - EKG, TTE/TEE
  - PTT/PT/INR

# Central Retinal Artery Occlusion

- Treatment - no proven effective treatment
  - Dislodging the embolus distally
    - Ocular massage
    - IOP reduction
    - Vaso-dilation
  - ↑Oxygen delivery
  - ↓Retinal edema
    - IV steroid
  - Thrombolytic/embolytic therapy

# Central Retinal Artery Occlusion

- Prognosis - Poor
  - Permanent visual impairment
    - VA:  $> 20/200$  – 30-35%
  - Spontaneous recovery - uncommon and unpredictable - depends on subtype of CRAO
  - Risk of iris neovascularization => Neovascular glaucoma - 5%
  - Shorter life expectancy

# Reference

- Hazin, Ribhia; Dixon, James Ab; Bhatti, M Tariq; Thrombolytic therapy in central retinal artery occlusion: cutting edge therapy, standard of care therapy, or impractical therapy? *Current Opinion in Ophthalmology*; 2009 May; 20(3):210-218.
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**Thank You**