Sclera, Choroid, Retina, oh my!

AMIEE HO, OD, FAAO
PACIFIC UNIVERSITY

Cases
The Red Eye
The Black Spot
Good Vision
Super Healthy Guy
A little bump in the road

The Red Eye

64 year old African American male

CC: Eye pain and redness OD x 3 days
- Pays with bright light
- Pain is dull(?)
- Gradually more painful
- Mild blurred vision
- A little watery
- First time, no previous Hx of similar pain
- (-) trauma; (-)FB; (-) itchiness; (-) mucus; (-) CL wearer

Ocular History

Ocular Hx:
- Age-related cataracts OU
- Dry eye OU vs. mild mucus fishing syndrome
- Slightly more scleral show OS>OD
- Exophthalmometry nearly symmetric
- Refractive error OU and presbyopia

LEE: ~1 month ago
Medical History

Medical Hx:
- Anemia
- Asthma
- COPD
- GERD
- Hypertension
- Hyperlipidemia
- Primary Hyperparathyroidism
- Prostate Cancer
- Substance Abuse

Medications and Vitals

Medications
- DILTIAZEM
- ALBUTEROL
- BUDESONIDE/FORMOTEROL
- TIXTORIUM
- CARBOXYMETH 0.5% (REFRESH TEARS)
- OMEPRAZOLE
- Allergies: NKDA

Vitals
- HEMOGLOBIN: 13.5 g/dL
- HEMATOCRIT: 40.0%
- PLATELETS: 295 k/uL
- INR: 1.3
- HEMOGLOBIN AUC: 5.8 % H
- GLUCOSE: 105 mg/dL
- MICROALBUMIN: 1.6 mg/dL
- ESTIMATED GLOMERULAR FILTRATION RATE: 70 mL/min/m²
- CHOLESTEROL: 183 mg/dL
- HDL: 30 mg/dL
- LDL: 129 mg/dL
- LAST BLOOD PRESSURE: 134/87

Exam Findings

ENTERING VAcc:
OD: 20/20
OS: 20/20

EDMs: SAFE DU
CVFs: FTFC OD, OS
PUPILS: ERRL, (-) APD OD, OS

Yikes!

Pinguecula; melanosis; chemosis 3-9:00; hyperemia temporal>inferior>nasal>superior

CONJUNCTIVA
Pinguecula; melanosis
Arcus 360; trace ends pigment OD>OS
[+] NaFl staining

CORNEA
Arcus 360; trace ends pigment OD>OS
[+] NaFl staining

ANGLES
4x4 (+) 1+ cell; (+) 1+ flare

ANTERIOR CHAMBER
Deep and quiet

IRIS
Flat

Lens
Flat
1+ SEC

VITREOUS
Clear

SL Exam Findings

Posterior Exam Findings

Clear | Media | Clear
---|---|---
Distinct | Margins | Distinct
Pink and healthy | Rim | Pink and healthy
0.30:0.30 | C/D ratio (VHN) | 0.30:0.30
AV 2/3; ALR % | Blood vessels | AV 2/3; ALR %
Homogenous | Background | Homogenous
Flat, even pigment | Macula | Flat, even pigment
No holes, tears or breaks 360 | Periphery | No holes, tears or breaks 360
RPE dropout along vessel vs vessel sheathing superior (elevated vessel?)
Interesting observation

AFTER DILATION.....

SL Exam Findings

<table>
<thead>
<tr>
<th>Finding</th>
<th>Right Eye</th>
<th>Left Eye</th>
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</thead>
<tbody>
<tr>
<td>LID, LASHES, LACRIMAL</td>
<td>3+ NG stasis, (‐) lids tender to touch, (‐) lid swelling</td>
<td>3+ NG stasis, (‐) lids tender to touch, (‐) lid swelling</td>
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<tr>
<td>Conjunctiva</td>
<td>pinguecula; melanosis; 360° Arcus 360; trace ends pigment OD&gt;OS; (‐) half staining</td>
<td>pinguecula; melanosis; 360° Arcus 360; trace ends pigment OD&gt;OS; (‐) half staining</td>
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<tr>
<td>ANTERIOR CHAMBER</td>
<td>Deep and quiet</td>
<td>Deep and quiet</td>
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<tr>
<td>Flat</td>
<td>Flat</td>
<td>Flat</td>
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<tr>
<td>1+ NUC</td>
<td>Lens</td>
<td>Lens</td>
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<tr>
<td>Clear</td>
<td>Clear</td>
<td>Clear</td>
</tr>
<tr>
<td>IOP</td>
<td>Clear</td>
<td>Clear</td>
</tr>
<tr>
<td>Reliable, full field</td>
<td>Reliable, full field</td>
<td>Reliable, full field</td>
</tr>
</tbody>
</table>

Assessment/Plan

Assessment/Plan:

1. Anterior uveitis vs. scleritis OD
   - Start 1% cyclopentolate BID + PRED FORTE q1h OD only

2. Vessel sheathing vs RPE dropout along vessel OD
   - RTC in 1 day for DFE, IOP check, A/C check
   - RTC immediately if symptoms worsen

~5 day f/u
5 day F/U

Assessment/Plan:
1) Scleritis OD
   - Rx’d indomethacin 25 mg PO TID + ranitidine 150 mg PO BID
   - D/C cyclopentolate
   - Continue topical Pred Forte TID for now

Recommend full physical examination by internist
Ordered CBC, ESR, uric acid, RPR, FTA-ABS, rheumatoid factor, ANA, C3, C4, ACE, serum ANCA, CF 50

17 day F/U

Assessment/Plan:
Scleritis OD
- Taper Pred Forte down BID x 1 week, Qday x 1 week and then stop
- Stop NSAIDs/ranitidine
- AFTs PRN
- Return precautions

Labs
Ordered CBC, ESR, uric acid, RPR, FTA-ABS, rheumatoid factor, ANA, C3, C4, ACE, serum ANCA, CF 50

<table>
<thead>
<tr>
<th>Test</th>
<th>Results</th>
<th>Norms</th>
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<tr>
<td>Immunoglobulin E</td>
<td>3438.0</td>
<td>&lt;114</td>
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<tr>
<td>ESR</td>
<td>64</td>
<td>0-20</td>
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<tr>
<td>Red cell distribution width</td>
<td>15.8</td>
<td>12-15</td>
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<tr>
<td>Monocytes</td>
<td>11.3</td>
<td>2-10</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>8.8</td>
<td>1-6</td>
</tr>
<tr>
<td>Complement function activity</td>
<td>&lt;10</td>
<td>31-60</td>
</tr>
</tbody>
</table>
~1 month F/U

Assessment/Plan:
Improving scleritis OD
- Now with subconjunctival hemorrhage OD
- Cont Pred Forte daily OD for 1-2 weeks then stop
- Return precautions

RTC general 2 months for follow up
- No showed

Scleritis

Classification

Scleritis
- Anterior (98%)
- Posterior (2%)
- Diffuse
- Nodular
- Nodular with inflammation (Scleromalacia Perforans)

Posterior Scleritis

Indian Journal of Ophthalmology
Humawar D, Chawla R, Hasan N. Retinochoroidal fold with severe discedema in a case of posterior scleritis.

Signs and Symptoms

Anterior
- Pain
- Injection
- Scleral edema
- Scleral nodule(s)
- Globe tenderness to palpation
- Normal or decreased VA
- Photophobia
- Corneal infiltrate/thinning
- Scleral thinning (30%)
- A/C cells/flare (30%)

Posterior
- Choroidal folds
- Retinal detachment
- Vitritis
- Cotton wool spots
- Decreased VA (wide range)
- May be with or without:
  - Ocular pain
  - Ocular redness
  - Discomfort with EOMs or have EOM restriction
  - Dry eye
  - Thinning of sclera and choroid
  - T-groove
  - Enhanced depth imaging OCT

Etiology

50% have associated systemic disease

- Rheumatoid arthritis (10-30%)
- Sjogrens
- Connective tissue disease (10%)
- Granulomatosis with polyangiitis
- Replaping polychondritis
- Lupus
- Behcets
- Polyarteritis nodosa
- AS
- Bacteri

- Syphilis
- Surgically induced necrotising scleritis (SINS)
- GVHD
- 7G
- Lyme disease
- Sarcoidosis
- Hypertension
- Foreign body
- Viruses, bacteria, fungi, parasite (4-10%)
Epidemiology

Middle age
Females>Males
African Americans

Differentials

Episcleritis
Conjunctivitis
Trauma
Ocular rosacea
Herpes zoster
Anterior uveitis
Pingueculitis
Phlyctenule
Retrobulbar mass
Mynitis
Scleral ectasia
Staphyloma

Evaluation

History
Examine sclera in all directions of gaze by gross inspection in adequate room light
Slit-lamp examination
DFE
Complete physical exam
Lab work-up and imaging
- CBC, ESR, C-reactive protein, uric acid, RPR, FTA-AB, RF, ANA, ACE, ANCA, HLA-B27, Lyme serology
- B-scan, OCT, UBM, MRI or CT, Chest x-ray,

Treatment

- Oral NSAID
- Oral Steroids
- Add H2 blocker or PPI
- Immunosuppressive agents
- Biologics
- Infectious etiologies:
  - Topical and systemic antibiotics
- *Recommend glasses or eye shield (for significant thinning/perforation risk)

Prognosis

Mild or moderate scleritis – relatively good
Necrotizing and posterior scleritis – higher risk of VA loss
Recurrences are common
42 year old African American Male

New patient

CC: black spot in vision OD x 1 week
- Constant, stable
- Blurred vision
- Darker color vision
- Denies headaches, pain, flashes, curtain over vision, floaters

Ocular history:
- Unremarkable

Medical history:
- Eczema

FOMx:
- Unremarkable

FMHx:
- Unremarkable

Medications:
- Hydrocortisone 1% ointment

Allergies:
- NKDA

BP: 138/96

VA:
- OD: 20/25
- OS: 20/20-

Pupils: PERRL | JAPA OD/OS

EDMs: SAFE

CVF: FTFC OD/OS

CT: Ortho (distance); 2XP (near)

Red cap: equal between eyes

Amsler grid: yellow shadow-central circle, no metamorphopsia OD

Assessment:
- Central serous chorioretinopathy OD
- Pt reports elevated stress for the last few months
- Pt reports using hydrocortisone for eczema on eyes and regularly getting it into eyes
- Elevated BP

Plan:
- Pt edu on findings and relation to stress and cortisol use
- Recommended avoiding use of hydrocortisone, especially getting into eyes
- Exam summary letter written to PCP to encourage f/u for elevated BP
- RTC in 1 month for f/u
Why CSCR??

Central serous is a pachychoroid disease!

What does pachychoroid mean?
- Pachy (Greek) – thick

**Thickened choroid**

---

**The Choroid**

The choroid is very important!

-Layers of the choroid
- Bruch's Membrane
- Choriocapillaris
- Sattler's layer
- Haller's layer
- Choroid/sclera transition zone (suprachoroid)

---

**ENHANCED DEPTH IMAGING OCT**

**The Choroid**

Layers of the choroid
- Bruch's Membrane
- Choriocapillaris
- Sattler’s layer
- Haller’s layer
- Choroid/sclera transition zone (suprachoroidal)

---

**The Choroid**

**Choroidal thickness**
- Subfoveal thickness range: 260-350µm
- >300µm can be pathologic
- Varies based on:
  - Age
  - Refractive error/axial length
  - Diurnal variation
  - Blood pressure
  - Ethnicity

---

**The Choroid**

Choroidal thickness

**Thickened**

---

**The Choroid**

Choroidal thickness

Choroidal thickness

**Thickened**

---
Pachychoroid Diseases

Features:
- Attenuated small and medium choroidal vessels
- Dilated large choroidal vessels (increased vascular permeability)

Consequences:
- Can cause RPE compromise
- Can cause vision loss
- Can cause neovascularization

Central serous chorioretinopathy
Pachychoroid pigment epitheliopathy
Pachychoroid neovasculopathy
Polypoidal choroidal vasculopathy

Central serous chorioretinopathy

M>F
30-60 y.o.
Type A, stress, glucocorticoids

EDI OCT:
- Dilated outer choroidal vessels
- Attenuated small/medium vessels

Pachychoroid Pigment Epitheliopathy

Clinical features:
- EDI OCT – Pachychoroid
- Normal VA (asymptomatic)
- Orange-redish fundus
- Fundus tessellation absent
- Non-specific RPE changes
- Sub-RPE drusen-like deposits
- Small PEDs
Pachychoroid diseases
- Central serous chorioretinopathy
- Pachychoroid pigment epitheliopathy
- Pachychoroid neovasculopathy
- Polypoidal choroidal vasculopathy

**Pachychoroid Neovasculopathy**

**Type I CNV**

*EDI OCT – Pachychoroid*

**Type I:**
- Underneath RPE
- Vessels originate from the choroid
- Corresponds to hidden CNV

**Type II:**
- Break through RPE but remains sub-retinal
- Vessels also originate from the choroid
- Corresponds to classic CNV

**Type III:**
- Vessels originate from the retinal arteries
- Aka: retinal angiomatous proliferation (RAP)

**Symptoms:**
- Absence of drusen
- Often misdiagnosed as AMD
- Decreased VAs
- Central scotoma
- Metamorphopsia

---

**Pachychoroid diseases**

- Central serous chorioretinopathy
- Pachychoroid pigment epitheliopathy
- Pachychoroid neovasculopathy
- Polypoidal choroidal vasculopathy

**Polypoidal Choroidal Vasculopathy**

First described in 1990s
No universal definition

- Pachychoroid
- Choroidal vascular abnormalities
- Polyps – aneurysmal dilation
- Type 1 CNV
Polypoidal Choroidal Vasculopathy

Clinical features:
- Orange-red nodules
- Serous subretinal detachment
- Submacular hemorrhage
- Serous or hemorrhagic PEDs


https://www.aaojournal.org/article/S0161-6420(17)32863-4/fulltext#articleInformation

Exudative Hemorrhagic Mixed

https://www.ijo.in/article.asp?issn=0301-4738;year=2018;volume=66;issue=7;spage=896;epage=908;aulast=Anantharaman

Best diagnosed by indocyanine green (ICG) angiography

Characteristics:
- Subtype of AMD?
- Asian & African American
- M>F (Asian); M=F (Caucasian)
- Age: 50-65


https://vimeo.com/303317232

AMD vs PCV, why does it matter??

PCV responds better to combo therapies
Pachychoroid Disease

<table>
<thead>
<tr>
<th>Condition</th>
<th>CSCR</th>
<th>Pachychoroid pigment epitheliopathy</th>
<th>Pachychoroid neovasculopathy</th>
<th>Polypoidal choroidal vasculopathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced depth imaging (OCT)</td>
<td>Pachychoroid → attenuated choriocapillaris &amp; Sattler’s layer, dilated Haller’s layer</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Other features</td>
<td>Subretinal detachment PED</td>
<td>CSCR w/o subretinal fluid Non-specific RPE changes Type I CNV Absence of drusen Type I CNV Polyps Asian &amp; African American</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>Monitor</td>
<td>Monitor</td>
<td>Anti-VEGF</td>
<td>Combo Rx: Anti-VEGF, PDT, steroids</td>
</tr>
</tbody>
</table>

“Good Vision”

9 year old Caucasian female

CC: “Good vision in both eyes” says Grandma

Last eye exam: last year, has glasses but rarely wears them

Ocular Hx: unremarkable
Medical Hx: unremarkable
FOHx: unremarkable
FMHx: unremarkable

Meds: None
Allergies: NKDA

Anterior segment: Unremarkable OU

Refraction:
- OD: +5.25 –1.00 x 090 20/20
- OS: +5.00 -0.75 x 086 20/25+

9 year old Caucasian female

VA/MM:
- OD: 20/15
- OS: 20/15+2
- OU: 20/20-1

Pupils: PERRL ( ) APD

EOMs: SAFE OU

CVF: FTFW

Cyc:
- Distance: 6 esophoria
- Near: 6 esophoria

9 year old Caucasian female

DMM and DMM OD Analysis Optics Disc Code 20x/20x

- 20x
- 20x
Assessment/Plan
Neuroretinitis OS
- Denies systemic conditions
- Denies neurological symptoms
- No medications
- (+) cats at home

OMD Testing
MRI: minimal prominence of left optic cup, which may be seen with mild papilledema. Otherwise normal brain and orbits MRI
Bartonella: (+) presence of IgM antibodies suggests recent infection.
Lyme: negative

Neuroretinitis
Pathophysiology:
- Inflammation of optic disc vasculature causing exudation of fluid into peripapillary retina
Differentials:
- Any condition which can cause optic disc edema

Proposed Classification of Neuroretinitis
Cases of neuroretinitis between 1950-2010

Based on etiology:
- Idiopathic
  - Single episode
  - Recurrent
- Infectious
  - Most common: cat scratch disease

Cat Scratch Neuroretinitis

Cat scratch disease is the most common cause of neuroretinitis
- Bartonella henselae is most likely cause of cat-scratch disease
Incidence: 9.3 per 100,000
Self-limiting, benign
Children
Cat Scratch Neuroretinitis

Review of 65 case reports:
- Laterality: unilateral
- Age: 4-64 years
- Gender: 1.8 (female) : 1 (male)
- Symptoms:
  - Systemic symptoms (73%)
  - Eye pain (7.7%)
- VA:
  - 20/40 (14.5%)
  - 20/50-20/200 (13.9%)
  - >20/200 (52.2%)
- Final VA: 20/40 or better (93%)
- VF: Central defect (88%)
- Pupils: RAPD (67.5%)
- Color vision: (+) defect

Neuroretinitis

Characteristics:
- Stellate maculopathy
- Disc edema
- Vitreous inflammation
- CWS
- NFL hemes
- Multifocal deep yellow-white retinal lesions
- Resolution: spontaneous

Testing and Tx for Neuroretinitis

- OCT: Labs:
  - Cat scratch titers (Bartonella species)
  - Fluorescent treponemal antibody absorption test (FTA-ABS)
  - Tuberculosis skin test (PPD)
  - Lyme disease
  - Angiotensin-converting enzyme
  - Chest x-ray
- Treatment:
  - Antibiotic: shortened course of systemic disease
  - Meds: most effective
  - Rifampin: 87% of cases
  - Ciprofloxacin: 84%
  - Trimethoprim-sulfamethoxazole: 58%

“Super healthy guy”

41 year old Caucasian male

CC: Reading at near is getting a little difficult
  - Have to pull reading material further away
  - Makes text on computer and phone a little bigger

Medical Hx: unremarkable
  - Last PCP visit: within the last year
Ocular Hx: unremarkable
  - Last eye exam: can’t remember
FMHx: unremarkable
FOHx: unremarkable

41 year old Caucasian male

VA:
- OD: 20/20-
- OS: 20/20-
Refraction:
- OD: +0.25 -0.50 x 180 20/20
- OS: +0.50 x 180 20/20
- Add +1.00
CT (distance): ortho
CT (near): ortho
Pupils: PERBRA ( ) APD
EOMs: SAFE DU
CVF: FFCC OD/OS
BP: 186/121
**OLD vs NEW HTN Guidelines**

<table>
<thead>
<tr>
<th>Systolic BP</th>
<th>Diastolic BP</th>
</tr>
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<tbody>
<tr>
<td><strong>Old category</strong></td>
<td><strong>New category</strong></td>
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<tr>
<td>Normal</td>
<td>Normal</td>
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<tr>
<td>&lt;120</td>
<td>&lt;120</td>
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<tr>
<td>Pre-</td>
<td>Elevated</td>
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<tr>
<td>hypertension</td>
<td>hypertension</td>
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<td>120-139</td>
<td>130-139</td>
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<td>Stage 1 HTN</td>
<td>Stage 1 HTN</td>
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<tr>
<td>&gt;160</td>
<td>&gt;140</td>
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<tr>
<td>Stage 2 HTN</td>
<td>Stage 2 HTN</td>
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<td>Hypertensive</td>
<td>Hypertensive</td>
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<tr>
<td>Crisis</td>
<td>Crisis</td>
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<tr>
<td>&gt;180</td>
<td>&gt;180</td>
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</table>

**What’s the next step?**

**41 year old Caucasian male**

First reading
BP: 186/121
BP: 176/113
BP: 178/111

**New BP guidelines**

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt; 120</td>
<td>&lt; 80</td>
</tr>
<tr>
<td>Elevated</td>
<td>120-129</td>
<td>&lt; 80</td>
</tr>
<tr>
<td>Stage 1</td>
<td>130-139</td>
<td>&lt; 80</td>
</tr>
<tr>
<td>Stage 2</td>
<td>&gt;140</td>
<td>&lt; 90</td>
</tr>
<tr>
<td>Hypertensive crisis</td>
<td>&gt;180</td>
<td>&gt;120</td>
</tr>
</tbody>
</table>

BP: 177/112

**How to Properly Measure Blood Pressure**

- The patient should be seated and relaxed for 5 to 10 minutes prior to taking measurement.
- Choose the proper sized cuff: if the cuff is too large, you can underestimate BP; if the cuff is too small, you can overestimate BP.
- The patient should have unrestricted bearing of the upper arm.
- The patient should be seated with legs uncrossed and with back against a chair or wall.
- The patient should have a slightly bent arm with palm up so the midpoint of the upper arm is resting at right atrium level.
- If the arm is above heart level, the reading will be underestimated.
- If the arm is held below heart level, the reading will be overestimated (due to gravitational forces).
- The patient’s arm is rested on a table or an armrest, or it can be fully supported by the clinician if needed. No exertion should be present in order to prevent muscle contractions, which could artificially increase the reading.
- The clinician should palpate for the radial pulse, then pump the cuff quickly to the point where this pulse first disappears. The clinician should then continue to pump for an additional 30 mm Hg before slowly deflating the cuff at a rate of 2 to 3 mm Hg/second and listening for the first sound.

**HTN Management**

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic</th>
<th>Diastolic</th>
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</thead>
<tbody>
<tr>
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<td>&lt; 80</td>
</tr>
<tr>
<td>Stage 2</td>
<td>&gt;140</td>
<td>&lt; 90</td>
</tr>
<tr>
<td>Hypertensive crisis</td>
<td>&gt;180</td>
<td>&gt;120</td>
</tr>
</tbody>
</table>

Recommended follow-up:
- Normal: Continue yearly.
- Elevated: Refer to PCP; Should recheck in 3-6 months, discuss lifestyle modification.
- Stage 1: Refer to PCP; Refer within 2 months; Discuss lifestyle modification.
- Stage 2: Refer to PCP; Refer within 1 month; Discuss lifestyle modification.
- Hypertensive crisis: Refer immediately.
HTN Follow-Up

Hypertensive crisis
BP >180 / >120

Hypertensive Urgency
No end organ damage
Refer within 24-48 hours

Hypertensive Emergency
End organ damage
Refer Immediately

Ocular manifestations of HTN

Hypertensive retinopathy
- Anterior ischemic optic neuropathy
- Central or branch retinal artery occlusion (CRAO or BRAO)
- Central or branch retinal vein occlusion (CRVO or BRVO)
- Central or branch retinal artery occlusion
- Central or branch retinal vein occlusion
- Choroidal infarction
- Cranial nerve palsies

Progression of diabetic retinopathy
Glucoma
Idiopathic polypoidal choroidal vasculopathy
Macroaneurysms
Ocular ischemic syndrome
Subconjunctival hemorrhage
Transient visual obscurations

41 year old Caucasian male

Confirmed he has high blood pressure...
What’s the next step?

Can we still dilate the patient?

2.5% phenylephrine?
10% phenylephrine?

41 year old Caucasian male

Patient declined dilation
Only wants spectacle Rx

41 year old Caucasian male

Patient declined dilation
Only wants spectacle Rx

41 year old Caucasian male

Patient declined dilation
Only wants spectacle Rx
What about kids?

“A little bump in the road”

30 year old Hispanic female
- CC: routine annual exam, no complaints with vision
- currently 2 months pregnant
- Medical Hx: (+) Type 2 diabetes x 2 years, (−) HTN
- Ocular Hx: unremarkable, (−) x of DR
- FMHx: (+) Diabetes: father
- FOHx: (+) Cataracts: father

Dilate or not?

Diabetes

Pre-existing DM  Gestational DM

Dilate or not?

Diabetes

Pre-existing DM  Gestational DM
Gestational Diabetes

Not a risk factor for DR

Pre-existing Diabetes

DR Risk factors:
- Type I vs. Type II
- Duration ~2 years
- Blood glucose control "good"
- Hypertension (+) HTN
- Maternal age 30 y.o.
- Stage of DR (+) History of DR

Recommendations

American Optometric Association recommendations:

"Women with diabetes who become pregnant should have a comprehensive eye and vision examination during every trimester of pregnancy, with follow-up at 6 to 12 months postpartum."

30 year old Hispanic female

CC: routine annual exam, no complaints with vision
- currently 2 months pregnant

Medical Hx: (+) Type 2 diabetes x 2 years, (-) HTN
Ocular Hx: unremarkable, (-) Hx of DR
FMHx: (+) Diabetes: father
FOHx: (+) Cataracts: father

Are dilation drops safe?

Pregnancy Category C

Needs dilation!
Pregnancy Categories
Established in 1979 by the FDA

<table>
<thead>
<tr>
<th>FDA Pregnancy Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A: Strong studies failed to demonstrate risk to fetus.</td>
</tr>
<tr>
<td>Category B: Animal studies failed to demonstrate risk to fetus; no adequate studies in humans.</td>
</tr>
<tr>
<td>Category C: Animal studies show adverse effect on fetuses; no adequate studies on humans; warrant use if benefits outweigh the risks.</td>
</tr>
<tr>
<td>Category D: Possible evidence of risk on human fetus; warrant use if benefits outweigh the risks.</td>
</tr>
<tr>
<td>Category X: Studies demonstrated fetal abnormalities and fetal risk; risks outweigh potential benefits.</td>
</tr>
</tbody>
</table>

New Pregnancy Labeling
NEW Pregnancy drug labeling: narrative sections and subsections

Example

Don’t forget!
Topical medication recommendation:
- Use minimal concentration
- Use minimal dose
- Punctual occlusion
- Wipe off extra drug

Thank you
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