Ophthalmology for the Non-Ophthalmologist

Gregory P Bloxdorf DO FACOEP
DME St John Medical Center
EM Residency Director
OUHCOM Professor of EM
OUHCOM Master Clinical Faculty
Disclosures

• None
Objectives

- Anatomy
- History/physical exam including adjuncts
- Introduce/recognize common eye/visual complaints
- Treatment/management of these conditions
- Hopefully share some pearls along the way
Normal Eye Anatomy

http://avserver.lib.uthsc.edu:8080/Medicine/eye_exam/Revisedpage17A.htm

http://www.mygoodeyes.com/eyedisorders.html
Fundus

- Optic Cup
- Optic Disc
- Artery
- Vein
- Fovea
- Macula
Papilledema

HISTORY

- **A** - allergies
- **M** - medications
- **P** – PMH
- **L** – last meal
- **E** – Events leading up to complaint

- **Remember** to ask about glasses and more importantly **contact lens**!
Physical Exam

• ALWAYS get visual acuity with corrective lens on.
• “outside to the inside” examination
• Adjuncts
Snellen Chart

Rosenbaum Chart

http://en.wikipedia.org/wiki/Snellen_chart#mediaviewer/File:Snellen_chart.svg

http://pixgood.com/pocket-snellen-chart.html

http://www.amazon.com/Optical-Suppliers-Rosenbaum-Pocket-Screener/dp/B008N1ZB5M
Physical Exam
Anisocoria

http://www.mcleishoptometrists.com/information/further-information/eye-problems/pupil-problems/
VERSUS

Field of View

Standard Scope  PanOptic Scope

5x Larger View of the Fundus
http://www.company7.com/library/c7_uv_primer.html

http://trade.indiamart.com/search.mp?search=fluorescein+strips
Trauma
(Top) Ruptured globe caused by golf ball. (Bottom) The patient has transmarginal eyelid lacerations, a cornea-scleral laceration, and prolapsed uvea on the eyelid.

Nail Penetration
Extensive subconjunctival hemorrhage can be a sign of occult globe rupture

Globe Rupture

Foreign Body

http://lifeinthefastlane.com/ophthalmology-befuddler-010/
Positive Seidel Test

“8 Ball” Hyphema
Hyphema

## Hyphema Grading

<table>
<thead>
<tr>
<th>Grade</th>
<th>Anterior chamber filling</th>
<th>Diagram</th>
<th>Best prognosis for 20/50 vision or better</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microhyphema</td>
<td>Circulating red blood cells by slit lamp exam only</td>
<td><img src="image" alt="Slit lamp view" /></td>
<td>90 percent</td>
</tr>
<tr>
<td>I</td>
<td>&lt;33 percent</td>
<td><img src="image" alt="Diagram" /></td>
<td>90 percent</td>
</tr>
<tr>
<td>II</td>
<td>33-50 percent</td>
<td><img src="image" alt="Diagram" /></td>
<td>70 percent</td>
</tr>
<tr>
<td>III</td>
<td>&gt;50 percent</td>
<td><img src="image" alt="Diagram" /></td>
<td>50 percent</td>
</tr>
<tr>
<td>IV</td>
<td>100 percent</td>
<td><img src="image" alt="Diagram" /></td>
<td>50 percent</td>
</tr>
</tbody>
</table>

Commotio retinae, seen as a whitish change in the retina after blunt trauma. This is believed to be caused by disorganization at the photoreceptor level.

Eyelid Laceration

http://www.floridalionsfoundation.org/Eyelid_Injuries.html
Blowout Fracture
Cat Scan of Blowout Fracture

http://www.ohniww.org/orbital-blowout-treatment-fracture/
Retrobulbar Hemorrhage
Retrobulbar Hemorrhage
Retrobulbar Hemorrhage
Retrobulbar Hemorrhage
Foreign Body

http://lifeinthefastlane.com/ophthalmology-befuddler-010/
Corneal Abrasion

http://www.fprmed.com/Pages/Physical_Findings/Eyes.html
Acute Alkaline Burn

- Ohio Chapter of the American College of Emergency Physicians, pg. 44
“the red eye”
Subconjunctival hemorrhage

http://www.patient.co.uk/health/
Viral Conjunctivitis

Figure 236-32 (Courtesy of Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)
Bacterial Conjunctivitis

Viral Conjunctivitis

http://www.eyeconsultants.net/viral-conjunctivitis.htm

Bacterial Conjunctivitis

http://www.allaboutvision.com/conditions/conjunctivitis.htm
<table>
<thead>
<tr>
<th>Conjunctivitis</th>
<th>Other ocular disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial</td>
<td>Hyperacute bacterial</td>
</tr>
<tr>
<td>• Constant crusty, discolored discharge</td>
<td>• Copious, thick, purulent, yellow-green</td>
</tr>
<tr>
<td>• Possible photophobia</td>
<td>• Possible photophobia</td>
</tr>
<tr>
<td>• Some itching</td>
<td>• Some itching</td>
</tr>
<tr>
<td>• Blurry vision, but clears with blinking</td>
<td>• Blurry vision</td>
</tr>
<tr>
<td>• Moderate erythema</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign body presence</td>
<td>Corneal abrasion</td>
</tr>
<tr>
<td>• Watery discharge</td>
<td>• Watery discharge</td>
</tr>
<tr>
<td>• Photophobia</td>
<td>• Photophobia</td>
</tr>
<tr>
<td>• Irritation</td>
<td>• Severe pain</td>
</tr>
<tr>
<td>• Usually blurry vision</td>
<td>• Blurry vision</td>
</tr>
<tr>
<td></td>
<td>• Mild-to-moderate erythema</td>
</tr>
</tbody>
</table>

http://www.clinicaladvisor.com/therapeutic-strategies-for-bacterial-conjunctivitis/article/209142/
<table>
<thead>
<tr>
<th>Age Group</th>
<th>Common Causes of Bacterial Conjunctivitis</th>
</tr>
</thead>
</table>
| **Neonates** | Chlamydia trachomatis (neonatal)  
Staphylococcus aureus  
Haemophilus influenzae  
Streptococcus pneumoniae  
Neisseria gonorrhoeae |
| **Children** | H. influenzae  
S. pneumoniae  
S. aureus  
Moraxella catarrhalis  
Staphylococcus epidermis  
Streptococcus viridans  
Gram-negative intestinal bacteria |
| **Adults** | S. aureus  
Coagulase-negative Staphylococcus organisms  
H. influenzae  
S. pneumoniae  
N. gonorrhoeae (hyperacute form) |
Iritis with Ciliary Flush
Red Eye
Corneal Ulceration
FIGURE 236-22. Positive Seidel test showing aqueous leaking through a full-thickness corneal wound. Aqueous will turn fluorescein lime-green under a cobalt-blue light as it oozes through the wound while being observed at the slit lamp.
Acute glaucoma

Other infections
Stye (Hordedum)

http://www.onlyeyesknew.com
Chalazion

http://www.charcoalremedies.com
Canaliculitis

Dacryocystitis

Periorbital Cellulitis

http://ehealthwall.com
Orbital Cellulitis

Orbital Cellulitis

http://medicalpicturesinfo.com/pathophysiology-of-orbital-cellulitis/
Periorbital vs orbital Cellulitis Chart

**Periorbital**
- Usually not toxic but reddness, warm, local edema
- NO pupil abnormality
- NO decreased visual acuity
- NO painful EOM / NO ophthalmoplegia
- NO proptosis

**Orbital**
- s/s of periorbital with fever
- Decreased visual acuity
- Pupil abnormality
- Painful EOM movements
- Limited EOM / ophthalmoplegia
- proptosis
Hutchinson’s Sign
Dendritic Lesion

FIGURE 236-36. Herpes simplex corneal dendrite in an infant seen with fluorescein staining. (Courtesy of Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)
Fundus

“painless vision loss"
Retinal Detachment

Retinal Detachment

http://www.tedmontgomery.com/the_eye/eye_photos/RetinalDetachment-4.html

http://www.improveeyesighthq.com/retinal-detachment.html
Retinal Detachment

https://www.omahaeye.com/retinal-detachment.htm
FIGURE 236-67. A high-resolution linear array US transducer is being applied to the closed eyelid. (Courtesy of Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)
FIGURE 236-68. Normal eye in transverse view showing the anterior chamber, lens, vitreous, and optic nerve. (Courtesy of Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)
FIGURE 236-71. Retinal detachment is seen as a hyperechoic membrane in the posterior aspect of the globe (arrow). (Courtesy of D. Chandwani and Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)
**FIGURE 236-70.** A hyperechoic foreign body (arrow) in the eye. Note the bright echogenic reverberation artifact (arrowheads). (Courtesy of M. Blaivas and Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)
Is this a central retinal artery or vein occlusion?

How about this one?

Retinal Artery Occlusion

Retinal Vein Occlusion

http://www.danburyeye.com/danbury/retina_surgery_retinal_detachment_diabetic_retinopathy.htm
References

• Google images

• The Wills Eye Manual 5th edition Wolters Kluwer / Lippincott Williams & Wilkens


• Rosens’s Emergency Medicine 7th edition Elsevier 2010 chapter 69