Ophthalmology for the Non-Ophthalmologist

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EM Residency Director
OUHCOM Professor of EM
OUHCOM Master Clinical Faculty

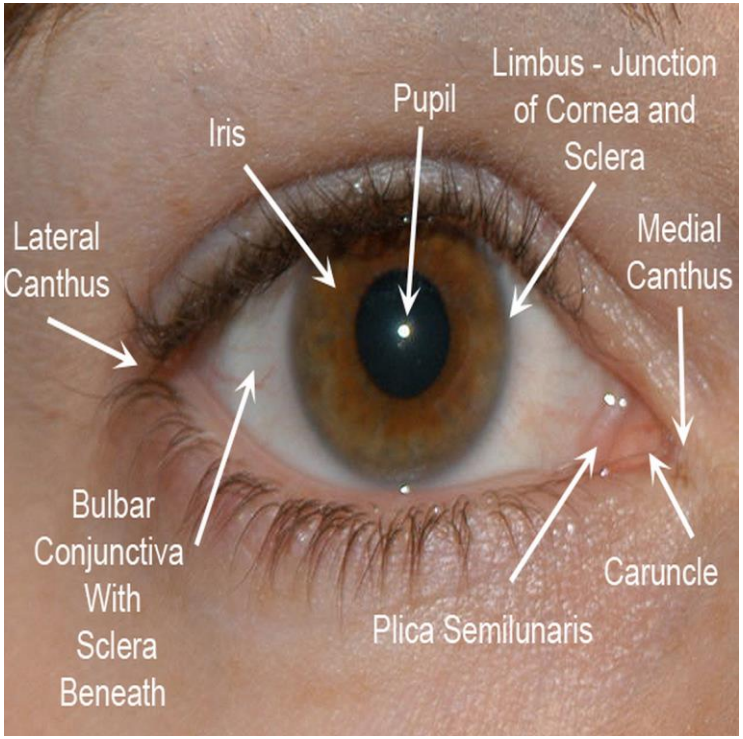
Disclosures

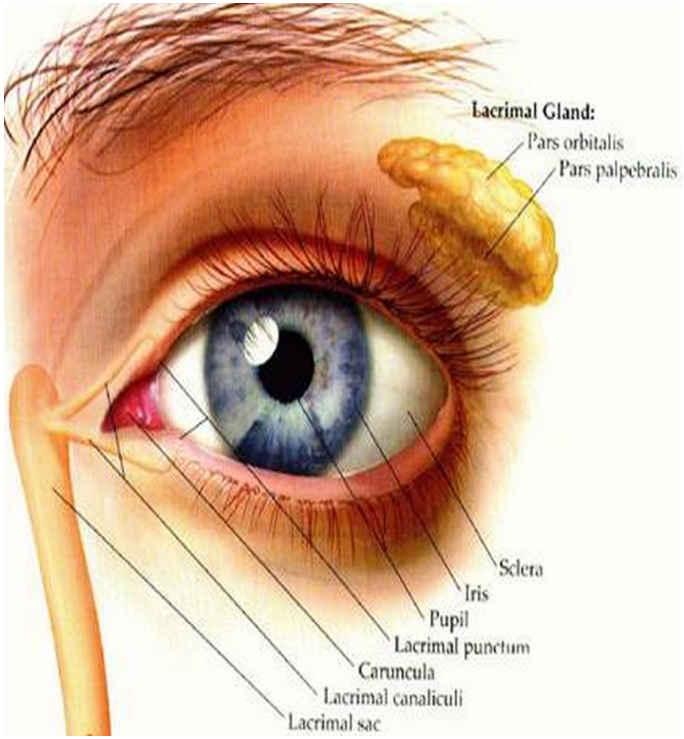
- None

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

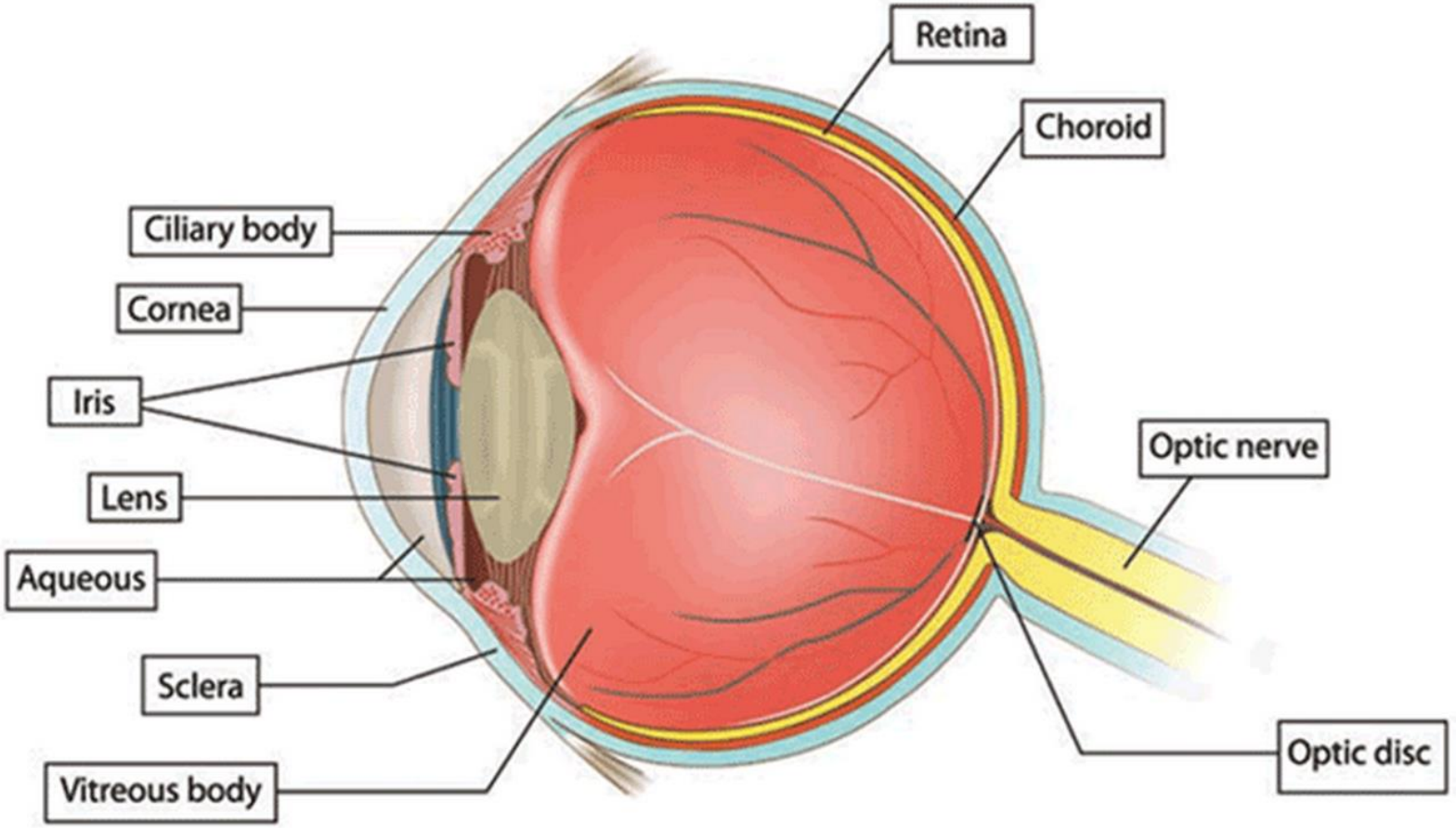




http://avserver.lib.uthsc.edu:8080/Medicine/eye_exam/Revisedpage17A.htm

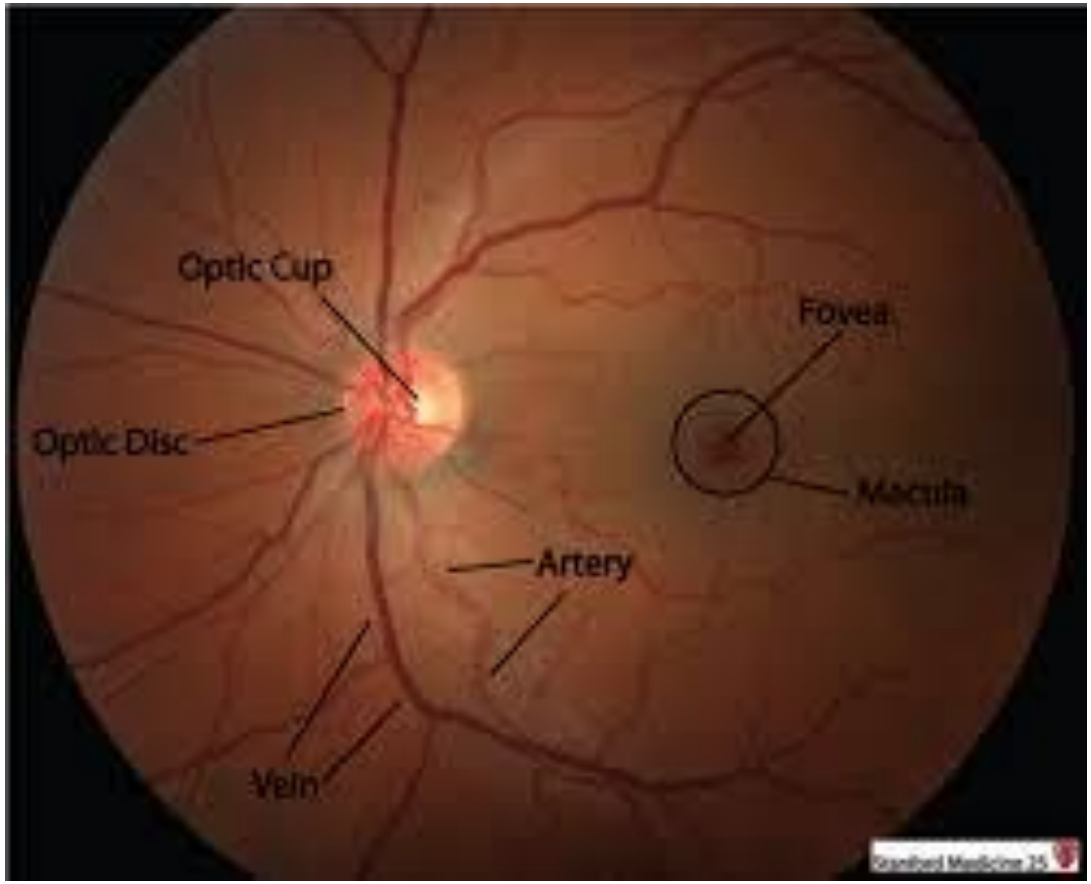
http://www.mygoodeyes.com/eyedisorders.html

Normal Eye

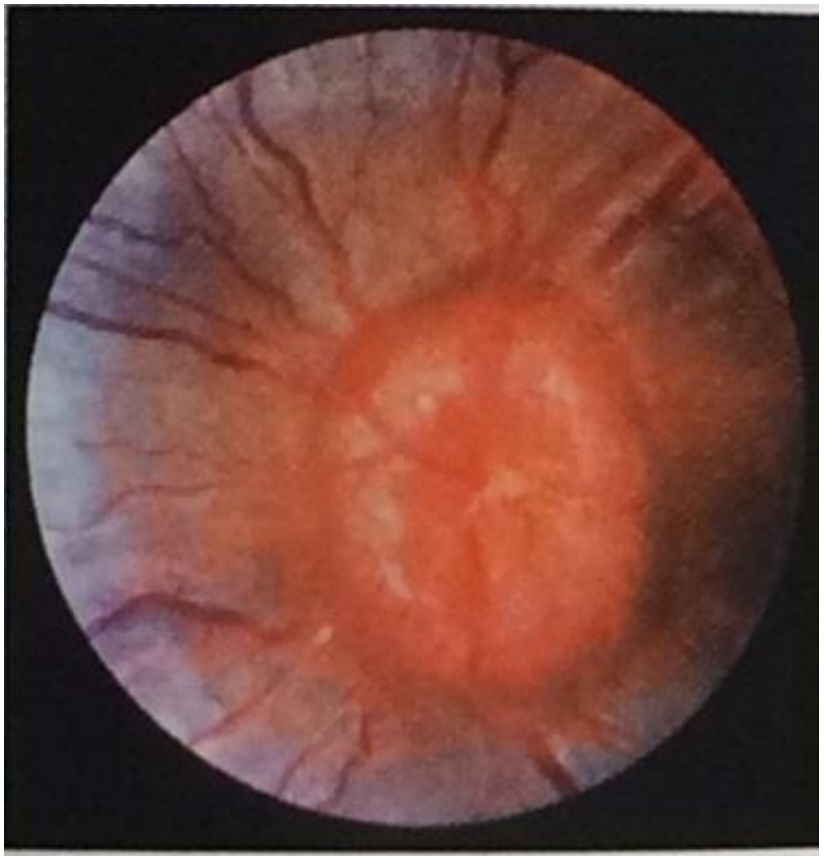


http://www.glaucoma.org/glaucoma/anatomy-of-the-eye.php

Fundus



Papilledema



PDR Medical Dictionary 2nd edition, Section B4.

HISTORY

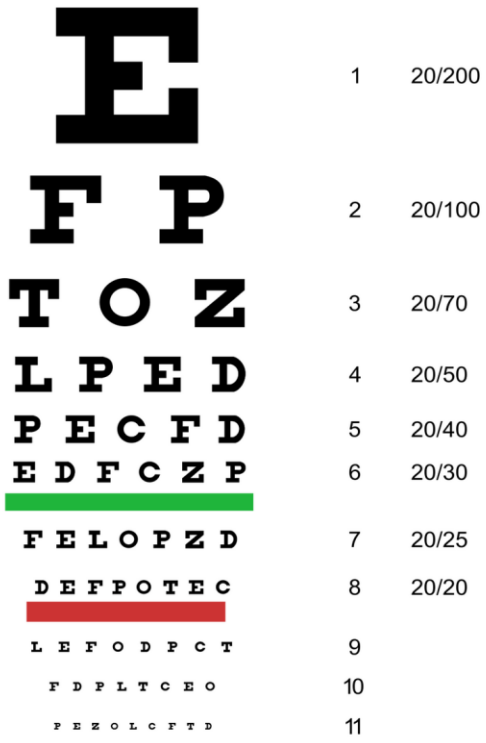
- **A -** allergies
- **M -** medications
- **P –** PMH
- **L –** last meal
- **E –** Events leading up to complaint

- **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



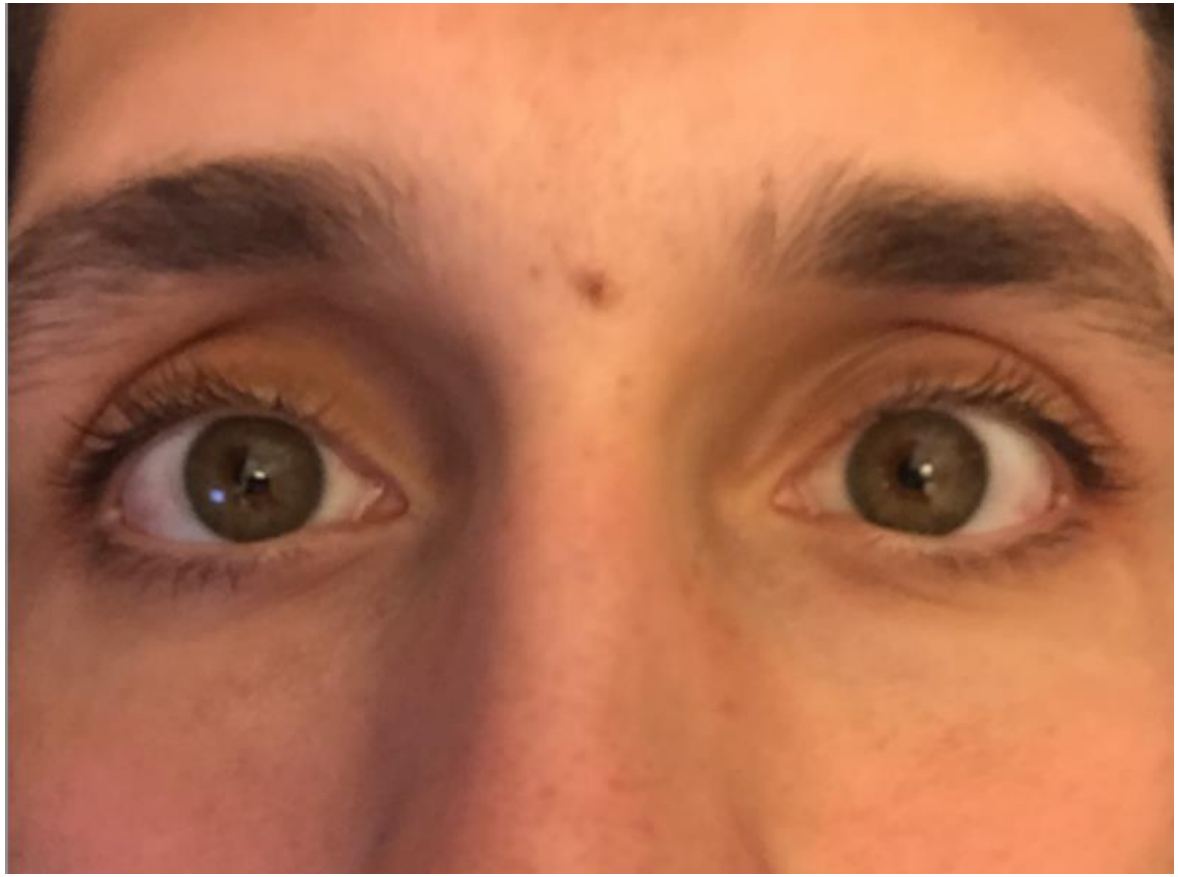
http://en.wikipedia.org/wiki/Snellen_chart#mediaviewer/File:Snellen_chart.svg

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

Rosenbaum Chart

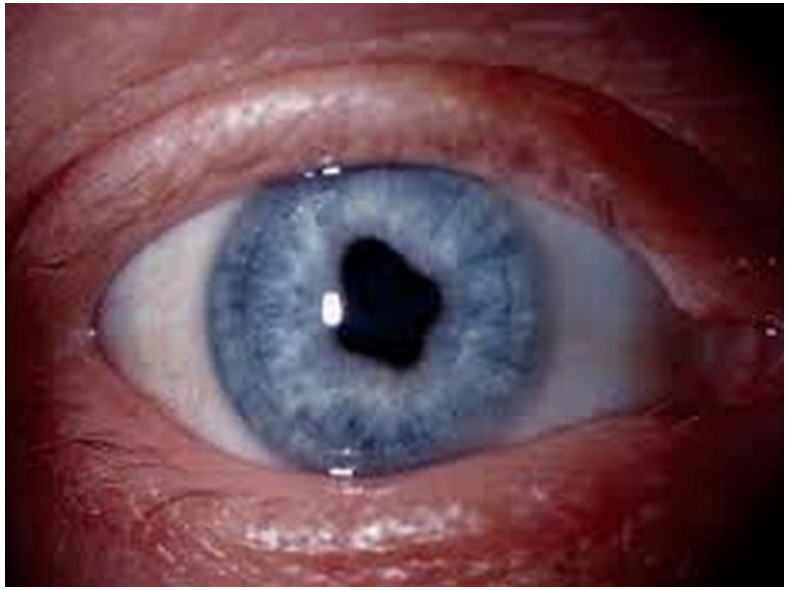
http://www.amazon.com/Optical-Suppliers-Rosenbaum-Pocket-Screener/dp/B008N1ZB5M

Physical Exam

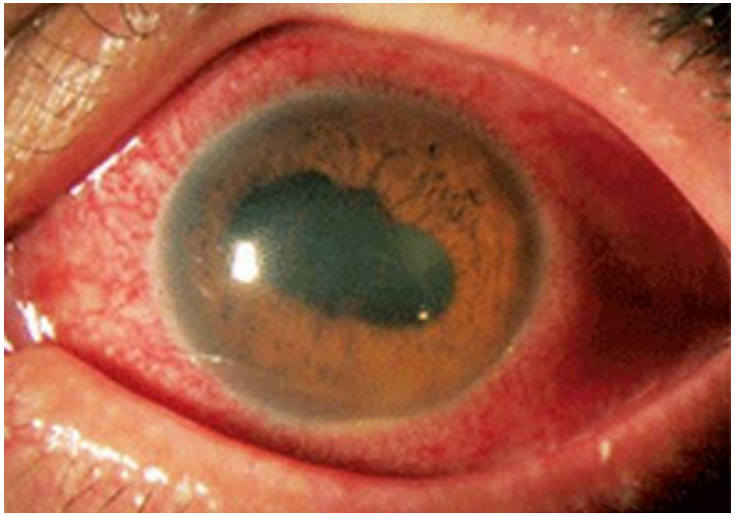


Anisocoria

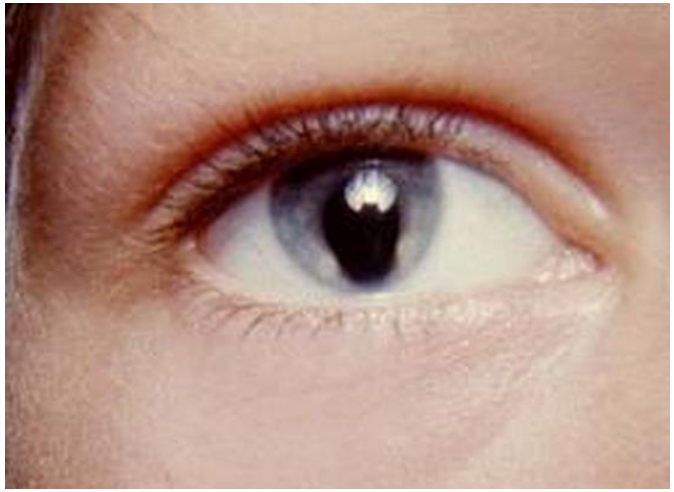
http://www.mcleishoptometrists.com/information/further-information/eye-problems/pupil-problems/



http://searchweb101.com/irregular-pupil-shape/



http://www.reviewofoptometry.com/content/d/retina_quiz/i/1086/c/20413/dnnprintmode/true/?skinsrc=%5Bl%5Dskins/ro2009/pageprint&containersrc=%5Bl%5Dcontainers/ro2009/simple



http://medicalpicturesinfo.com/coloboma/

http://www.medisave.co.uk/welch-allyn-35v-coaxial-ophthalmoscope-with-ccell-handle-in-ha-p-100408.html

http://www.hce-uk.com/Welch-Allyn-35v-PanOptic-Ophthalmoscope-Head-Only

VERSUS

http://www.gopixpic.com/349/welch-allyn-diagnostic-set-with-panoptic-ophthalmoscope/http:%7C%7Cwww*healthcare-exp*com%7Cb2b%7Cpics%7CWelch_Allyn_Diagnostic_Set_With_Panoptic_Ophthalmoscope_*jpg/

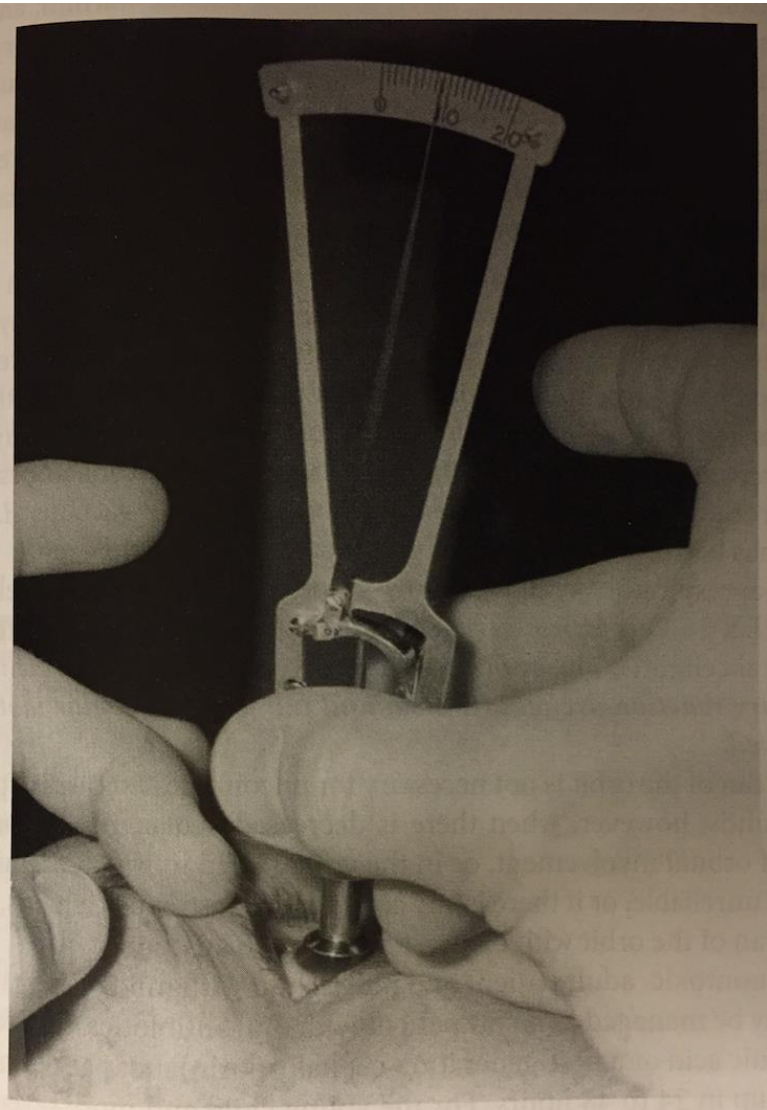


FIGURE 236-23. Schiötz tonometry. (Reproduced with permission from Riordan-Eva P, Whitcher J: *Vaughn & Asbury's General Ophthalmology, 17th ed.* New York, Lange Medical Books/McGraw Hill, 2008.)

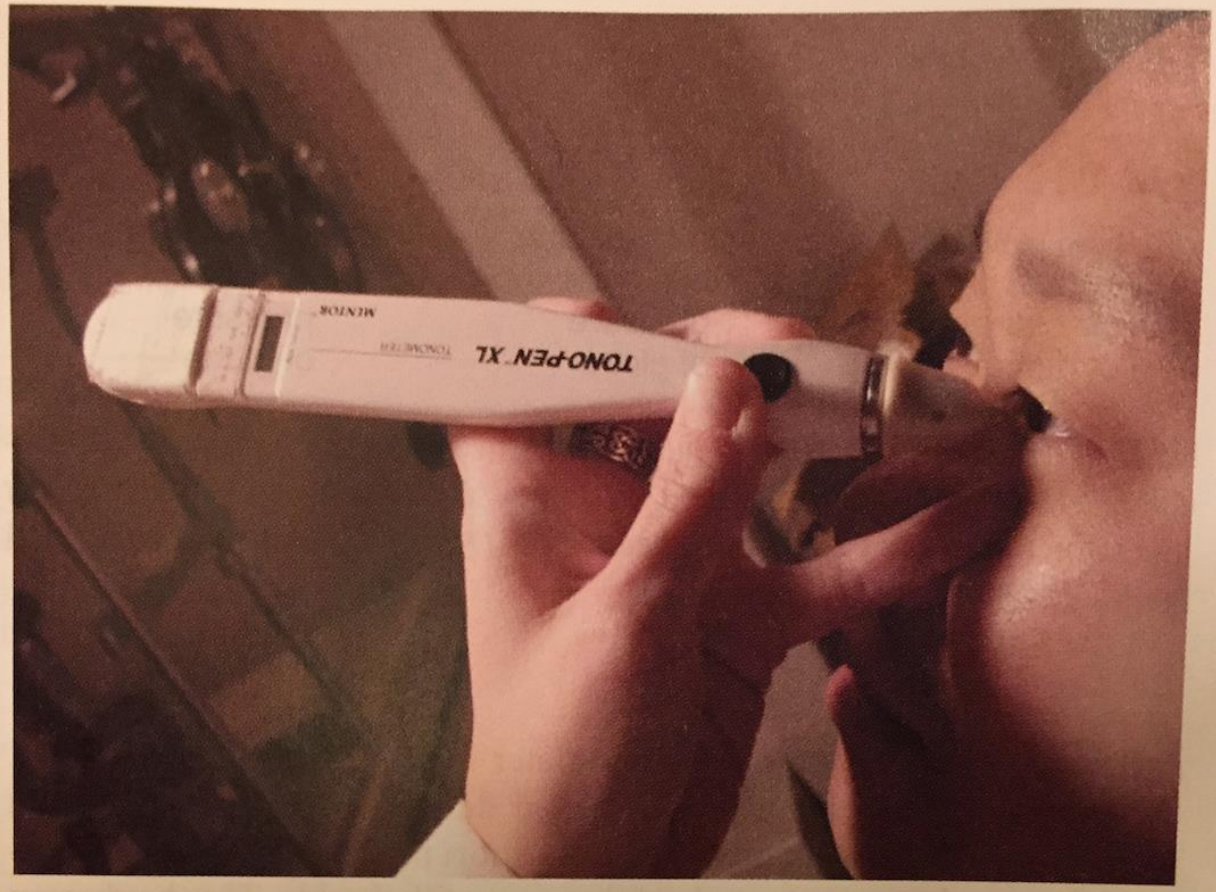


FIGURE 236-24. Tono-Pen® XL (Reichert, Inc., Depew, NY). (Reproduced with permission from Rhee J: *Glaucoma: Color Atlas and Synopsis of Clinical Ophthalmology*. New York, NY, McGraw-Hill, 2003.)

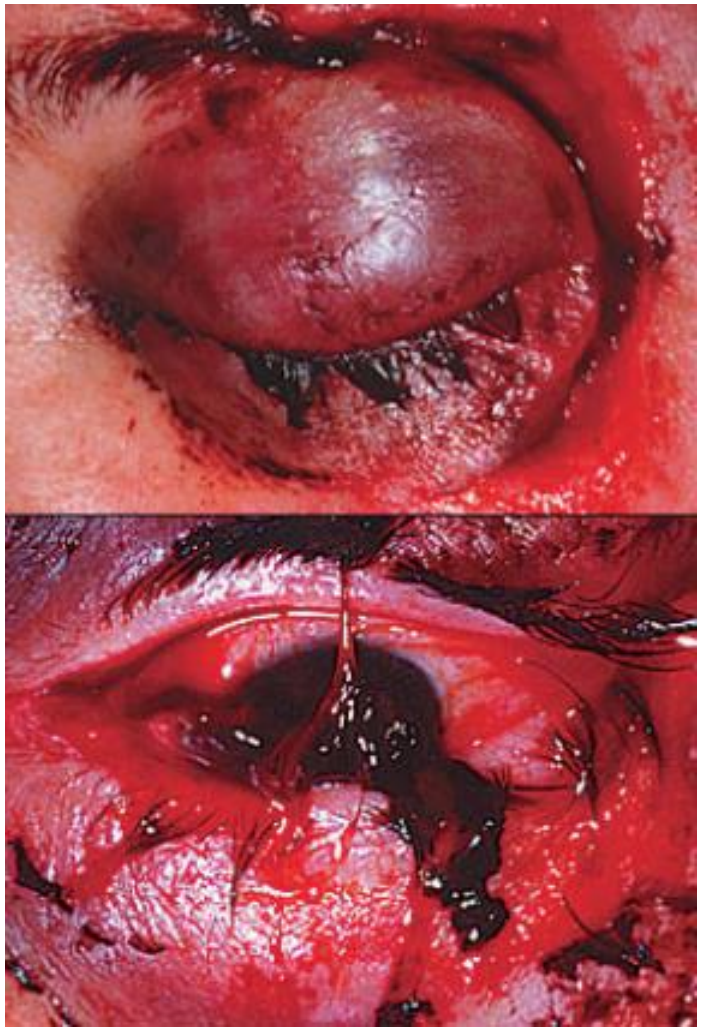
http://en.wikipedia.org/wiki/Slit_lamp

http://trade.indiamart.com/search.mp?search=fluorescein+strips

http://www.company7.com/library/c7_uv_primer.html

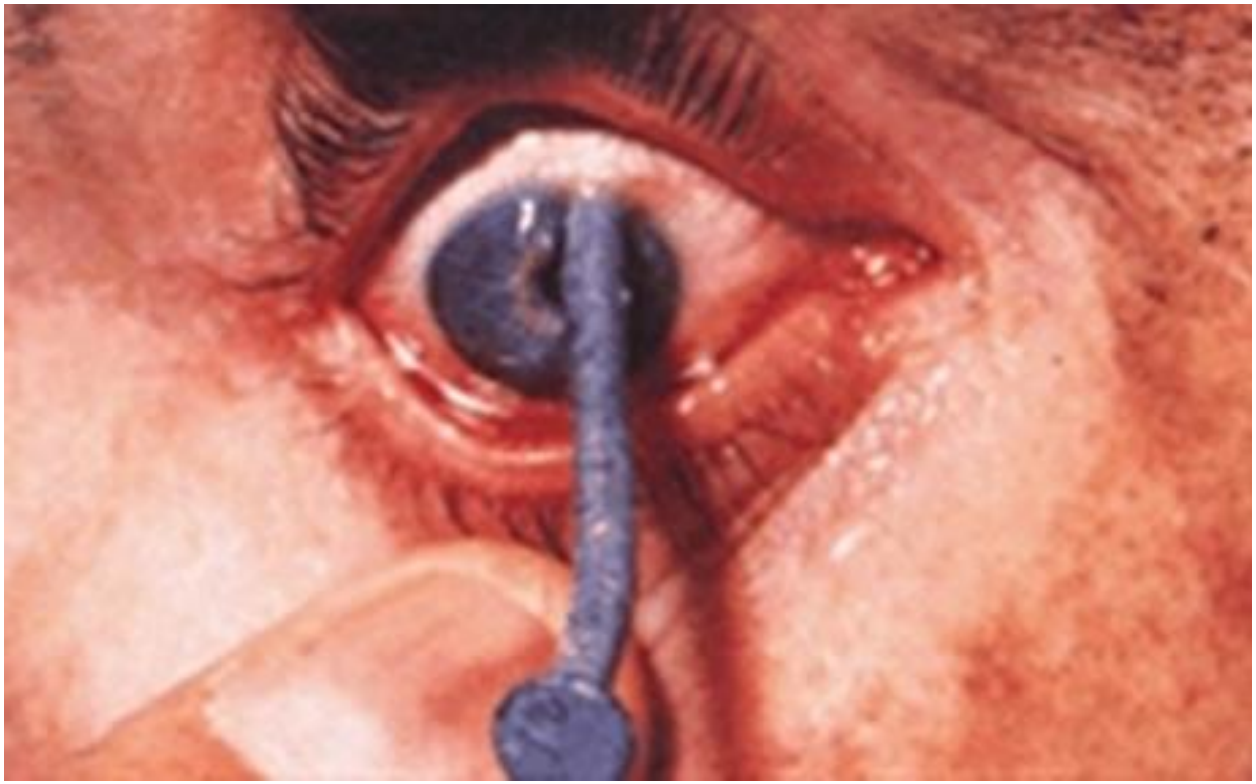
Trauma

(*Top*) Ruptured globe caused by golf ball. *(Bottom)* The patient has transmarginal eyelid lacerations, a cornea-scleral laceration, and prolapsed uvea on the eyelid.



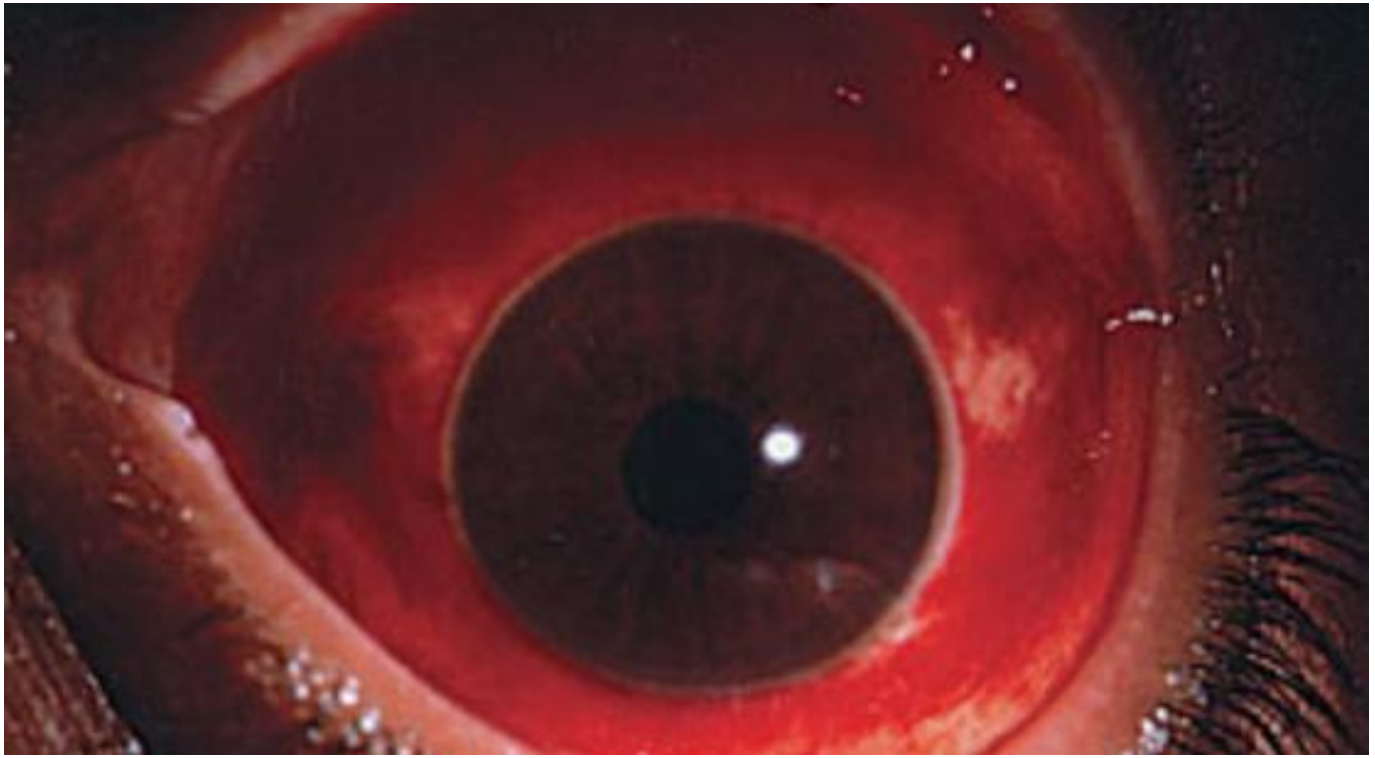
http://www.aafp.org/afp/2003/0401/p1481.html

Nail Penetration



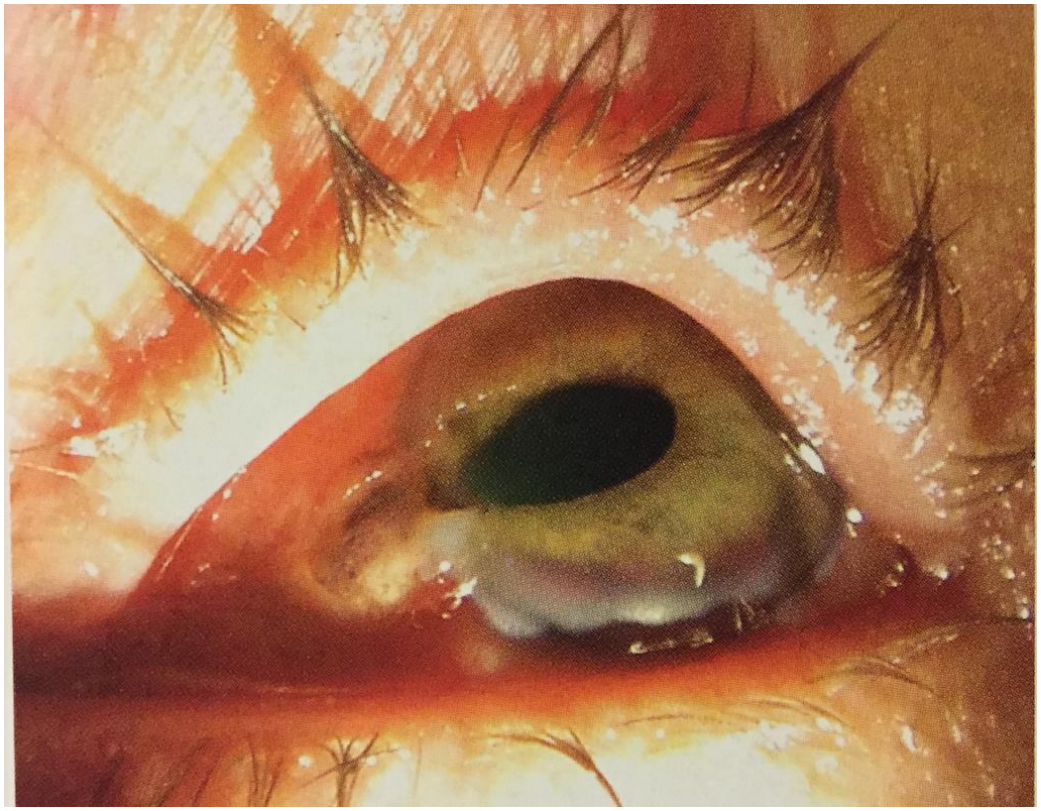
http://www.thehortongroup.com/Insurance_Library/128200916342578

Extensive subconjunctival hemorrhage can be a sign of occult globe rupture



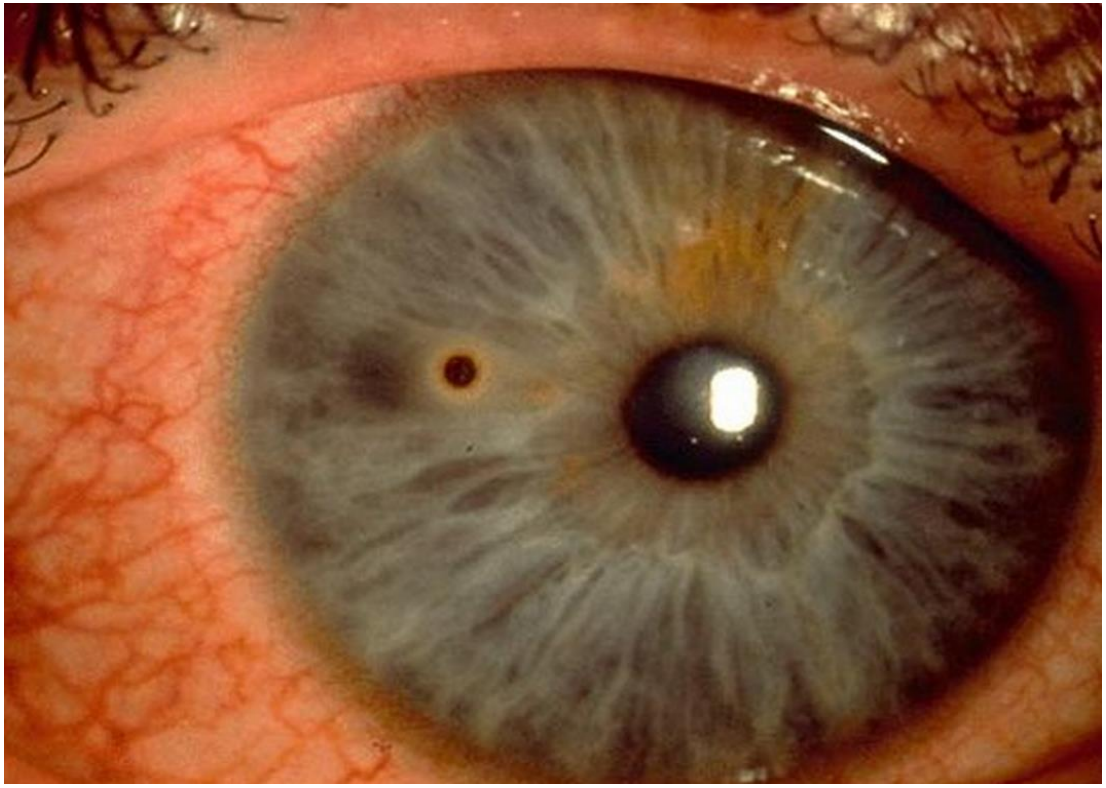
http://www.aafp.org/afp/2003/0401/p1481.html

Globe Rupture



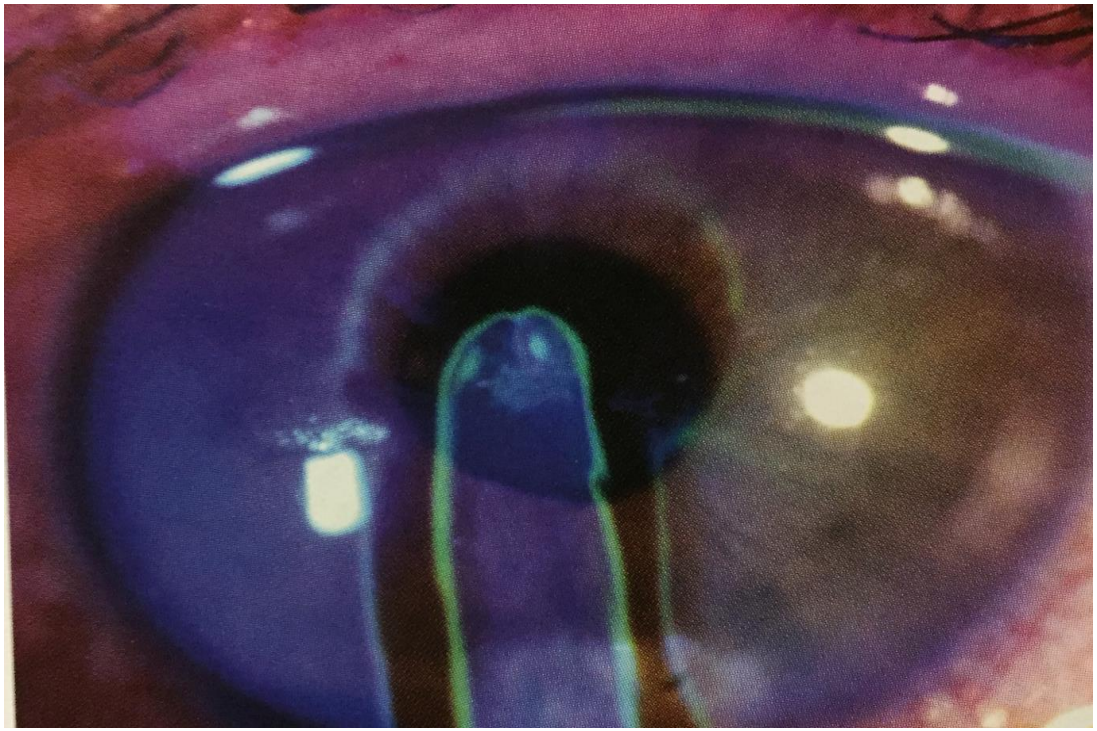
The Wills Eye Manual 5th edition Wolters Kluwer/Lippincott Williams & Wilkens, p. 40.

Foreign Body



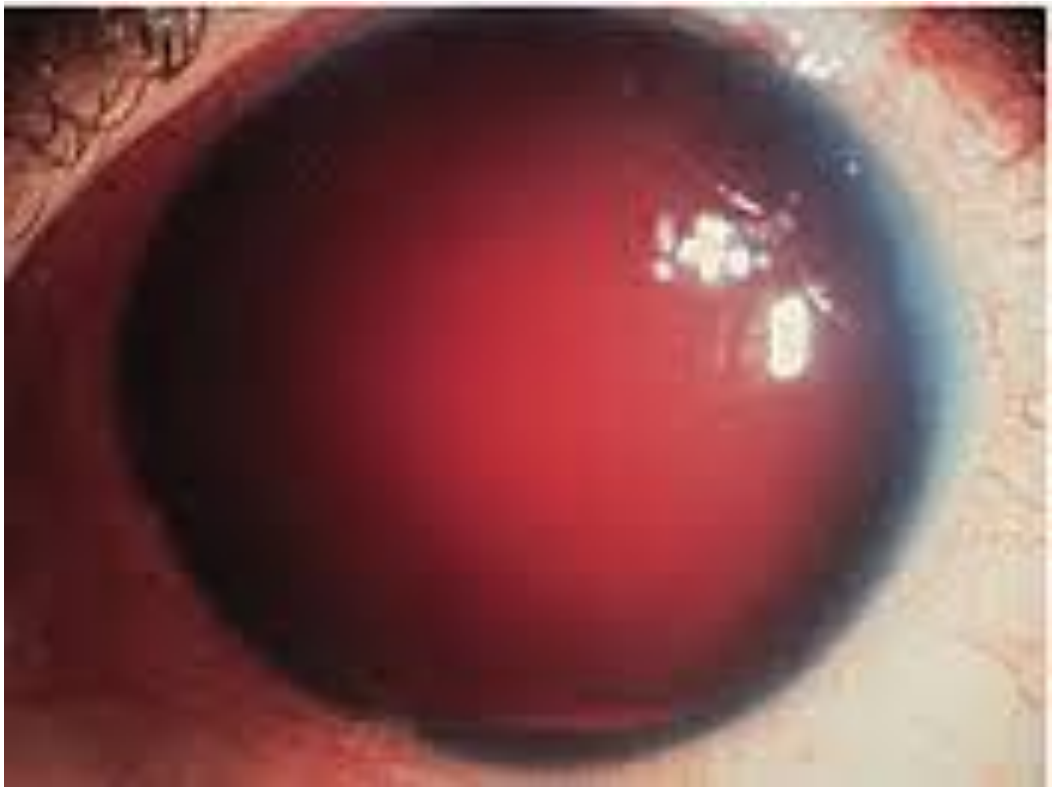
http://lifeinthefastlane.com/ophthalmology-befuddler-010/

Positive Seidel Test

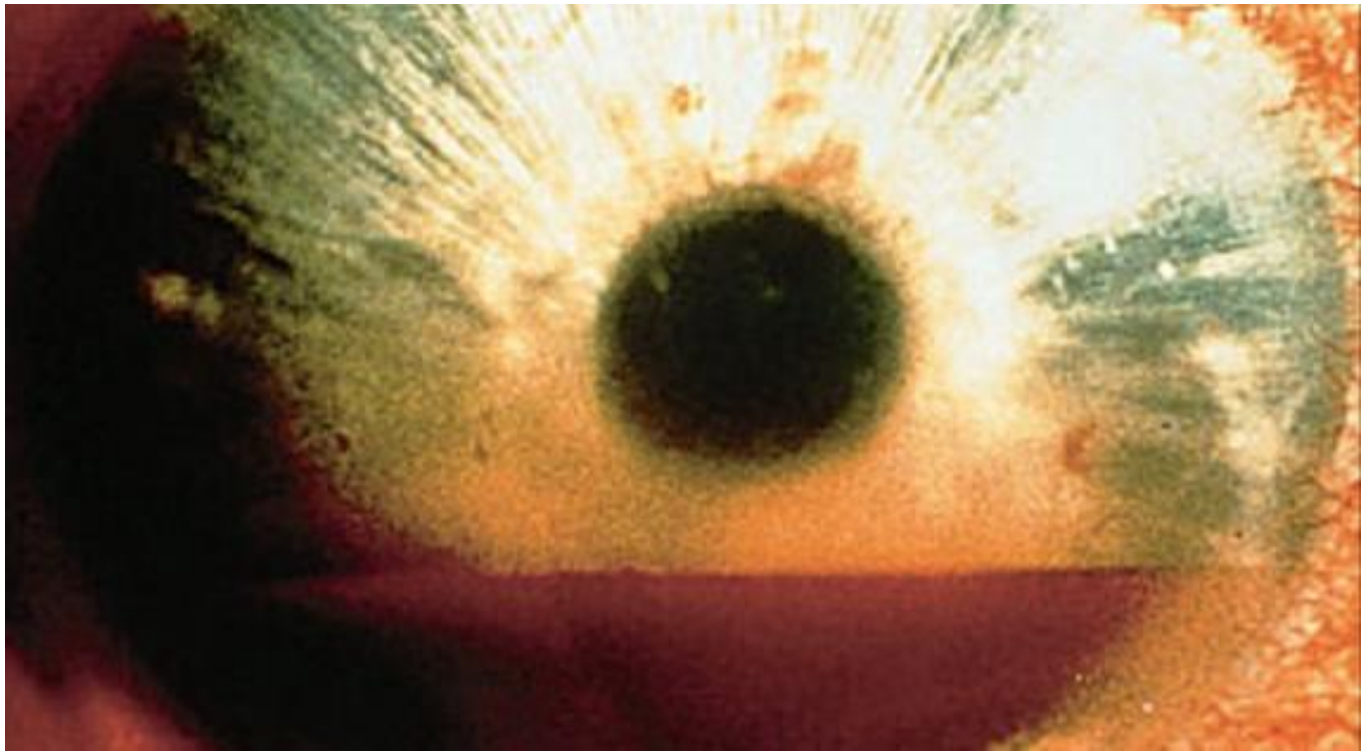


The Wills Eye Manual 5th edition Wolters Kluwer/Lippincott Williams & Wilkens, p. 39.

“8 Ball” Hyphema

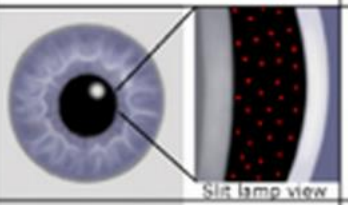


Hyphema



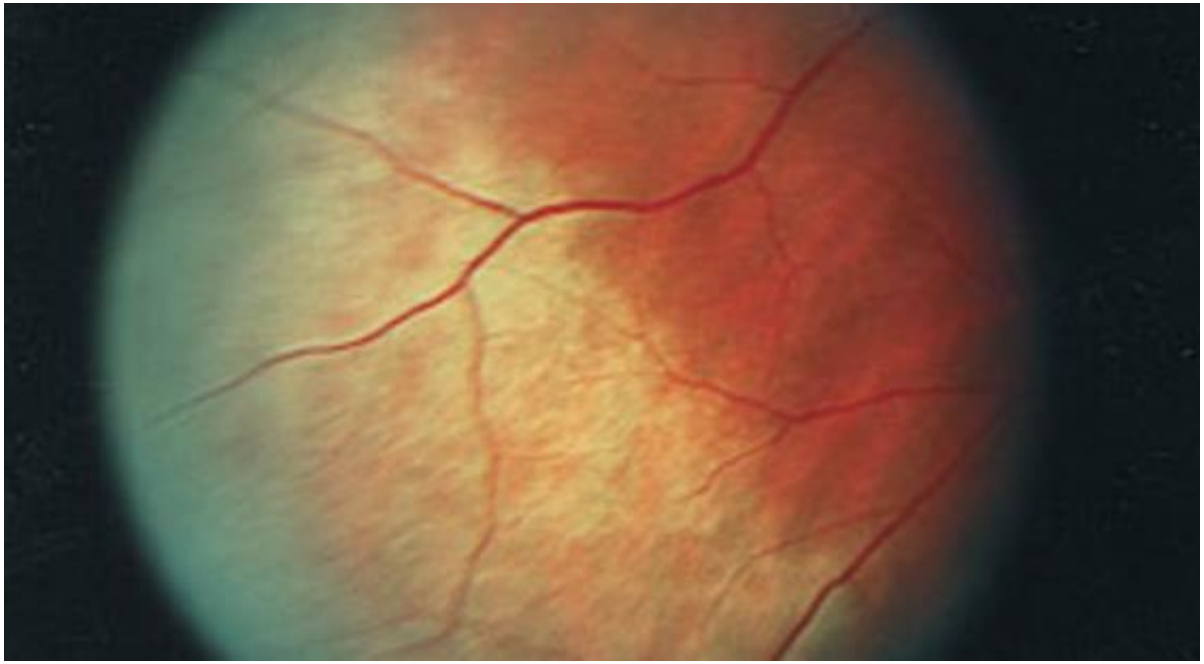
http://www.aafp.org/afp/2003/0401/p1481.html

Hyphema Grading

Grade	Anterior chamber filling	Diagram	Best prognosis for 20/50 vision or better
Microhyphema	Circulating red blood cells by slit lamp exam only		90 percent
I	<33 percent		90 percent
II	33-50 percent		70 percent
III	>50 percent		50 percent
IV	100 percent		50 percent

http://pixgood.com/8-ball-hyphema.html

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.

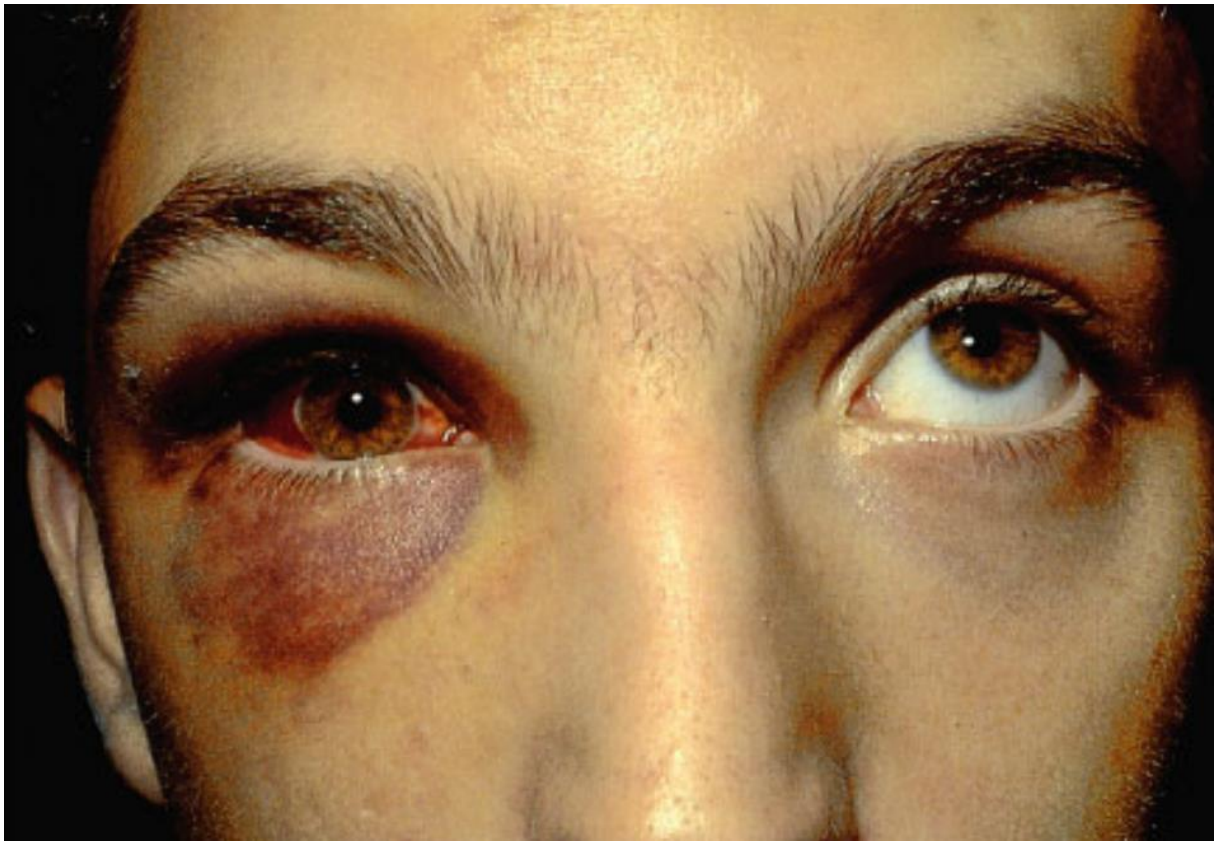


http://www.aafp.org/afp/2003/0401/p1481.html

Eyelid Laceration

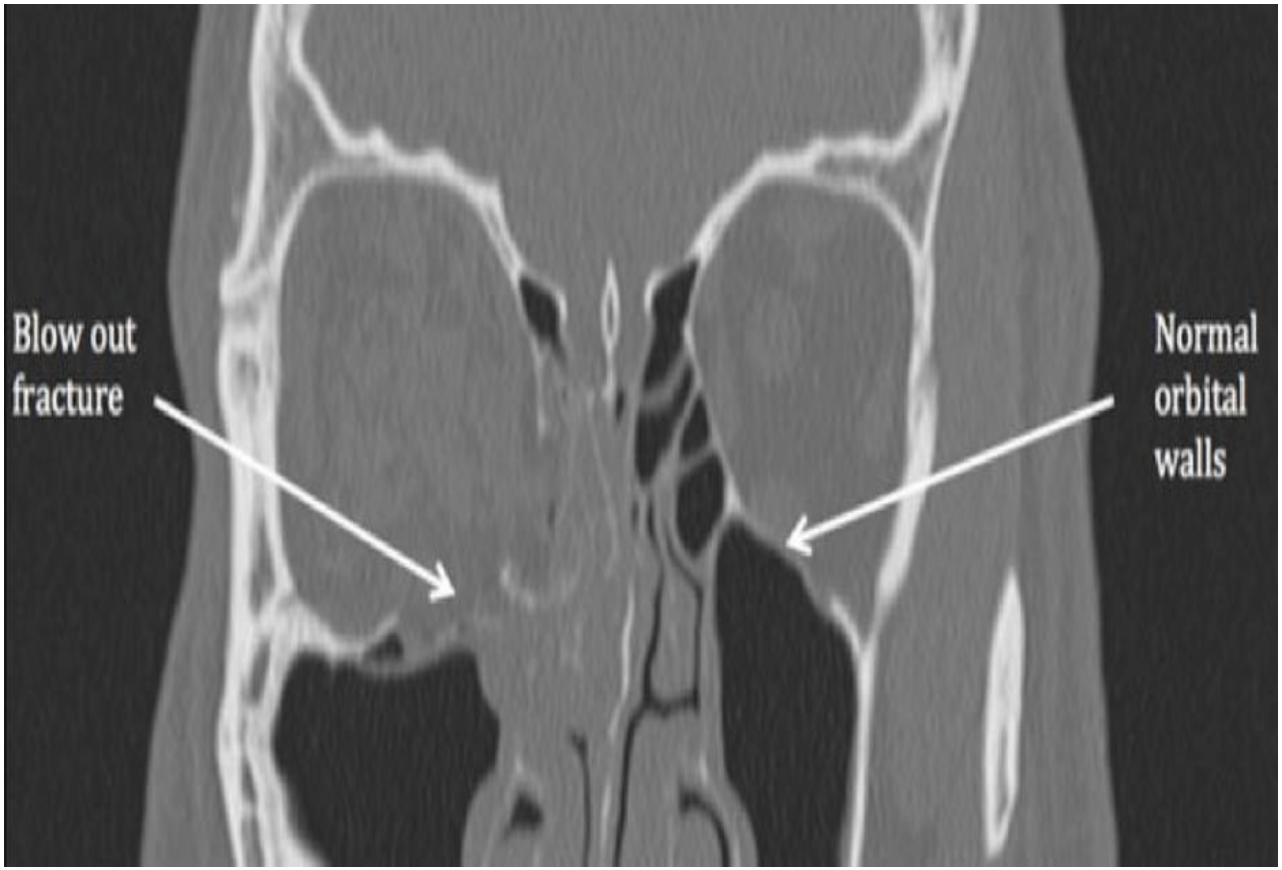
http://www.floridalionsfoundation.org/Eyelid_Injuries.html

Blowout Fracture



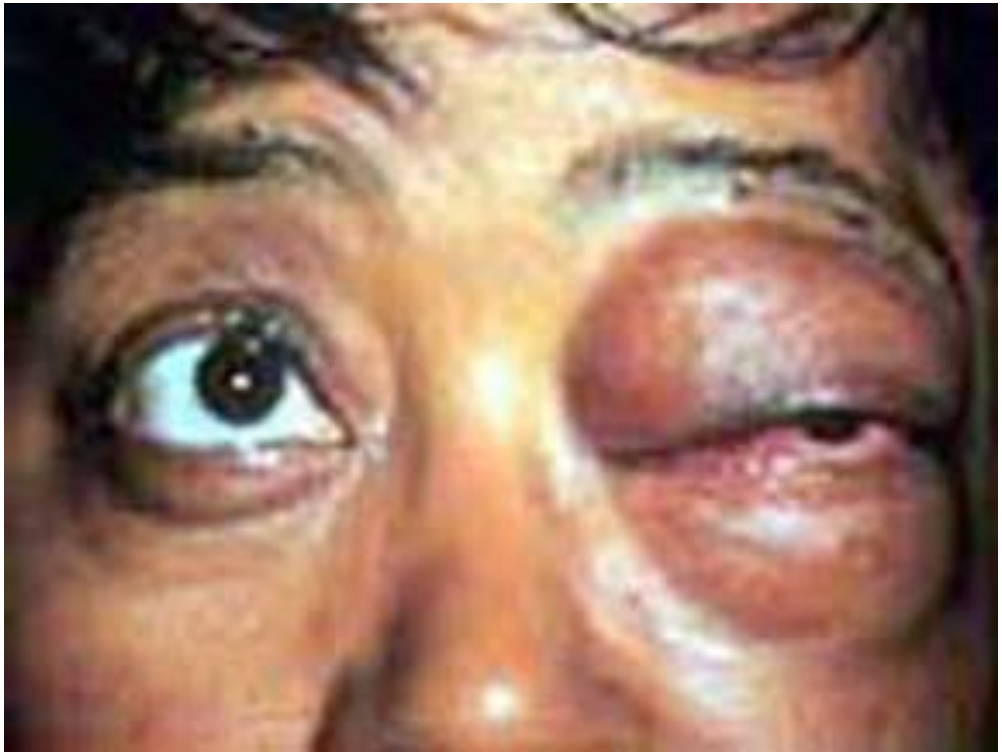
http://web.uni-plovdiv.bg/stu1104541018/docs/res/emergency_medicine_atlas/Ch.1.htm

Cat Scan of Blowout Fracture

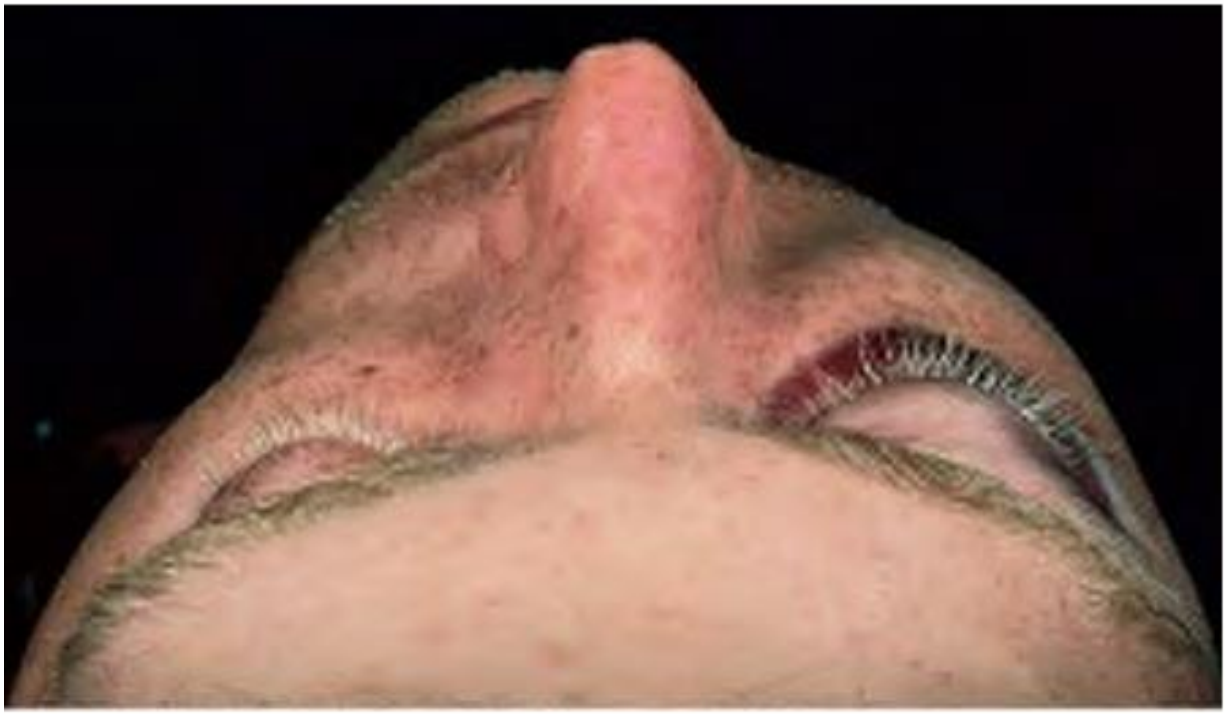


http://www.ohniww.org/orbital-blowout-treatment-fracture/

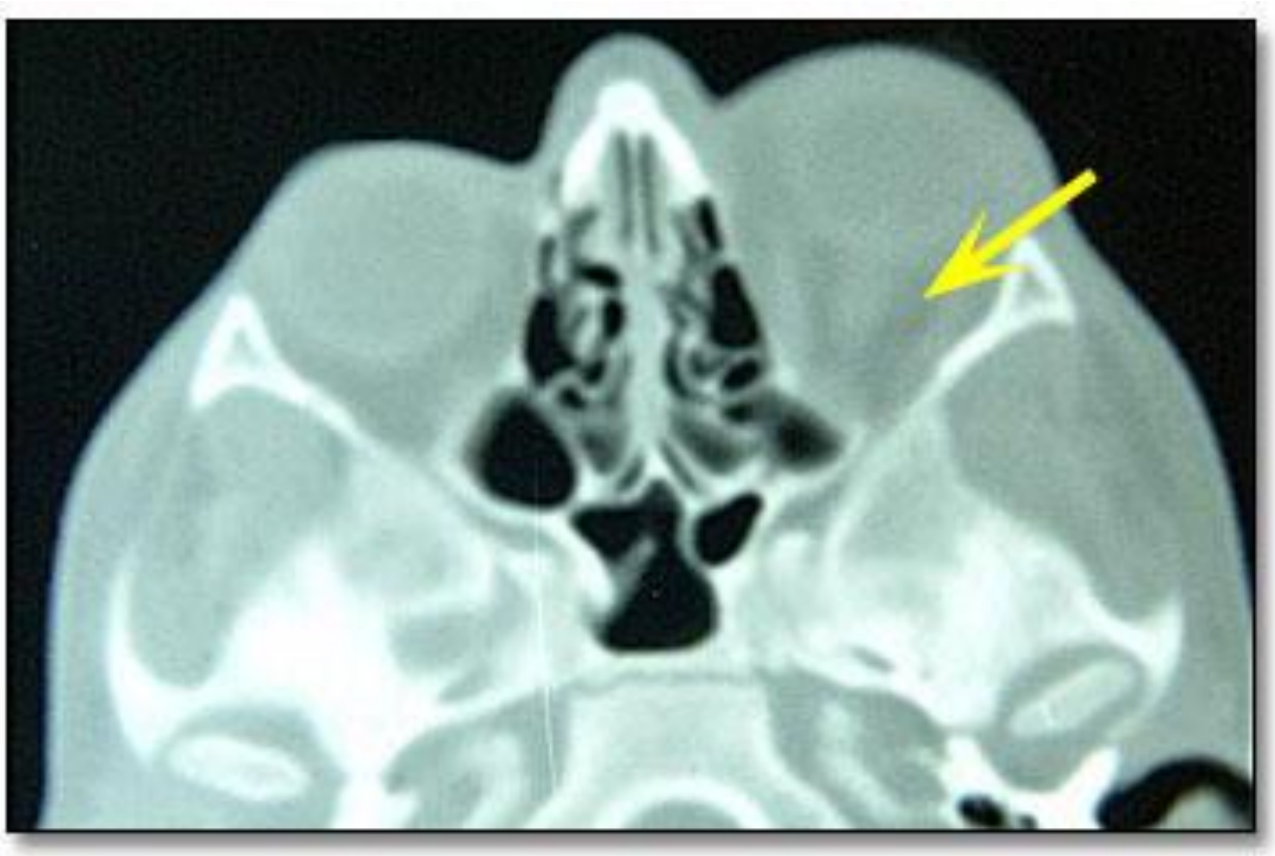
Retrobulbar Hemorrhage



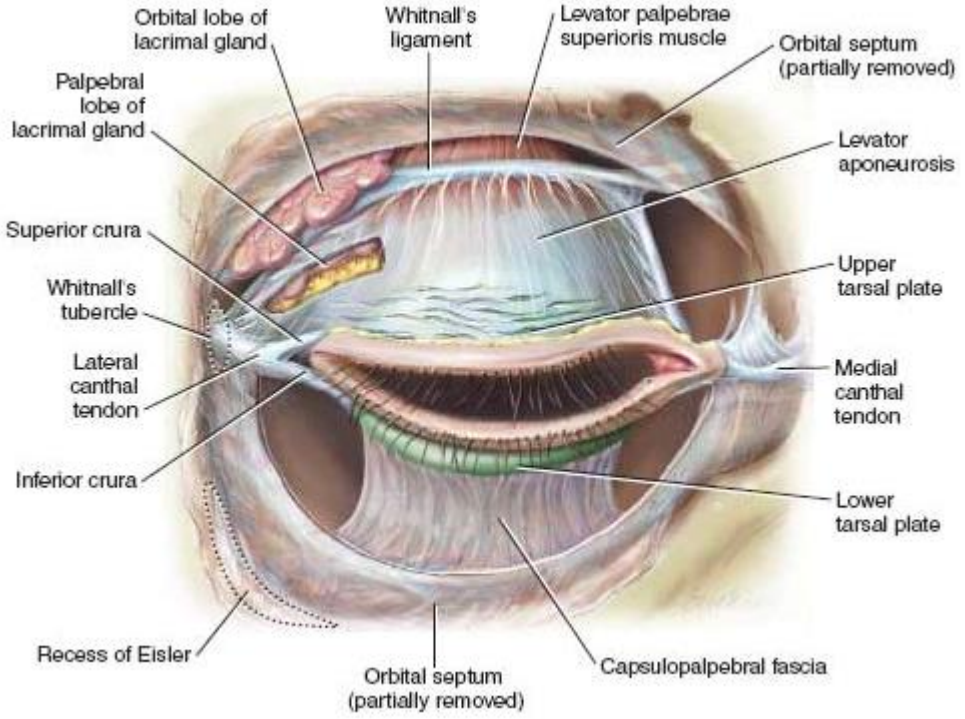
Retrobulbar Hemorrhage



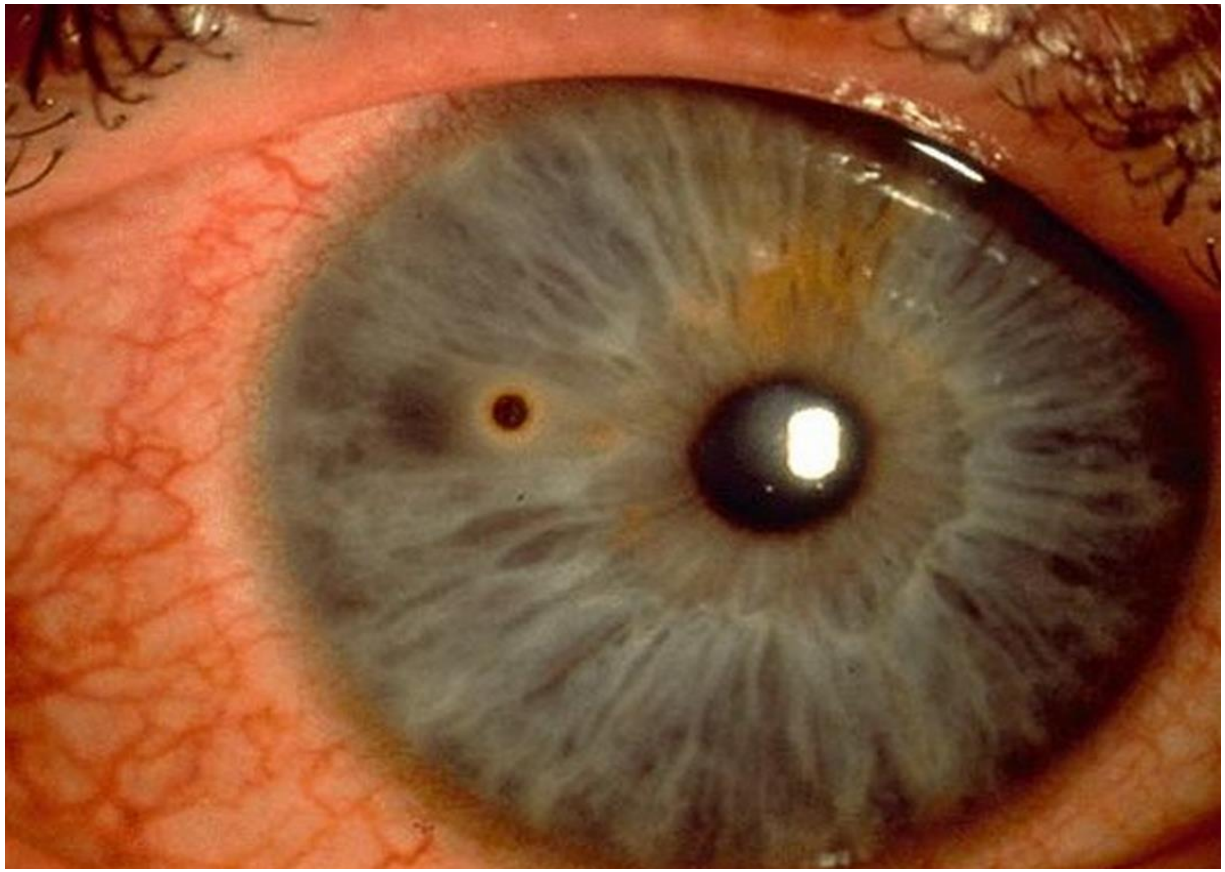
Retrobulbar Hemorrhage



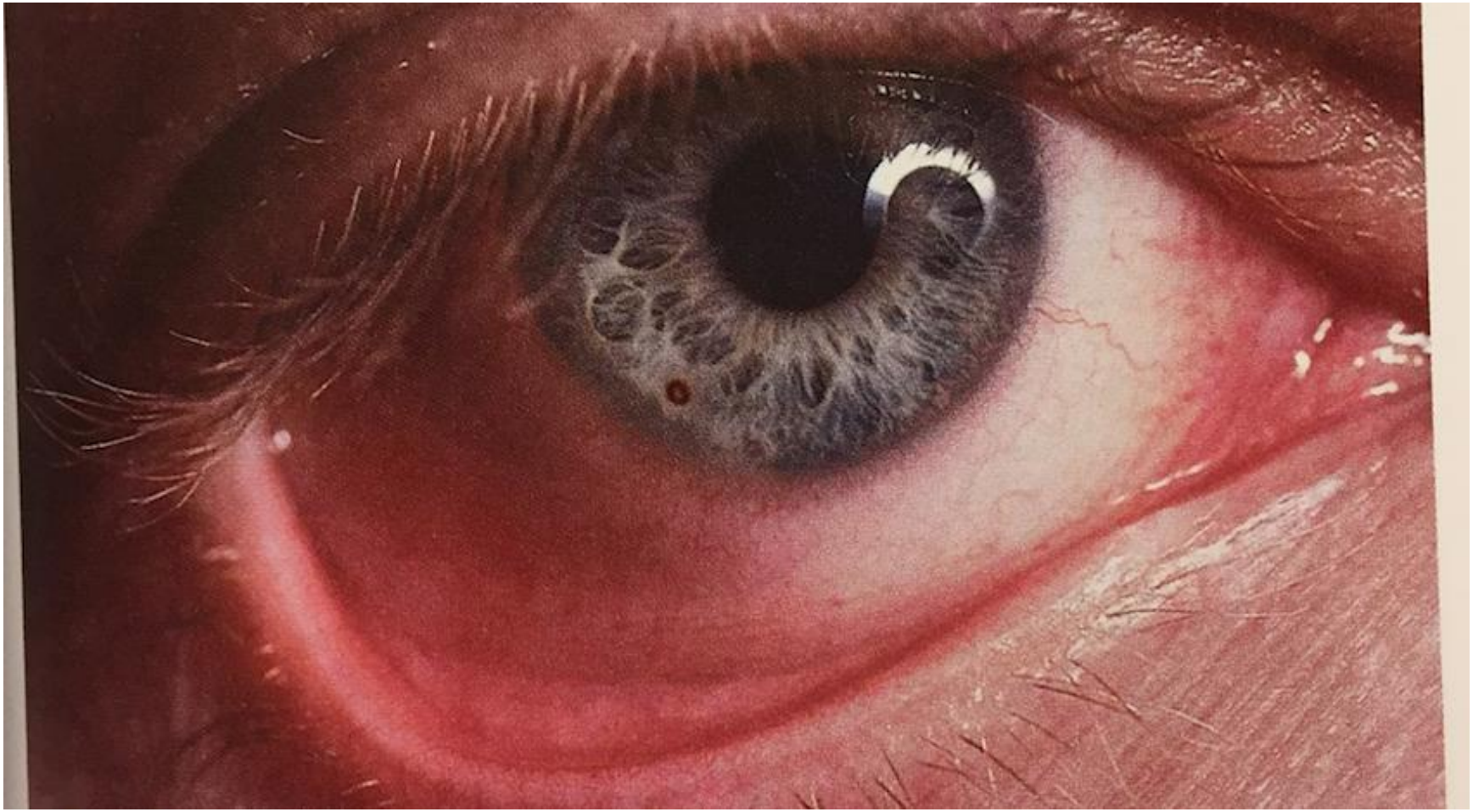
Retrobulbar Hemorrhage



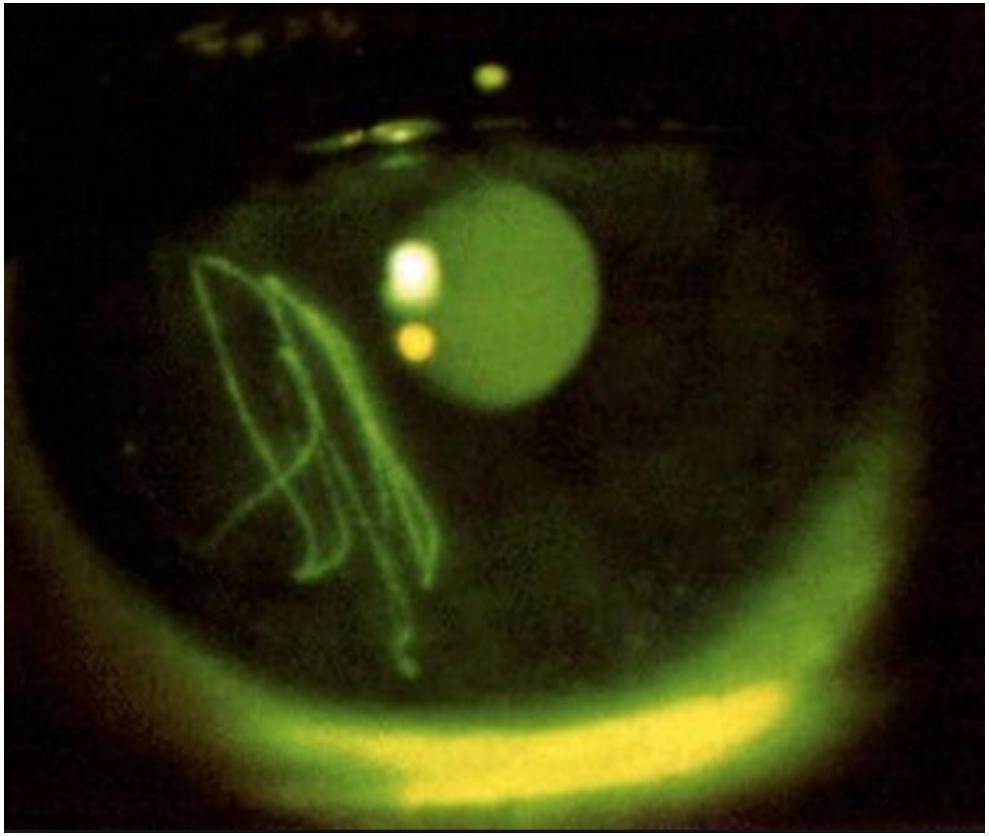
Foreign Body



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

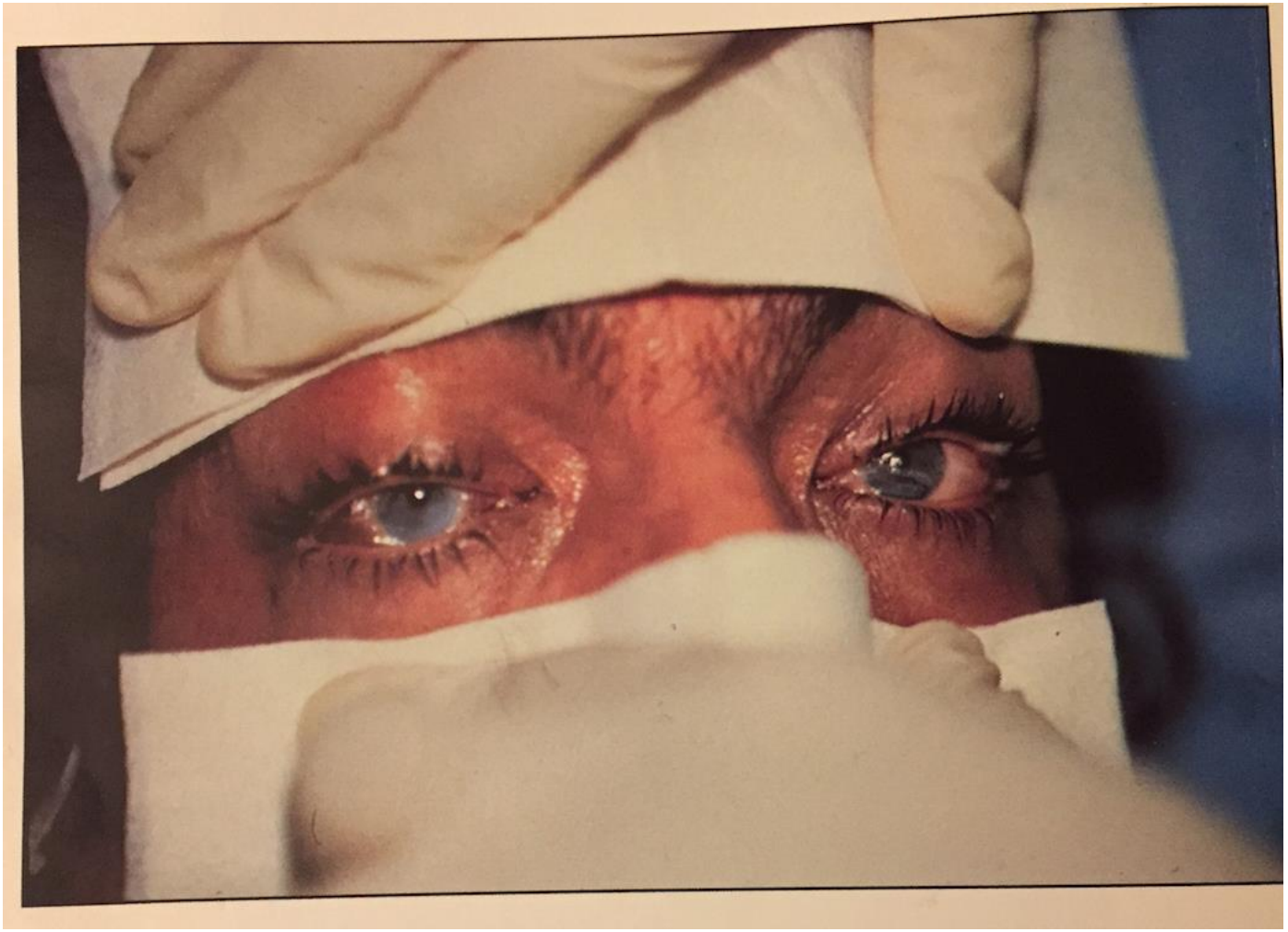


Corneal Abrasion



http://www.fprmed.com/Pages/Physical_Findings/Eyes.html

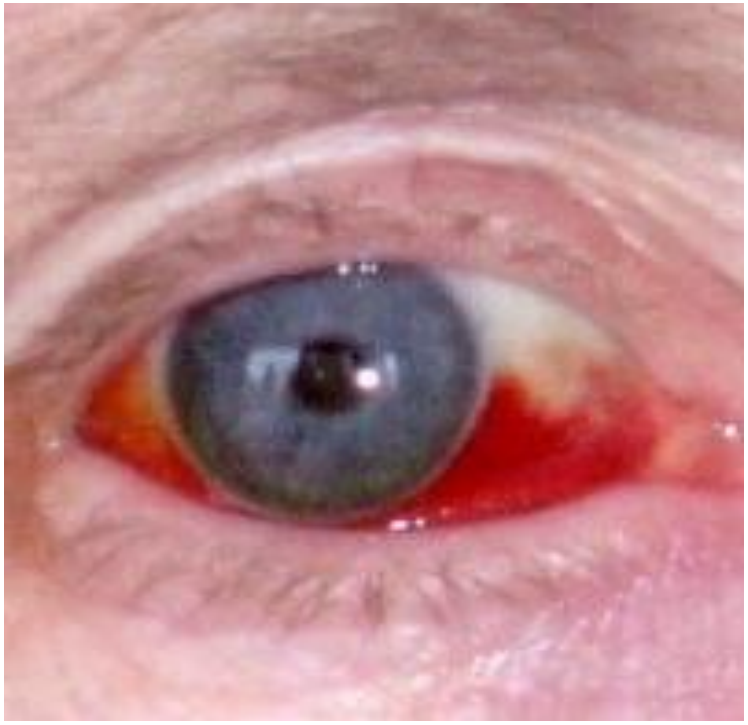
Acute Alkaline Burn



- Ohio Chapter of the American College of Emergency Physicians, pg. 44

“the red eye”

Subconjunctival hemorrhage



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

Viral Conjunctivitis

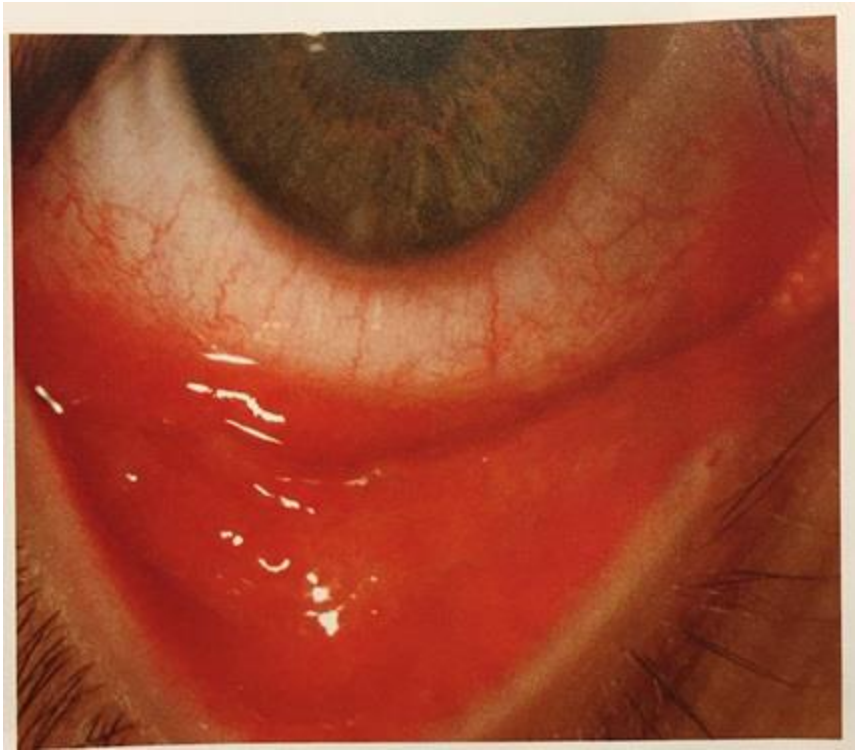


Figure 236-32 (Courtesy of Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)

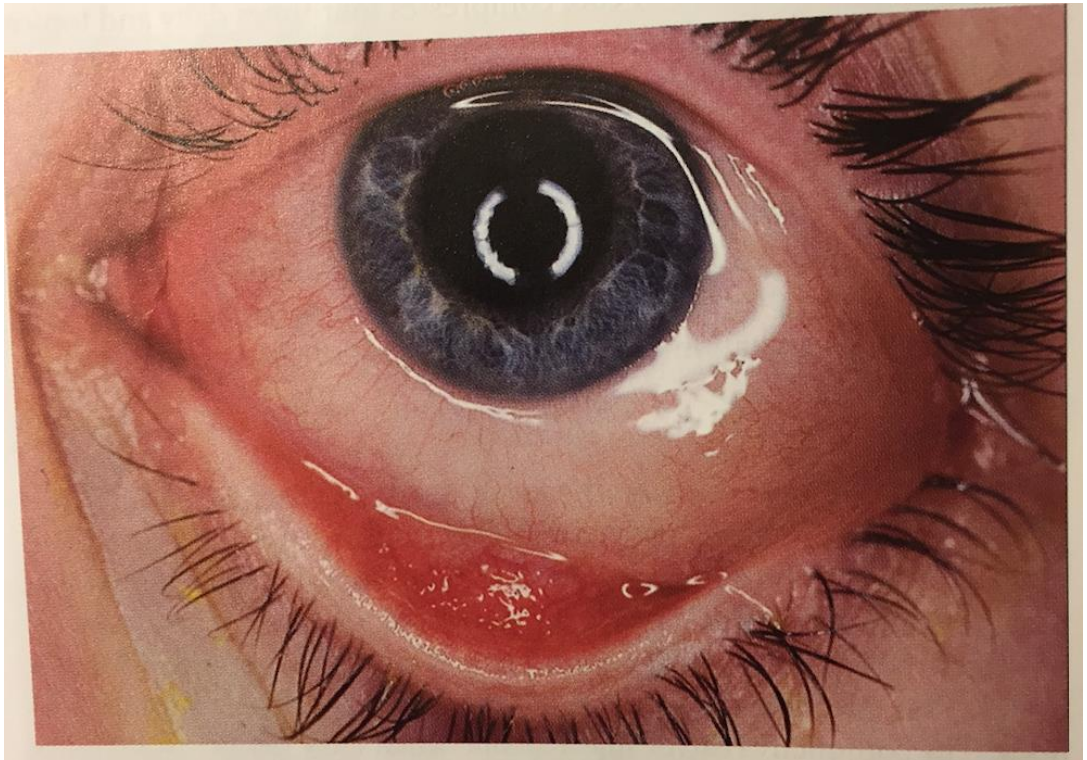


FIGURE 236-35. Prominent chemosis may be seen in allergic conjunctivitis. (Reproduced with permission from Knoop K, Stack L, Storrow A: *Atlas of Emergency Medicine, 2nd ed.* © 2002, McGraw-Hill, New York.)

Bacterial Conjunctivitis

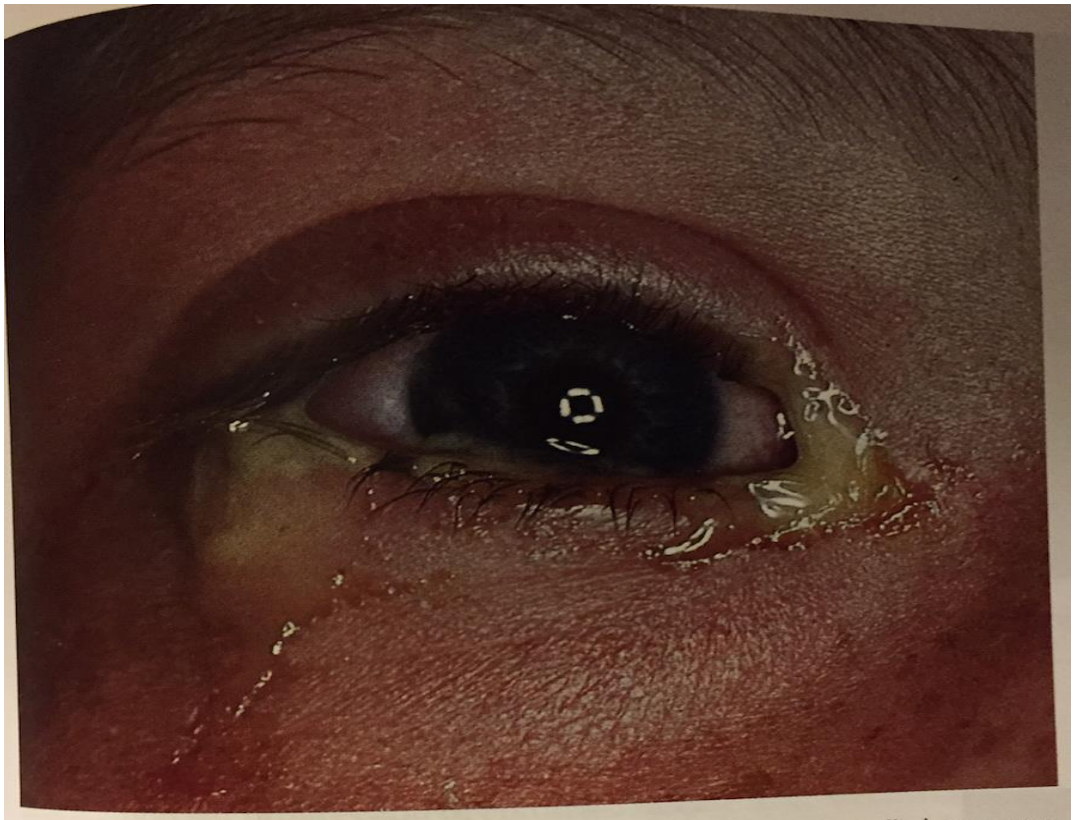
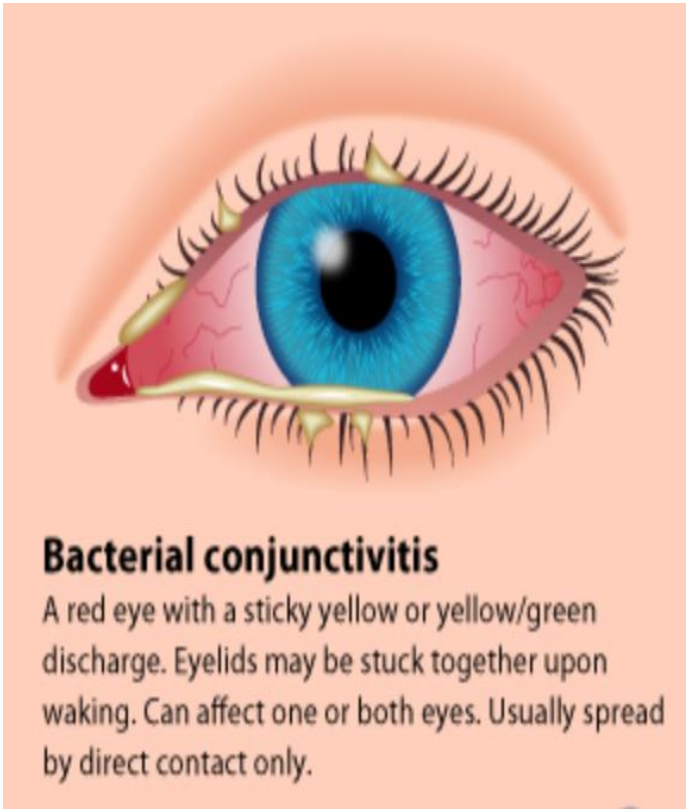


FIGURE 236-31. Bacterial conjunctivitis. Note the mucopurulent discharge, conjunctival injection, and lid edema in a pediatric patient with *Haemophilus influenzae* conjunctivitis. (Reproduced with permission from Knoop K, Stack L, Storrow A: *Atlas of Emergency Medicine, 2nd ed.* © 2002, McGraw-Hill, New York.)

Viral Conjunctivitis

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

Bacterial Conjunctivitis



http://www.allaboutvision.com/conditions/conjunctivitis.htm

Conjunctivitis				Other ocular disorders		
Bacterial	Hyperacute bacterial	Viral	Allergic	Foreign body presence	Corneal abrasion	Blepharitis
• Constant crusty, discolored discharge • Possible photophobia • Some itching • Blurry vision, but clears with blinking • Moderate erythema	• Copious, thick, purulent, yellow-green • Possible photophobia • Some itching • Blurry vision • Severe edema and erythema	• Watery discharge • Photophobia • Some itching • Usually no vision changes • Mild-to-moderate erythema	• White, stringy mucoid discharge • Frequent photophobia • Very itchy • Usually no vision changes • Mild-to-moderate erythema	• Watery discharge • Photophobia • Irritation • Usually blurry vision • Mild-to-moderate erythema	• Watery discharge • Photophobia • Severe pain • Blurry vision • Mild-to-moderate erythema	• Eyelid crusting • No photophobia • Some itching • No vision change • Mild erythema

http://www.clinicaladvisor.com/therapeutic-strategies-for-bacterial-conjunctivitis/article/209142/

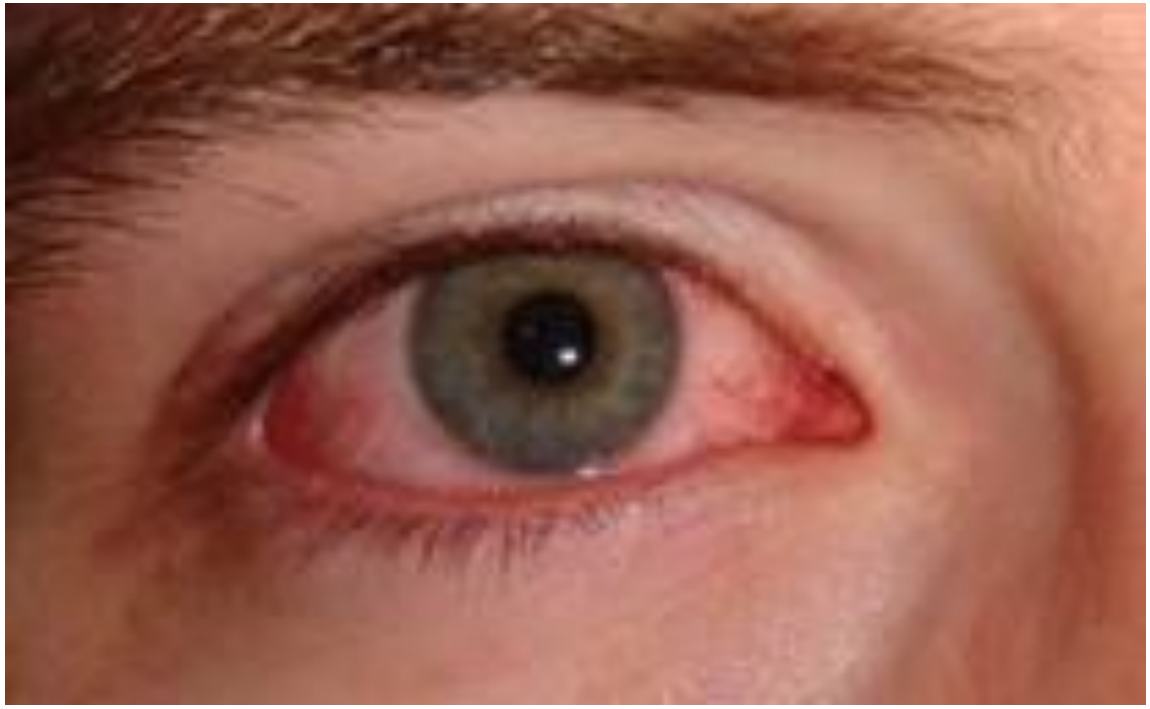
TABLE 2. Common causes of bacterial conjunctivitis by age group[5,9-11]

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)

http://www.clinicaladvisor.com/therapeutic-strategies-for-bacterial-conjunctivitis/article/209142/

Iritis with Ciliary Flush

Red Eye



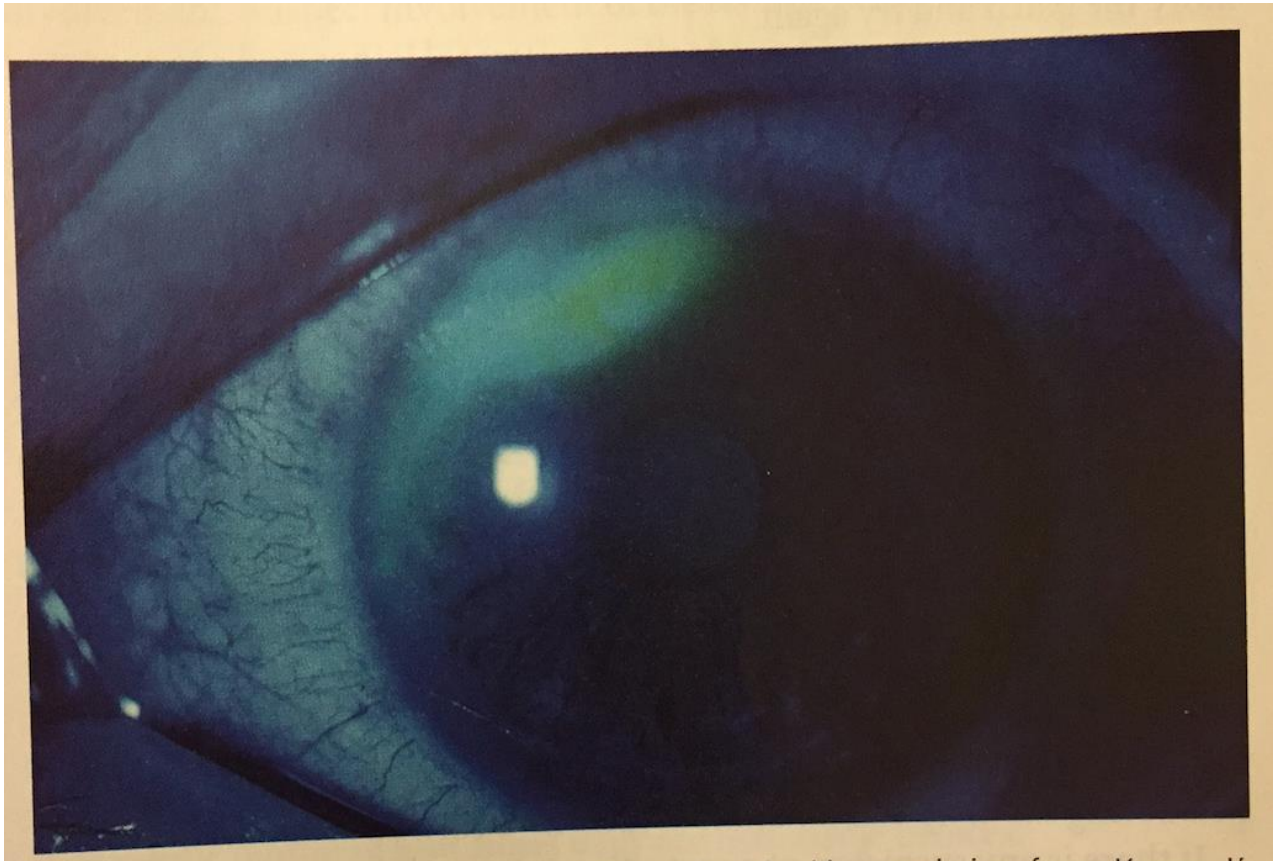
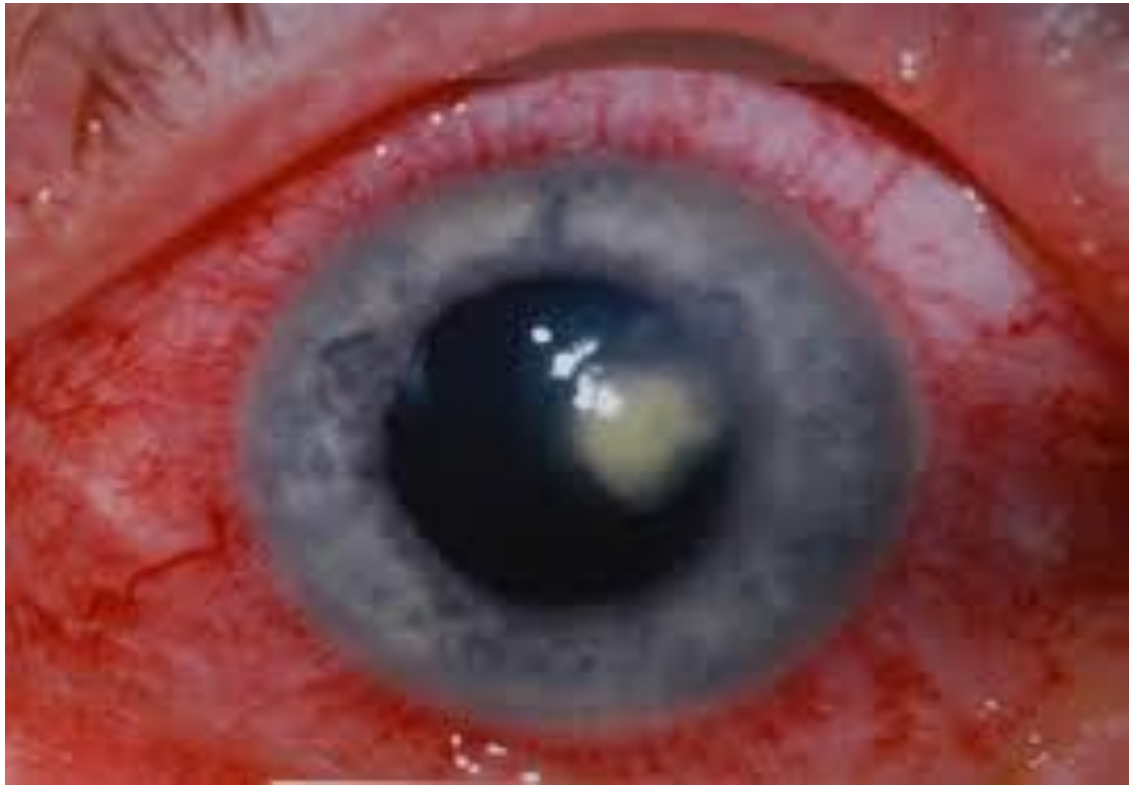


FIGURE 236-39. Corneal abrasion. (Reproduced with permission from Knoop K, Stack L, Storrow A: *Atlas of Emergency Medicine, 2nd ed.* © 2002, McGraw-Hill, New York.)

Corneal Ulceration



Siedel Stain

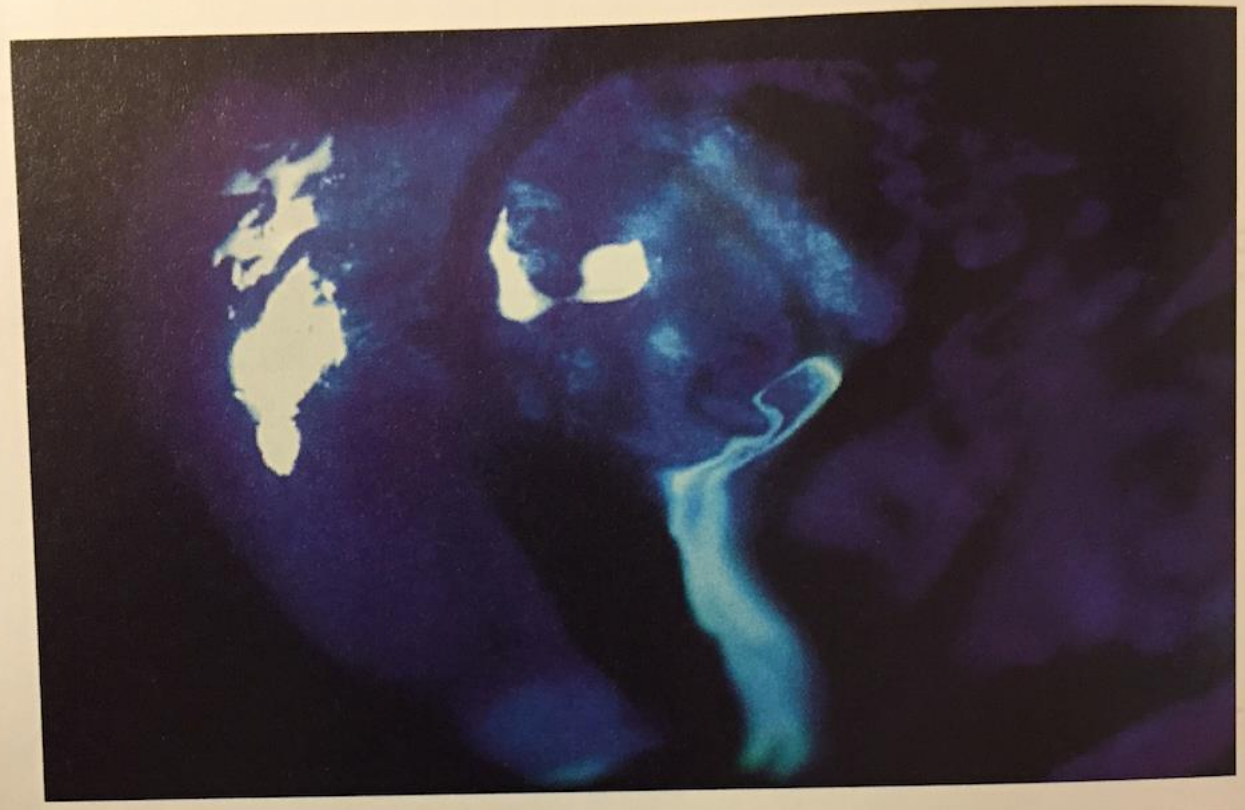
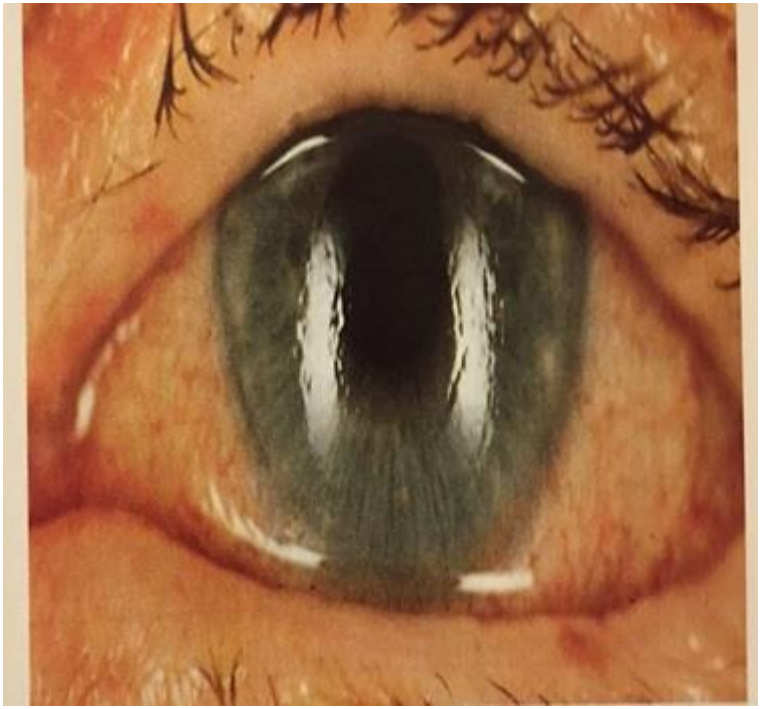
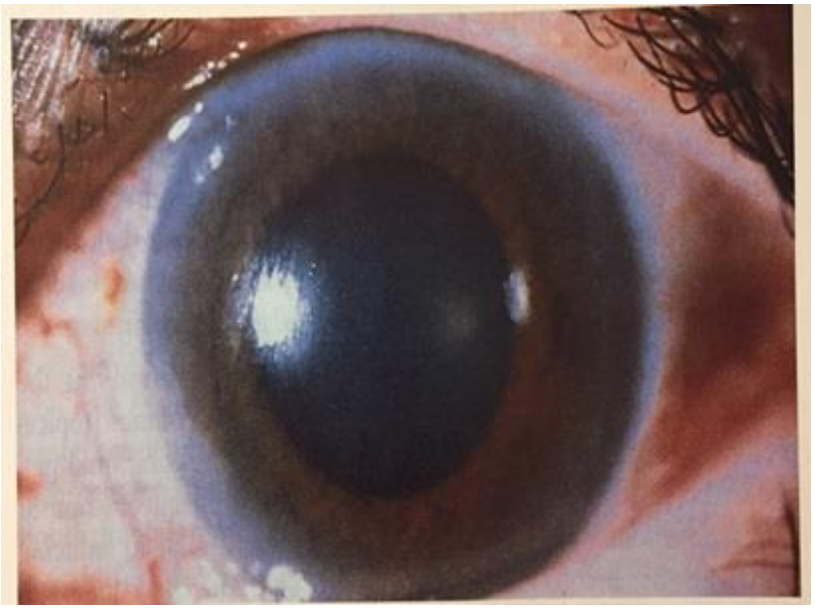


FIGURE 236-22. Positive Seidel test showing aqueous leaking through a full-thickness corneal wound. Aqueous will turn fluorescein lime-green under a cobalt-blue light as it oozes through the wound while being observed at the slit lamp.

Acute glaucoma

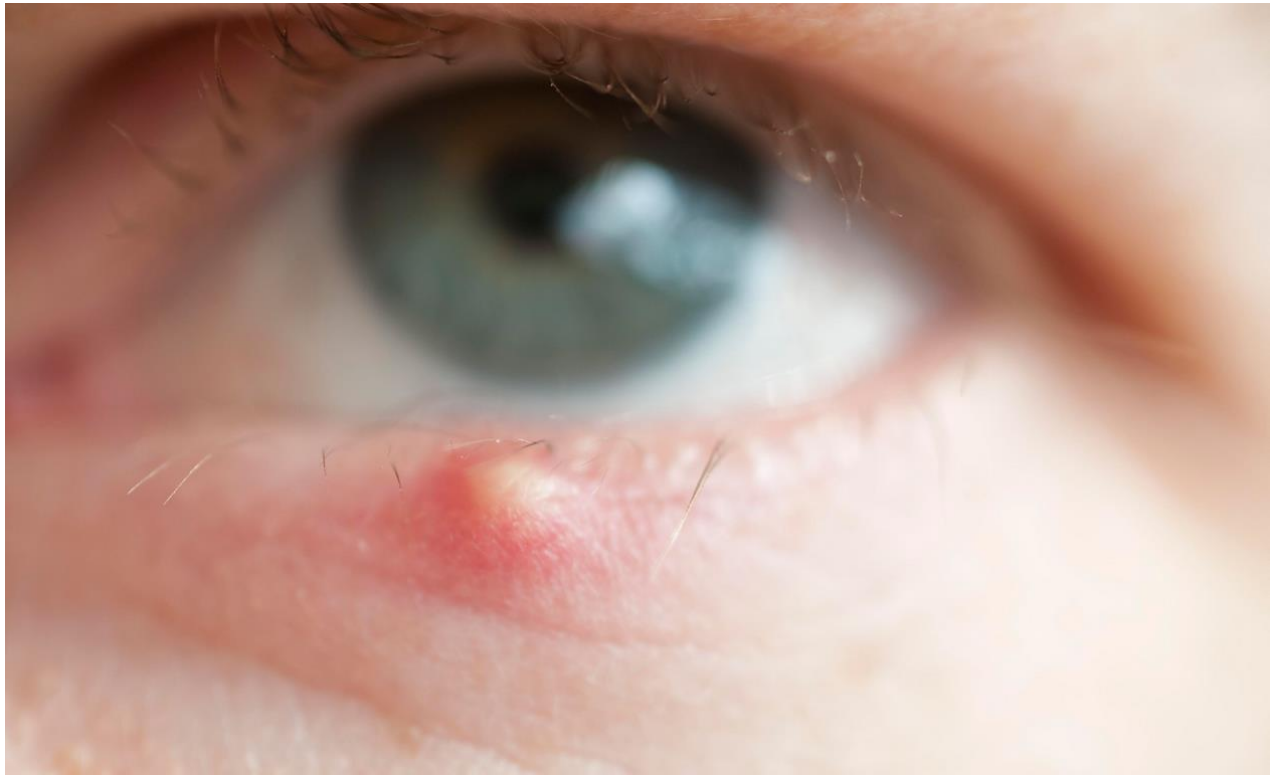




Figures 236-59,60 (Courtesy of Knoop K., Stack I., Storrow A.: *Atlas of Emergency Medicine, 2nd e*d. 2002, McGraw-Hill, New York.)

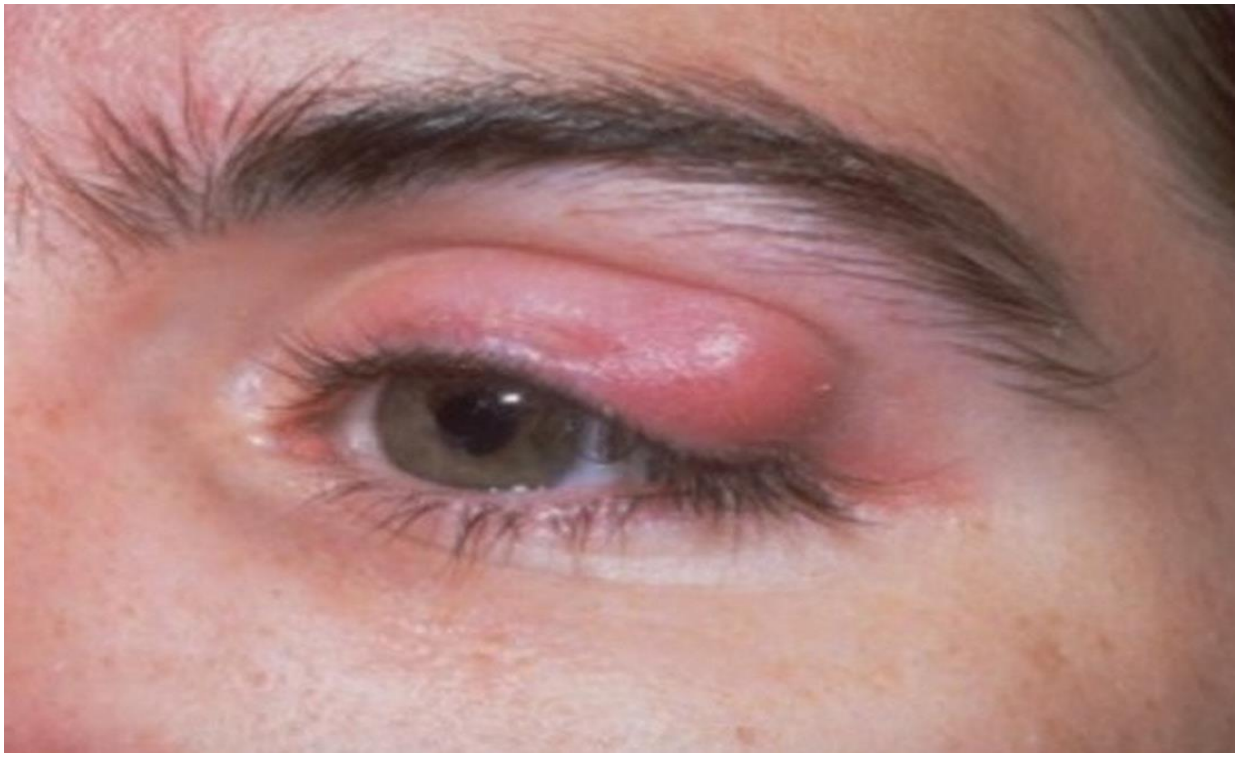
Other infections

Stye (Hordedum)



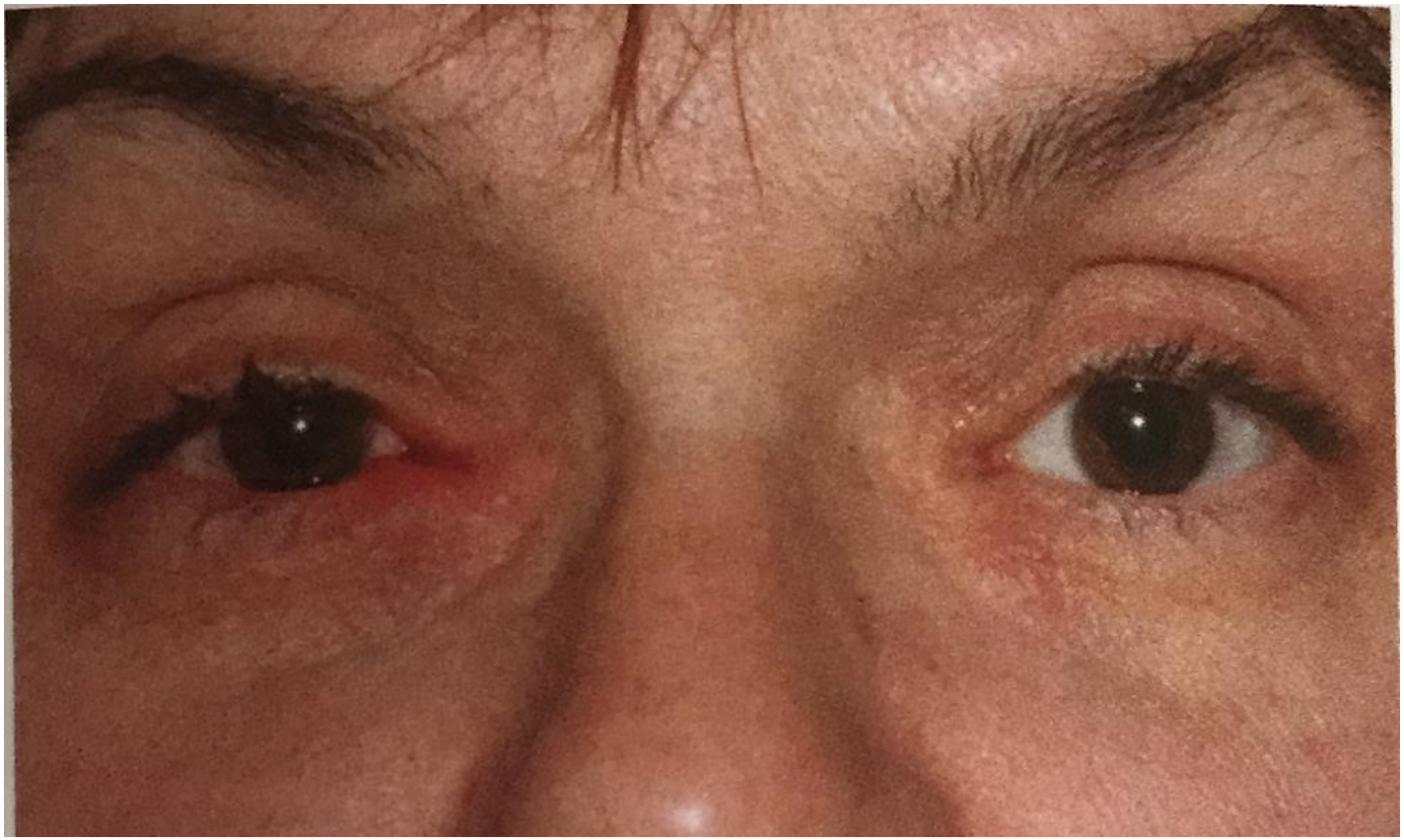
http://www.onlyeyesknew.com

Chalazion



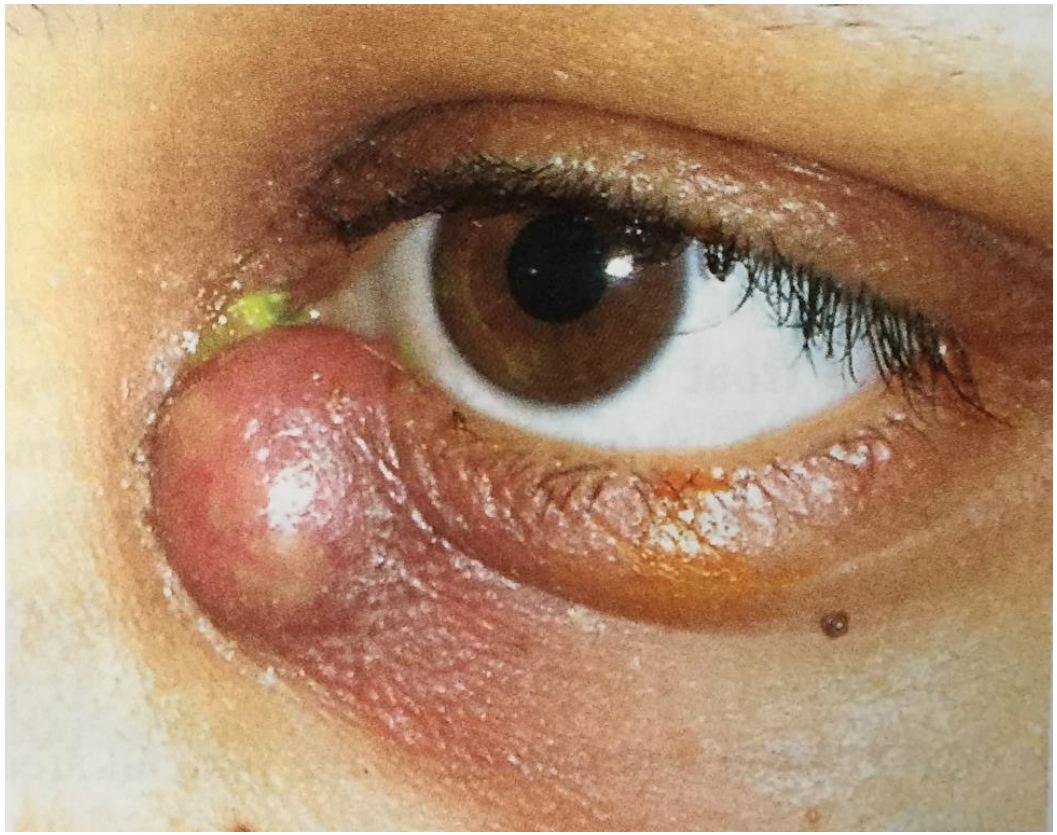
http://www.charcoalremedies.com

Canaliculitis



The Wills Eye Manual 5th edition Wolters Kluwer/Lippincott Williams & Wilkens, p. 137.

Dacryocystitis

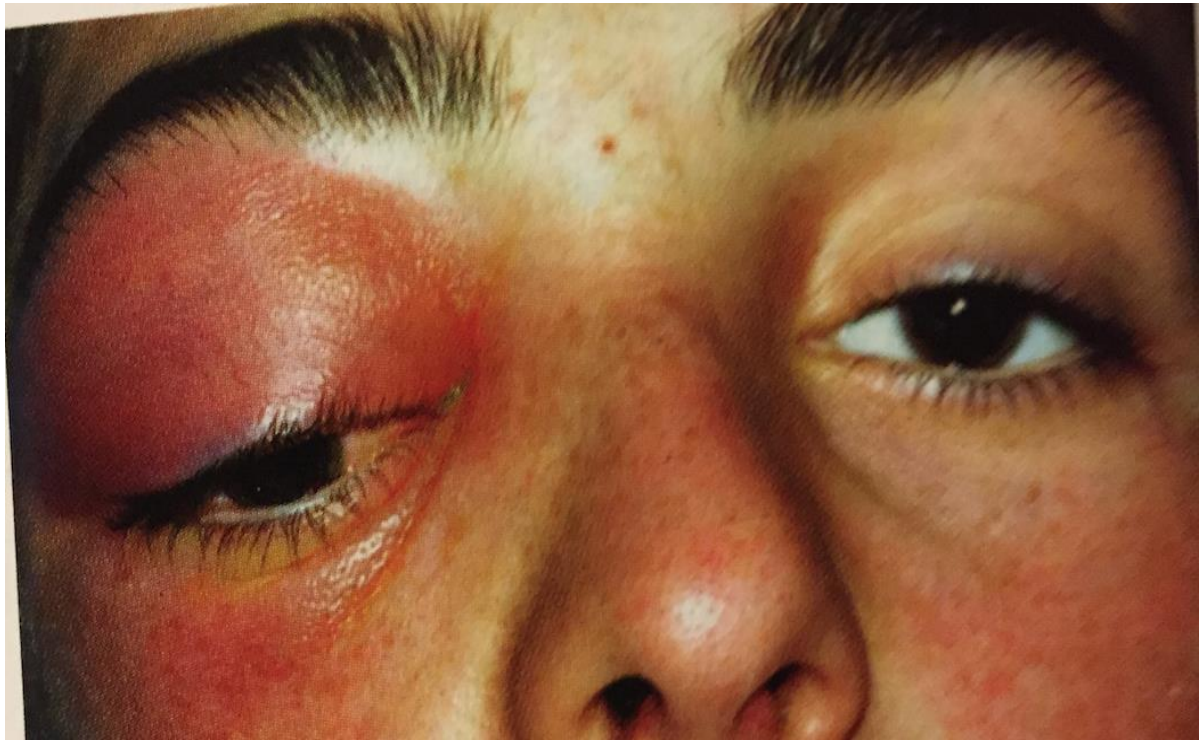


The Wills Eye Manual 5th edition Wolters Kluwer/Lippincott Williams & Wilkens, p. 138.

Periorbital Cellulitis

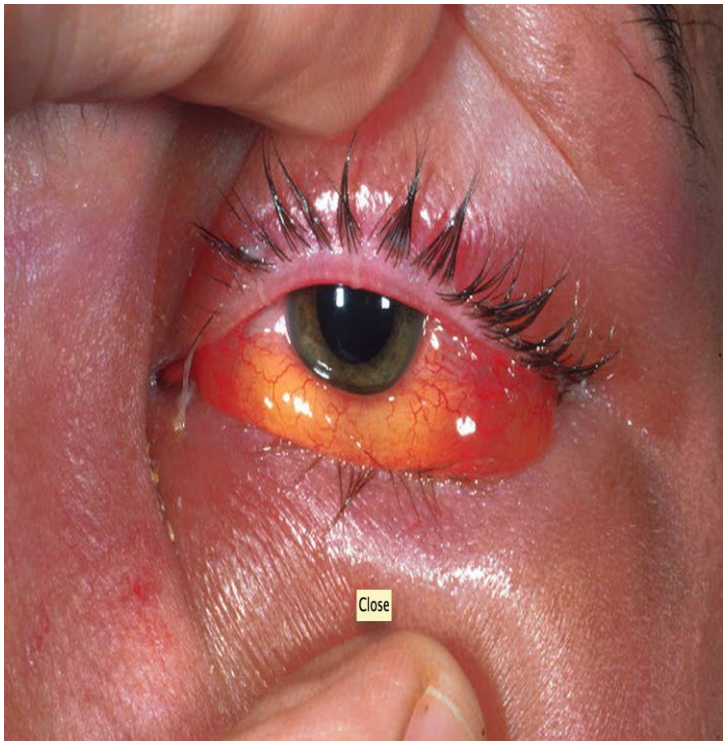
http://ehealthwall.com

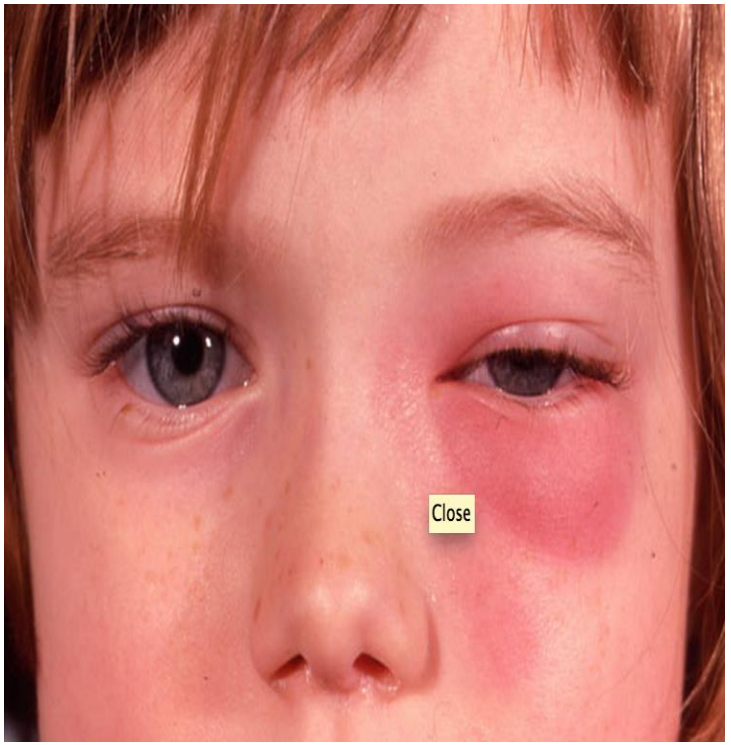
Orbital Cellulitis



The Wills Eye Manual 5th edition Wolters Kluwer/Lippincott Williams & Wilkens, p. 151.

Orbital Cellulitis





http://medicalpicturesinfo.com/pathophysiology-of-orbital-cellulitis/

Periorbital vs orbital Cellulitis Chart

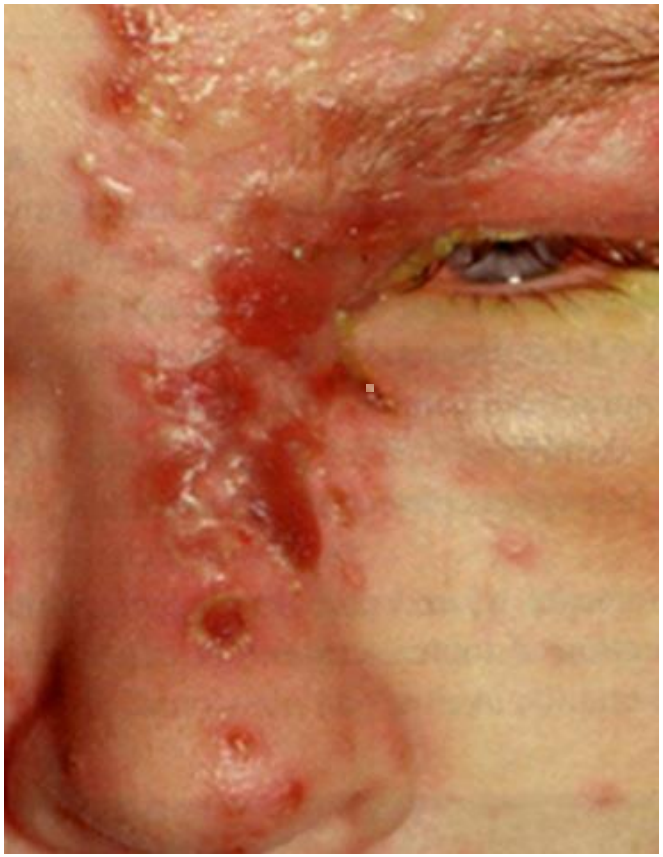
Periorbital

- 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 perorbital with fever
- Decreased visual acuity
- Pupil abnormality
- Painful EOM movements
- Limited EOM / ophthalmoplegia
- proptosis

Hutchinson's Sign



http://quizlet.com/15650046/savory-eye-infection-flash-cards/

Dendritic Lesion

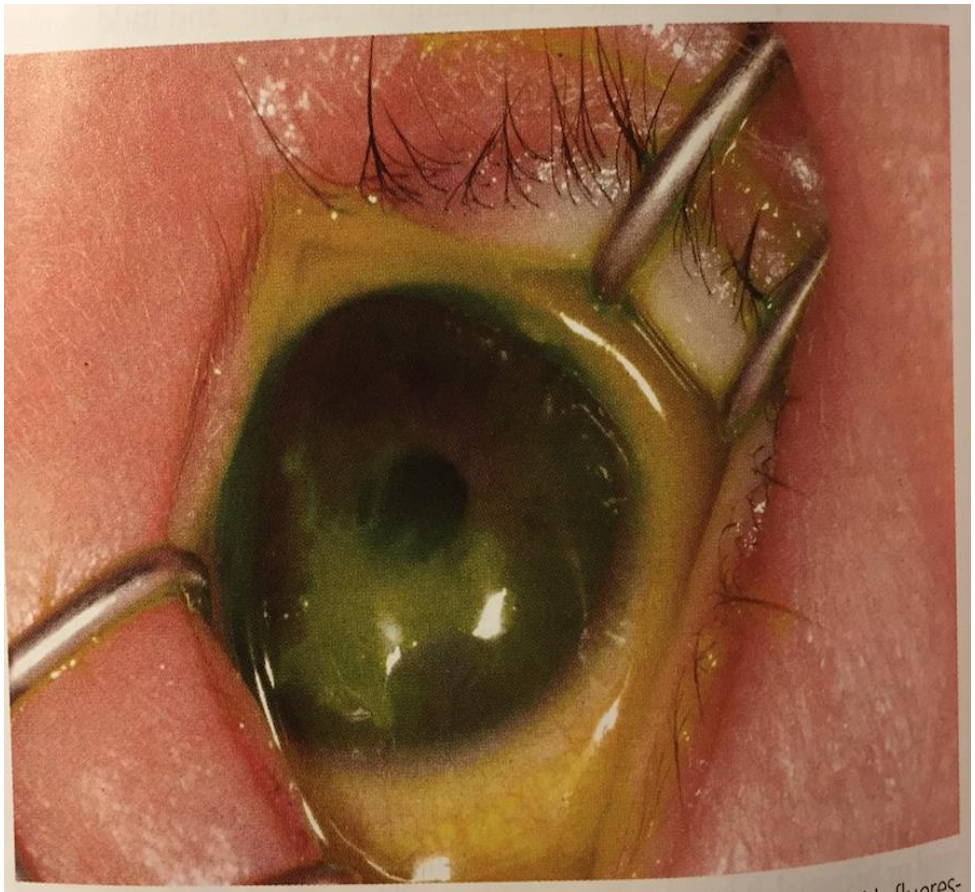
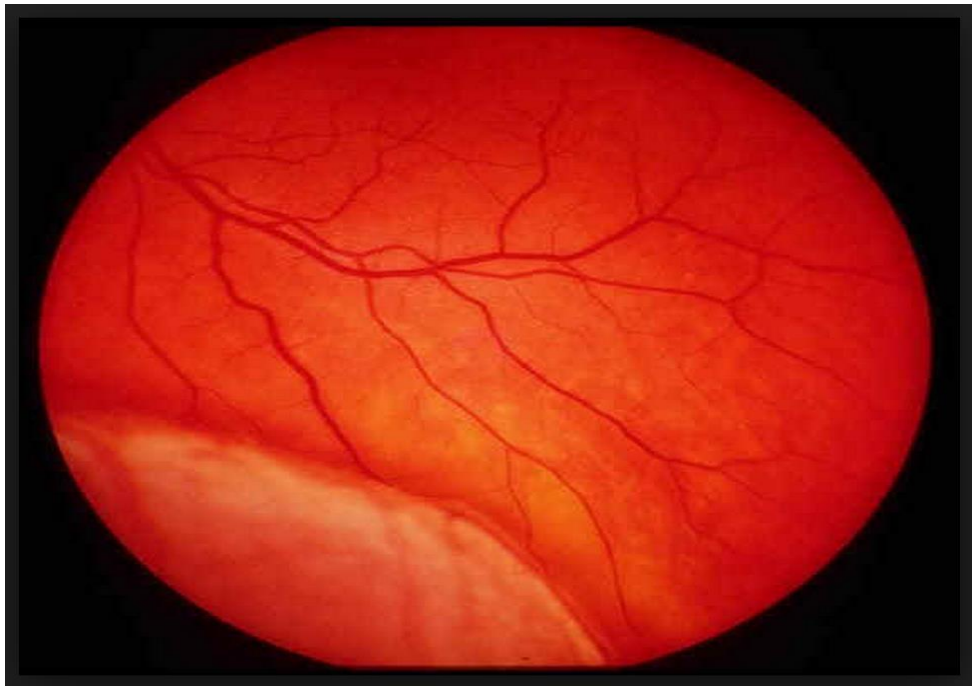


FIGURE 236-36. Herpes simplex corneal dendrite in an infant seen with fluorescein staining. (Courtesy of Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)

Fundus

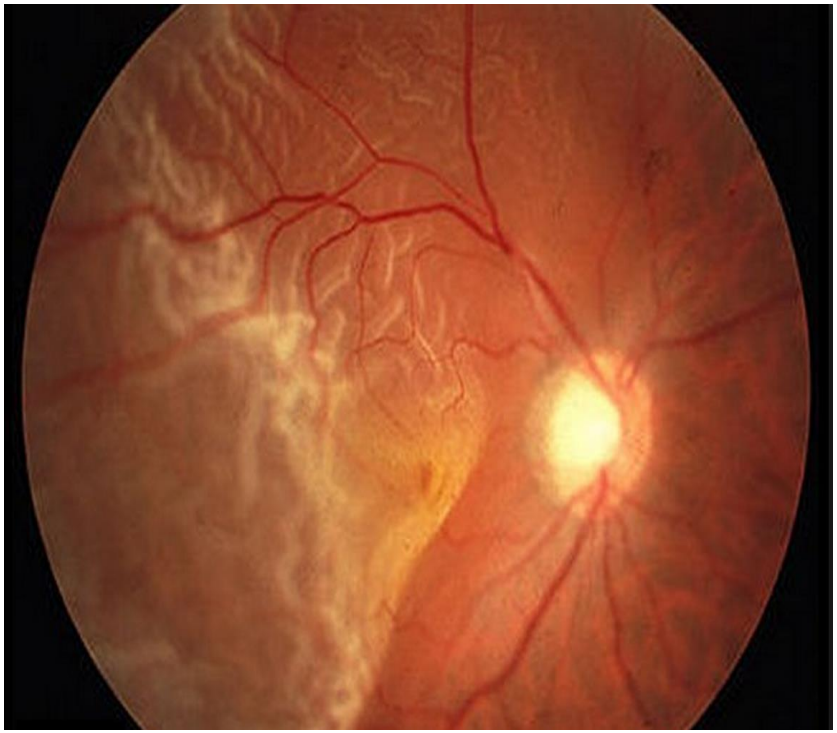
“painless vision loss"

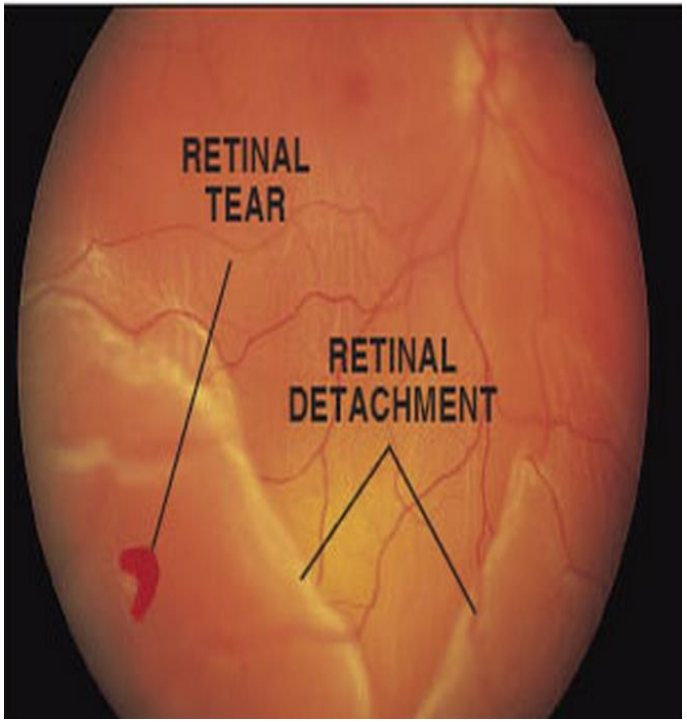
Retinal Detachment



http://emedsa.org.au/EDHandbook/eyes.htm

Retinal Detachment

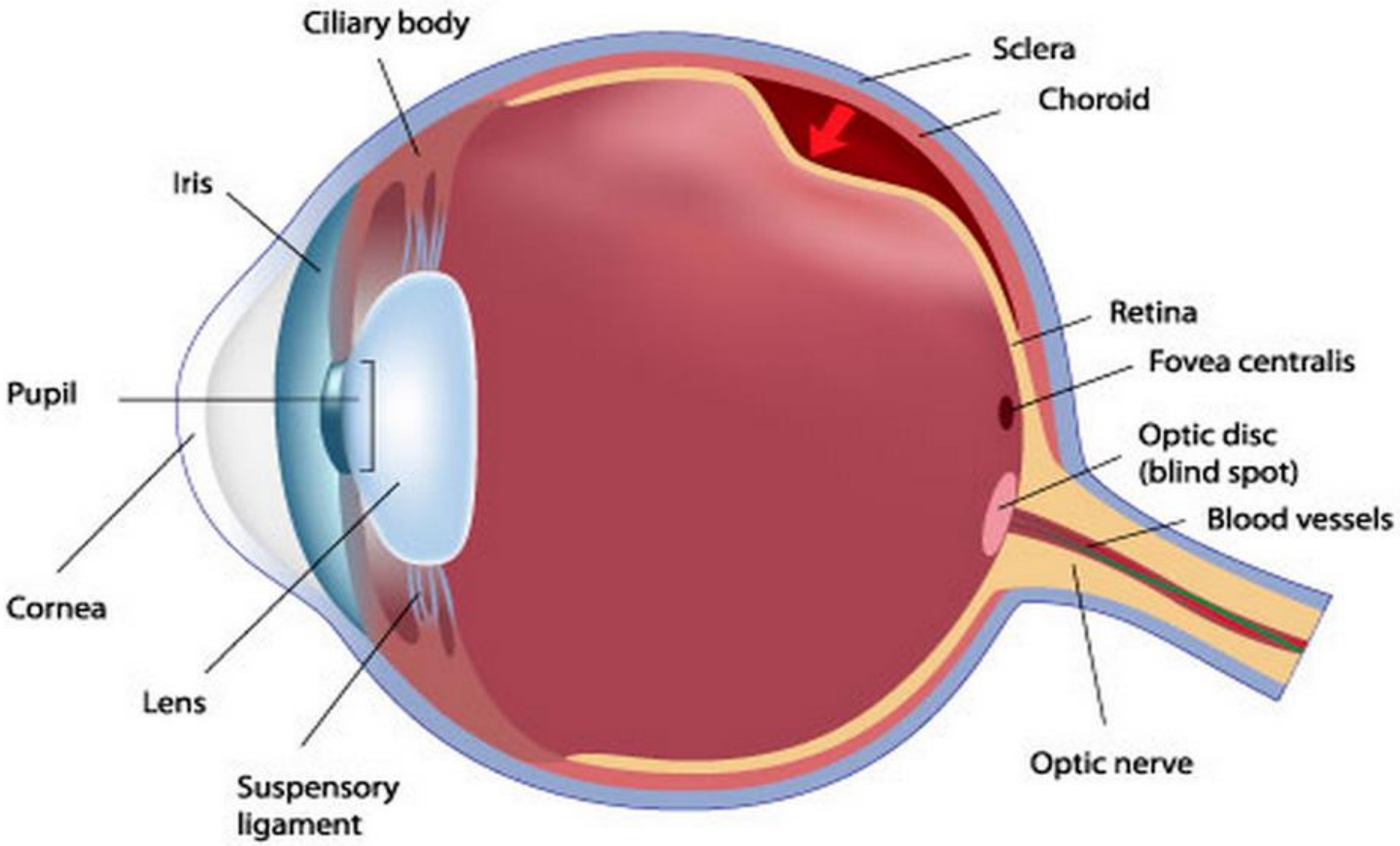




http://www.tedmontgomery.com/the_eye/eyephotos/RetinalDetachment-4.html

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

Retinal Detachment



https://www.omahaeye.com/retinal-detachment.htm

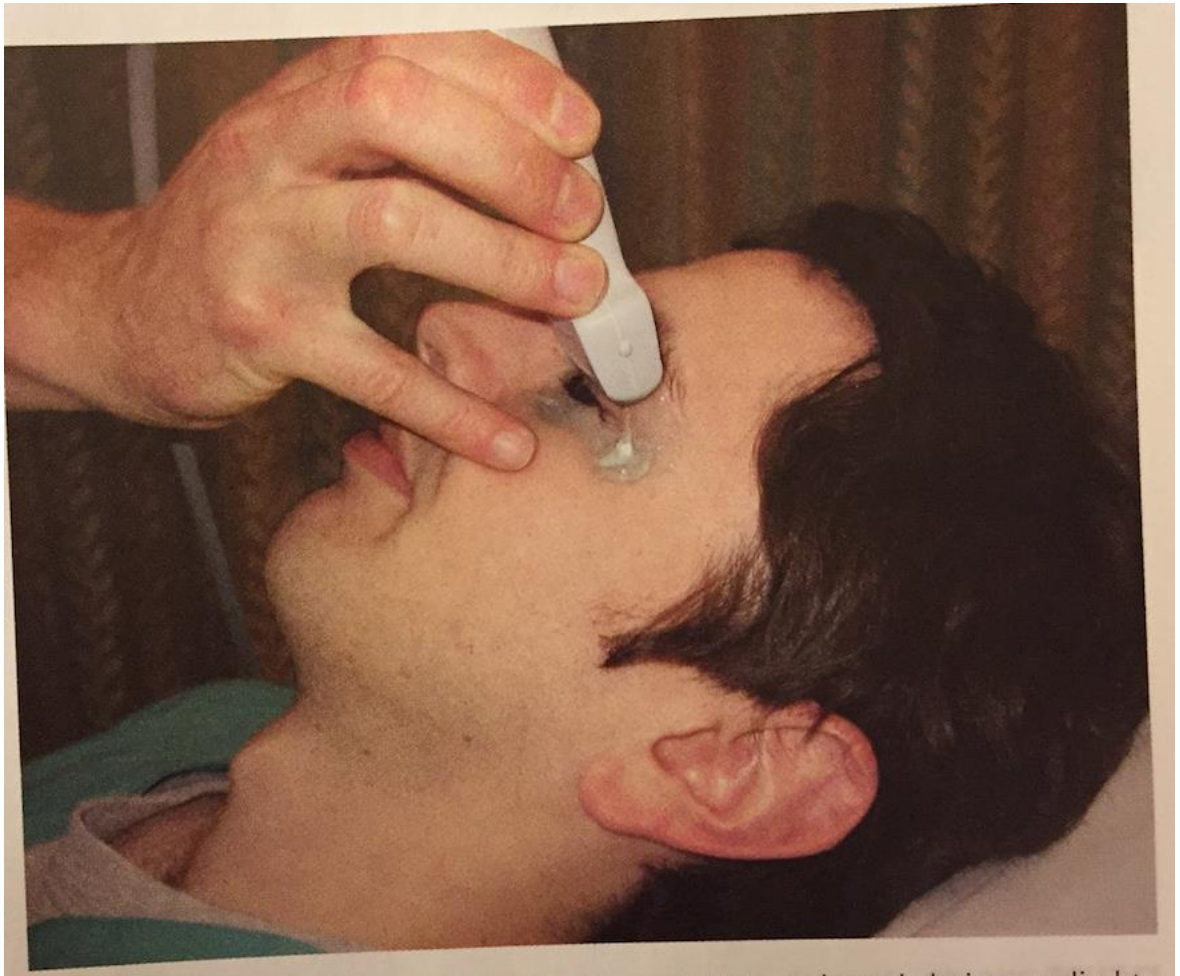


FIGURE 236-67. A high-resolution linear array US transducer is being applied to the closed eyelid. (Courtesy of Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)

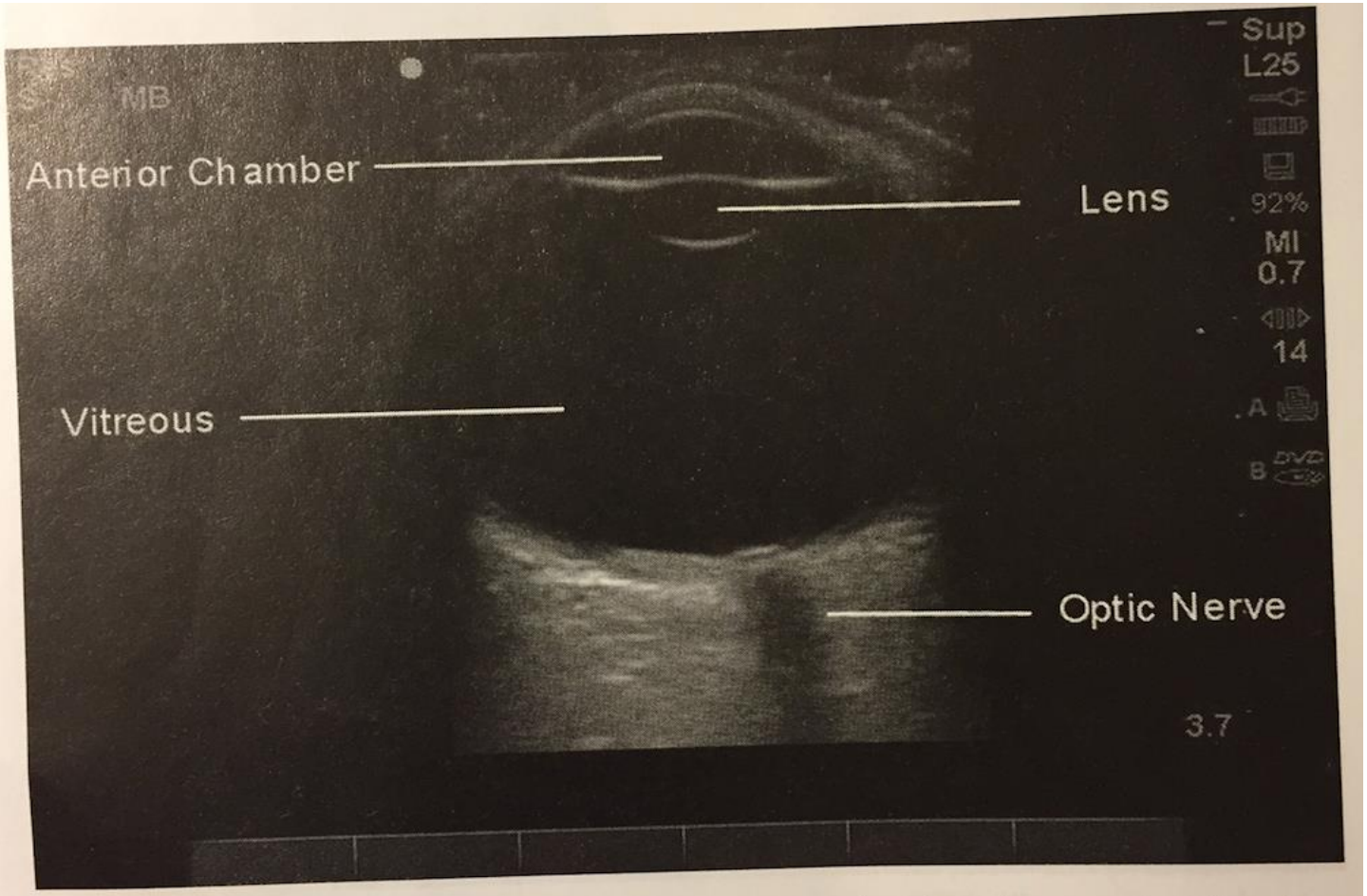


FIGURE 236-68. Normal eye in transverse view showing the anterior chamber, lens, vitreous, and optic nerve. (Courtesy of Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)

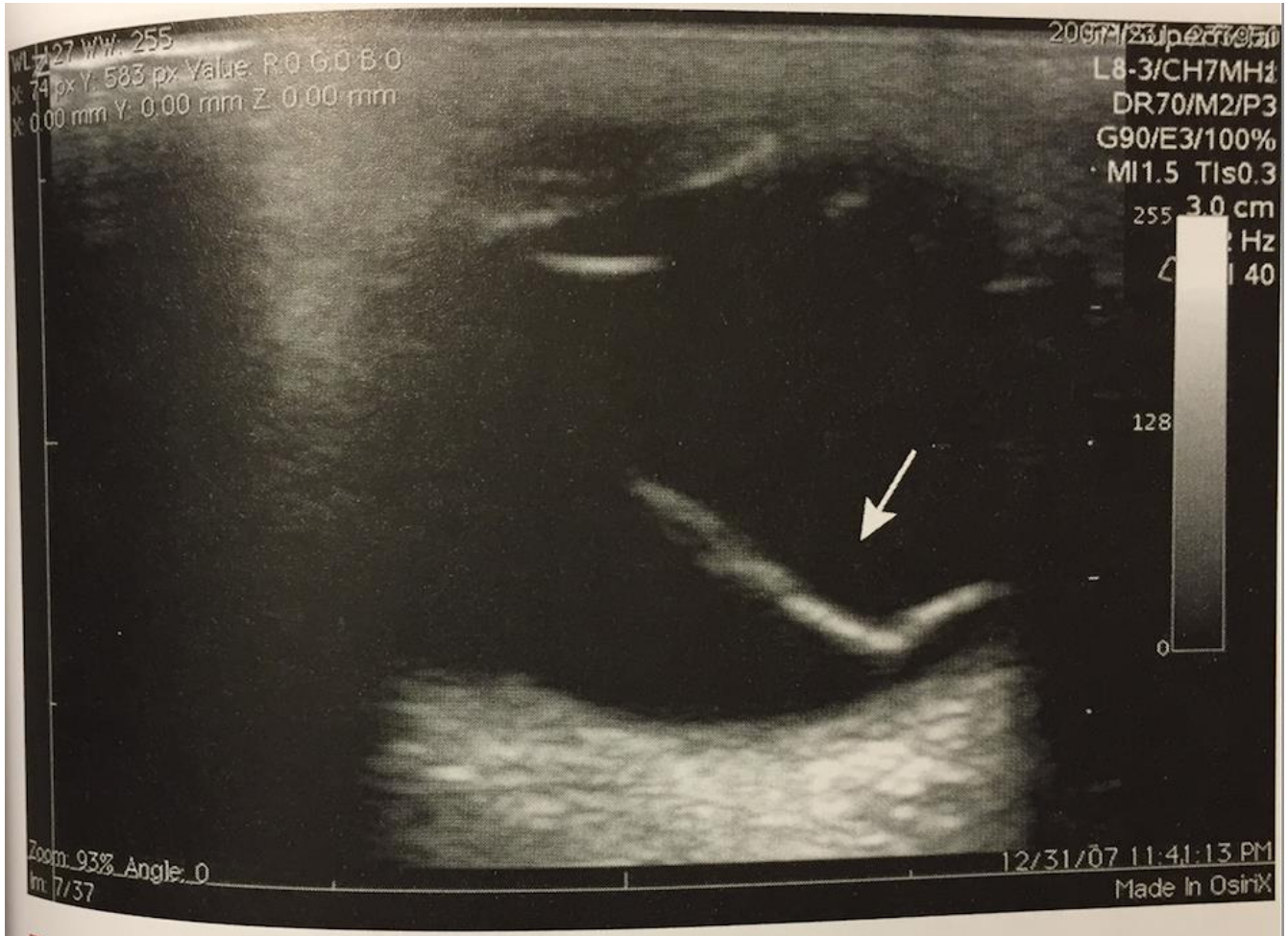


FIGURE 236-71. Retinal detachment is seen as a hyperechoic membrane in the posterior aspect of the globe (*arrow*). (Courtesy of D. Chandwani and Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)

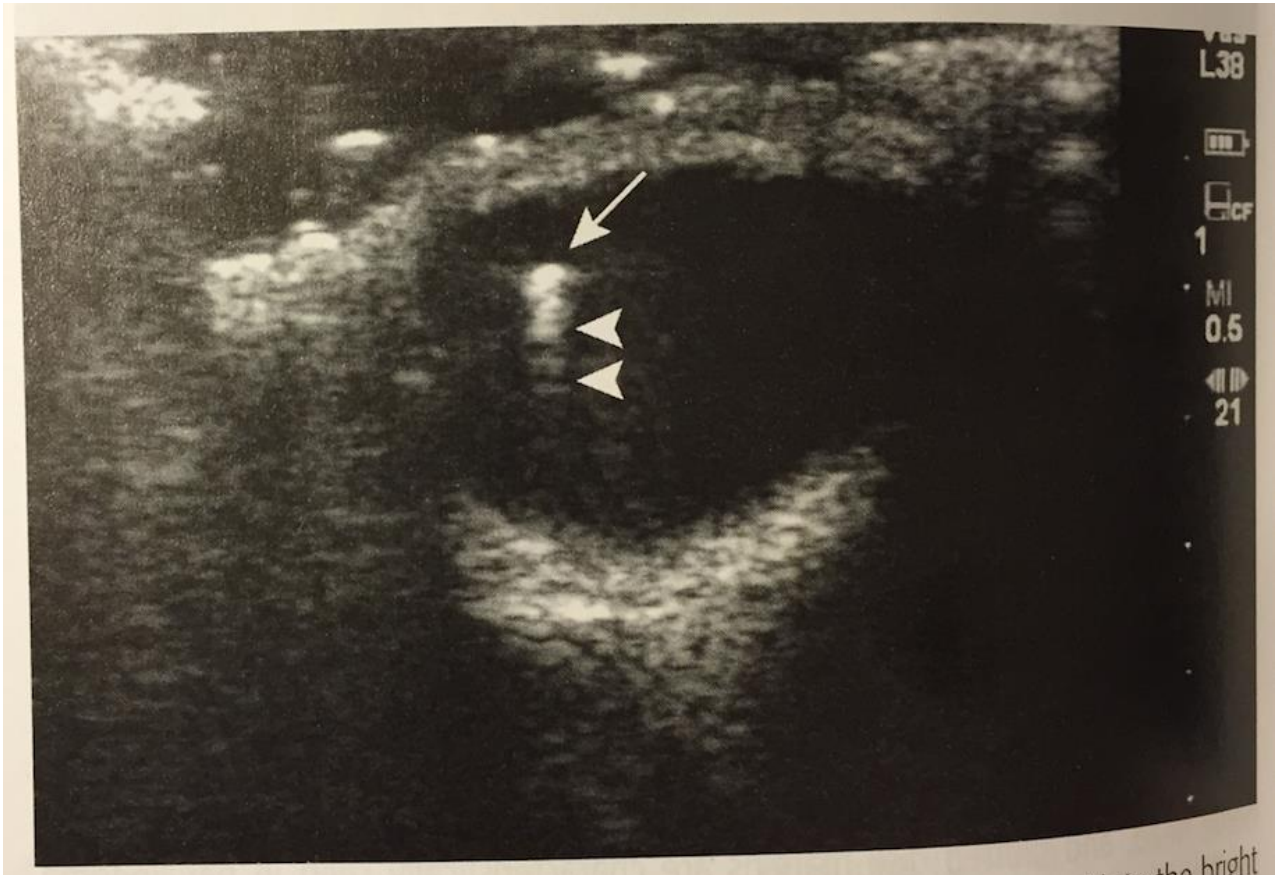
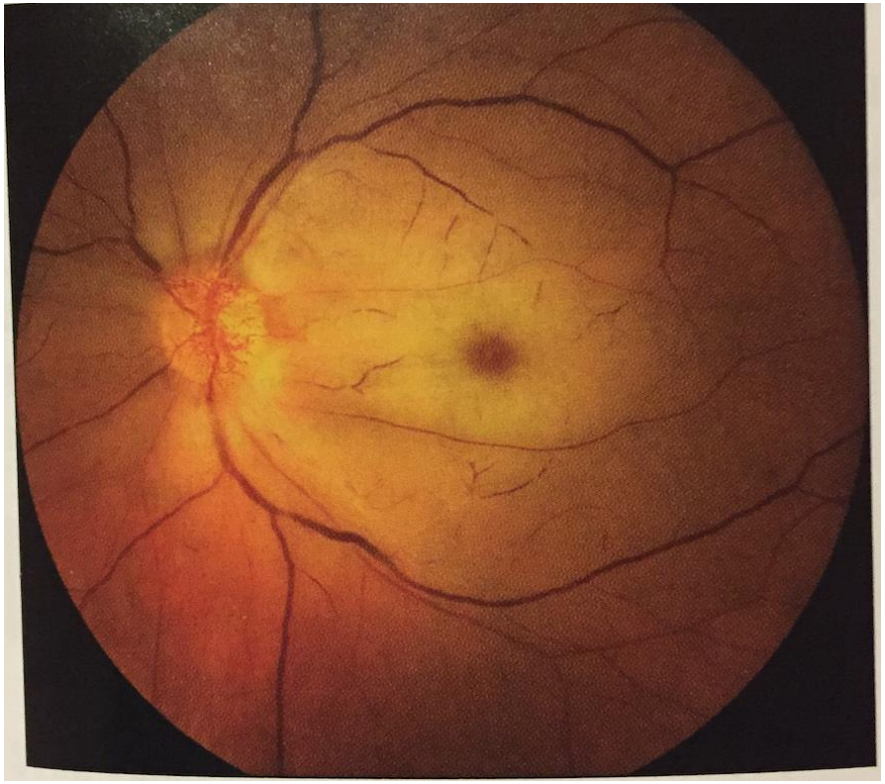


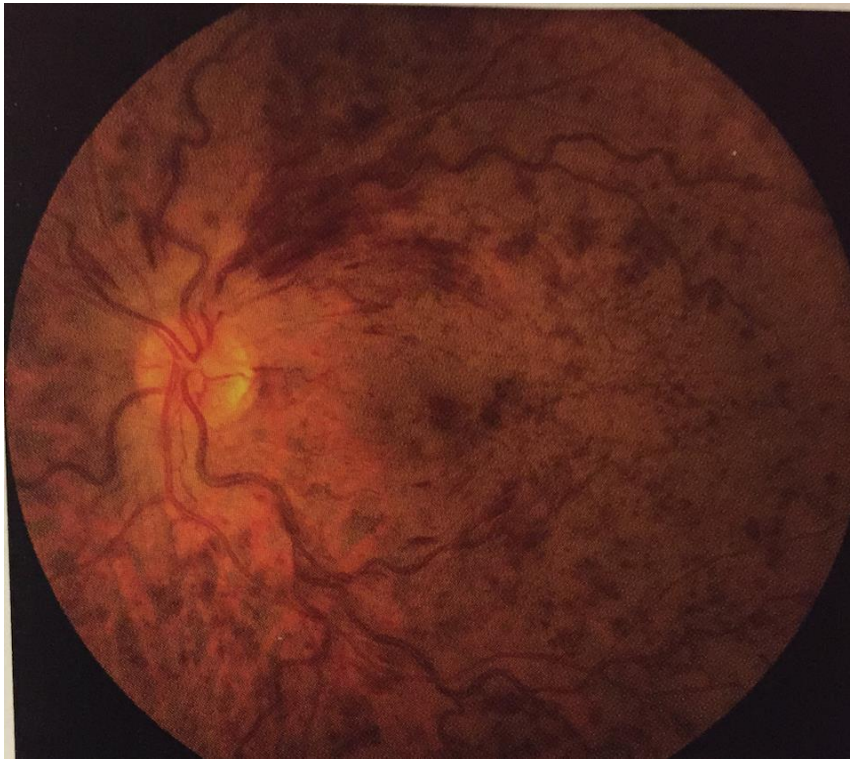
FIGURE 236-70. A hyperechoic foreign body (*arrow*) in the eye. Note the bright echogenic reverberation artifact (*arrowheads*). (Courtesy of M. Blaivas and Allen R. Katz, Department of Ophthalmology, University of Nebraska Medical Center.)

Is this a central retinal artery or vein occlusion?

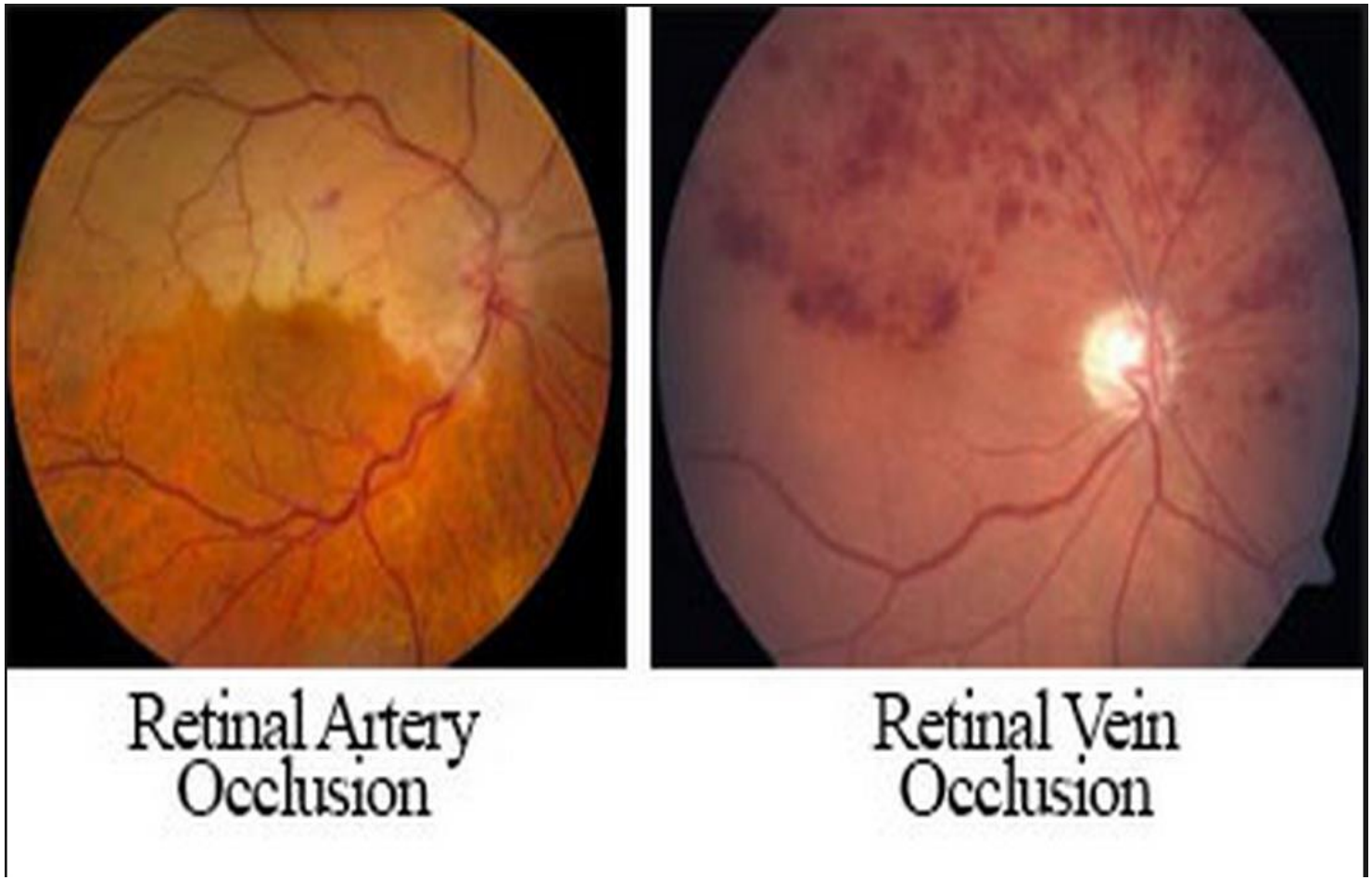


The Wills Eye Manual 5th edition Wolters Kluwer/Lippincott Williams & Wilkens, p. 283.

How about this one?



The Wills Eye Manual 5th edition Wolters Kluwer/Lippincott Williams & Wilkens, p. 285.



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
- Tintinalli's Emergency Medicine 7th edition McGraw Hill chapter 236 "Eye Emergencies"
- Rosens's Emergency Medicine 7th edition Elsevier 2010 chapter 69