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A 4-year-old boy is brought to the office by his mother for a routine health maintenance visit. The patient has been toilet trained for 2 years. He sees a pediatric dentist every 6 months and has no dental caries. The boy's mother describes him as a picky eater. She states that he prefers to eat bananas, apples, and bread but dislikes vegetables, meat, and milk products. He participates in a weekly community soccer league. He had acute gastroenteritis twice during infancy, but has no chronic medical conditions and takes no medications. The boy lives with his mother, who is a single parent, and 2 older brothers. He attends preschool 5 days per week and is learning to write his name. His mother says that he is not a social child and prefers to play with his best friend or his brothers. Which of the following preventive health measures is most appropriate at this visit?

- ☐ A. Autism screening
- ☐ B. Depression screening
- ☐ C. Meningococcal vaccination
- ☐ D. Rotavirus vaccination
- ☐ E. Urinalysis
- ☐ F. Visual acuity testing

Submit

Block Time Remaining: 00:53:59
TIMEDTUTOR

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A 4-year-old boy is brought to the office by his mother for a routine health maintenance visit. The patient has been toilet trained for 2 years. He sees a pediatric dentist every 6 months and has no dental caries. The boy's mother describes him as a picky eater. She states that he prefers to eat bananas, apples, and bread but dislikes vegetables, meat, and milk products. He participates in a weekly community soccer league. He had acute gastroenteritis twice during infancy, but has no chronic medical conditions and takes no medications. The boy lives with his mother, who is a single parent, and 2 older brothers. He attends preschool 5 days per week and is learning to write his name. His mother says that he is not a social child and prefers to play with his best friend or his brothers. Which of the following preventive health measures is most appropriate at this visit?

- ☐ A. Autism screening [14%]
- ☒ B. Depression screening [1%]
- ☐ C. Meningococcal vaccination [12%]
- ☐ D. Rotavirus vaccination [14%]
- ☐ E. Urinalysis [1%]
- ☒ F. Visual acuity testing [55%]

Incorrect

Correct answer

55% Answered correctly

4 Seconds Time Spent

09/24/2018 Last Updated

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Vision is evaluated at **every well-child visit**, as untreated eye abnormalities during the first few years of life can lead to permanent vision loss. Infants and young children are assessed by observation of visual behavior. For example, infants can fixate on objects shortly after birth, and by age 3 months they demonstrate horizontal and vertical tracking. **Red reflex testing** is also performed to detect a congenital cataract or retinoblastoma, and **corneal light reflex testing** assesses ocular alignment. In older infants and children, strabismus can also be detected by the cover test, in which a child focuses on an object and each eye is covered independently to assess for abnormal movement in the contralateral, fixated eye.

Visual acuity testing is performed routinely at age 4 but can be performed as early as age 3 in cooperative children. The **Snellen chart** is the gold standard, although the HOTV (4-letter) or LEA (picture) chart may be used for young children with limited or no ability to identify letters. Visual acuity worse than 20/40 at age 4 or worse than 20/30 at age ≥ 5 should prompt ophthalmologic evaluation for refractive errors. Additional indications for referral include pupillary asymmetry of ≥ 1 mm, nystagmus, and ptosis or other conditions obstructing the visual field.

(Choices A and B) Autism screening is routinely performed at ages 18 months and 2 years, and depression screening starts at age 12. As this child has appropriate relationships, is doing well in preschool, and is participating in activities, he does not require testing for autism or depression.

(Choice C) The quadrivalent meningococcal vaccination is routinely administered at age 11 or 12, followed by a booster dose at age 16 due to the risk of college outbreaks. Children with asplenia, HIV, or complement deficiency may be vaccinated as early as age 2. This patient is at low risk for meningococcal disease and does not require early vaccination.

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for young children with limited or no ability to identify letters. Visual acuity worse than 20/40 at age 4 or worse than 20/30 at age ≥ 5 should prompt ophthalmologic evaluation for refractive errors. Additional indications for referral include pupillary asymmetry of ≥ 1 mm, nystagmus, and ptosis or other conditions obstructing the visual field.

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(Choice C) The quadrivalent meningococcal vaccination is routinely administered at age 11 or 12, followed by a booster dose at age 16 due to the risk of college outbreaks. Children with asplenia, HIV, or complement deficiency may be vaccinated as early as age 2. This patient is at low risk for meningococcal disease and does not require early vaccination.

(Choice D) The rotavirus vaccine is recommended at age 2-8 months as the greatest risk for dehydration from severe gastroenteritis is during early infancy. The vaccine is not administered past this age range.

(Choice E) Urinalysis is indicated for a patient with concerning urinary symptoms (eg, dysuria, frequency). It is not a preventative health test.

Educational objective:

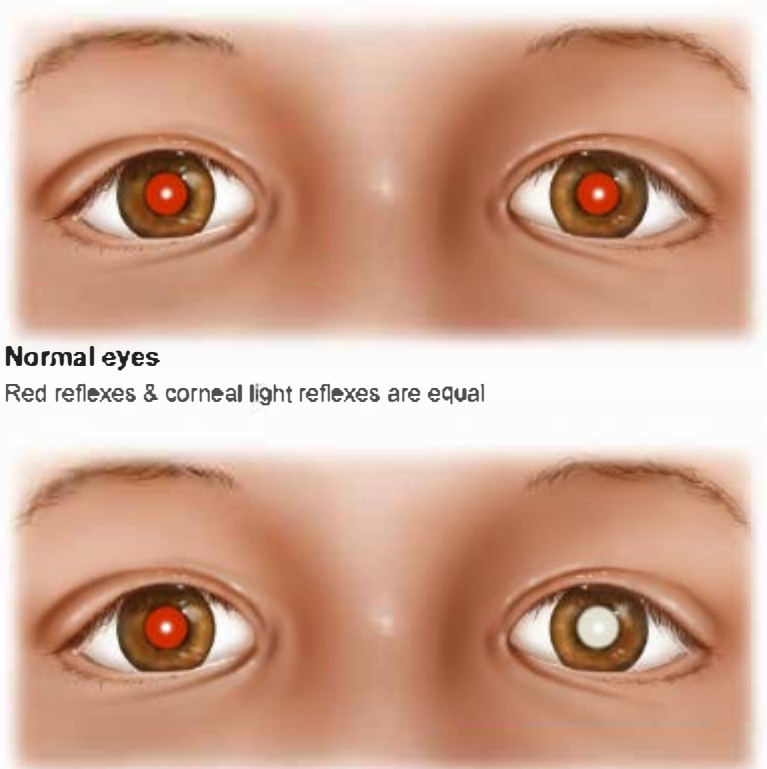
Vision is evaluated at every well-child visit, as early detection of eye abnormalities can prevent long-term vision loss. Formal visual acuity testing is recommended starting at age 4 as well as in cooperative 3-year-olds.

References

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Exhibit Display

Normal eyes & white reflex



Normal eyes
Red reflexes & corneal light reflexes are equal

Absent reflex
White reflex on abnormal eye can result from opacities of the lens (eg, cataract) or tumor (eg, retinoblastoma)

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Exhibit Display



Normal eyes
Red reflexes & corneal light reflexes are equal



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Exhibit Display

C L D	3	20/70
Z O T N	4	20/50
L F D P O	5	20/40
D N E Z T C	6	20/30
P E L N Z O D	7	20/25
T F P L D O E Z	8	20/20

Zoom In

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Exhibit Display

E	1	20/200
P F	2	20/100
C L D	3	20/70
Z O T N	4	20/50
L F D P O	5	20/40

Zoom In

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Reset

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Exhibit Display

L F D P O	5	20/40
D N E Z T C	6	20/30
P E L N Z O D	7	20/25
T F P L D O E Z	8	20/20
C T F N E C Z O	9	
F D P L T C E O	10	
P E Z O L C F T D	11	

Zoom In

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A 30-year-old man comes to the emergency department screaming, "Something blew into my right eye while I was drilling!" He complains of a foreign body sensation in the right eye, photophobia, and excessive lacrimation. Gross examination of the right eye with a penlight after the application of a topical anesthetic is insignificant. What is the best next step in the management of this patient?

- ☐ A. Tonometry
- ☐ B. Fluorescein examination
- ☐ C. Topical antibiotic
- ☐ D. Ultrasonography
- ☐ E. MRI of the orbits

Submit

Block Time Remaining: 00:53:55

TIMEDTUTOR



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 30-year-old man comes to the emergency department screaming, "Something blew into my right eye while I was drilling!" He complains of a foreign body sensation in the right eye, photophobia, and excessive lacrimation. Gross examination of the right eye with a penlight after the application of a topical anesthetic is insignificant. What is the best next step in the management of this patient?

- ☐ A. Tonometry [4%]
- ☒ B. Fluorescein examination [83%]
- ☐ C. Topical antibiotic [2%]
- ☐ D. Ultrasonography [3%]
- ☐ E. MRI of the orbits [5%]

Correct



83%

Answered correctly



4 Seconds

Time Spent



10/05/2018

Last Updated

Explanation

This patient most probably sustained a high-velocity eye injury that is commonly associated with drilling, hammering, grinding, etc. In contrast to a low-velocity injury, a high-velocity injury has a greater probability of

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Feedback



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Explanation

This patient most probably sustained a high-velocity eye injury that is commonly associated with drilling, hammering, grinding, etc. In contrast to a low-velocity injury, a high-velocity injury has a greater probability of globe penetration and intraocular foreign body formation. The clinician should always be cognizant of such a possibility, even if initial presentation is subtle. Although not seen on gross examination, an abrasion or foreign body may be present. Fluorescein application following a Wood's lamp or, preferably, slit lamp examination is the most reasonable next step in this case.

(Choices D and E) If a foreign body is not demonstrated and a strong suspicion remains, CT or ultrasonography can be considered. MRI is never performed for the diagnosis of a foreign body; in fact, it is contraindicated, since it can dislodge the foreign body because of the strong magnetic field.

(Choice C) A topical antibiotic is applied after the foreign body has been removed.

(Choice A) Tonometry is performed only if penetration of the globe is ruled out.

Educational Objective:

Be overly suspicious for an intraocular foreign body in patients with high-velocity injuries (drilling, grinding, etc). If the initial pen light examination does not reveal any conjunctival and corneal abrasions or foreign bodies, proceed with fluorescein examination.

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Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 65-year-old man presents with complaints of decreased vision in both eyes. His visual impairment has been progressively worsening over the past five months. He was diagnosed with diabetes ten years ago. His current medications are metformin and glyburide. His blood pressure is 140/90 mm Hg, pulse is 82/min, respirations are 14/min, and temperature is 98.4° F (36.8° C). Examination shows decreased visual acuity in both eyes. Ophthalmoscopy reveals microaneurysms, dot and blot hemorrhages, hard exudates, and macular edema. Which of the following is the most likely diagnosis?

- ☐ A. Central retinal vein occlusion
- ☐ B. Diabetic retinopathy
- ☐ C. Macular degeneration
- ☐ D. Retinal detachment
- ☐ E. Open angle glaucoma

Submit

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Feedback



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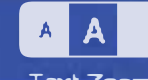
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A 65-year-old man presents with complaints of decreased vision in both eyes. His visual impairment has been progressively worsening over the past five months. He was diagnosed with diabetes ten years ago. His current medications are metformin and glyburide. His blood pressure is 140/90 mm Hg, pulse is 82/min, respirations are 14/min, and temperature is 98.4° F (36.8° C). Examination shows decreased visual acuity in both eyes. Ophthalmoscopy reveals microaneurysms, dot and blot hemorrhages, hard exudates, and macular edema. Which of the following is the most likely diagnosis?

- ☒ A. Central retinal vein occlusion [3%]
- ☐ B. Diabetic retinopathy [85%]
- ☐ C. Macular degeneration [8%]
- ☐ D. Retinal detachment [0%]
- ☐ E. Open angle glaucoma [1%]

Incorrect

Correct answer



85%
Answered correctly



4 Seconds
Time Spent



08/09/2018
Last Updated

Explanation

Block Time Remaining: 00:53:48

TIMEDTUTOR



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Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Diabetic retinopathy is the leading cause of blindness in the USA. It occurs in both insulin dependent and non-insulin dependent diabetes mellitus. There are 3 main categories:

1. background or simple retinopathy - consists of microaneurysms, hemorrhages, exudates, and retinal edema, as in this patient
2. pre-proliferative retinopathy - with cotton wool spots
3. proliferative or malignant retinopathy - consists of newly formed vessels.

Patients are usually asymptomatic at first, despite early signs of retinopathy (e.g., microaneurysms). Visual impairment occurs with the development of macular edema. Argon laser photocoagulation is the suggested treatment for the prevention of complications.

(Choice A) Central retinal vein occlusion is characterized by sudden, unilateral visual impairment that is usually noted upon waking in the morning. Diabetics are at increased risk for retinal vein occlusion. Ophthalmoscopy reveals disc swelling, venous dilation and tortuosity, retinal hemorrhages and cotton wool spots.

(Choice C) Macular degeneration affects central vision. It is characterized by distorted vision and central scotoma. Cigarette smoking increases the risk of macular degeneration. Ophthalmoscopy findings vary according to the type (i.e., atrophic vs. exudative). The atrophic form is characterized by multiple sores in the macular region, while the exudative form is characterized by new blood vessels that may leak, bleed, and scar the retina.

(Choice D) Retinal detachment occurs unilaterally. It presents as blurred vision that progressively worsens. Ophthalmoscopy reveals the retina hanging in the vitreous.

(Choice E) Open angle glaucoma is also seen in diabetics, but is characterized by gradual loss of peripheral



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Feedback



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End Block



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Tutorial



Lab Values



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Reverse Color



Text Zoom



Settings

Patients are usually asymptomatic at first, despite early signs of retinopathy (e.g., microaneurysms). Visual impairment occurs with the development of macular edema. Argon laser photocoagulation is the suggested treatment for the prevention of complications.

(Choice A) Central retinal vein occlusion is characterized by sudden, unilateral visual impairment that is usually noted upon waking in the morning. Diabetics are at increased risk for retinal vein occlusion. Ophthalmoscopy reveals disc swelling, venous dilation and tortuosity, retinal hemorrhages and cotton wool spots.

(Choice C) Macular degeneration affects central vision. It is characterized by distorted vision and central scotoma. Cigarette smoking increases the risk of macular degeneration. Ophthalmoscopy findings vary according to the type (i.e., atrophic vs. exudative). The atrophic form is characterized by multiple sores in the macular region, while the exudative form is characterized by new blood vessels that may leak, bleed, and scar the retina.

(Choice D) Retinal detachment occurs unilaterally. It presents as blurred vision that progressively worsens. Ophthalmoscopy reveals the retina hanging in the vitreous.

(Choice E) Open angle glaucoma is also seen in diabetics, but is characterized by gradual loss of peripheral vision, resulting in tunnel vision. Ophthalmoscopy shows pathologic cupping of the optic disc.

Educational Objective:

The 3 main categories of diabetic retinopathy are background or simple (microaneurysms, hemorrhages, exudates, retinal edema), pre-proliferative (cotton wool spots), and proliferative or malignant (neovascularization). Visual impairment occurs with the development of macular edema. Argon laser photocoagulation is performed for the prevention of complications.

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A 65-year-old male comes to the emergency department because of a sudden, painless loss of vision in his right eye that occurred a half an hour ago. Five hours ago, he experienced a similar but transient loss of vision in the same eye, which lasted for five minutes. He has hypertension, diabetes, hypercholesterolemia, and peripheral vascular disease. He had an anterior wall myocardial infarction six years ago. His medications include glyburide, captopril, atenolol, simvastatin, and aspirin. His temperature is 36.7° C (98.0° F), respirations are 16/min, pulse is 88/min, and blood pressure is 146/88 mmHg. Examination of the right eye reveals visual acuity of 20/60 and subtle retinal whitening. A right carotid bruit is heard. Which of the following is the most appropriate next step in the management of this patient?

- ☐ A. Topical pilocarpine
- ☐ B. Ocular massage and high flow oxygen
- ☐ C. Systemic corticosteroids
- ☐ D. Topical beta blocker
- ☐ E. Intravenous thrombolytics

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Block Time Remaining: 00:53:47

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2/11/10



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Tutorial



Lab Values



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Reverse Color



Text Zoom



A 65-year-old male comes to the emergency department because of a sudden, painless loss of vision in his right eye that occurred a half an hour ago. Five hours ago, he experienced a similar but transient loss of vision in the same eye, which lasted for five minutes. He has hypertension, diabetes, hypercholesterolemia, and peripheral vascular disease. He had an anterior wall myocardial infarction six years ago. His medications include glyburide, captopril, atenolol, simvastatin, and aspirin. His temperature is 36.7° C (98.0° F), respirations are 16/min, pulse is 88/min, and blood pressure is 146/88 mmHg. Examination of the right eye reveals visual acuity of 20/60 and subtle retinal whitening. A right carotid bruit is heard. Which of the following is the most appropriate next step in the management of this patient?

- ☐ A. Topical pilocarpine [3%]
- ☒ B. Ocular massage and high flow oxygen [42%]
- ☐ C. Systemic corticosteroids [4%]
- ☐ D. Topical beta blocker [3%]
- ☐ E. Intravenous thrombolytics [45%]

Correct42%
Answered correctly3 Seconds
Time Spent06/18/2018
Last Updated

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20/11/10



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Tutorial



Lab Values



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Calculator



Reverse Color



Text Zoom



Settings

The most likely diagnosis is central retinal artery occlusion (CRAO) secondary to embolism. Painless loss of monocular vision is the usual presenting symptom. Risk factors include carotid artery disease, endocarditis, cardiac valvular disease, long bone fracture, hypercoagulable conditions, vasculitis, atrial myxoma, etc. It occurs when a severe, abrupt diminution of blood flow through the central retinal artery causes ischemia of the inner retina. (Remember that the ophthalmic artery is the first intracranial branch of the internal carotid artery. It supplies blood to the eye via the (1) central retinal artery, which is an end artery that supplies the inner retina, and the (2) ciliary branches, which supply the choroids and anterior portion of globe). Embolism of the retinal artery is the most common cause of ocular stroke. Emboli may travel to the distal branches of the retinal artery, causing loss of only a section of the visual field. It is commonly associated with amaurosis fugax before the occlusion (as in this patient). Visual acuity is typically 20/800 (6/240) or worse. Fundoscopy reveals diffuse ischemic retinal whitening and cherry red spots (typical but not specific for CRAO).

CRAO is an ophthalmologic emergency. A delay in treatment may result in permanent loss of vision. Immediate intervention includes ocular massage, which dislodges the embolus to a point further down the arterial circulation and improves retinal perfusion. Medical management and anterior chamber paracentesis to lower the intraocular pressure may be used, but ocular massage has the most rapid action. Carbogen therapy (5 % CO₂ and 95% O₂) or hyperbaric oxygen (HBO) therapy have been shown to be beneficial if given early.

(Choice A and D) Topical pilocarpine and beta-blockers are used in the management of acute angle closure glaucoma, which is characterized by a sudden, painful loss of vision with red eye.

(Choice C) Systemic steroids are used in the management of vision loss associated with temporal arteritis; however, this patient has no signs suggestive of temporal arteritis.

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Lab Values



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Reverse Color



Text Zoom



Settings

the most common cause of ocular stroke. Emboli may travel to the distal branches of the retinal artery, causing loss of only a section of the visual field. It is commonly associated with amaurosis fugax before the occlusion (as in this patient). Visual acuity is typically 20/800 (6/240) or worse. Fundoscopy reveals diffuse ischemic retinal whitening and cherry red spots (typical but not specific for CRAO).

CRAO is an ophthalmologic emergency. A delay in treatment may result in permanent loss of vision. Immediate intervention includes ocular massage, which dislodges the embolus to a point further down the arterial circulation and improves retinal perfusion. Medical management and anterior chamber paracentesis to lower the intraocular pressure may be used, but ocular massage has the most rapid action. Carbogen therapy (5 % CO₂ and 95% O₂) or hyperbaric oxygen (HBO) therapy have been shown to be beneficial if given early.

{Choice A and D} Topical pilocarpine and beta-blockers are used in the management of acute angle closure glaucoma, which is characterized by a sudden, painful loss of vision with red eye.

{Choice C} Systemic steroids are used in the management of vision loss associated with temporal arteritis; however, this patient has no signs suggestive of temporal arteritis.

{Choice E} Thrombolytics may be useful if initiated within 4-6 hours of visual loss but they are administered intraarterially. Their efficacy has not been systematically studied.

Educational objective:

Central retinal artery occlusion is emergently treated with an ocular massage and high-flow oxygen administration.

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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



A 3-day-old girl is brought to the emergency department with a day of copious, purulent eye drainage. The infant was born vaginally to a 31-year-old gravida 3 para 3. The delivery was performed at a community birthing center by a midwife. The mother declined any medications for the infant, including vitamin K, erythromycin ointment, and hepatitis B vaccination. The patient was discharged home with her mother 4 hours after delivery. She has been breastfeeding exclusively and has been voiding and stooling appropriately. Temperature is 36.8 C (98.2 F). Examination shows bilateral eyelid edema and purulent discharge. The anterior fontanelle is open, soft, and flat. The nares are patent and the oral mucosa is clear without lesions or thrush. Auscultation reveals clear lungs bilaterally and no murmurs. The abdomen is soft, tender, and nondistended, and the external genitalia appear normal with no discharge. Which of the following is the most likely diagnosis?

- ☐ A. Chemical conjunctivitis
- ☐ B. Chlamydial conjunctivitis
- ☐ C. Dacryostenosis
- ☐ D. Gonococcal conjunctivitis
- ☐ E. Herpes simplex virus conjunctivitis
- ☐ F. *Staphylococcus aureus* conjunctivitis

Submit

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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



A 3-day-old girl is brought to the emergency department with a day of copious, purulent eye drainage. The infant was born vaginally to a 31-year-old gravida 3 para 3. The delivery was performed at a community birthing center by a midwife. The mother declined any medications for the infant, including vitamin K, erythromycin ointment, and hepatitis B vaccination. The patient was discharged home with her mother 4 hours after delivery. She has been breastfeeding exclusively and has been voiding and stooling appropriately. Temperature is 36.8 C (98.2 F). Examination shows bilateral eyelid edema and purulent discharge. The anterior fontanelle is open, soft, and flat. The nares are patent and the oral mucosa is clear without lesions or thrush. Auscultation reveals clear lungs bilaterally and no murmurs. The abdomen is soft, tender, and nondistended, and the external genitalia appear normal with no discharge. Which of the following is the most likely diagnosis?

- ☒ A. Chemical conjunctivitis [2%]
- ☐ B. Chlamydial conjunctivitis [18%]
- ☐ C. Dacryostenosis [1%]
- ☒ D. Gonococcal conjunctivitis [72%]
- ☐ E. Herpes simplex virus conjunctivitis [0%]
- ☐ F. *Staphylococcus aureus* conjunctivitis [4%]

Incorrect

Block Time Remaining: 00:53:42

TIMEDTUTOR



Feedback



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Gonococcal conjunctivitis

Clinical presentation

- Copious exudate & eyelid swelling typically at age 2-5 days

Diagnosis

- Gram stain with gram-negative intracellular diplococci
- Positive culture on modified Thayer-Martin media

Treatment

- One dose of intramuscular ceftriaxone or cefotaxime

Prevention

- Erythromycin ointment

This infant's severe, bilateral, purulent conjunctivitis in the first week of life is most likely due to *Neisseria gonorrhoeae*. Infants acquire gonococcal conjunctivitis through contact with infected genital secretions. Gonococcal conjunctivitis is the **most severe** form of neonatal conjunctivitis. Infected infants classically present at **age 2-5 days** with eyelid edema, **purulent exudate**, and chemosis (conjunctival injection). If left untreated, gonococcal conjunctivitis can progress to corneal ulceration, scarring, and **blindness**. Infected infants should receive a single intramuscular dose of third-generation cephalosporin (eg, cefotaxime, ceftriaxone).

Prevention of gonococcal conjunctivitis can be achieved by **topical ophthalmic prophylaxis** given shortly after delivery. **Erythromycin** ophthalmic ointment is the first-line agent for prophylaxis and is mandatory in most parts of the United States. Silver nitrate was used historically, but it frequently caused chemical conjunctivitis and is no longer available in the United States. Prophylactic erythromycin ointment will not prevent *Chlamydia trachomatis* conjunctivitis. The best way to prevent both *C trachomatis* and gonococcal conjunctivitis is to screen for and treat these infections in pregnant women age <25 or with risk factors.





(Choice A) Chemical conjunctivitis usually occurs within 24 hours of birth and is most common in neonates given silver nitrate. Chemical conjunctivitis is generally mild and does not result in purulent discharge.

(Choice B) *C trachomatis* can also cause neonatal conjunctivitis, but this normally occurs 5-14 days after birth. Compared with gonococcal conjunctivitis, chlamydial conjunctivitis typically involves milder chemosis and eyelid swelling as well as watery, rather than purulent, discharge.

(Choice C) Nasolacrimal duct obstruction (**dacryostenosis**) is common in neonates and has chronic tearing that is often unilateral. Eyelid swelling and purulent discharge are not seen in this condition. Symptoms generally resolve with gentle massage of the nasolacrimal sac.

(Choice E) Neonatal herpes simplex virus infection can involve the eye. Infected infants generally present in the second or third week of life with vesicular or ulcerative eye disease rather than purulent discharge in the first week of life.

(Choice F) *Staphylococcus aureus* conjunctivitis is a common cause of bacterial conjunctivitis in adults. It is less common in children and extremely rare in neonates (age ≤ 28 days).

Educational objective:

Copious, purulent eye drainage and eyelid swelling in the first week of life are most consistent with gonococcal conjunctivitis. Gonococcal conjunctivitis can be prevented with application of topical erythromycin ointment soon after birth.

References

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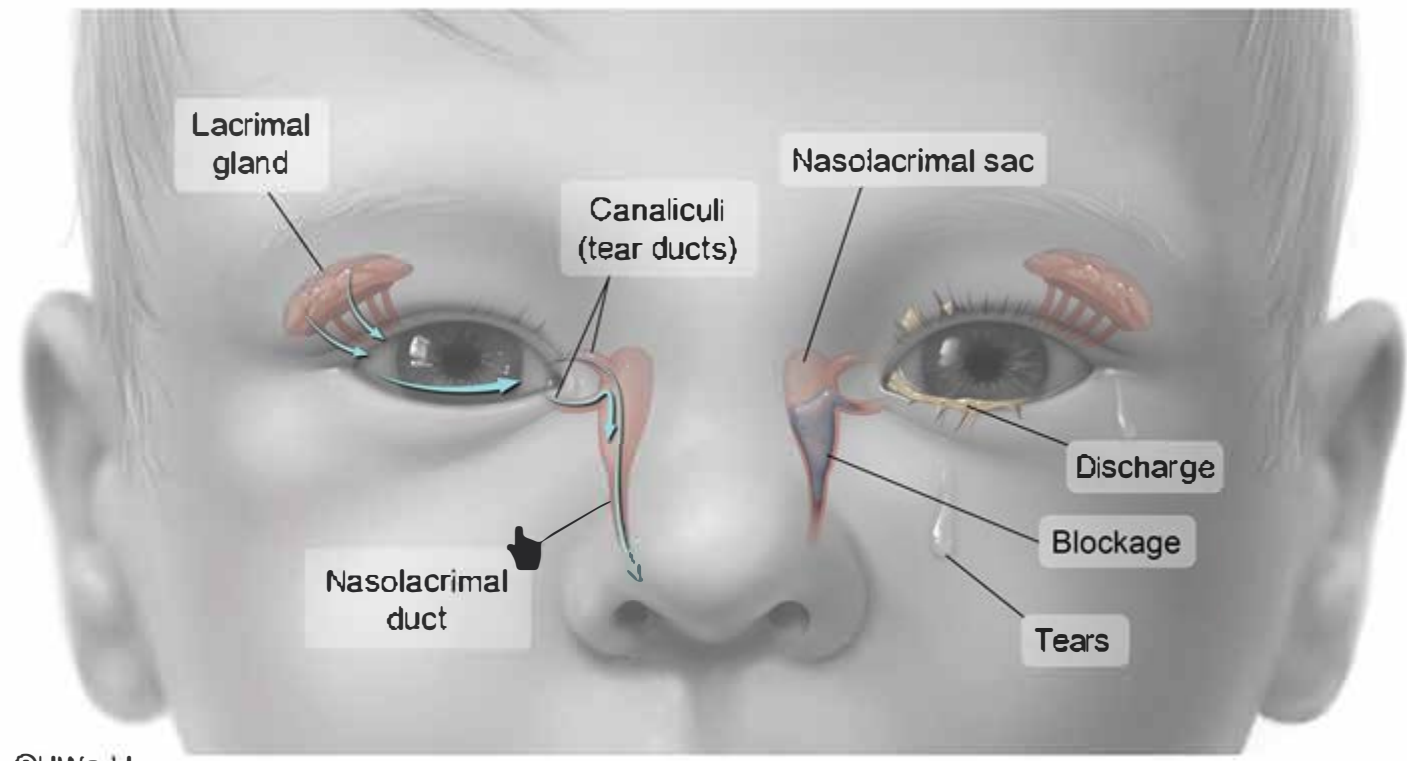
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Exhibit Display

Dacryostenosis



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common in children and extremely rare in neonates (age <28 days).



A 6-month-old girl is brought to the office for a well visit. The patient can sit with support and recently started babbling. Her diet consists of breast milk and pureed fruits and vegetables. She was born at 35 weeks gestation due to preterm labor, and her neonatal course was notable for a 1-week hospital stay due to difficulty feeding. She was hospitalized for bronchiolitis at age 3 months for 4 days. The patient takes no medications and has no known allergies. Immunizations are up to date. Height and weight track along the 55th and 40th percentiles, respectively. She is alert and interactive, smiling at the examiner and her mother. Ophthalmoscopic examination reveals a white reflex in the left eye and a red reflex in the right. Extraocular movements are intact, and pupils are equal and reactive to light. Corneal light reflex is symmetric. The rest of the examination is normal. Which of the following is the most likely cause of this patient's physical examination findings?

- ☐ A. Bilateral cataracts
- ☐ B. Glaucoma
- ☐ C. Retinoblastoma
- ☐ D. Retinopathy of prematurity
- ☐ E. Strabismus
- ☐ F. Uveitis

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A 6-month-old girl is brought to the office for a well visit. The patient can sit with support and recently started babbling. Her diet consists of breast milk and pureed fruits and vegetables. She was born at 35 weeks gestation due to preterm labor, and her neonatal course was notable for a 1-week hospital stay due to difficulty feeding. She was hospitalized for bronchiolitis at age 3 months for 4 days. The patient takes no medications and has no known allergies. Immunizations are up to date. Height and weight track along the 55th and 40th percentiles, respectively. She is alert and interactive, smiling at the examiner and her mother. Ophthalmoscopic examination reveals a white reflex in the left eye and a red reflex in the right. Extraocular movements are intact, and pupils are equal and reactive to light. Corneal light reflex is symmetric. The rest of the examination is normal. Which of the following is the most likely cause of this patient's physical examination findings?

- ☐ A. Bilateral cataracts [0%]
- ☒ B. Glaucoma [1%]
- ☒ C. Retinoblastoma [86%]
- ☐ D. Retinopathy of prematurity [10%]
- ☐ E. Strabismus [1%]
- ☐ F. Uveitis [0%]

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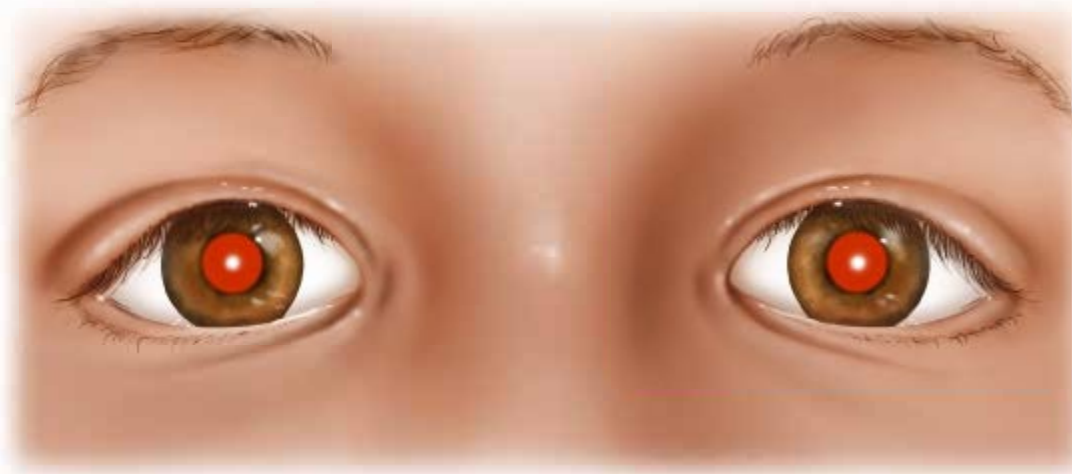
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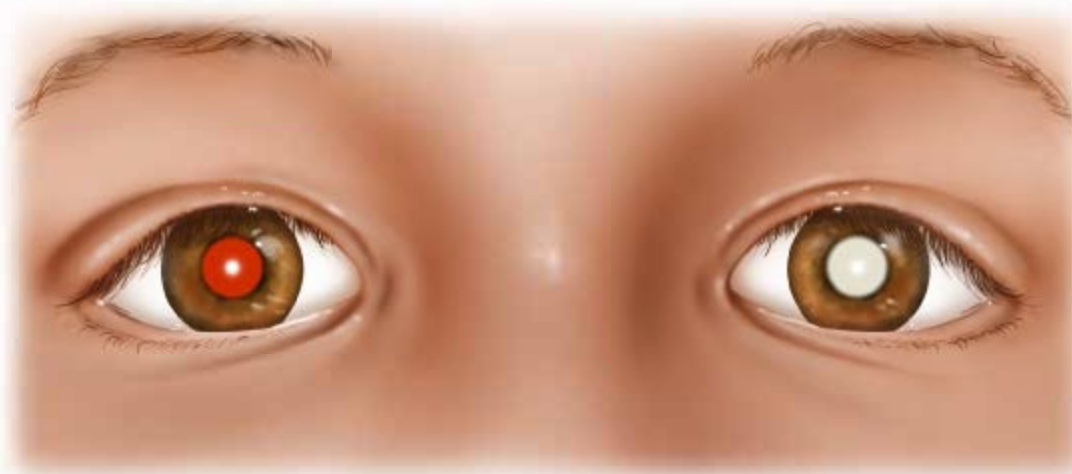
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Normal eyes & white reflex



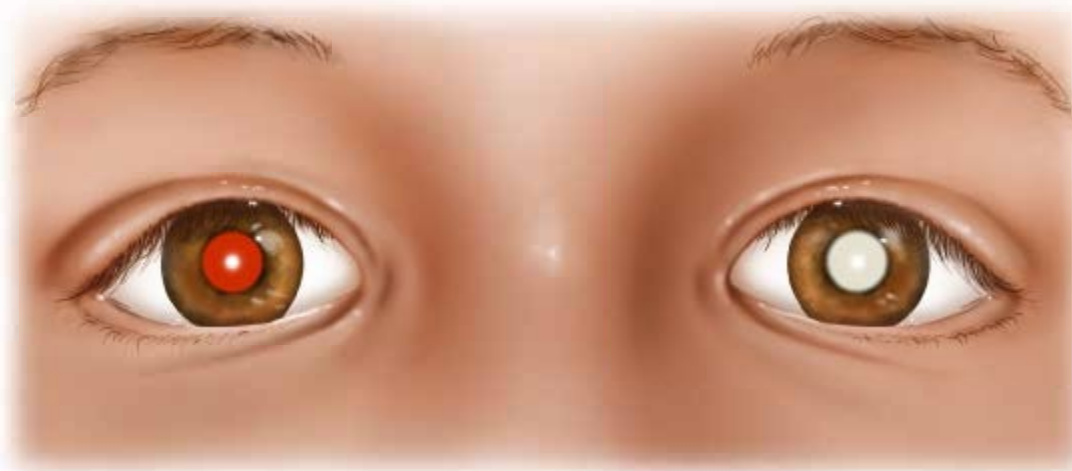
Normal eyes

Red reflexes & corneal light reflexes are equal



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Absent reflex

White reflex on abnormal eye can result from opacities of the lens (eg, cataract) or tumor (eg, retinoblastoma)

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This child has **leukocoria** (or white pupillary reflex), concerning for **retinoblastoma**, the most common intraocular tumor of childhood, which occurs due to inactivation of the tumor suppressor gene *RB1*. Sporadic retinoblastoma often presents as unilateral disease, whereas inheritable retinoblastoma is more commonly bilateral.

Retinoblastoma is most commonly diagnosed in children age <2 and should therefore be suspected in any young child with an absent red reflex. Other presenting features include **strabismus**, **nystagmus**, vision impairment, and ocular inflammation. **Immediate ophthalmology referral** is required for treatment, to avoid metastases to the contralateral eye and the brain, and diagnosis is confirmed with **MRI of the brain and orbits** (red circle). Biopsy is not performed due to risk of tumor seeding.

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19

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Previous



Next



Tutorial



Lab Values



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Text Zoom



Settings

(Choice A) A cataract can cause leukocoria due to lens opacification. However, bilateral congenital cataracts present with bilateral white reflexes, not unilateral as in this patient.

(Choice B) Glaucoma (increased intraocular pressure) can cause corneal enlargement/edema and optic nerve cupping, not leukocoria.

(Choice D) Severe retinopathy of prematurity (ROP) with associated retinal detachment can cause leukocoria, but it is unlikely in this patient as ROP typically affects infants born at <30 weeks gestation.

(Choice E) Strabismus, or ocular misalignment, can cause an **asymmetric red reflex** with increased intensity in the deviated eye. However, the corneal light reflex will also be asymmetric, not seen in this patient.

(Choice F) Uveitis is intraocular inflammation often associated with systemic disease (eg, infection, juvenile idiopathic arthritis). Examination can reveal leukocoria due to inflammatory debris, but eye redness and pain are also expected.

Educational objective:

Leukocoria, or white pupillary reflex, in an infant or young child should prompt immediate referral to an ophthalmologist to evaluate for retinoblastoma. Other presenting signs of retinoblastoma include strabismus and nystagmus.

References

- [Retinoblastoma](#).

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This child has leukocoria (or white pupillary reflex), concerning for retinoblastoma, the most common intraocular

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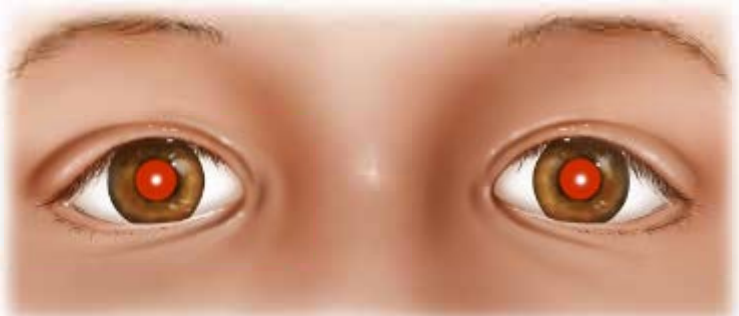
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also expected.

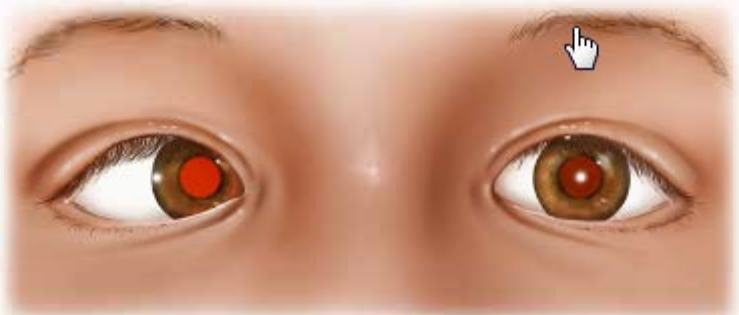
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Exhibit Display

Normal eyes & strabismus



Normal eyes
Red reflexes & corneal light reflexes are equal



Asymmetric reflections
In strabismus, the red reflex is more intense in the deviated eye. The corneal light reflexes are also asymmetric.

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A 5-year-old boy is brought to the emergency department with eye pain. This morning, the boy began to have right eye pain that did not improve with ibuprofen and warm compresses. Over the last few hours, he has had blurred vision. The patient has a history of frequent otitis media, multiple dental caries, recurrent sinusitis, and atopic dermatitis. He is allergic to mosquito bites, which result in urticaria. Temperature is 39.4 C (102.9 F), blood pressure is 100/70 mm Hg, pulse is 120/min, and respirations are 20/min. The patient is cooperative but appears tired and uncomfortable. Visual acuity is 20/70 in the right eye and 20/10 in the left. Examination shows conjunctival injection, proptosis, and periorbital edema and erythema on the right. Neurologic examination reveals limited adduction of the right eye and pain with extraocular movements. Funduscopic examination is normal. The left eye is normal. There is moderate tenderness to palpation over the right cheek. Examination of the oral cavity shows a large, malodorous dental caries in the left lower second molar. The remainder of the examination is unremarkable. Which of the following predisposing factors is most likely responsible for this patient's condition?

- ☐ A. Atopic dermatitis
- ☐ B. Bacterial sinusitis
- ☐ C. Dental abscess
- ☐ D. Insect bite
- ☐ E. Otitis media





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Tutorial



Lab Values



Notes



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A 5-year-old boy is brought to the emergency department with eye pain. This morning, the boy began to have right eye pain that did not improve with ibuprofen and warm compresses. Over the last few hours, he has had blurred vision. The patient has a history of frequent otitis media, multiple dental caries, recurrent sinusitis, and atopic dermatitis. He is allergic to mosquito bites, which result in urticaria. Temperature is 39.4 C (102.9 F), blood pressure is 100/70 mm Hg, pulse is 120/min, and respirations are 20/min. The patient is cooperative but appears tired and uncomfortable. Visual acuity is 20/70 in the right eye and 20/10 in the left. Examination shows conjunctival injection, proptosis, and periorbital edema and erythema on the right. Neurologic examination reveals limited adduction of the right eye and pain with extraocular movements. Funduscopic examination is normal. The left eye is normal. There is moderate tenderness to palpation over the right cheek. Examination of the oral cavity shows a large, malodorous dental caries in the left lower second molar. The remainder of the examination is unremarkable. Which of the following predisposing factors is most likely responsible for this patient's condition?

- ☒ A. Atopic dermatitis [1%]
- ☐ B. Bacterial sinusitis [60%]
- ☐ C. Dental abscess [30%]
- ☐ D. Insect bite [5%]
- ☐ E. Otitis media [2%]

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Orbital cellulitis	
Risk factors	- Local infection (eg, sinusitis, dental infection, skin infection) - Orbital trauma
Clinical signs	- Painful eye movements - Ophthalmoplegia - Proptosis - Visual changes
Diagnosis	- Clinical - CT scan if diagnosis is uncertain
Treatment	- Intravenous antibiotics - Surgical drainage for abscess

This child has pain with eye movements, proptosis, ophthalmoplegia, and visual changes, findings consistent with **orbital cellulitis**. The most common risk factor for orbital cellulitis is **sinusitis**, particularly of the ethmoid or maxillary sinuses. Patients may have purulent rhinorrhea, fever, and facial pain, such as the right cheek tenderness in this child. The proximity of the sinuses to the orbital space allows the contiguous spread of bacteria (eg, *Streptococcus* species, *Staphylococcus aureus*) during episodes of severe sinusitis. The subsequent intraorbital infection causes inflammation of the extraocular muscles (**ophthalmoplegia, painful eye movements**)



and orbital fat (proptosis).

Patients with suspected orbital cellulitis should undergo CT scan of the orbits and sinuses to identify drainable fluid collections within the orbit (ie, orbital abscess). Intravenous **antibiotic** therapy is the **mainstay** of treatment, and purulent material in the sinuses or orbit should be drained if present.

(Choices A and D) Breaks in the skin due to inflammation (eg, atopic dermatitis) or trauma (eg, insect bite) can lead to cutaneous infections, such as preseptal cellulitis. Unlike orbital cellulitis, preseptal cellulitis is an infection anterior to the **orbital septum** and does not present with proptosis, visual changes, or ophthalmoplegia.

(Choice C) Dental caries or abscesses, particularly in maxillary teeth (which are close to the sinuses and orbits), can predispose to orbital cellulitis. This child's abscess is in a mandibular tooth on the contralateral side of the orbital infection. In addition, sinusitis is a much more common predisposing factor for orbital cellulitis.

(Choice E) Severe or untreated otitis media can progress to an invasive bacterial infection, such as mastoiditis or meningitis. The orbits are not contiguous with the middle ear, making orbital cellulitis an unlikely sequela. Moreover, this patient does not have active otitis media.

Educational objective:

Symptoms of orbital cellulitis include proptosis, ophthalmoplegia, and visual changes. Bacterial sinusitis is the most common predisposing factor for orbital cellulitis.

References

Management of pediatric orbital cellulitis and abscess

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Text Zoom



A 65-year-old man comes to the emergency department due to a sudden loss of vision in his right eye. He has had diabetes, and has been treated with metformin and glyburide for the past 10 years. Visual acuity is reduced to light perception in his right eye, and normal in his left. His vital signs are normal. Ophthalmoscopy reveals loss of fundus details, floating debris and a dark red glow. What is the most likely diagnosis?

- ☐ A. Retinal detachment
- ☐ B. Diabetic retinopathy
- ☐ C. Vitreous hemorrhage
- ☐ D. Central retinal vein occlusion
- ☐ E. Age related macular degeneration

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Tutorial



Lab Values



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Settings

A 65-year-old man comes to the emergency department due to a sudden loss of vision in his right eye. He has had diabetes, and has been treated with metformin and glyburide for the past 10 years. Visual acuity is reduced to light perception in his right eye, and normal in his left. His vital signs are normal. Ophthalmoscopy reveals loss of fundus details, floating debris and a dark red glow. What is the most likely diagnosis?

- ☐ A. Retinal detachment [32%]
- ☒ B. Diabetic retinopathy [5%]
- ☐ C. Vitreous hemorrhage [45%]
- ☐ D. Central retinal vein occlusion [15%]
- ☐ E. Age related macular degeneration [1%]

Incorrect

Correct answer

C



45%

Answered correctly



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Last Updated

Explanation

Vitreous hemorrhage typically presents as a sudden loss of vision and onset of floaters. The most common cause is diabetic retinopathy. An important diagnostic clue is that the fundus is hard to visualize, and even if it is

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Lab Values



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Text Zoom



Settings

Vitreous hemorrhage typically presents as a sudden loss of vision and onset of floaters. The most common cause is diabetic retinopathy. An important diagnostic clue is that the fundus is hard to visualize, and even if it is visualized, details may be obscured. Immediate ophthalmologic consultation is required. For patients with underlying medical conditions, conservative treatment (i.e., upright position during sleep, which enhances settling of the hemorrhage) is recommended.

{Choice A} Retinal detachment refers to the separation of the inner layers of the retina. It may be associated with metabolic disorders (e.g., diabetes mellitus), trauma (including ocular surgery), vascular disease, myopia, or degeneration. Patients typically complain of vision loss, photopsia with showers of floaters. Fundoscopy typically demonstrates an elevated retina with folds and/or a tear.

{Choice B} Diabetic retinopathy patients are usually asymptomatic, even though changes in fundoscopy are seen. Vitreous hemorrhage frequently occurs in patients with proliferative diabetic retinopathy. Once a diabetic patient presents with a sudden onset of visual loss with numerous floaters, a vitreous hemorrhage is most likely to have occurred.

{Choice D} Central retinal vein occlusion presents as a sudden, painless, unilateral loss of vision. It is also noted in patients with a history of hypertension. Ophthalmoscopic signs are disk swelling, venous dilation and tortuosity, retinal hemorrhages, and cotton wool spots.

{Choice E} Patients with macular degeneration typically present with painless progressive blurring of central vision, which can be acute or insidious. It occurs bilaterally.

Educational objective:

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of the hemorrhage) is recommended.

(Choice A) Retinal detachment refers to the separation of the inner layers of the retina. It may be associated with metabolic disorders (e.g., diabetes mellitus), trauma (including ocular surgery), vascular disease, myopia, or degeneration. Patients typically complain of vision loss, photopsia with showers of floaters. Fundoscopy typically demonstrates an elevated retina with folds and/or a tear.

(Choice B) Diabetic retinopathy patients are usually asymptomatic, even though changes in fundoscopy are seen. Vitreous hemorrhage frequently occurs in patients with proliferative diabetic retinopathy. Once a diabetic patient presents with a sudden onset of visual loss with numerous floaters, a vitreous hemorrhage is most likely to have occurred.

(Choice D) Central retinal vein occlusion presents as a sudden, painless, unilateral loss of vision. It is also noted in patients with a history of hypertension. Ophthalmoscopic signs are disk swelling, venous dilation and tortuosity, retinal hemorrhages, and cotton wool spots.

(Choice E) Patients with macular degeneration typically present with painless progressive blurring of central vision, which can be acute or insidious. It occurs bilaterally.

Educational objective:

Vitreous hemorrhage typically presents as a sudden loss of vision and onset of floaters. Vitreous hemorrhage occurs in patients with diabetic retinopathy.

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Text Zoom



A 28-year-old kindergarten teacher complains of a gritty sensation and discharge from the right eye for 3 days. She also has rhinorrhea, mild sore throat, and low-grade fever of 37.9 C (100.3 F). The symptoms began a week after classes started in the fall. Her past medical history is significant for genital herpes and endometriosis. Eye examination shows mild injection and granular appearance of the tarsal conjunctiva of the right eye with profuse watery discharge. Nasal mucosa is normal, and the pharynx has mild erythema without exudates. Which of the following is the most appropriate next step in management of this patient?

- ☐ A. Cool, moist compresses
- ☐ B. Erythromycin ophthalmic ointment
- ☐ C. Olopatadine eyedrops
- ☐ D. Oral valacyclovir
- ☐ E. Prednisolone eyedrops

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Lab Values



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A 28-year-old kindergarten teacher complains of a gritty sensation and discharge from the right eye for 3 days. She also has rhinorrhea, mild sore throat, and low-grade fever of 37.9 C (100.3 F). The symptoms began a week after classes started in the fall. Her past medical history is significant for genital herpes and endometriosis. Eye examination shows mild injection and granular appearance of the tarsal conjunctiva of the right eye with profuse watery discharge. Nasal mucosa is normal, and the pharynx has mild erythema without exudates. Which of the following is the most appropriate next step in management of this patient?

- ☒ A. Cool, moist compresses [48%]
- ☐ B. Erythromycin ophthalmic ointment [17%]
- ☐ C. Olopatadine eyedrops [12%]
- ☐ D. Oral valacyclovir [13%]
- ☐ E. Prednisolone eyedrops [7%]

IncorrectCorrect answer
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Answered correctly4 Seconds
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Last Updated

Explanation

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Lab Values



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Reverse Color



Text Zoom



Conjunctivitis treatment

Bacterial conjunctivitis

- Erythromycin ointment
- Polymyxin-trimethoprim drops
- Azithromycin drops
- Preferred agent in contact lens wearers: fluoroquinolone drops

Viral conjunctivitis

- Warm or cold compresses
- ± Antihistamine/decongestant drops

Allergic conjunctivitis

- Over-the-counter antihistamine/decongestant drops for intermittent symptoms
- Mast cell stabilizer/antihistamine drops for frequent episodes

This patient, with conjunctival inflammation and watery discharge in the setting of an upper respiratory illness, has typical features of **viral conjunctivitis** ("pink eye"). Most cases are caused by **adenovirus**, and outbreaks are common among small children and caregivers in late summer and early fall. Symptoms typically last several days and are self-limited. Occasional cases can develop a secondary bacterial infection ("bacterial superinfection") with more severe pain and grossly purulent exudate. Purulent bacterial conjunctivitis responds to topical antibiotic therapy (**Choice B**), but uncomplicated viral conjunctivitis can be managed symptomatically.

(Choice C) Mast cell stabilizing agents, such as olopatadine and azelastine, are indicated for treatment of allergic conjunctivitis. Although symptoms of allergic and viral conjunctivitis are often similar, allergic conjunctivitis typically occurs episodically with a shorter duration of symptoms. In addition, although many viral conjunctivitis

symptoms may be due to release of histamine from mast cells, mast cell stabilizers have not been well studied for

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(Choice C) Mast cell stabilizing agents, such as olopatadine and azelastine, are indicated for treatment of allergic conjunctivitis. Although symptoms of allergic and viral conjunctivitis are often similar, allergic conjunctivitis typically occurs episodically with a shorter duration of symptoms. In addition, although many viral conjunctivitis symptoms may be due to release of histamine from mast cells, mast cell stabilizers have not been well studied for this purpose and are generally not needed.

(Choice D) Oral antiviral medications, such as acyclovir and valacyclovir, are recommended for treatment of herpes simplex keratitis. This condition causes a painful, red eye with impaired vision, opacification of the cornea, and corneal ulcers. Antiviral agents would not be effective in this patient with typical adenoviral conjunctivitis.

(Choice E) Prednisolone ophthalmic drops are approved for use in ocular inflammatory and allergic conditions. They are relatively contraindicated in viral conjunctivitis and are not needed as symptoms will resolve spontaneously.

Educational objective:

Viral conjunctivitis is a self-limited condition associated with adenovirus and other viral upper respiratory illnesses. It is common in sporadic outbreaks, especially among children and caregivers in late summer and early fall. No specific treatment is needed, although some patients may develop a bacterial superinfection which requires topical antibiotics.

References

- Adenovirus.

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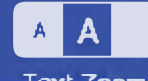
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A 69-year-old man comes to the office due to progressive bilateral loss of vision over the past several months. He only has problems with his central vision. His peripheral field and navigational vision are not affected. He does not use tobacco or alcohol. The patient does not have a history of diabetes or hypertension. Two years ago, he had cataracts removed from both eyes. What is the most likely diagnosis?

- ☐ A. Open-angle glaucoma
- ☐ B. Macular degeneration
- ☐ C. Recurrent cataracts
- ☐ D. Central retinal artery occlusion
- ☐ E. Retinal detachment

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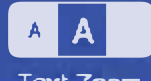
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A 69-year-old man comes to the office due to progressive bilateral loss of vision over the past several months. He only has problems with his central vision. His peripheral field and navigational vision are not affected. He does not use tobacco or alcohol. The patient does not have a history of diabetes or hypertension. Two years ago, he had cataracts removed from both eyes. What is the most likely diagnosis?

- ☒ A. Open-angle glaucoma [3%]
- ☒ B. Macular degeneration [84%]
- ☐ C. Recurrent cataracts [6%]
- ☐ D. Central retinal artery occlusion [3%]
- ☐ E. Retinal detachment [1%]

Incorrect

Correct answer



84%
Answered correctly



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07/11/2018
Last Updated

Explanation

Age-related macular degeneration (AMD) is usually seen in patients age >50. It presents with progressive and bilateral loss of central vision. Peripheral field and navigational vision (allowing patients to navigate around

Block Time Remaining: 00:53:21

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Text Zoom



Settings

Age-related macular degeneration (AMD) is usually seen in patients age >50. It presents with progressive and bilateral loss of central vision. **Peripheral** fields and navigational vision (allowing patients to navigate around obstacles in their surroundings and maintain social independence) are classically **maintained**, although they may become impaired due to the development of cataracts.

AMD results from degeneration and atrophy of the **central** retina (macula), retinal pigment epithelium, Bruch's membrane, and choriocapillaries.

{Choice A} Open-angle glaucoma usually presents as a gradual loss of peripheral vision (over a period of years) and consequent tunnel vision. Central vision is spared.

{Choice C} Once removed, cataracts do not typically recur. Following cataract surgery, some patients develop posterior capsule opacification (thickening of the capsule holding the artificial lens), which can cause cloudy vision and can be treated (eg, with laser) without resulting in longterm vision problems. Progressive central vision loss with maintenance of peripheral vision is highly suggestive of AMD.

{Choices D and E} Central retinal artery occlusion and retinal detachment are very acute conditions with complete vision loss.

Educational objective:

Age-related macular degeneration is usually seen in patients age >50. It presents with progressive and bilateral loss of central vision. Navigational vision is preserved.

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Block Time Remaining: 00:53:21

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Feedback



Suspend



End Block

EN

01:15

20/11/10



A 65-year-old man comes to the clinic due to gradual onset of blurred vision over the past 2 months. He also has difficulty driving at night and reading fine print. His past medical history is notable for diabetes and hypertension. The patient's medications include ramipril and metformin. His vital signs are normal. His best corrected vision is OD (right eye) 20/80 and OS (left eye) 20/100, with normal findings on visual field testing. Ophthalmoscopic examination with pupillary dilation reveals a loss of transparency of the lens in both eyes. The red fundal reflex is normal, but retinal details are difficult to visualize. What is the most likely diagnosis?

- ☐ A. Cataract
- ☐ B. Central retinal vein occlusion
- ☐ C. Macular degeneration
- ☐ D. Open-angle glaucoma
- ☐ E. Retinal detachment

Submit

Block Time Remaining: 00:53:20

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19



Feedback



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01:15م

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Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 65-year-old man comes to the clinic due to gradual onset of blurred vision over the past 2 months. He also has difficulty driving at night and reading fine print. His past medical history is notable for diabetes and hypertension. The patient's medications include ramipril and metformin. His vital signs are normal. His best corrected vision is OD (right eye) 20/80 and OS (left eye) 20/100, with normal findings on visual field testing. Ophthalmoscopic examination with pupillary dilation reveals a loss of transparency of the lens in both eyes. The red fundal reflex is normal, but retinal details are difficult to visualize. What is the most likely diagnosis?

- ☒ A. Cataract [92%]
- ☐ B. Central retinal vein occlusion [0%]
- ☒ C. Macular degeneration [4%]
- ☐ D. Open-angle glaucoma [1%]
- ☐ E. Retinal detachment [0%]

IncorrectCorrect answer
A

92%

Answered correctly

4 Seconds
Time Spent06/06/2018
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Explanation

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Feedback



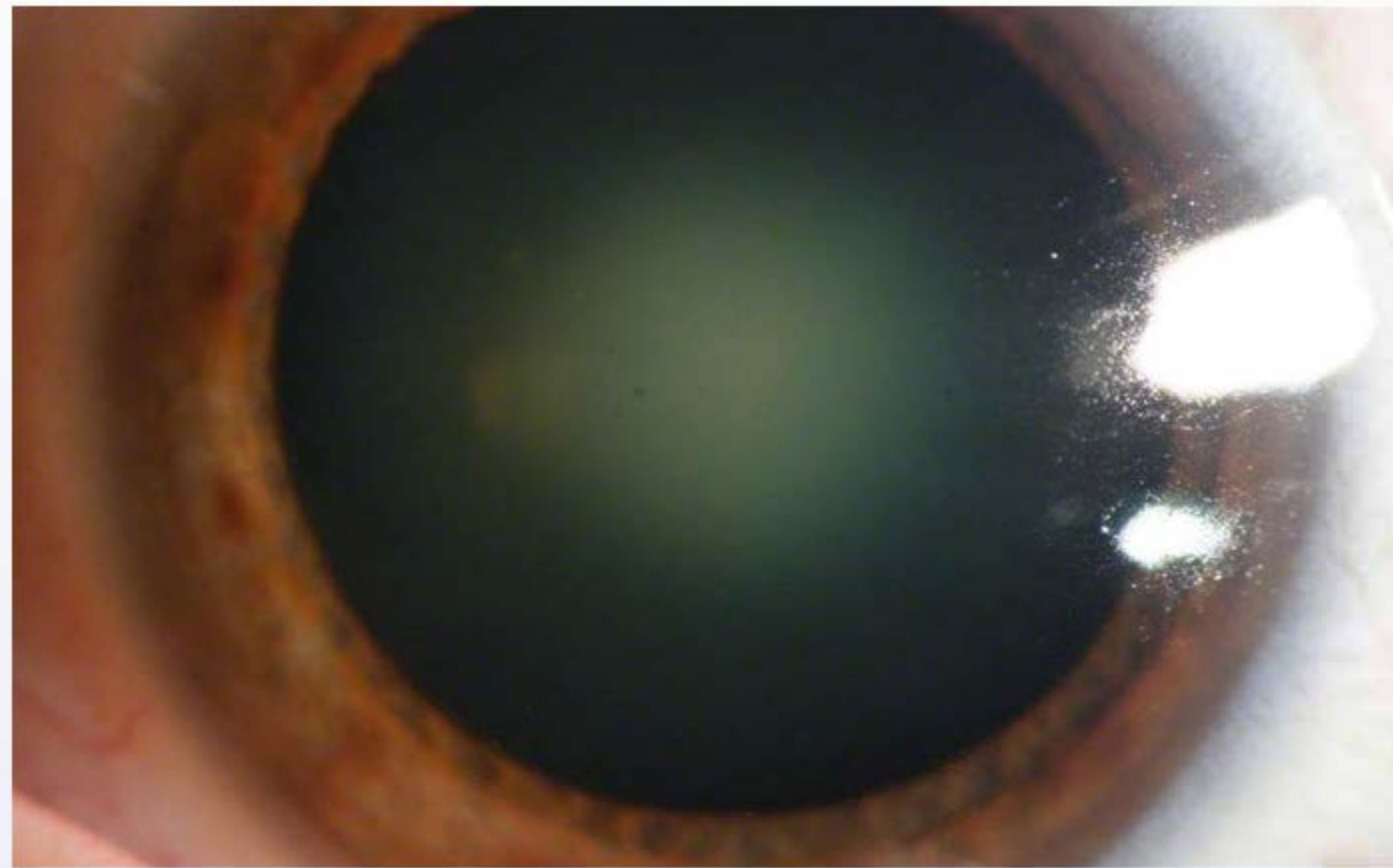
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A cataract is a vision-impairing opacification of the lens. Oxidative damage of the lens occurs with aging and leads to cataract formation. Risk factors for cataract include advancing age, diabetes, smoking, chronic sunlight exposure, and glucocorticoid use. Cataracts are usually bilateral, but patients may become symptomatic in one eye before the other. Patients usually report painless blurred vision, glare, and often halos around lights. Ocular examination in early cataract formation may show a normal red reflex and retinal visualization, but as the cataract



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

to cataract formation. Risk factors for cataract include advancing age, diabetes, smoking, chronic sunlight exposure, and glucocorticoid use. Cataracts are usually bilateral, but patients may become symptomatic in one eye before the other. Patients usually report painless blurred vision, glare, and often halos around lights. Ocular examination in early cataract formation may show a normal red reflex and retinal visualization, but as the cataract progresses, the red reflex is lost and retinal detail may not be visible.

Cataracts typically follow a slowly progressive course, and treatment is indicated when loss of vision impairs activities of daily living. Definitive treatment is lens extraction with artificial lens implantation. The risk of perioperative complications in cataract surgery is low, and anticoagulants do not need to be held.

(Choice B) Central retinal vein occlusion causes acute or subacute loss of vision. Ophthalmoscopy reveals a swollen disc, venous dilation, retinal hemorrhages, and cotton wool spots.

(Choice C) Macular degeneration (MD) affects central vision. It occurs in 2 primary forms: atrophic ("dry"), which causes slowly progressive, bilateral vision loss; and exudative/neovascular ("wet"), which causes unilateral, aggressive vision loss. Examination in dry MD shows drusen and patchy depigmentation in the macular region.

(Choice D) Open-angle glaucoma is characterized by an insidious onset, with gradual loss of peripheral vision and consequent tunnel vision. Intraocular pressures are high. Ophthalmoscopic examination reveals cupping of the optic disc.

(Choice E) Retinal detachment usually occurs unilaterally and suddenly. Patients often describe "a curtain falling in front of the eye" or obscuring of a part of the visual field. Ophthalmoscopic examination reveals an elevated, detached retina.



19



Feedback



Suspend



End Block



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

swollen disc, venous dilation, retinal hemorrhages, and cotton wool spots.

(Choice C) Macular degeneration (MD) affects central vision. It occurs in 2 primary forms: atrophic ("dry"), which causes slowly progressive, bilateral vision loss; and exudative/neovascular ("wet"), which causes unilateral, aggressive vision loss. Examination in dry MD shows **drusen** and patchy depigmentation in the macular region.

(Choice D) Open-angle glaucoma is characterized by an insidious onset, with gradual loss of peripheral vision and consequent tunnel vision. Intraocular pressures are high. Ophthalmoscopic examination reveals **cupping** of the optic disc.

(Choice E) Retinal detachment usually occurs unilaterally and suddenly. Patients often describe "a curtain falling in front of the eye" or **obscuring** of a part of the visual field. Ophthalmoscopic examination reveals an elevated, detached retina.

Educational objective:

A cataract is a vision-impairing opacification of the lens. Patients usually have painless blurred vision, glare, and often halos around lights. Treatment with lens extraction and artificial lens implantation is indicated when loss of vision impairs activities of daily living.

References

- [The visually impaired patient.](#)

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Feedback



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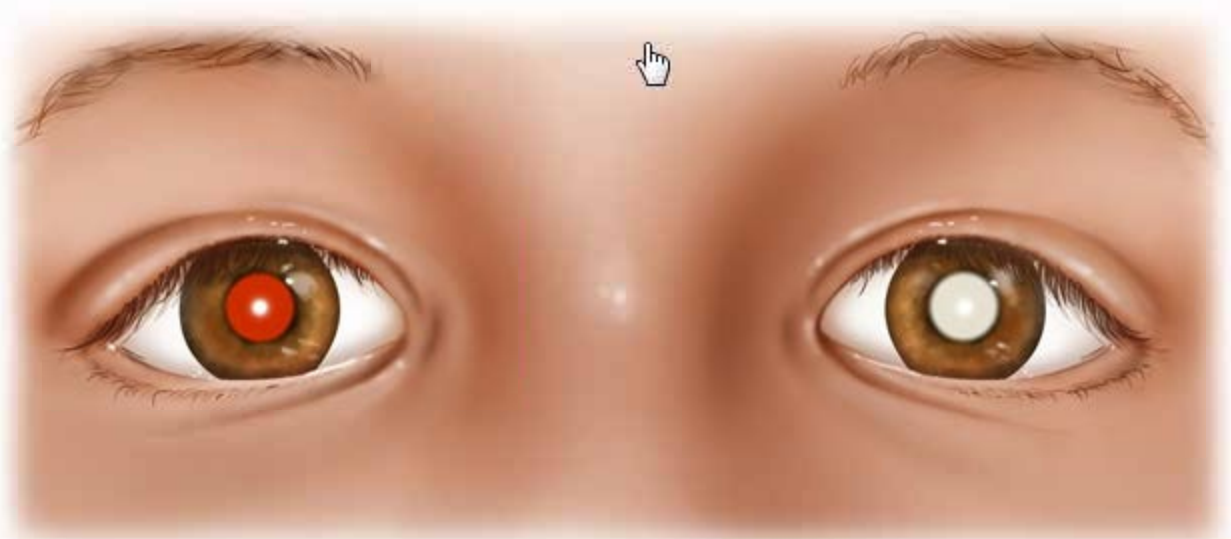
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Exhibit Display

Normal eyes
Red reflexes & corneal light reflexes are equal



Absent reflex
White reflex on abnormal eye can result from opacities of the lens (eg, cataract), or tumor (eg, retinoblastoma)



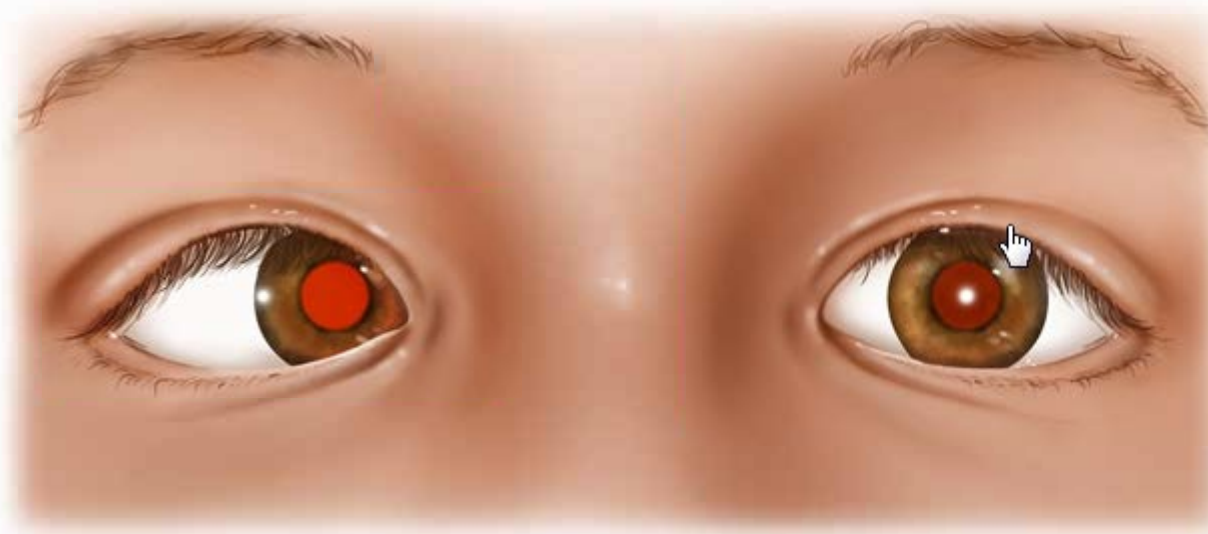
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in front of the eye" or **obscuring** of a part of the visual field. Ophthalmoscopic examination reveals an elevated,

Exhibit Display

Absent reflex

White reflex on abnormal eye can result from opacities of the lens (eg, cataract), or tumor (eg, retinoblastoma)



Asymmetric reflections

In strabismus, the red reflex is more intense in the deviated eye. The corneal light reflexes are also asymmetric.

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Zoom In

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Feedback

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Previous



Next



Tutorial



Lab Values



Notes



Calculator



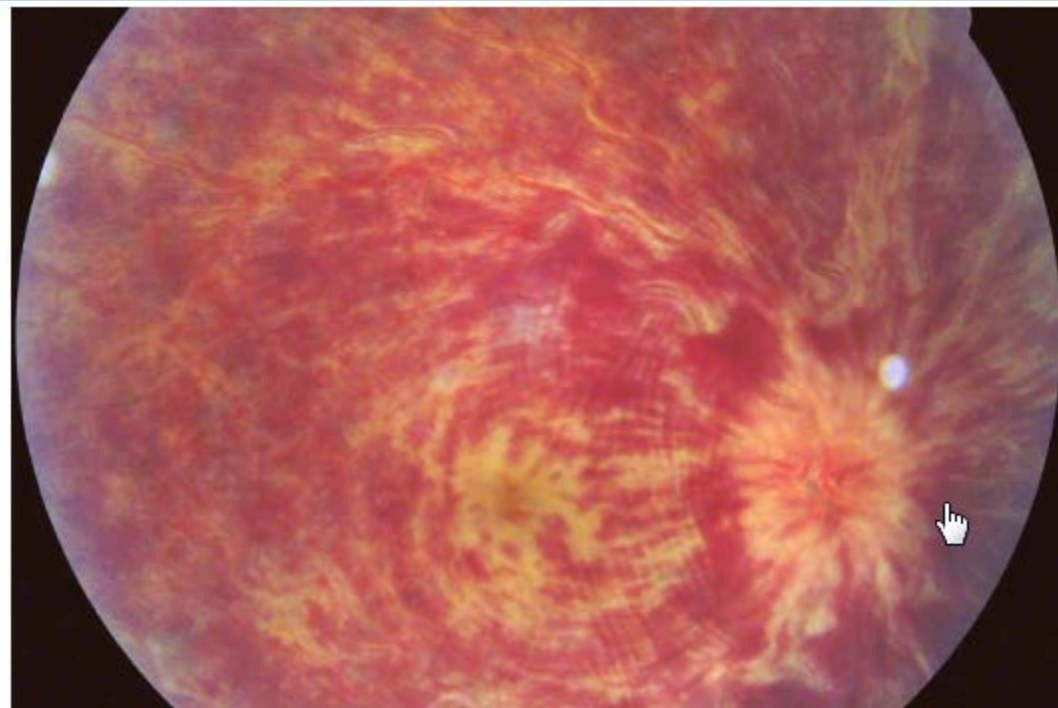
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Text Zoom



Exhibit Display



- Venous dilation & tortuosity due to venous occlusion
- Scattered & diffuse hemorrhages due to backup of blood & increased resistance, leading to ischemic damage
- "Blood & thunder" appearance due to diffuse hemorrhages
- Cotton wool spots

Zoom In

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in front of the eye" or **obscuring** of a part of the visual field. Ophthalmoscopic examination reveals an elevated,

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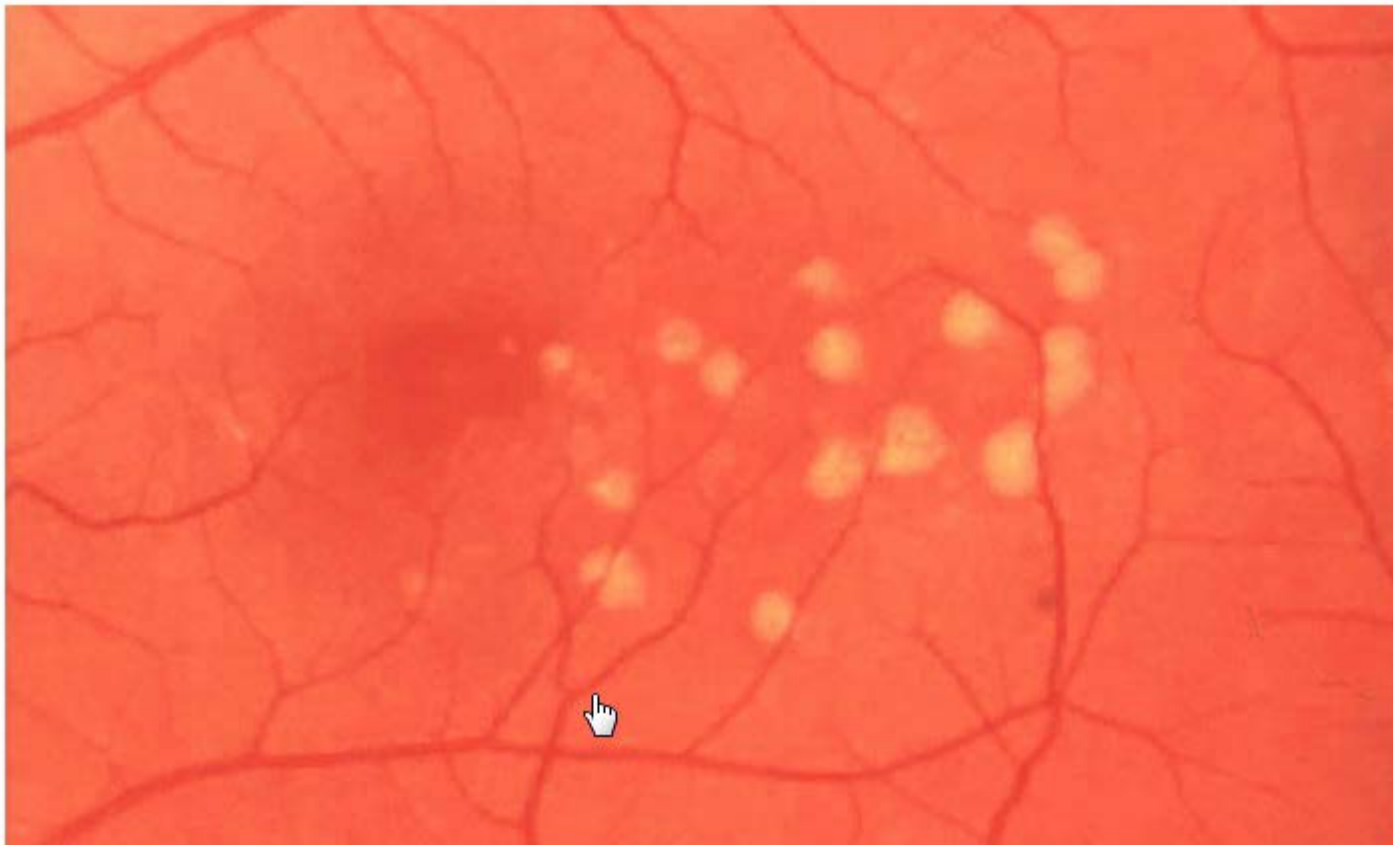
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Exhibit Display



Zoom In Zoom Out Reset Add To Flash Card

in front of the eye" or **obscuring** of a part of the visual field. Ophthalmoscopic examination reveals an elevated,



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Tutorial



Lab Values



Notes



Calculator



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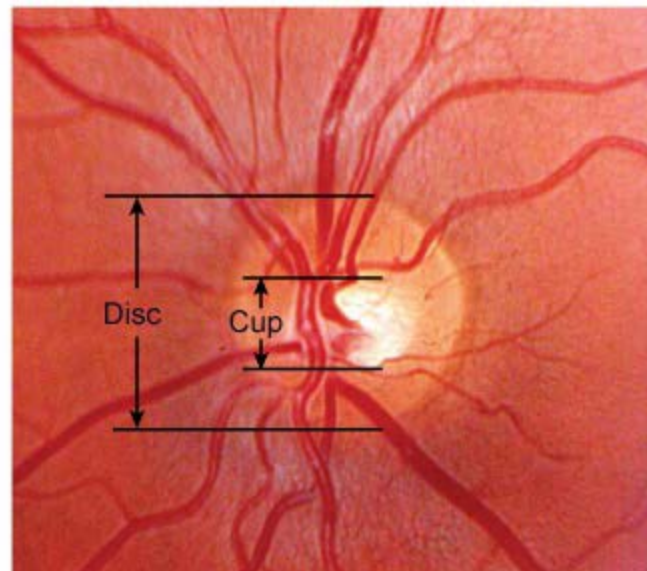
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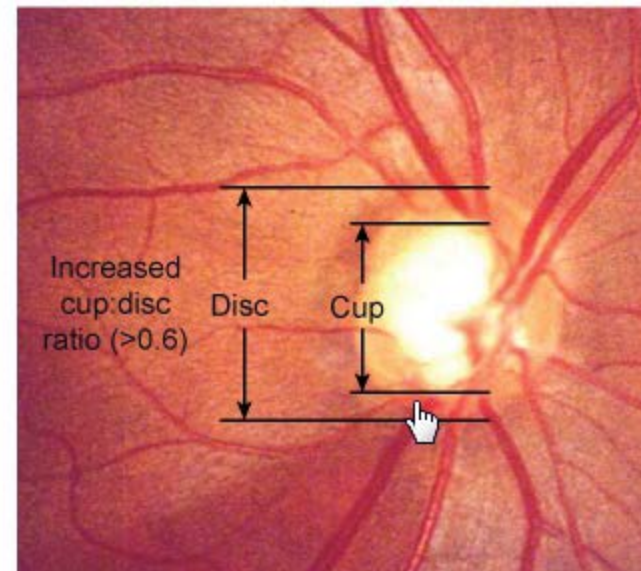
Optic disc in glaucoma

Normal



- Cup:disc ratio < 0.5
- Clear disc rim

Open-angle glaucoma



- Enlarged cup with cup:disc ratio > 0.6
- Increase in cup size over time
- Thinning of disc rim
- Pale disc (optic nerve atrophy)

Zoom In

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in front of the eye" or **obscuring** of a part of the visual field. Ophthalmoscopic examination reveals an elevated,

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Exhibit Display



Zoom In Zoom Out Reset Add To Flash Card

in front of the eye" or **obscuring** of a part of the visual field. Ophthalmoscopic examination reveals an elevated,



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



A 6-year-old boy is brought to the clinic by his parents due to 3 weeks of itchy, red eyes. The patient has intermittent, mild, clear eye drainage and rubs his eyes frequently. His parents have noticed some light crusting of both eyes when the boy wakes up in the morning. The patient has a history of mild intermittent asthma for which he uses an albuterol inhaler. He had a clavicle fracture last year but has had no other medical problems. He lives with his parents, little sister, 2 cats, and a hamster. His sister has had rhinorrhea, cough, pharyngitis, and subjective fever for 2 days. Vital signs are normal. Examination shows diffuse conjunctival injection in both eyes and mild eyelid edema. The child has no photophobia. Visual acuity is 20/20 in both eyes. Which of the following is the etiology of this patient's condition?

- ☐ A. Abrasion of corneal epithelium
- ☐ B. Adenovirus infection
- ☐ C. *Haemophilus influenzae* infection
- ☐ D. IgE-mediated hypersensitivity
- ☐ E. Increased intraocular pressure
- ☐ F. Obstruction of the nasolacrimal duct

Submit

Block Time Remaining: 00:53:16

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Feedback



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End Block

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20/11/10



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



A 6-year-old boy is brought to the clinic by his parents due to 3 weeks of itchy, red eyes. The patient has intermittent, mild, clear eye drainage and rubs his eyes frequently. His parents have noticed some light crusting of both eyes when the boy wakes up in the morning. The patient has a history of mild intermittent asthma for which he uses an albuterol inhaler. He had a clavicle fracture last year but has had no other medical problems. He lives with his parents, little sister, 2 cats, and a hamster. His sister has had rhinorrhea, cough, pharyngitis, and subjective fever for 2 days. Vital signs are normal. Examination shows diffuse conjunctival injection in both eyes and mild eyelid edema. The child has no photophobia. Visual acuity is 20/20 in both eyes. Which of the following is the etiology of this patient's condition?

- ☐ A. Abrasion of corneal epithelium [0%]
- ☐ B. Adenovirus infection [31%]
- ☒ C. *Haemophilus influenzae* infection [0%]
- ☒ D. IgE-mediated hypersensitivity [65%]
- ☐ E. Increased intraocular pressure [0%]
- ☐ F. Obstruction of the nasolacrimal duct [1%]

Incorrect

Correct answer

 65%
Answered correctly 5 Seconds
Time Spent 06/30/2018
Last Updated

Block Time Remaining: 00:53:12

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End Block

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Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Conjunctivitis

Symptoms	Viral	Bacterial	Allergic
Distribution	Unilateral or bilateral	Unilateral or bilateral	Always bilateral
Duration	1-2 weeks	1-2 weeks	<30 minutes to perennial
Discharge	Watery/mucoid	Purulent	Watery
Associated findings	Viral prodrome	Unremitting ocular discharge	Ocular pruritus

This child's conjunctival injection, ocular pruritus, eyelid edema, and tearing are consistent with **allergic conjunctivitis (AC)**. AC is due to IgE-mediated acute hypersensitivity to environmental allergens. Episodes may be acute if due to novel exposure (eg, a new cat) but more commonly are seasonal (pollens) or perennial (mold, dust). **Ocular pruritus** is typical; **edema** of the conjunctivae and eyelids and **clear discharge** are also seen. Patients may have very mild crusting in AC. AC is more common in those who have other atopic diseases, such as asthma or allergic rhinitis.

The diagnosis is clinical. AC does not cause visual changes, pain, or foreign body sensation. The offending allergen should be identified whenever possible to promote **avoidance**. AC can be treated with **topical agents**, including **antihistamines**, **mast cell stabilizers**, and artificial tears. Oral antihistamines can be helpful for patients who also experience allergic rhinitis, but these have more systemic side effects (eg, sedation) compared to topical antihistamines.



19



Feedback



Suspend



End Block



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

(Choice A) Corneal abrasion is due to trauma to the eye surface by a foreign body. Individuals generally experience acute, severe eye pain and photophobia, neither of which is present in this patient. A fluorescein examination is used to diagnose corneal abrasion.

(Choice B) Viral conjunctivitis is most commonly due to adenovirus. Affected patients may have a viral prodrome followed by 1-2 weeks of watery or mucoid eye drainage and eye redness. Viral conjunctivitis does not cause ocular pruritus and rarely lasts >2 weeks.

(Choice C) Bacterial conjunctivitis is due to a variety of organisms, including *Staphylococcus aureus* (most common in adults) and *Streptococcus pneumoniae* and *Haemophilus influenzae* (more common in children). Patients have copious, purulent discharge and eye crusting.

(Choice E) Glaucoma is an optic neuropathy that may be associated with increased intraocular pressure and eye redness and tearing. However, symptomatic patients typically have corneal clouding and photophobia, neither of which is present in this child.

(Choice F) Dacryostenosis (obstruction of the lacrimal duct) is most common in infancy. Dacryostenosis causes crusting of the eyelashes and tearing, but not ocular itching or eyelid edema.

Educational objective:

Allergic conjunctivitis is an IgE-mediated response to allergens and presents with ocular pruritus, bilateral conjunctivitis, and tearing. Topical therapy, such as antihistamines or mast cell stabilizers, is used for treatment, along with allergen avoidance.



19



Feedback



Suspend



End Block



A 53-year-old man comes to the office because of difficulty reading fine print over the last year. He now has to hold books, menus, and magazines at an arms length in order to read them. He has never had visual problems before. Which of the following is most likely abnormal in this patient?

- ☐ A. Corneal shape
- ☐ B. Lens elasticity
- ☐ C. Lens opacity
- ☐ D. Macula
- ☐ E. Peripheral retina
- ☐ F. Intraocular pressure

Submit

Block Time Remaining: 00:53:11

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01:17 م
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Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 53-year-old man comes to the office because of difficulty reading fine print over the last year. He now has to hold books, menus, and magazines at an arms length in order to read them. He has never had visual problems before. Which of the following is most likely abnormal in this patient?

- ☐ A. Corneal shape [7%]
- ☒ B. Lens elasticity [84%]
- ☐ C. Lens opacity [3%]
- ☐ D. Macula [3%]
- ☐ E. Peripheral retina [0%]
- ☐ F. Intraocular pressure [0%]

Correct84%
Answered correctly3 Seconds
Time Spent08/09/2018
Last Updated**Explanation**

This patient is most likely suffering from presbyopia, which is a common age-related disorder that results from the

Block Time Remaining: 00:53:09

TIMEDTUTOR



Feedback



Suspend



End Block

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01:17 م
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Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



This patient is most likely suffering from presbyopia, which is a common age-related disorder that results from the loss of elasticity in the lens. This decrease in elasticity prohibits accommodation of the lens, which is required in order to focus on near objects. The tendency of patients to hold reading material at a further distance is classic for presbyopia. Patients often have no history of eye problems. Most patients will report the onset of presbyopia while they are in their forties, and symptoms typically peak at some point in their sixties. The poor near vision associated with presbyopia can easily be improved with reading glasses.

(Choice A) A nonspherical cornea can lead to astigmatism, which typically presents with blurry vision both at a distance and up close.

(Choice C) Increased lens opacity is the etiology of cataracts. Patients may have difficulty reading, but a history of difficulty with night vision or driving at night is more characteristic.

(Choice D) Age-related macular degeneration is a common cause of visual loss in patients over the age of 50, but it is typically associated with central visual field loss.

(Choice E) Disease located in the peripheral retina is usually secondary to diabetes, which can lead to either proliferative or non-proliferative retinopathy. This patient, however, has no known history of diabetes.

(Choice F) Elevated intraocular pressure is the etiology of glaucoma. Primary open-angle glaucoma usually presents with peripheral visual field defects followed by central visual loss.

Educational objective:

Presbyopia is a common age-related decrease in lens elasticity that leads to difficulty with near vision. A history of a middle-aged individual who has to hold books at an arms length to read is classic.

Block Time Remaining: 00:53:09

TIMEDTUTOR



19



Feedback



Suspend



End Block

EN

01:17

20/11/10



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 35-year-old HIV-positive male is complaining of deterioration of his vision over the past week. He initially experienced eye pain and mild conjunctivitis, followed by rapid progressive visual loss. Examination of his eyes reveals marked keratitis. Funduscopy shows widespread, pale, peripheral retinal lesions and central necrosis of the retina. Which of the following is the most likely causative organism of this patient's condition?

- ☐ A. Pseudomonas
- ☐ B. Cytomegalovirus
- ☐ C. Herpes simplex
- ☐ D. Candida albicans
- ☐ E. Epstein Barr virus

Submit

Block Time Remaining: 00:53:07

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Feedback



Suspend



End Block

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01:18 م

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Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 35-year-old HIV-positive male is complaining of deterioration of his vision over the past week. He initially experienced eye pain and mild conjunctivitis, followed by rapid progressive visual loss. Examination of his eyes reveals marked keratitis. Funduscopy shows widespread, pale, peripheral retinal lesions and central necrosis of the retina. Which of the following is the most likely causative organism of this patient's condition?

- ☒ A. Pseudomonas [2%]
- ☐ B. Cytomegalovirus [68%]
- ☒ C. Herpes simplex [26%]
- ☐ D. Candida albicans [1%]
- ☐ E. Epstein Barr virus [1%]

Incorrect

Correct answer

C

26%
Answered correctly4 Seconds
Time Spent08/09/2018
Last Updated

Explanation

Ophthalmologic problems occur in approximately half of patients with advanced HIV infection. Retinitis can occur

Block Time Remaining: 00:53:05

TIMEDTUTOR



Feedback



Suspend



End Block



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

Ophthalmologic problems occur in approximately half of patients with advanced HIV infection. Retinitis can occur as a complication of opportunistic infections in AIDS patients. Both varicella-zoster (VZV) and herpes simplex virus (HSV) can cause severe, devastating intraocular inflammation. Most cases of retinal disease are believed to be a reactivation of a previously acquired infection.

In an immunocompromised individual, HSV retinitis may be characterized by rapidly progressing bilateral necrotizing retinitis (referred to as the "acute retinal necrosis syndrome"). This patient's clinical presentation is suggestive of acute retinal necrosis most likely due to HSV. The initial symptoms are keratitis and conjunctivitis with eye pain, followed by rapidly progressive visual loss. Funduscopy reveals widespread, pale, peripheral lesions and central necrosis of the retina.

HSV infection of the eye is the most common cause of corneal blindness in the United States.

(Choice B) CMV retinitis is the most common serious ocular complication of HIV-positive patients; however, it is typically painless, and funduscopy shows fluffy or granular retinal lesions located near the retinal vessels and associated hemorrhages. It does not usually cause initial conjunctivitis or keratitis, as in this patient.

(Choice D) Candida can cause endophthalmitis, especially with disseminated candidiasis infection. Patients with candida fungemia who appear sick should be evaluated by an ophthalmologist for possible endophthalmitis.

(Choices A and E) *Pseudomonas* and Epstein-Barr virus are not common causes of retinitis in immunosuppressed patients.

Educational Objective:

In HIV patients, both HSV and VZV can cause severe, acute retinal necrosis associated with pain, keratitis, uveitis.

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Feedback



Suspend



End Block

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Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

necrotizing retinitis (referred to as the "acute retinal necrosis syndrome"). This patient's clinical presentation is suggestive of acute retinal necrosis most likely due to HSV. The initial symptoms are keratitis and conjunctivitis with eye pain, followed by rapidly progressive visual loss. Funduscopy reveals widespread, pale, peripheral lesions and central necrosis of the retina.

HSV infection of the eye is the most common cause of corneal blindness in the United States.

(Choice B) CMV retinitis is the most common serious ocular complication of HIV-positive patients; however, it is typically painless, and funduscopy shows fluffy or granular retinal lesions located near the retinal vessels and associated hemorrhages. It does not usually cause initial conjunctivitis or keratitis, as in this patient.

(Choice D) Candida can cause endophthalmitis, especially with disseminated candidiasis infection. Patients with candida fungemia who appear sick should be evaluated by an ophthalmologist for possible endophthalmitis.

(Choices A and E) *Pseudomonas* and Epstein-Barr virus are not common causes of retinitis in immunosuppressed patients.

Educational Objective:

In HIV patients, both HSV and VZV can cause severe, acute retinal necrosis associated with pain, keratitis, uveitis, and funduscopy findings of peripheral pale lesions and central retinal necrosis. In contrast, CMV retinitis is painless, not usually associated with keratitis or conjunctivitis, and characterized by funduscopy findings of hemorrhages and fluffy or granular lesions around the retinal vessels.

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TIMEDTUTOR



19



Feedback



Suspend



End Block

EN

01:18

20/11/10



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 4-year-old boy is brought by his parents to the volunteer medical center of a large refugee camp in Egypt for evaluation of eye redness. For 10 days the boy has had mild rhinorrhea and cough that are now resolving. He began having mild eye redness 2 days ago with scant, watery discharge. He has not had ocular pain or itching. The patient's 6-year-old brother has similar symptoms. The family fled their home in Sudan due to regional conflict and arrived in the refugee camp approximately 2 months ago. The boy's grandfather and 2 dogs remained at their home. Vital signs are stable. Examination of the chest and abdomen is unremarkable. Examination of the eyes shows several pale follicles and inflammatory changes in the tarsal conjunctivae bilaterally. The conjunctivae appear mildly thickened. Visual acuity is 20/20 bilaterally. Which of the following is the most likely diagnosis for this patient?

- ☐ A. Chlamydial conjunctivitis
- ☐ B. Gonococcal conjunctivitis
- ☐ C. Herpes simplex keratitis
- ☐ D. Ocular syphilis
- ☐ E. Orbital cellulitis
- ☐ F. Trachoma

Submit

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01:18 م
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Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 4-year-old boy is brought by his parents to the volunteer medical center of a large refugee camp in Egypt for evaluation of eye redness. For 10 days the boy has had mild rhinorrhea and cough that are now resolving. He began having mild eye redness 2 days ago with scant, watery discharge. He has not had ocular pain or itching. The patient's 6-year-old brother has similar symptoms. The family fled their home in Sudan due to regional conflict and arrived in the refugee camp approximately 2 months ago. The boy's grandfather and 2 dogs remained at their home. Vital signs are stable. Examination of the chest and abdomen is unremarkable. Examination of the eyes shows several pale follicles and inflammatory changes in the tarsal conjunctivae bilaterally. The conjunctivae appear mildly thickened. Visual acuity is 20/20 bilaterally. Which of the following is the most likely diagnosis for this patient?

- ☐ A. Chlamydial conjunctivitis [18%]
- ☐ B. Gonococcal conjunctivitis [1%]
- ☒ C. Herpes simplex keratitis [18%]
- ☐ D. Ocular syphilis [2%]
- ☐ E. Orbital cellulitis [4%]
- ☒ F. Trachoma [54%]

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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

This child's conjunctival injection, tarsal inflammation, and pale follicles are concerning for **trachoma**. Trachoma is due to *Chlamydia trachomatis* serotypes A, B, and C and is the leading cause of blindness worldwide. *C trachomatis* spreads effectively in crowded or unsanitary conditions. The active phase is most common in children and is characterized by **follicular conjunctivitis** and pannus (neovascularization) formation in the cornea. There is often a concomitant nasopharyngeal infection (eg, rhinorrhea, pharyngitis). Repeated or chronic infection leads to **scarring** of the eyelids and **inversion** of the eyelashes (trichiasis). Over time, the lashes rub on the eye and cause ulcerations and **blindness** (cicatricial trachoma).

The diagnosis can be made clinically by examination of the tarsal conjunctivae. *C trachomatis* may be visible by Giemsa stain examination of conjunctival scrapings. Oral **azithromycin** is effective against *C trachomatis*; in general, the entire region (eg, village, refugee camp) should be treated simultaneously. For individuals with trichiasis, **eyelid surgery** is needed to preserve vision.

(Choices A and B) Gonococcal (2-5 days) and chlamydial (5-14 days) conjunctivitis are common causes of conjunctivitis after birth (ophthalmia neonatorum). They are acquired through contact with infected genital secretions. They both present with conjunctival injection, eye discharge, and swollen eyelids. They are rare in older children.

(Choice C) Herpes simplex keratitis presents as pain, photophobia, and decreased vision. Vesiculo-ulcerative lesions are commonly present in the corneal epithelium.

(Choice D) Tertiary syphilis can manifest as uveitis, causing eye redness, ocular pain, and decreased vision. Tertiary syphilis is extremely rare in children and, when present, should raise suspicion for sexual abuse.

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Tutorial



Lab Values



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Reverse Color



Text Zoom



Settings

{Choices A and B} Gonococcal (2-5 days) and chlamydial (5-14 days) conjunctivitis are common causes of conjunctivitis after birth (ophthalmia neonatorum). They are acquired through contact with infected genital secretions. They both present with conjunctival injection, eye discharge, and swollen eyelids. They are rare in older children.

{Choice C} Herpes simplex keratitis presents as pain, photophobia, and decreased vision. Vesiculo-ulcerative lesions are commonly present in the corneal epithelium.

{Choice D} Tertiary syphilis can manifest as uveitis, causing eye redness, ocular pain, and decreased vision. Tertiary syphilis is extremely rare in children and, when present, should raise suspicion for sexual abuse.

{Choice E} Orbital cellulitis refers to infection posterior to the orbital septum. These infections are unilateral and more common in children with paranasal sinus infection. Patients present with an abrupt onset of fever, proptosis, restriction of extraocular movements, and swollen, red eyelids.

Educational objective:

Trachoma is due to infection with *Chlamydia trachomatis* serotypes A, B, and C. Acute trachoma presents with follicular conjunctivitis and inflammation. Repeated or chronic infection causes inversion of the eyelashes and scarring of the cornea.

References

- [Trachoma.](#)
- [Trachoma: past, present, and future.](#)

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Feedback



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01:18 م

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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



A 4-year-old girl is brought to the office by her parents due to frequent squinting of the left eye. That eye also seems more prominent than the right, according to the mother. The child was born full term after a normal pregnancy and delivery. Developmental milestones have been age appropriate. Left eye examination reveals mild proptosis, esotropia, and optic disc pallor. Visual acuity is decreased in the left eye but is normal in the right. There are several large café-au-lait macules and marked axillary freckling. Which of the following is the most likely cause of this patient's ocular findings?

- ☐ A. Acoustic neuroma
- ☐ B. Craniopharyngioma
- ☐ C. Medulloblastoma
- ☐ D. Optic pathway glioma
- ☐ E. Retinitis pigmentosa
- ☐ F. Sporadic retinoblastoma

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Tutorial



Lab Values



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Text Zoom



A 4-year-old girl is brought to the office by her parents due to frequent squinting of the left eye. That eye also seems more prominent than the right, according to the mother. The child was born full term after a normal pregnancy and delivery. Developmental milestones have been age appropriate. Left eye examination reveals mild proptosis, esotropia, and optic disc pallor. Visual acuity is decreased in the left eye but is normal in the right. There are several large café-au-lait macules and marked axillary freckling. Which of the following is the most likely cause of this patient's ocular findings?

- ☐ A. Acoustic neuroma [7%]
- ☐ B. Craniopharyngioma [1%]
- ☒ C. Medulloblastoma [3%]
- ☐ D. Optic pathway glioma [74%]
- ☐ E. Retinitis pigmentosa [5%]
- ☐ F. Sporadic retinoblastoma [7%]

Incorrect

Correct answer

74%
Answered correctly4 Seconds
Time Spent09/12/2018
Last Updated

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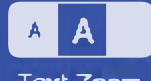
Neurofibromatosis types 1 & 2

Diagnosis	NF1 (von Recklinghausen disease)	NF2 (central neurofibromatosis)
Gene mutation	<i>NF1</i> tumor suppressor gene; codes the protein neurofibromin	<i>NF2</i> tumor suppressor gene; codes the protein merlin
Location of mutated gene	Chromosome 17	Chromosome 22
Main clinical features	• Café-au-lait spots • Multiple neurofibromas • Lisch nodules	• Bilateral acoustic neuromas

This child with **café-au-lait macules**, axillary freckling, and monocular eye proptosis and vision changes likely has **neurofibromatosis type 1 (NF1)** with **optic pathway glioma**.

NF1 is an autosomal dominant disease caused by a mutation to the *NF1* gene, which codes for neurofibromin. Starting in childhood, patients usually develop characteristic skin and soft tissue findings, including café-au-lait macules, freckling in skinfolds, and **Lisch nodules**.

Approximately 15% of patients with NF1 who are age <6 also develop low-grade optic pathway glioma. These tumors are often asymptomatic but can grow large enough to compress the optic nerve and cause **decreased visual acuity**, alterations in color vision, optic nerve atrophy, and **proptosis**.



(Choice A) Acoustic neuromas, or vestibular schwannomas, are benign tumors that arise from the eighth cranial nerve (CN VIII). They are seen in patients with neurofibromatosis type 2 and typically present with hearing loss and difficulty with balance.

(Choice B) Craniopharyngioma is a rare tumor that usually arises in the pituitary stalk and typically affects children age 5-14. Manifestations arise from compression of the optic chiasm (eg, visual field defects) or pituitary stalk (eg, growth hormone deficiency). This tumor type is not associated with NF1 and is unlikely to cause proptosis.

(Choice C) Medulloblastoma is a malignant pediatric brain tumor that typically results in increased intracranial pressure (eg, headache, nausea, vomiting) and cerebellar dysfunction (eg, gait ataxia, incoordination). Proptosis and esotropia would be uncommon; there is no association of medulloblastoma with NF1.

(Choice E) Retinitis pigmentosa is an inherited degenerative disease of the retinal photoreceptor cells that causes bilateral tunnel vision and, eventually, binocular blindness. Unilateral vision loss, proptosis, and skin findings would be uncommon.

(Choice F) **Retinoblastoma** is a rare intraocular malignancy that usually affects children age <2. Suspicion typically arises when a child has leukocoria, an abnormal white reflex of the eye. Patients may also have progressive deterioration of monocular vision, strabismus, and proptosis. This patient with café-au-lait spots and axillary freckling is more likely to have NF1 with an optic tract glioma.

Educational objective:

Neurofibromatosis type 1 is a genetic disorder that causes café-au-lait macules, freckling in skinfolds, Lisch nodules, and neurofibromas. Approximately 15% of children with this disorder develop optic pathway gliomas,





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Tutorial



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Text Zoom



Settings

growth hormone deficiency). This tumor type is not associated with NF1 and is unlikely to cause proptosis.

(Choice C) Medulloblastoma is a malignant pediatric brain tumor that typically results in increased intracranial pressure (eg, headache, nausea, vomiting) and cerebellar dysfunction (eg, gait ataxia, incoordination). Proptosis and esotropia would be uncommon; there is no association of medulloblastoma with NF1.

(Choice E) Retinitis pigmentosa is an inherited degenerative disease of the retinal photoreceptor cells that causes bilateral tunnel vision and, eventually, binocular blindness. Unilateral vision loss, proptosis, and skin findings would be uncommon.

(Choice F) **Retinoblastoma** is a rare intraocular malignancy that usually affects children age <2. Suspicion typically arises when a child has leukocoria, an abnormal white reflex of the eye. Patients may also have progressive deterioration of monocular vision, strabismus, and proptosis. This patient with café-au-lait spots and axillary freckling is more likely to have NF1 with an optic tract glioma.

Educational objective:

Neurofibromatosis type 1 is a genetic disorder that causes café-au-lait macules, freckling in skinfolds, Lisch nodules, and neurofibromas. Approximately 15% of children with this disorder develop optic pathway gliomas, which often manifest with unilateral vision loss, proptosis, esotropia, and optic disc pallor.

References

- [Café-au-lait macules and neurofibromatosis type 1: a review of the literature.](#)



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Exhibit Display

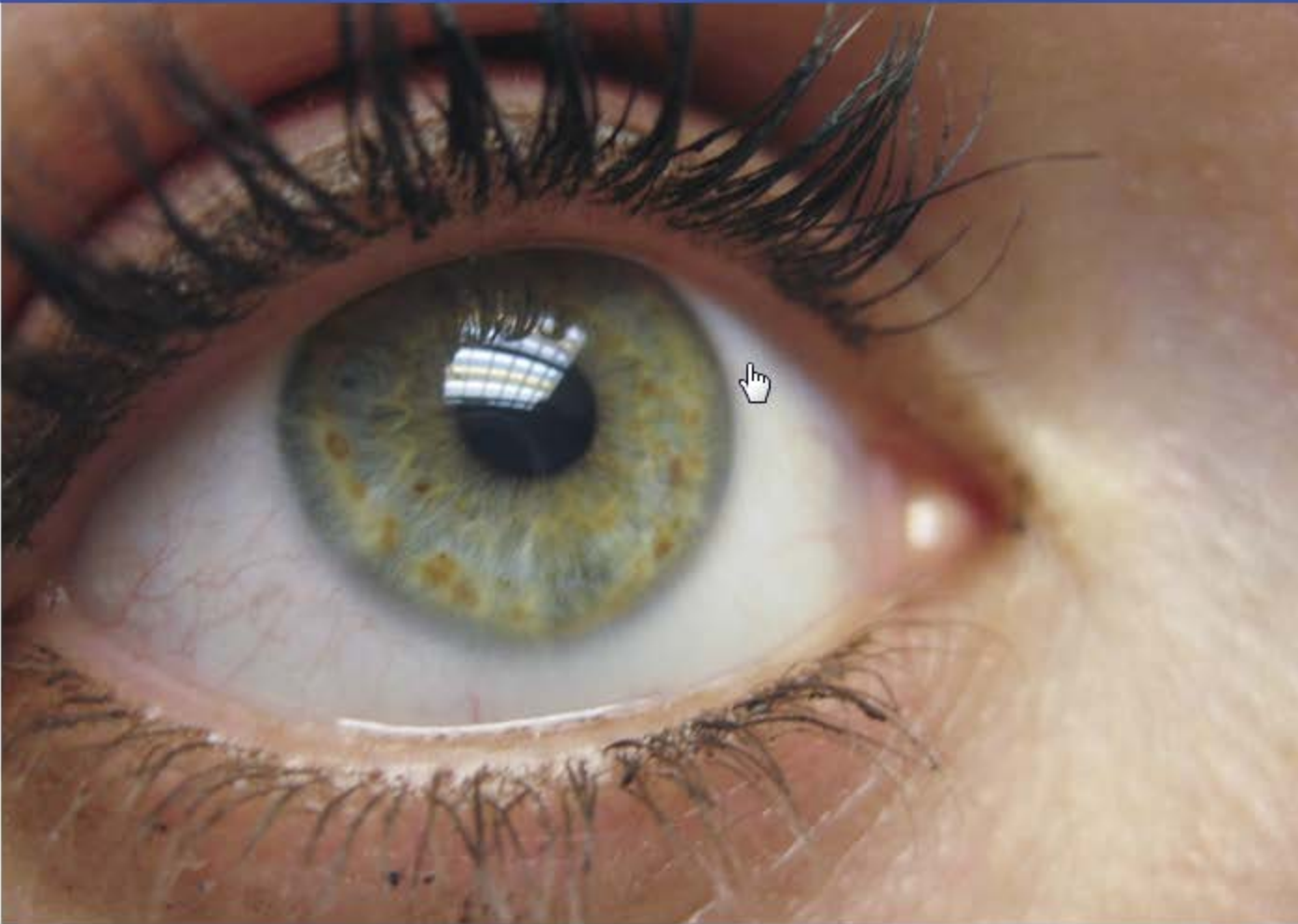


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visual acuity, alterations in color vision, optic nerve atrophy, and **proptosis**.

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Exhibit Display



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visual acuity, alterations in color vision, optic nerve atrophy, and proptosis.



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Tutorial



Lab Values



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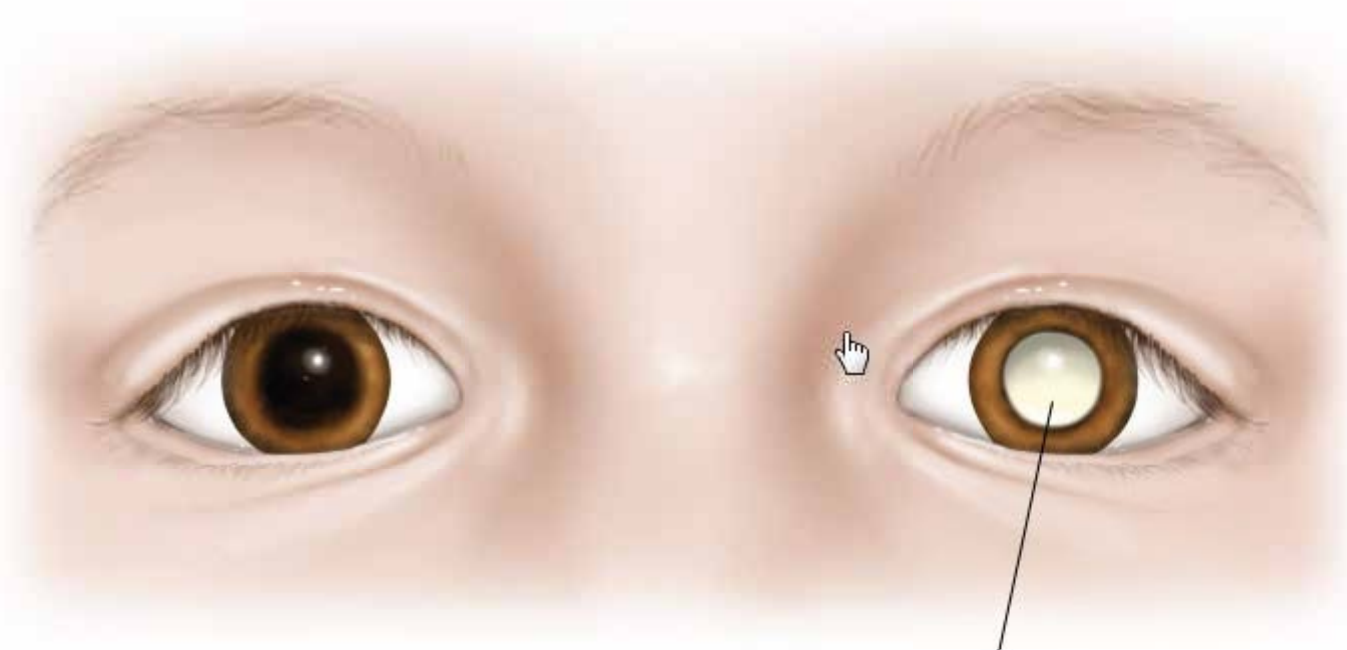


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(Choice B) Craniopharyngioma is a rare tumor that usually arises in the pituitary stalk and typically affects children

Exhibit Display

Retinoblastoma white reflex



Retinoblastoma of the left
eye with white reflex

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Zoom In

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TIMEDTUTOR



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Feedback



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End Block

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01:19

20/11/10



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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



A 32-year-old male construction worker presents with complaints of pain, watering, and redness in his left eye for the past 2 days. He reports having similar symptoms in the same eye a few months ago. Examination of his left eye reveals vesicles and dendritic ulcers in the cornea. His vital signs are stable. What is the most likely diagnosis?

- ☐ A. Bacterial keratitis
- ☐ B. Herpes simplex keratitis
- ☐ C. Herpes zoster ophthalmicus
- ☐ D. Corneal abrasion
- ☐ E. Fungal keratitis

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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 32-year-old male construction worker presents with complaints of pain, watering, and redness in his left eye for the past 2 days. He reports having similar symptoms in the same eye a few months ago. Examination of his left eye reveals vesicles and dendritic ulcers in the cornea. His vital signs are stable. What is the most likely diagnosis?

- ☒ A. Bacterial keratitis [1%]
- ☐ B. Herpes simplex keratitis [74%]
- ☐ C. Herpes zoster ophthalmicus [13%]
- ☐ D. Corneal abrasion [9%]
- ☐ E. Fungal keratitis [1%]

Incorrect

Correct answer



74%

Answered correctly



3 Seconds

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06/18/2018

Last Updated

Explanation

Herpes simplex keratitis is a frequent cause of corneal blindness in the US. It mostly occurs in adults. These patients usually complain of pain, photophobia, tearing, and redness. A history of prior episodes

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20/11/10



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Tutorial



Lab Values



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Calculator



Reverse Color



Text Zoom



Settings

Herpes simplex keratitis is a frequent cause of corneal blindness in the US. It mostly occurs in adults. These patients usually complain of pain, photophobia, blurred vision, tearing, and redness. A history of prior episodes may be present. Usually, the recurrences are precipitated by excessive sun exposure, outdoor occupation (as in this patient), fever, or immunodeficiency. Corneal vesicles and dendritic ulcers are characteristic. Dendritic ulcers are the most common presentation. It is primarily diagnosed clinically, although epithelial scrapings will show multinucleated giant cells. Antiviral therapy (oral or topical) is effective in the treatment of Herpes simplex keratitis.

(Choice A) Bacterial keratitis usually occurs in contact lens wearers, following corneal trauma or entry of a foreign body. The cornea appears hazy with a central ulcer and adjacent stromal abscess. Hypopyon may be present.

(Choice C) Herpes zoster ophthalmicus is an infection caused by varicella-zoster virus. Most episodes occur in the elderly. It presents with fever, malaise and a burning, itching sensation in the periorbital region. Examination reveals a vesicular rash in the distribution of the cutaneous branch of the first division of the trigeminal nerve. Conjunctivitis and dendriform corneal ulcers characterize the eye involvement.

(Choice D) Corneal abrasion presents with severe pain and photophobia. There is usually a history of trauma to the eye. Slit lamp examination reveals corneal abrasion.

(Choice E) Fungal keratitis occurs after corneal injury in agricultural workers or immunocompromised patients. The cornea shows multiple stromal abscesses.

Educational objective:

Herpes simplex keratitis is characterized by corneal vesicles and dendritic ulcers.

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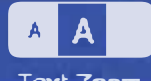
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20/11/10



A 62-year-old man comes to the physician due to sudden onset of pain and redness in the left eye. He also has photophobia, nausea, and a severe headache that has not responded to ibuprofen. There has been no trauma, and he has never had such an episode before. On review of systems, the patient has had "a mild cold" for which he used an over-the-counter oral decongestant. Physical examination shows a nonreactive mid-dilated left pupil. The eye appears red with conjunctival flushing. Which of the following is the best next step in evaluating this patient's condition?

- ☐ A. CT scan of the head
- ☐ B. Duplex studies of carotid artery
- ☐ C. Fluorescein staining of the eye
- ☐ D. Lumbar puncture
- ☐ E. Tonometry

Submit

Block Time Remaining: 00:52:54

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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 62-year-old man comes to the physician due to sudden onset of pain and redness in the left eye. He also has photophobia, nausea, and a severe headache that has not responded to ibuprofen. There has been no trauma, and he has never had such an episode before. On review of systems, the patient has had "a mild cold" for which he used an over-the-counter oral decongestant. Physical examination shows a nonreactive mid-dilated left pupil. The eye appears red with conjunctival flushing. Which of the following is the best next step in evaluating this patient's condition?

- ☐ A. CT scan of the head [16%]
- ☒ B. Duplex studies of carotid artery [3%]
- ☐ C. Fluorescein staining of the eye [6%]
- ☐ D. Lumbar puncture [2%]
- ☒ E. Tonometry [70%]

IncorrectCorrect answer
E70%
Answered correctly4 Seconds
Time Spent10/04/2018
Last Updated

Explanation

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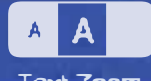


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20/11/18



This patient with headache, nausea, eye pain, and a nonreactive mid-dilated pupil, has typical features of **acute angle-closure glaucoma (ACG)**, possibly precipitated by decongestant use. Acute ACG is characterized by an acute rise in **intraocular pressure (IOP)** due to impaired drainage of aqueous humor into the anterior chamber (which normally occurs through the **iridocorneal angle**). This increased IOP can damage the optic nerve and lead to permanent vision loss. ACG can occur spontaneously or be **triggered** by certain medications (decongestants, antiemetics, anticholinergic drugs) in patients with predisposing anatomy. Symptoms include sudden-onset **eye pain**, headache, nausea, diminished vision, and halos around lights. Patients typically have a **nonreactive and mid-dilated pupil**; redness and corneal opacification can also be seen.

Urgent **ophthalmologic consultation** is indicated in patients with suspected ACG. The gold standard for diagnosis is gonioscopy, in which an ophthalmologist uses a specialized prismatic lens with a slit lamp to visualize





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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

Urgent **ophthalmologic consultation** is indicated in patients with suspected ACG. The gold standard for diagnosis is gonioscopy, in which an ophthalmologist uses a specialized prismatic lens with a slit lamp to visualize the iridocorneal angle. Ocular (eg, Schiottz) **tonometry** measures IOP and can provide additional information if needed or if ophthalmologic consultation is not immediately available. The device is placed against the anesthetized cornea, quantitated pressure is applied, and the resulting indentation is measured. ACG management may include pressure-lowering eye drops and laser or surgical interventions (eg, iridotomy or iridectomy).

(Choice A) Urgent non-contrast head CT is indicated for suspected intracranial hemorrhage. Typical symptoms include sudden-onset severe headache, often accompanied by altered mental status. A CT scan would also be useful to assess for the presence of an intracranial mass in patients with focal neurologic deficits. However, this patient's ocular findings are more consistent with ACG.

(Choice B) Duplex studies of the carotids are done to evaluate the carotid artery for plaques or stenosis. Emboli released from carotid plaques may cause stroke or transient ischemic attack but are not a common cause of headache.

(Choice C) Fluorescein staining of the eye is usually performed to detect corneal abrasions or herpes keratitis.

(Choice D) Lumbar puncture is useful to assess for subarachnoid hemorrhage or meningitis. If subarachnoid hemorrhage is suspected, a head CT scan should be performed first to identify signs of bleeding or increased intracranial pressure.

Educational objective:

Block Time Remaining: 00:52:51

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Tutorial



Lab Values



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Calculator



Reverse Color



Text Zoom



Settings

anesthetized cornea, quantitated pressure is applied, and the resulting indentation is measured. ACG

management may include pressure-lowering eye drops and laser or surgical interventions (eg, iridotomy or iridectomy).

(Choice A) Urgent non-contrast head CT is indicated for suspected intracranial hemorrhage. Typical symptoms include sudden-onset severe headache, often accompanied by altered mental status. A CT scan would also be useful to assess for the presence of an intracranial mass in patients with focal neurologic deficits. However, this patient's ocular findings are more consistent with ACG.

(Choice B) Duplex studies of the carotids are done to evaluate the carotid artery for plaques or stenosis. Emboli released from carotid plaques may cause stroke or transient ischemic attack but are not a common cause of headache.

(Choice C) Fluorescein staining of the eye is usually performed to detect corneal abrasions or herpes keratitis.

(Choice D) Lumbar puncture is useful to assess for subarachnoid hemorrhage or meningitis. If subarachnoid hemorrhage is suspected, a head CT scan should be performed first to identify signs of bleeding or increased intracranial pressure.

Educational objective:

Acute angle-closure glaucoma is characterized by sudden-onset eye pain, headache, and nausea. Signs may include conjunctival erythema, corneal opacification, and a mid-dilated pupil. Gonioscopy is the gold standard for diagnosis. Ocular tonometry can be helpful if urgent ophthalmological consultation is unavailable.

References

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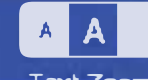
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01:19

20/11/10



A 65-year-old woman presents with complaints of pain and swelling over the inner aspect of her right eye for the past two days. Examination of the eye reveals tenderness, edema, and redness over the medial canthus. Slight pressure over the area causes expression of purulent material. Visual acuity is normal. What is the most likely diagnosis?

- ☐ A. Episcleritis
- ☐ B. Dacryocystitis
- ☐ C. Hordeolum
- ☐ D. Chalazion
- ☐ E. Orbital cellulitis

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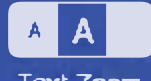
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A 65-year-old woman presents with complaints of pain and swelling over the inner aspect of her right eye for the past two days. Examination of the eye reveals tenderness, edema, and redness over the medial canthus. Slight pressure over the area causes expression of purulent material. Visual acuity is normal. What is the most likely diagnosis?

- ☒ A. Episcleritis [6%]
- ☐ B. Dacryocystitis [59%]
- ☐ C. Hordeolum [13%]
- ☐ D. Chalazion [14%]
- ☐ E. Orbital cellulitis [5%]

Incorrect
Correct answer
B

59%
Answered correctly

3 Seconds
Time Spent

09/21/2018
Last Updated

Explanation

Dacryocystitis is an infection of the lacrimal sac. It usually occurs in infants and adults over the age of 40. Acute dacryocystitis is characterized by the sudden onset of pain and redness in the medial canthal region. Sometimes

Block Time Remaining: 00:52:48

TIMEDTUTOR





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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Dacryocystitis is an infection of the lacrimal sac. It usually occurs in infants and adults over the age of 40. Acute dacryocystitis is characterized by the sudden onset of pain and redness in the medial canthal region. Sometimes, a purulent discharge is noted from the punctum. A few patients present with fever, prostration, and an elevated leukocyte count. *Staphylococcus aureus* and beta-hemolytic *Streptococcus* are the usual infecting organisms. It usually responds to systemic antibiotic therapy.

(Choice A) Episcleritis is an infection of the episcleral tissue between the conjunctiva and sclera. Patients complain of an acute onset of mild to moderate discomfort, photophobia, and watery discharge. Examination reveals diffuse or localized bulbar conjunctival injection.

(Choice C) Hordeolum refers to an abscess located over the upper or lower eyelid. It is usually caused by *Staphylococcus aureus*. It appears as a localized red, tender swelling over the eyelid.

(Choice D) Chalazion presents as lid discomfort. It is a chronic, granulomatous inflammation of the meibomian gland. It appears as a hard, painless lid nodule.

(Choice E) Orbital cellulitis refers to an infection posterior to the orbital septum. It is unilateral and more common in children. It is manifested by an abrupt onset of fever, proptosis, restriction of extraocular movements and swollen, red eyelids.

Educational Objective:

Dacryocystitis presents with inflammatory changes in the medial canthal region of the eye. *Staphylococcus aureus* and beta-hemolytic *Streptococcus* are the usual infecting organisms.

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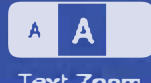
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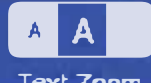


A 67-year-old Caucasian male complains of progressive visual loss in his right eye over the past several months. He has a history of hypertension and type 2 diabetes mellitus. Current medications include a daily baby aspirin, hydrochlorothiazide, lisinopril, and metformin. There is no family history of visual problems. He has a 35 pack year smoking history and admits to occasional alcohol use. He is afebrile with a blood pressure of 137/82 mmHg and pulse of 73/min. Cardiac and pulmonary examinations are unremarkable. A neurologic examination demonstrates no focal motor or sensory abnormalities. The patient is asked to cover his left eye and to look at a small spot on a grid made of parallel vertical and horizontal lines. He describes the vertical lines as being bent and wavy. Which of the following is the most likely cause of this patient's complaints?

- ☐ A. Lens opacity
- ☐ B. Enlarged blind spot
- ☐ C. Increased intraocular pressure
- ☐ D. Macular degeneration
- ☐ E. Peripheral retinal degeneration

Submit





A 67-year-old Caucasian male complains of progressive visual loss in his right eye over the past several months. He has a history of hypertension and type 2 diabetes mellitus. Current medications include a daily baby aspirin, hydrochlorothiazide, lisinopril, and metformin. There is no family history of visual problems. He has a 35 pack year smoking history and admits to occasional alcohol use. He is afebrile with a blood pressure of 137/82 mmHg and pulse of 73/min. Cardiac and pulmonary examinations are unremarkable. A neurologic examination demonstrates no focal motor or sensory abnormalities. The patient is asked to cover his left eye and to look at a small spot on a grid made of parallel vertical and horizontal lines. He describes the vertical lines as being bent and wavy. Which of the following is the most likely cause of this patient's complaints?

- ☒ A. Lens opacity [19%]
- ☐ B. Enlarged blind spot [2%]
- ☐ C. Increased intraocular pressure [16%]
- ☒ D. Macular degeneration [47%]
- ☐ E. Peripheral retinal degeneration [13%]

Incorrect
Correct answer
D

47%
Answered correctly

3 Seconds
Time Spent

06/18/2018
Last Updated

Block Time Remaining: 00:52:45
TIMEDTUTOR





Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



The most likely diagnosis in this case is macular degeneration, which is the leading cause of blindness in industrialized countries. One of the earliest findings in macular degeneration is distortion of straight lines such that they appear wavy. The grid test described above is frequently used to screen for patients with macular degeneration. The primary risk factor for macular degeneration is increasing age, although smoking can increase the risk as well. Patients may be asymptomatic, but others complain of visual problems in either one or both eyes. Driving and reading are often some of the first activities that are affected since they require fine visual acuity, which is provided primarily by the macula. In addition to the grid test described above, ophthalmologic examination can identify drusen deposits in the macula, which are common lesions seen with this disorder.

{Choice A} Lens opacification is the cause of visual loss from cataracts. Cataracts, however, should not cause straight lines to appear wavy.

{Choice B} An enlarged blind spot may be seen with papilledema, but this patient has no evidence of increased intracranial pressure to result in papilledema.

{Choice C} Increased intraocular pressure is the cause of glaucoma, which does not typically present with distortion of straight lines.

{Choice E} Visualization of straight lines is a task that requires fine visual acuity, which is controlled primarily by the centrally-located macula as opposed to the more peripheral retina.

Educational objective:

Macular degeneration is the most common cause of blindness in industrialized nations. Activities that require fine visual acuity are usually the first affected, and patients with this condition may report that straight grid lines appear

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19



Feedback



Suspend



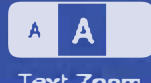
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EN



01:20

20/11/10



degeneration. The primary risk factor for macular degeneration is increasing age, although smoking can increase the risk as well. Patients may be asymptomatic, but others complain of visual problems in either one or both eyes. Driving and reading are often some of the first activities that are affected since they require fine visual acuity, which is provided primarily by the macula. In addition to the grid test described above, ophthalmologic examination can identify drusen deposits in the macula, which are common lesions seen with this disorder.

(Choice A) Lens opacification is the cause of visual loss from cataracts. Cataracts, however, should not cause straight lines to appear wavy.

(Choice B) An enlarged blind spot may be seen with papilledema, but this patient has no evidence of increased intracranial pressure to result in papilledema.

(Choice C) Increased intraocular pressure is the cause of glaucoma, which does not typically present with distortion of straight lines.

(Choice E) Visualization of straight lines is a task that requires fine visual acuity, which is controlled primarily by the centrally-located macula as opposed to the more peripheral retina.

Educational objective:

Macular degeneration is the most common cause of blindness in industrialized nations. Activities that require fine visual acuity are usually the first affected, and patients with this condition may report that straight grid lines appear curved.

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Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 34-year-old male presents to the emergency department with a red eye. He says, "I just woke up this morning and saw that my right eye was red." He denies any itching, pain or discharge. He has no known drug or environmental allergies. He takes no medication. His vital signs are stable. The photo of his eye is shown below.



19



Feedback



Suspend



End Block



What is the best next step in his management?

- ☐ A. Check intraocular pressure
- ☐ B. Refer to ophthalmologist
- ☐ C. Check coagulation parameters
- ☐ D. Observation
- ☐ E. Antibiotics

Submit



What is the best next step in his management?

- ☐ A. Check intraocular pressure [9%]
- ☐ B. Refer to ophthalmologist [4%]
- ☐ C. Check coagulation parameters [9%]
- ☒ D. Observation [75%]
- ☐ E. Antibiotics [1%]

Correct

75%
Answered correctly

Seconds
Time Spent

08/09/2018
Last Updated

Block Time Remaining: 00:52:37
TIMEDTUTOR

Feedback Suspend End Block



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom

















































































































































































































































































































































































Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

An 85-year-old man presents with a rash over his forehead, tip of nose and left eye. He also complains of pain and decreased vision. He has had fever, malaise, and a burning sensation around his left eye for the past 5 days. His blood pressure is 140/90 mm Hg, pulse is 92/min, respirations are 14/min, and temperature is 38.1° C (101° F). Physical examination reveals a vesicular rash on the periorbital region and lid margins. The left eye is red, with chemosis of the conjunctiva. Dendritiform ulcers are seen on the cornea. What is the most likely diagnosis?

- ☐ A. Herpes simplex keratitis
- ☐ B. Dacryocystitis
- ☐ C. Bacterial keratitis
- ☐ D. Trigeminal neuralgia
- ☐ E. Herpes zoster ophthalmicus

Submit

Block Time Remaining: 00:52:36

TIMEDTUTOR



19



Feedback



Suspend



End Block

EN



01:20

20/11/10



An 85-year-old man presents with a rash over his forehead, tip of nose and left eye. He also complains of pain and decreased vision. He has had fever, malaise, and a burning sensation around his left eye for the past 5 days. His blood pressure is 140/90 mm Hg, pulse is 92/min, respirations are 14/min, and temperature is 38.1° C (101° F). Physical examination reveals a vesicular rash on the periorbital region and lid margins. The left eye is red, with chemosis of the conjunctiva. Dendritiform ulcers are seen on the cornea. What is the most likely diagnosis?

- ☐ A. Herpes simplex keratitis [17%]
- ☒ B. Dacryocystitis [1%]
- ☐ C. Bacterial keratitis [1%]
- ☐ D. Trigeminal neuralgia [1%]
- ☒ E. Herpes zoster ophthalmicus [77%]

Incorrect

Correct answer
E



77%
Answered correctly



4 Seconds
Time Spent



08/09/2018
Last Updated

Explanation

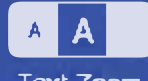
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EN

01:20
20/11/18



Herpes zoster ophthalmicus is an infection caused by varicella-zoster virus. Most episodes occur in the elderly or immunosuppressed. VZ virus remains latent in the trigeminal ganglion. During periods of immunosuppression, the virus travels via the ophthalmic branch to the forehead and the eye. Symptoms become manifest thereafter with fever, malaise and a burning, itching sensation in the periorbital region. Examination reveals a vesicular rash in the distribution of the cutaneous branch of the first division of the trigeminal nerve. Conjunctivitis and dendriform corneal ulcers characterize the eye involvement. Treatment started within 72 hrs after eruption with high dose acyclovir reduces the development of complications.

(Choice A) Herpes simplex keratitis presents with pain, photophobia, and decreased vision. Dendritic ulcer is the most common presentation. There may also be minute clear vesicles in the corneal epithelium. The typical vesicular rash of herpes zoster and systemic symptoms are not seen.

(Choice B) Dacryocystitis is an infection of the lacrimal sac due to obstruction of the nasolacrimal duct. It is characterized by pain, swelling, tenderness, and redness in the tear sac area. Mucous or pus can be expressed.

(Choice C) Bacterial keratitis is usually seen in contact lens wearers, and following corneal trauma. The cornea appears hazy with a central ulcer and adjacent stromal abscess. Hypopyon may be present.

(Choice D) The history is the only factor by which a diagnosis of trigeminal neuralgia is made clinically. It is characterized by a stabbing or shock-like pain over the distribution of the maxillary or mandibular division of the trigeminal nerve. The pain may be triggered by light touch or vibration. Rash is not seen.

Educational Objective:

Herpes zoster ophthalmicus is characterized by dendriform corneal ulcers and a vesicular rash in the trigeminal





Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

fever, malaise and a burning, itching sensation in the periorbital region. Examination reveals a vesicular rash in the distribution of the cutaneous branch of the first division of the trigeminal nerve. Conjunctivitis and dendriform corneal ulcers characterize the eye involvement. Treatment started within 72 hrs after eruption with high dose acyclovir reduces the development of complications.

(Choice A) Herpes simplex keratitis presents with pain, photophobia, and decreased vision. Dendritic ulcer is the most common presentation. There may also be minute clear vesicles in the corneal epithelium. The typical vesicular rash of herpes zoster and systemic symptoms are not seen.

(Choice B) Dacryocystitis is an infection of the lacrimal sac due to obstruction of the nasolacrimal duct. It is characterized by pain, swelling, tenderness, and redness in the tear sac area. Mucous or pus can be expressed.

(Choice C) Bacterial keratitis is usually seen in contact lens wearers, and following corneal trauma. The cornea appears hazy with a central ulcer and adjacent stromal abscess. Hypopyon may be present.

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Educational Objective:

Herpes zoster ophthalmicus is characterized by dendriform corneal ulcers and a vesicular rash in the trigeminal distribution.

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Block Time Remaining: 00:52:33

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19



Feedback



Suspend



End Block

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01:20 PM

2/11/10



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

ocular pain, fever, or headache. The patient takes combination antiretroviral therapy that includes a protease inhibitor. Six months ago, he was hospitalized with *Pneumocystis* pneumonia due to medication noncompliance. Temperature is 37.2 C (99 F), blood pressure is 120/70 mm Hg, and pulse is 78/min. BMI is 17 kg/m². Vision is decreased in the right eye, and funduscopic examination shows several yellow-white exudates immediately adjacent to the fovea and retinal vessels. Several white patches are present on the oropharyngeal mucosa. Neurologic examination shows no focal weakness or sensory loss. Which of the following is the most likely diagnosis?

- ☐ A. Cytomegalovirus retinitis
- ☐ B. Herpes simplex keratitis
- ☐ C. Herpes-zoster ophthalmicus
- ☐ D. HIV retinopathy
- ☐ E. Medication toxicity
- ☐ F. Ocular toxoplasmosis
- ☐ G. Syphilitic chorioretinitis

Submit

Block Time Remaining: 00:52:32

TIMEDTUTOR



Feedback



Suspend



End Block

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01:20

2/11/10



A 38-year-old homeless man with a history of HIV comes to the emergency department due to floaters and blurred vision in his right eye. The symptoms started a week ago and have become "really bothersome." He has not had ocular pain, fever, or headache. The patient takes combination antiretroviral therapy that includes a protease inhibitor. Six months ago, he was hospitalized with *Pneumocystis* pneumonia due to medication noncompliance. Temperature is 37.2 C (99 F), blood pressure is 120/70 mm Hg, and pulse is 78/min. BMI is 17 kg/m². Vision is decreased in the right eye, and funduscopic examination shows several yellow-white exudates immediately adjacent to the fovea and retinal vessels. Several white patches are present on the oropharyngeal mucosa. Neurologic examination shows no focal weakness or sensory loss. Which of the following is the most likely diagnosis?

- ☒ A. Cytomegalovirus retinitis [73%]
- ☐ B. Herpes simplex keratitis [3%]
- ☐ C. Herpes-zoster ophthalmicus [1%]
- ☐ D. HIV retinopathy [14%]
- ☐ E. Medication toxicity [3%]
- ☐ F. Ocular toxoplasmosis [2%]
- ☐ G. Syphilitic chorioretinitis [0%]





Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

Cytomegalovirus (CMV) is a widely prevalent DNA virus of the herpes family that typically causes an asymptomatic initial infection followed by a **life-long latent** infection. In patients with significantly compromised cell-mediated immunity (eg, advanced HIV with CD4 count $<100/\text{mm}^3$), CMV reactivation may result in viremia or end-organ disease.

CMV retinitis is characterized by full-thickness retinal inflammation that moves centripetally along the vasculature, causing edema and scarring. Patients experience **blurred vision**, **floaters**, and photopsia (sensation of flashing lights). Lesions near the fovea and optic nerve may cause **blindness**, and scarring greatly increases the risk of **retinal detachment**. Diagnosis is made by **fundoscopy** showing **yellow-white, fluffy, hemorrhagic lesions along the vasculature**. Blood tests for CMV (polymerase chain reaction) are not sufficient for diagnosis as viremia may develop independently of end-organ disease. Patients are usually treated with oral antivirals (eg, **valganciclovir**); if lesions are near the fovea or optic nerve, **intravitreal injections** are added. All patients should be initiated on **antiretroviral therapy** (usually 2 weeks after beginning CMV treatment) to prevent recurrence and progression. This patient likely developed CMV retinitis due to medication noncompliance.

(Choice B) Herpes simplex keratitis causes corneal (not retinal) lesions and results in ocular pain, tearing, and discharge.

(Choice C) Herpes zoster ophthalmicus presents with eye pain and a vesicular eruption usually involving the cornea or iris. This patient did not have a rash, pain, or anterior lesion.

(Choice D) HIV retinopathy is marked by cotton-wool retinal lesions that are rarely hemorrhagic and tend to resolve over weeks to months. HIV retinopathy does not commonly cause floaters or blurred vision.

Block Time Remaining: 00:52:30

TIMEDTUTOR



19



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End Block

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01:21

20/11/10



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

(Choice B) Herpes simplex keratitis causes corneal (not retinal) lesions and results in ocular pain, tearing, and discharge.

(Choice C) Herpes zoster ophthalmicus presents with eye pain and a vesicular eruption usually involving the cornea or iris. This patient did not have a rash, pain, or anterior lesion.

(Choice D) HIV retinopathy is marked by cotton-wool retinal lesions that are rarely hemorrhagic and tend to resolve over weeks to months. HIV retinopathy does not commonly cause floaters or blurred vision.

(Choice E) Most antiretrovirals are not commonly associated with retinal lesions or the sensation of floaters.

(Choice F) Patients with toxoplasmic chorioretinitis present with eye pain and decreased vision. Retinal lesions appear in a nonvascular distribution. This patient does not have eye pain and has lesions in a perivascular distribution.

(Choice G) Syphilitic chorioretinitis usually presents with uveitis and diminished visual acuity and almost always occurs with syphilitic meningitis. This patient has retinal lesions.

Educational objective:

Cytomegalovirus retinitis typically presents with blurred vision, floaters, and photopsia (sensation of flashing lights). The major complications are vision loss (including blindness) and retinal detachment. Treatment involves antivirals (eg, valganciclovir) and, in severe disease, intravitreal injections. All patients should be started on antiretroviral treatment to prevent recurrence and progression.

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Block Time Remaining: 00:52:30

TIMED TUTOR



Feedback



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End Block

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01:21 م

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Exhibit Display



Zoom In

Zoom Out

Reset

Add To Flash Card



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



A 30-year-old man is concerned about "floating spots" and blurred vision in his right eye. He had a penetrating injury to his left eye several weeks ago, which eventually led to vision loss in that eye. Inspection reveals a moderate perilimbal flush. What is the most probable cause of this patient's condition?

- ☐ A. Reagin-mediated disease
- ☐ B. Circulating immune complexes
- ☐ C. Non-caseating granulomas
- ☐ D. Uncovering of 'hidden' antigens
- ☐ E. Non-immune injury

Submit

Block Time Remaining: 00:52:29

TIMEDTUTOR



19



Feedback



Suspend



End Block

EN

01:21
٢٠١١/١١/١٠

A 30-year-old man is concerned about "floating spots" and blurred vision in his right eye. He had a penetrating injury to his left eye several weeks ago, which eventually led to vision loss in that eye. Inspection reveals a moderate perilimbal flush. What is the most probable cause of this patient's condition?

- ☐ A. Reagin-mediated disease [9%]
- ☒ B. Circulating immune complexes [20%]
- ☐ C. Non-caseating granulomas [3%]
- ☒ D. Uncovering of 'hidden' antigens [38%]
- ☐ E. Non-immune injury [28%]

Incorrect

Correct answer



38%
Answered correctly



4 Seconds
Time Spent



08/09/2018
Last Updated

Explanation

Sympathetic ophthalmia is also known as "spared eye injury." It is characterized by an immune-mediated inflammation of one eye (the sympathetic eye) after a penetrating injury to the other eye. The typical manifestation is anterior uveitis, but posterior uveitis, exudative retinal detachment, and blindness may develop. The pathophysiological

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TIMED TUTOR



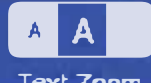
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End Block

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01:21
20/11/18



Explanation

Sympathetic ophthalmia is also known as "spared eye injury." It is characterized by an immune-mediated inflammation of one eye (the sympathetic eye) after a penetrating injury to the other eye. The typical manifestation is anterior uveitis, but panuveitis, papillary edema, and blindness may develop. The pathophysiological mechanism is believed to be the uncovering of 'hidden' antigens. Some antigens contained within the eye are protected from immunologic recognition by natural barriers. Breaking these barriers results in the uncovering of 'hidden' antigens. An immune response against these antigens can involve autoantibodies as well as a cell-mediated reaction.

(Choice A) Reagin-mediated (IgE-mediated) disease is seen in vernal (allergic) conjunctivitis.

(Choice B) Circulated immune complexes can affect the eye in systemic lupus erythematosus.

(Choice C) Ocular injury by non-caseating granulomas is typical for sarcoidosis.

(Choice E) Non-immunologic injury is less likely in this case.

Educational Objective:

Sympathetic ophthalmia is characterized by damage of one eye (the sympathetic eye) after a penetrating injury to the other eye. It is due to an immunologic mechanism involving the recognition of 'hidden' antigens.

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Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 75-year-old African American man comes to your office for his annual check up. He is a known diabetic and hypertensive. His medications include lisinopril and atenolol. His vital signs are normal. Examination of his fundus reveals cupping of the optic disc. Visual field examination reveals constricted peripheral vision. What is the most likely diagnosis?

- ☐ A. Diabetic retinopathy
- ☐ B. Closed angle glaucoma
- ☐ C. Macular degeneration
- ☐ D. Primary open angle glaucoma
- ☐ E. Cataract

Submit

Block Time Remaining: 00:52:25

TIMEDTUTOR



Feedback



Suspend



End Block

EN

01:21
٢٠١١/١١/١٠



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



A 75-year-old African American man comes to your office for his annual check up. He is a known diabetic and hypertensive. His medications include lisinopril and atenolol. His vital signs are normal. Examination of his fundus reveals cupping of the optic disc. Visual field examination reveals constricted peripheral vision. What is the most likely diagnosis?

- ☒ A. Diabetic retinopathy [17%]
- ☐ B. Closed angle glaucoma [10%]
- ☐ C. Macular degeneration [15%]
- ☒ D. Primary open angle glaucoma [52%]
- ☐ E. Cataract [3%]

Incorrect

Correct answer



52%

Answered correctly



4 Seconds

Time Spent



08/09/2018

Last Updated

Explanation

Open angle glaucoma is usually asymptomatic in the earlier stages. It is more common in African Americans, and

Block Time Remaining: 00:52:22

TIMEDTUTOR



19



Feedback



Suspend

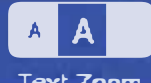


End Block

EN

01:21

20/11/10



Open angle glaucoma is usually asymptomatic in the earlier stages. It is more common in African Americans, and has an increased prevalence in those with a family history of glaucoma and diabetes. There is a gradual loss of peripheral vision over a period of years, and eventual tunnel vision. On examination, the intraocular pressure is high. There may be cupping of the optic disc with loss of peripheral vision. Annual examination in high-risk populations is of great benefit in prevention of the condition. Beta-blockers such as Timolol eye drops are effective in the initial management of the patient. Laser trabeculoplasty is used as an adjunctive measure. If there is a continuous increase in intraocular pressure, surgical trabeculectomy is done.

{Choice A} Diabetic retinopathy is the leading cause of acquired blindness among US adults. It can be classified into non-proliferative and proliferative retinopathy. Non-proliferative retinopathy is characterized by the dilation of veins, microaneurysms, retinal hemorrhages, edema, and hard exudates. Proliferative retinopathy is characterized by neovascularization. Most patients with diabetic retinopathy are asymptomatic until very late in the disease, at which point they may present with poor night vision, a curtain falling with a vitreous bleed, or floaters during the resolution of vitreous bleeds.

{Choice B} Angle closure glaucoma is characterized by a sudden onset of symptoms such as blurred vision, severe eye pain, nausea, and vomiting. Examination reveals a red eye with a hazy cornea and a fixed, dilated pupil.

{Choice C} Macular degeneration affects central vision.

{Choice E} Cataract is a vision-impairing disease characterized by progressive thickening of the lens. Oxidative damage of the lens occurs with aging and leads to cataract formation. Patients usually complain of blurred vision, problems with nighttime driving, and glare. Definitive treatment is lens extraction.





Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

continuous increase in intraocular pressure, surgical trabeculectomy is done.

(Choice A) Diabetic retinopathy is the leading cause of acquired blindness among US adults. It can be classified into non-proliferative and proliferative retinopathy. Non-proliferative retinopathy is characterized by the dilation of veins, microaneurysms, retinal hemorrhages, edema, and hard exudates. Proliferative retinopathy is characterized by neovascularization. Most patients with diabetic retinopathy are asymptomatic until very late in the disease, at which point they may present with poor night vision, a curtain falling with a vitreous bleed, or floaters during the resolution of vitreous bleeds.

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(Choice E) Cataract is a vision-impairing disease characterized by progressive thickening of the lens. Oxidative damage of the lens occurs with aging and leads to cataract formation. Patients usually complain of blurred vision, problems with nighttime driving, and glare. Definitive treatment is lens extraction.

Educational Objective:

Open angle glaucoma is more common in African-Americans. It is generally asymptomatic in the initial stages, followed by a gradual loss of peripheral vision over a period of years, and eventual tunnel vision.

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Block Time Remaining: 00:52:22

TIMEDTUTOR



Feedback



Suspend



End Block

EN

01:21
٢٠١٧/١١/١٠



A 13-day-old boy is brought to the office by his parents for a well-newborn visit. The infant was born at 38 weeks gestation via normal spontaneous vaginal delivery to a 27-year-old gravida 1 para 1. He had an uncomplicated newborn nursery course and was discharged home with his mother at age 2 days. The patient nurses for 15-20 minutes on each breast every 2 hours. He has approximately 7 wet diapers and 3 stools per day. Weight, length, and head circumference are at the 75th percentile. Vital signs are normal. On examination, the anterior fontanelle is open, soft, and flat. Pupils are equal, round, and reactive to light. Both eyes have mild eyelid swelling, conjunctival injection, and a scant amount of mucopurulent discharge. The rest of the examination is normal. A sample of the eye discharge is sent to the laboratory. Which of the following is the most appropriate treatment for this patient's condition?

- ☐ A. Intramuscular cefotaxime
- ☐ B. Massaging the nasolacrimal ducts
- ☐ C. Oral erythromycin
- ☐ D. Topical erythromycin
- ☐ E. Topical silver nitrate

Submit

Block Time Remaining: 00:52:21

TIMEDTUTOR



Feedback



Suspend



End Block

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01:21
٢٠١١/١١/١٠



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 13-day-old boy is brought to the office by his parents for a well-newborn visit. The infant was born at 38 weeks gestation via normal spontaneous vaginal delivery to a 27-year-old gravida 1 para 1. He had an uncomplicated newborn nursery course and was discharged home with his mother at age 2 days. The patient nurses for 15-20 minutes on each breast every 2 hours. He has approximately 7 wet diapers and 3 stools per day. Weight, length, and head circumference are at the 75th percentile. Vital signs are normal. On examination, the anterior fontanelle is open, soft, and flat. Pupils are equal, round, and reactive to light. Both eyes have mild eyelid swelling, conjunctival injection, and a scant amount of mucopurulent discharge. The rest of the examination is normal. A sample of the eye discharge is sent to the laboratory. Which of the following is the most appropriate treatment for this patient's condition?

- ☐ A. Intramuscular cefotaxime [9%]
- ☐ B. Massaging the nasolacrimal ducts [9%]
- ☒ C. Oral erythromycin [31%]
- ☐ D. Topical erythromycin [45%]
- ☐ E. Topical silver nitrate [3%]

Correct

31%
Answered correctly4 Seconds
Time Spent09/03/2018
Last Updated

Block Time Remaining: 00:52:18

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Feedback

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01:21
20/11/10



Mark



Previous



Next



Tutorial



Lab Values



Notes



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Text Zoom



Neonatal conjunctivitis

Type	Onset age	Findings	Treatment
Chemical	<24 hours	Mild conjunctival irritation & tearing after silver nitrate ophthalmic prophylaxis	Eye lubricant
Gonococcal	2-5 days	- Marked eyelid swelling - Profuse purulent discharge - Corneal edema/ulceration	Single IM dose of 3rd-generation cephalosporin
Chlamydial	5-14 days	- Mild eyelid swelling - Watery, serosanguinous, or mucopurulent eye discharge	PO macrolide

IM = intramuscular; PO = oral.

This infant's mild eyelid swelling and bilateral eye drainage in the second week of life are consistent with conjunctivitis secondary to *Chlamydia trachomatis*. Infants acquire **chlamydial conjunctivitis** through contact with infected genital secretions. Chlamydial conjunctivitis is less severe compared with gonococcal conjunctivitis. Infected infants usually present at age **5-14 days** with relatively mild findings, such as eyelid swelling, **watery** or **mucopurulent discharge**, and chemosis (conjunctival injection). Untreated infection may lead to corneal scarring.

C. trachomatis cannot be seen on Gram stain and does not grow in routine culture—polymerase chain reaction

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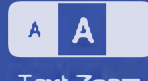
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C trachomatis cannot be seen on Gram stain and does not grow in routine culture; polymerase chain reaction testing is needed for confirmatory diagnosis. Infected infants should receive oral **macrolide** therapy; systemic treatment is needed as topical therapy has high failure rates. Infants should be monitored for pyloric stenosis, a potential side effect of erythromycin and azithromycin therapies.

C trachomatis conjunctivitis in neonates can be prevented by screening pregnant women (age <25 or with risk factors) and treating their infections. However, the majority of infants with chlamydial conjunctivitis are born to mothers who were not screened or were infected after screening but before delivery.

(Choice A) A single intramuscular dose of a third-generation cephalosporin (eg, cefotaxime) is the recommended treatment for infants with gonococcal conjunctivitis. Gonococcal conjunctivitis generally presents in the first week of life with heavy, purulent discharge.

(Choice B) Massaging the nasolacrimal ducts is the most appropriate treatment for infants with nasolacrimal duct obstruction (**dacryostenosis**), which typically presents with unilateral tearing and minimal conjunctival injection.

(Choice D) Topical erythromycin is effective prophylaxis for gonococcal conjunctivitis but is not effective prophylaxis or treatment for chlamydial conjunctivitis.

(Choice E) Although silver nitrate is no longer available in the United States, it is used for routine neonatal ophthalmic prophylaxis in some countries and is effective against penicillinase-producing strains of *Neisseria gonorrhoeae*. Topical silver nitrate can cause a chemical conjunctivitis that presents within the first 24 hours of life and resolves with supportive care.

Educational objective:

Block Time Remaining: 00:52:18

TIMEDTUTOR





Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

{Choice A} A single intramuscular dose of a third-generation cephalosporin (eg, cefotaxime) is the recommended treatment for infants with gonococcal conjunctivitis. Gonococcal conjunctivitis generally presents in the first week of life with heavy, purulent discharge.

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Educational objective:

Chlamydial conjunctivitis typically occurs at age 5-14 days with mild eyelid swelling, chemosis, and watery or mucopurulent discharge. Affected infants should receive oral macrolide therapy as topical treatments are not effective.

References

- Chlamydia trachomatis infections: screening, diagnosis, and management.

Block Time Remaining: 00:52:18

TIMEDTUTOR



Feedback



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01:21

20/11/10



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Previous



Next



Tutorial



Lab Values



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Calculator



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Text Zoom



A 3-year-old girl is brought to the physician for intermittent "eye crossing." The parents say her **right eye intermittently "turned in"** during her first few months of life. The symptoms have returned in the past month, especially around bedtime. She has no headaches or pain. The girl was born full-term, has no medical conditions, and has met all developmental milestones. Vital signs and growth are normal. Examination shows asymmetric corneal light reflection. When the left eye is covered, the right eye moves midline. Vision screening is normal. The rest of the examination is normal. What is the most appropriate next step in management of this patient?

- ☐ A. Brain MRI
- ☐ B. Immediate surgery
- ☐ C. Measurement of intraocular pressure
- ☐ D. Patch on the right eye
- ☐ E. Patch on the left eye
- ☐ F. Watchful waiting

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Exhibit Display



Zoom In Zoom Out Reset Add To Flash Card



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Previous



Next



Tutorial



Lab Values



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Reverse Color



Text Zoom



Settings

A 3-year-old girl is brought to the physician for intermittent "eye crossing." The parents say her **right eye intermittently "turned in"** during her first few months of life. The symptoms have returned in the past month, especially around bedtime. She has no headaches or pain. The girl was born full-term, has no medical conditions, and has met all developmental milestones. Vital signs and growth are normal. Examination shows asymmetric corneal light reflection. When the left eye is covered, the right eye moves midline. Vision screening is normal. The rest of the examination is normal. What is the most appropriate next step in management of this patient?

- ☐ A. Brain MRI [5%]
- ☐ B. Immediate surgery [3%]
- ☐ C. Measurement of intraocular pressure [0%]
- ☒ D. Patch on the right eye [4%]
- ☐ E. Patch on the left eye [78%]
- ☐ F. Watchful waiting [6%]

IncorrectCorrect answer
E78%
Answered correctly15 Seconds
Time Spent10/25/2018
Last Updated

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Strabismus (ocular misalignment)

Abnormal findings

- Constant strabismus at any age
- Eye deviation after 4 months of age
- Asymmetric corneal light reflexes
- Asymmetric intensity of red reflexes
- Deviation on cover test
- Torticollis or head tilt

Treatment options

- Penalization therapy: Cycloplegic drops to blur normal eye
- Occlusion therapy: Patch normal eye
- Prescription eyeglasses
- Surgery

Complications

- Amblyopia
- Diplopia

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Strabismus refers to intermittent or constant ocular misalignment usually due to nasal deviation (esotropia) or, less commonly, temporal deviation (exotropia). Important examination findings include asymmetric red reflexes or corneal light reflexes or a deviation during the cover test. The cover test is performed by asking the child to fix the gaze on a target as the examiner covers one eye while observing the movement of the other. A normal eye

Block Time Remaining: 00:52:03

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Previous



Next



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Settings

Strabismus refers to intermittent or constant ocular misalignment usually due to nasal deviation (esotropia) or, less commonly, temporal deviation (exotropia). Important examination findings include **asymmetric red reflexes** or **corneal light reflexes** or a deviation during the cover test. The **cover test** is performed by asking the child to fix the gaze on a target as the examiner covers one eye while observing the movement of the other. A normal eye keeps the same position and does not move; a misaligned eye shifts to re-fixate on the object when the normal eye is covered.

Intermittent strabismus can be expected in infants age <4 months due to immaturity of the extraocular muscles (ocular instability of infancy). Esotropia beyond early infancy must be treated to prevent **amblyopia** (vision loss from disuse of deviated eye). The first 5 years of life are extremely critical to the development of visual acuity as it is the time for visual cortex maturation. During this stage, any anomaly (eg, strabismus, refractive error, cataract) can compromise vision.

Treatment involves prescription eyeglasses for correction of significant refractive errors (if present) and promoting the use of the deviated eye. The deviated eye can be strengthened by **patching the normal eye** (occlusion therapy) or **blurring the vision of the normal eye** with cycloplegic drops (**penalization therapy**).

(Choice A) New onset of strabismus can be a sign of retinoblastoma if accompanied by a **white eye reflex**.

Acute onset of strabismus can also result from intracranial hemorrhage, brain abscess, or encephalitis. However, these other neurological derangements would be expected on examination. Brain MRI should be performed if additional abnormalities are present, but it is not routinely indicated in strabismus evaluation.

(Choice B) Occlusion or penalization therapies are the first steps in treatment. Surgery is reserved for persistent or severe cases.



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Previous



Next



Tutorial



Lab Values



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Settings

therapy) or blurring the vision of the normal eye with cycloplegic drops (penalization therapy).

(Choice A) New onset of strabismus can be a sign of retinoblastoma if accompanied by a **white eye reflex**.

Acute onset of strabismus can also result from intracranial hemorrhage, brain abscess, or encephalitis. However, these other neurological derangements would be expected on examination. Brain MRI should be performed if additional abnormalities are present, but it is not routinely indicated in strabismus evaluation.

(Choice B) Occlusion or penalization therapies are the first steps in treatment. Surgery is reserved for persistent or severe cases.

(Choice C) Measurement of intraocular pressure would be useful if congenital glaucoma was suspected. Children with this problem usually have sensitivity to light and excessive lacrimation.

(Choice D) The treatment of strabismus is aimed at forcing the use of the affected eye to stimulate its maturation; for this reason, the deviated eye should not be covered.

(Choice F) Reassurance and observation should be provided for intermittent strabismus during the first few months of life but is inappropriate beyond early infancy. Reassurance is also indicated for **pseudostrabismus**.

Educational objective:

Strabismus after age 4 months is usually abnormal and requires treatment to prevent amblyopia. Asymmetric corneal light reflections and deviation on cover test are concerning findings. The standard treatment is occlusion (patching) or penalization (blurring) of the normal eye.



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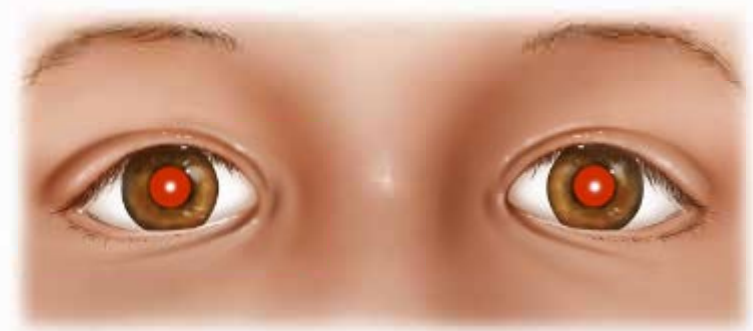


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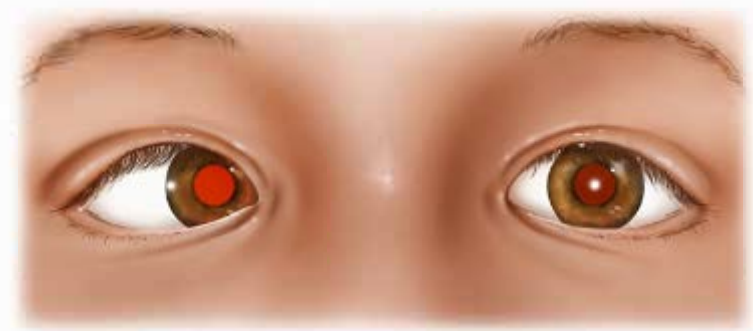
• Prescription eyeglasses

Exhibit Display

Normal eyes & strabismus



Normal eyes
Red reflexes & corneal light reflexes are equal



Asymmetric reflections
In strabismus, the red reflex is more intense in the deviated eye. The corneal light reflexes are also asymmetric.

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Previous



Next



Tutorial



Lab Values



Notes



Calculator



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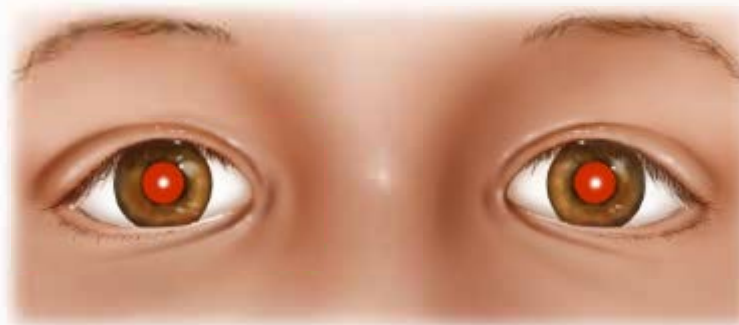


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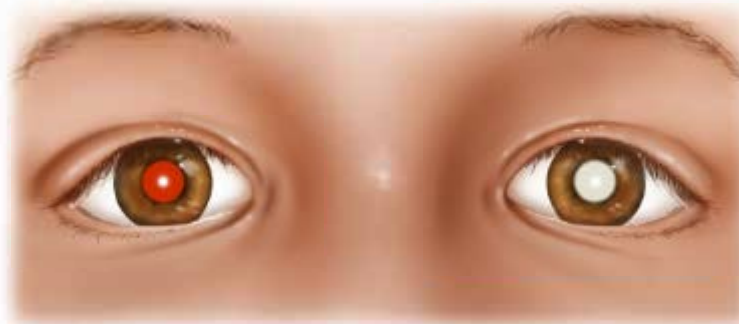
Exhibit Display

Normal eyes & white reflex



Normal eyes

Red reflexes & corneal light reflexes are equal



Absent reflex

White reflex on abnormal eye can result from opacities of the lens (eg, cataract) or tumor (eg, retinoblastoma)

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Strabismus after age 4 months is usually abnormal and requires treatment to prevent amblyopia. Asymmetric

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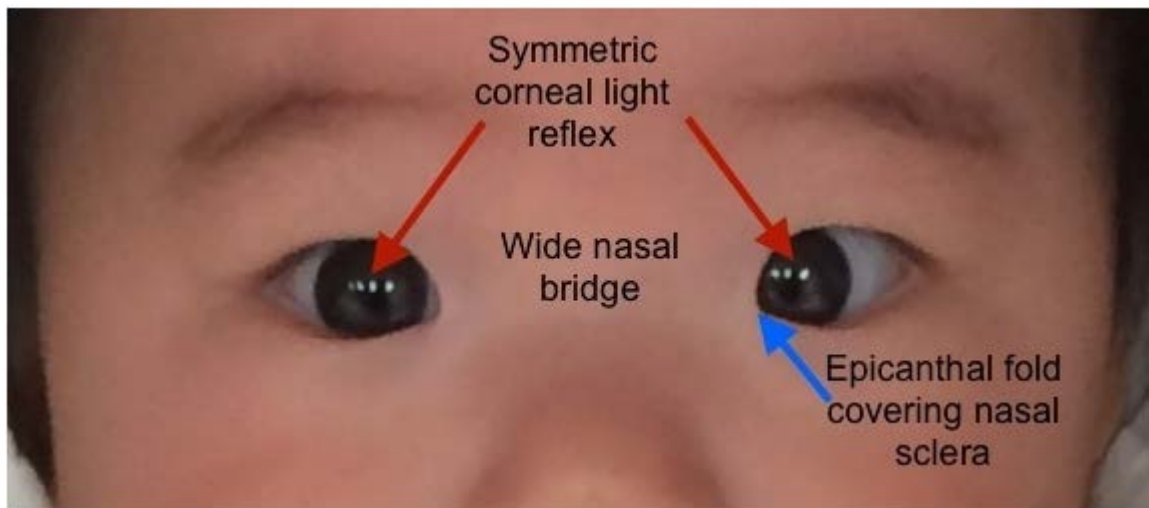
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or severe cases

Exhibit Display



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Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 62-year-old female is brought in by EMS due to a severe right-sided headache, nausea and eye pain. She was fixing a light bulb, when she suddenly felt pain in her right eye. She decided to rest, but the eye pain only got worse. In the next few minutes, she developed loss of vision, photophobia and redness in the same eye. She took medications to relieve the accompanying headache, but the eye pain persisted. She denies any trauma. Her past medical history is significant for diabetes and hypertension. She appears to be in intense pain with bouts of nausea. Her right eye is red, with conjunctival flushing and visual acuity of 20/200. Her right pupil is mid-dilated and non-reactive to light. The same eye feels hard on palpation. The one treatment that should be avoided in this patient is:

- ☐ A. Mannitol
- ☐ B. Acetazolamide
- ☐ C. Pilocarpine
- ☐ D. Timolol
- ☐ E. Atropine

Submit

Block Time Remaining: 00:52:02

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Previous



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Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 62-year-old female is brought in by EMS due to a severe right-sided headache, nausea and eye pain. She was fixing a light bulb, when she suddenly felt pain in her right eye. She decided to rest, but the eye pain only got worse. In the next few minutes, she developed loss of vision, photophobia and redness in the same eye. She took medications to relieve the accompanying headache, but the eye pain persisted. She denies any trauma. Her past medical history is significant for diabetes and hypertension. She appears to be in intense pain with bouts of nausea. Her right eye is red, with conjunctival flushing and visual acuity of 20/200. Her right pupil is mid-dilated and non-reactive to light. The same eye feels hard on palpation. The one treatment that should be avoided in this patient is:

- ☐ A. Mannitol [4%]
- ☒ B. Acetazolamide [4%]
- ☐ C. Pilocarpine [14%]
- ☐ D. Timolol [10%]
- ☒ E. Atropine [66%]

Incorrect

Correct answer

E



66%

Answered correctly



4 Seconds

Time Spent



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Block Time Remaining: 00:51:59

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Feedback



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01:22 PM

20/11/18



Mark



Previous



Next



Tutorial



Lab Values



Notes



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Text Zoom



Explanation

Acute glaucoma is a medical emergency. Narcotics are used to control the pain. The increased intraocular pressure is reduced with mannitol, acetazolamide, timolol or pilocarpine. Atropine should be avoided since it can dilate the pupil and worsen the glaucoma. Sometimes, mydriatic agents such as atropine can precipitate glaucoma.

(Choice A) The first line of treatment for an acute episode of glaucoma is to administer mannitol intravenously. It is an osmotic diuretic and works immediately.

(Choice B) Acetazolamide is a carbonic anhydrase inhibitor that rapidly reduces further production of aqueous humor, thus decreasing intraocular pressure.

(Choice C) Pilocarpine rapidly reduces intraocular pressure by opening the canals of Schlemm and allowing for drainage of the aqueous humor. It is applied topically.

(Choice D) Timolol is a beta-blocker that decreases the intraocular pressure by decreasing production of the aqueous humor. It is administered topically.

Educational objective:

Treat acute glaucoma emergently with mannitol, acetazolamide, pilocarpine or timolol. Avoid mydriatic agents such as atropine.

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An 80-year-old man comes to the emergency department due to sudden loss of vision in his left eye that occurred on waking this morning. He has no associated pain. Past medical history is notable for hypertension. Current medications include ramipril and chlorthalidone. He has smoked half a pack of cigarettes a day for the past 60 years. His temperature is 36.8 C (98.4 F), blood pressure is 140/90 mm Hg, pulse is 86/min, and respirations are 14/min. Examination of the right eye shows no abnormalities. Fundusoscopic examination of the left eye reveals swelling of the optic disk, retinal hemorrhages, dilated and tortuous veins, and cotton wool spots. Which of the following is the most likely diagnosis?

- ☐ A. Acute angle-closure glaucoma
- ☐ B. Acute anterior uveitis
- ☐ C. Amaurosis fugax
- ☐ D. Central retinal vein occlusion
- ☐ E. Optic neuritis

Submit

Block Time Remaining: 00:51:58

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Tutorial



Lab Values



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Text Zoom



Settings

An 80-year-old man comes to the emergency department due to sudden loss of vision in his left eye that occurred on waking this morning. He has no associated pain. Past medical history is notable for hypertension. Current medications include ramipril and chlorthalidone. He has smoked half a pack of cigarettes a day for the past 60 years. His temperature is 36.8 C (98.4 F), blood pressure is 140/90 mm Hg, pulse is 86/min, and respirations are 14/min. Examination of the right eye shows no abnormalities. Funduscopic examination of the left eye reveals swelling of the optic disk, retinal hemorrhages, dilated and tortuous veins, and cotton wool spots. Which of the following is the most likely diagnosis?

- ☐ A. Acute angle-closure glaucoma [2%]
- ☐ B. Acute anterior uveitis [0%]
- ☒ C. Amaurosis fugax [12%]
- ☒ D. Central retinal vein occlusion [82%]
- ☐ E. Optic neuritis [2%]

Incorrect

Correct answer



82%

Answered correctly



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Next



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Lab Values



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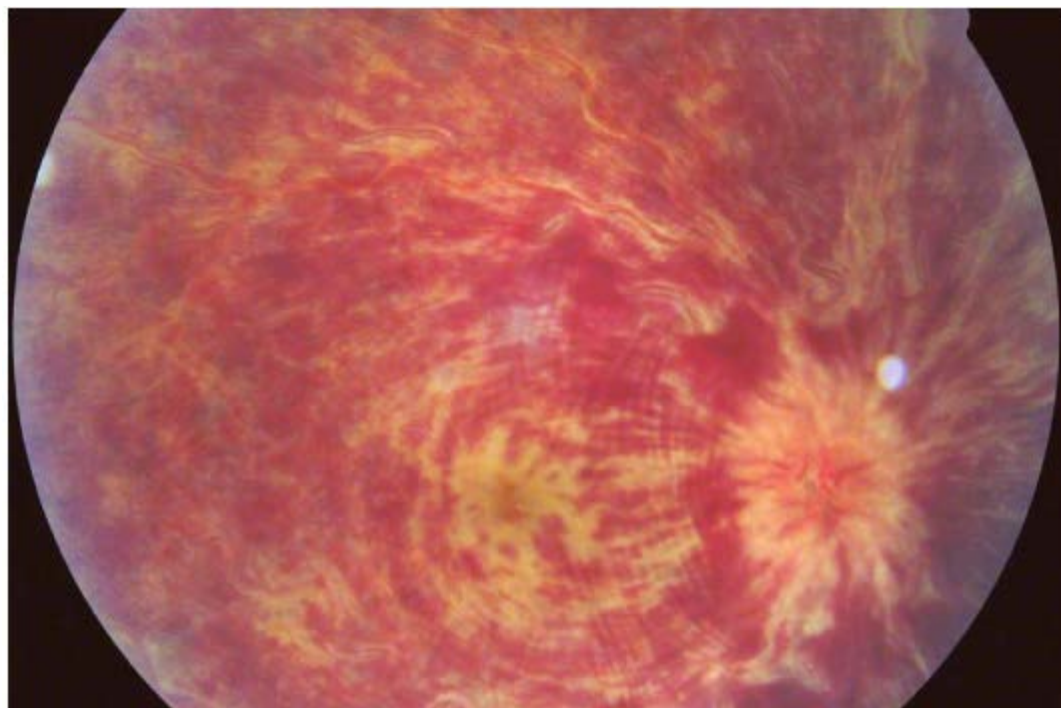
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Fundusoscopic findings in central retinal vein occlusion



- Venous dilation & tortuosity due to venous occlusion
- Scattered & diffuse hemorrhages due to backup of blood & increased resistance, leading to ischemic damage
- "Blood & thunder" appearance due to diffuse hemorrhages
- Cotton wool spots
- Disc swelling

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19



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20/11/10



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Previous



Next



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Lab Values



Notes



Calculator



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Text Zoom



Settings

This patient with acute, unilateral, **painless loss of vision** has findings suggestive of central retinal vein occlusion (CRVO). The characteristic changes on funduscopic examination are sometimes referred to as the "blood and thunder" appearance, and include optic disk swelling, **retinal hemorrhages**, dilated veins, and cotton wool spots. CRVO should be considered in the differential diagnosis for acute or subacute monocular loss of vision, but it is typically not quite as acute as the vision loss seen in patients with central retinal artery occlusion.

CRVO is caused by **thrombosis** of the central retinal vein and is most common in patients with coagulopathy, hyperviscosity, chronic glaucoma, and atherosclerotic risk factors (eg, age, diabetes, hypertension). The diagnosis can be confirmed with fluorescein angiography. Patients with no significant macular edema or neovascularization are often managed conservatively with close observation. Significant macular edema can be treated with intravitreal injection of vascular endothelial growth factor inhibitors. No treatment is particularly effective, but some patients may have partial recovery of vision within the first 3 months.

(Choice A) **Acute angle-closure glaucoma** presents with acute onset of **severe eye pain** and blurred vision associated with **nausea and vomiting**. Examination shows a red eye with a steamy cornea and moderately **dilated pupil** that is non-reactive to light.

(Choice B) Patients with **anterior uveitis** may have vision loss, but the affected eye is usually red and painful.

(Choice C) Amaurosis fugax is usually caused by atheroemboli from the carotid arteries and causes temporary vision loss as opposed to the persistent vision loss seen in this patient. Swelling of the optic disc may be seen in some cases, but **retinal hemorrhage** is more consistent with CRVO.

(Choice E) Optic neuritis is characterized by acute unilateral loss of vision, severe pain, and an afferent pupillary



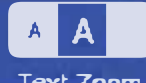
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can be confirmed with fluorescein angiography. Patients with no significant macular edema or neovascularization are often managed conservatively with close observation. Significant macular edema can be treated with intravitreal injection of vascular endothelial growth factor inhibitors. No treatment is particularly effective, but some patients may have partial recovery of vision within the first 3 months.

(Choice A) **Acute angle-closure glaucoma** presents with acute onset of **severe eye pain** and blurred vision associated with **nausea and vomiting**. Examination shows a red eye with a steamy cornea and moderately **dilated pupil** that is non-reactive to light.

(Choice B) Patients with **anterior uveitis** may have vision loss, but the affected eye is usually red and painful.

(Choice C) Amaurosis fugax is usually caused by atheroemboli from the carotid arteries and causes temporary vision loss as opposed to the persistent vision loss seen in this patient. Swelling of the optic disc may be seen in some cases, but **retinal hemorrhage** is more consistent with CRVO.

(Choice E) Optic neuritis is characterized by acute **unilateral** loss of vision, severe pain, and an afferent pupillary defect. It most commonly occurs in women age <50 and is often an initial presentation of multiple sclerosis.

Educational objective:

Central retinal vein occlusion presents with acute or subacute painless monocular visual loss. Funduscopic examination shows a "blood and thunder" appearance consisting of optic disk swelling, **retinal hemorrhages**, dilated veins, and cotton wool spots.

References





A 33-year-old man comes to the office due to painful swelling of the right lower eyelid for the past 2 days. He has had no trauma or history of similar symptoms in the past. The patient says he recently visited his niece who was having an upper respiratory tract infection. He has no significant prior medical problems other than occasional episodes of herpes labialis. He is sexually active with his girlfriend who takes oral contraceptives. Temperature is 36.8 C (98.2 F), blood pressure is 130/80 mm Hg, and pulse is 80/min. Examination of the right eye shows localized swelling along the margin of the lower eyelid with associated erythema and tenderness. There is no conjunctival injection or ocular discharge. Visual acuity is normal, and the left eye appears unremarkable. Which of the following is the most appropriate initial management of this patient's current condition?

- ☐ A. Erythromycin ointment
- ☐ B. Incision and curettage
- ☐ C. Oral doxycycline
- ☐ D. Topical ganciclovir
- ☐ E. Warm compress only

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Block Time Remaining: 00:51:54

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Lab Values



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Calculator



Reverse Color



Text Zoom



Settings

A 33-year-old man comes to the office due to painful swelling of the right lower eyelid for the past 2 days. He has had no trauma or history of similar symptoms in the past. The patient says he recently visited his niece who was having an upper respiratory tract infection. He has no significant prior medical problems other than occasional episodes of herpes labialis. He is sexually active with his girlfriend who takes oral contraceptives. Temperature is 36.8 C (98.2 F), blood pressure is 130/80 mm Hg, and pulse is 80/min. Examination of the right eye shows localized swelling along the margin of the lower eyelid with associated erythema and tenderness. There is no conjunctival injection or ocular discharge. Visual acuity is normal, and the left eye appears unremarkable. Which of the following is the most appropriate initial management of this patient's current condition?

- ☒ A. Erythromycin ointment [8%]
- ☐ B. Incision and curettage [2%]
- ☐ C. Oral doxycycline [3%]
- ☐ D. Topical ganciclovir [4%]
- ☒ E. Warm compress only [81%]

Incorrect

Correct answer

E



81%

Answered correctly



4 Seconds

Time Spent



10/26/2018

Last Updated

Block Time Remaining: 00:51:51

TIMED TUTOR



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01:23 PM

2018/11/10



Mark



Previous



Next



Tutorial



Lab Values



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Calculator



Reverse Color



Text Zoom



Settings

This patient has an **external hordeolum (stye)**. A **hordeolum** is an acute inflammatory disorder of the eyelash follicle or tear gland and presents as an erythematous, tender nodule at the lid margin. It is often due to infection with *Staphylococcus aureus* but can be sterile in many cases. A similar process arising in the meibomian gland (internal hordeolum) presents as a tender nodule visible at the palpebral conjunctiva but is less common.

Within a few days, a minute pustule may appear at the lid margin (pointing), which will then rupture with discharge of pus and relief of pain. **Warm compresses** are advised to accelerate the process. Following resolution of infection, some patients have a residual granulomatous nodule (chalazion) that regresses slowly over several months. For patients with a persistent hordeolum (eg, >1-2 weeks) or a large chalazion, additional management options include incision and curettage (**Choice B**).

(Choice A) Erythromycin ophthalmic ointment is used for treatment of bacterial conjunctivitis and in the prevention of ophthalmia neonatorum due to *Neisseria gonorrhoeae*. Topical antibiotics are often prescribed for hordeolum but are usually unnecessary.

(Choice C) **Preseptal cellulitis** is an infection of the eyelid anterior to the orbital septum. It presents with fever and leukocytosis as well as erythema and edema of the eyelid and is treated with oral antibiotics (eg, doxycycline).

(Choice D) Viral keratitis is infection of the cornea due to herpes simplex or varicella zoster virus. Patients have corneal vesicles, opacification, and/or **dendritic ulcers**. Treatment includes topical ganciclovir or trifluridine.

Educational objective:

An external hordeolum is an acute inflammatory disorder of the eyelash follicle or tear gland and presents as an erythematous, tender nodule at the lid margin. It is often due to infection with *Staphylococcus aureus* but can be



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Feedback



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with *Staphylococcus aureus* but can be sterile in many cases. A similar process arising in the meibomian gland (internal hordeolum) presents as a tender nodule visible at the palpebral conjunctiva but is less common.

Within a few days, a minute pustule may appear at the lid margin (pointing), which will then rupture with discharge of pus and relief of pain. Warm compresses are advised to accelerate the process. Following resolution of infection, some patients have a residual granulomatous nodule (chalazion) that regresses slowly over several months. For patients with a persistent hordeolum (eg, >1-2 weeks) or a large chalazion, additional management options include incision and curettage (Choice B).

(Choice A) Erythromycin ophthalmic ointment is used for treatment of bacterial conjunctivitis and in the prevention of ophthalmia neonatorum due to *Neisseria gonorrhoeae*. Topical antibiotics are often prescribed for hordeolum but are usually unnecessary.

(Choice C) Preseptal cellulitis is an infection of the eyelid anterior to the orbital septum. It presents with fever and leukocytosis as well as erythema and edema of the eyelid and is treated with oral antibiotics (eg, doxycycline).

(Choice D) Viral keratitis is infection of the cornea due to herpes simplex or varicella zoster virus. Patients have corneal vesicles, opacification, and/or dendritic ulcers. Treatment includes topical ganciclovir or trifluridine.

Educational objective:

An external hordeolum is an acute inflammatory disorder of the eyelash follicle or tear gland and presents as an erythematous, tender nodule at the lid margin. It is often due to infection with *Staphylococcus aureus* but can be sterile. Initial treatment includes warm compresses.

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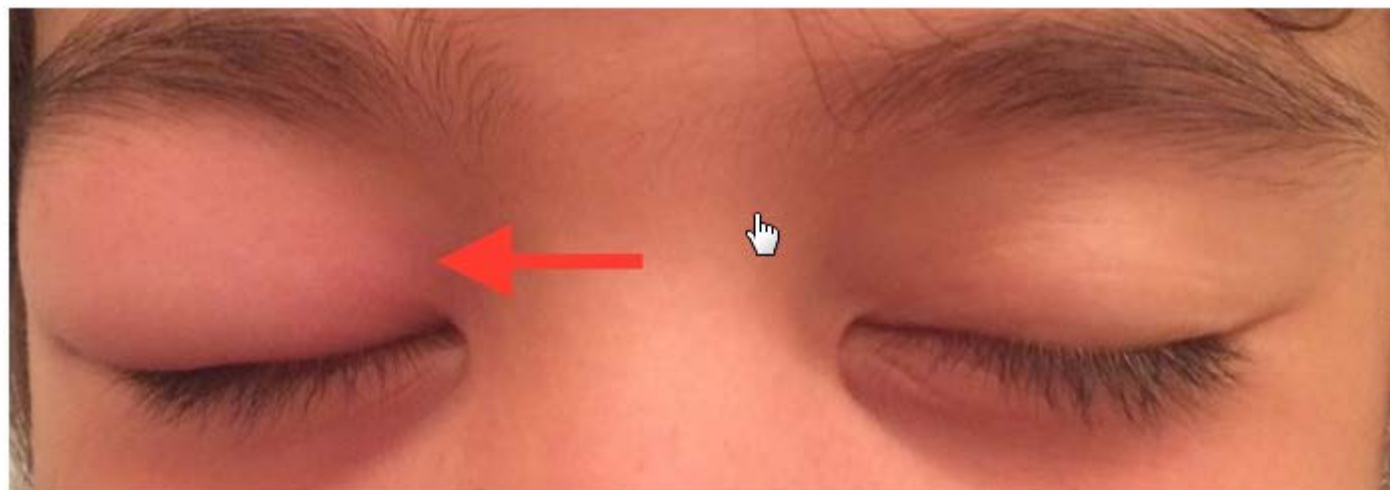
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and leukocytosis as well as conjunctivitis and edema of the eyelid and is treated with oral antibiotics (eg, doxycycline).

(internal hordeolum) presents as a tender nodule visible at the palpebral conjunctiva but is less common

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(internal hordeolum) presents as a tender nodule visible at the palpebral conjunctiva but is less common

Exhibit Display



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Previous



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Tutorial



Lab Values



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Text Zoom



A 26-year-old man comes to the physician with sudden onset of redness, watery discharge, and itching of both eyes. His vision is slightly distorted from excess tearing but is not blurred. He otherwise feels fine. The patient's past medical history is significant for obesity, asthma, sleep apnea, and chronic back pain. On eye examination, there is bilateral injection with granular appearance of the conjunctiva. Mild eyelid swelling and clear discharge are also noted. Pupils are equally round and reactive to light. The lungs have a few scattered wheezes, and the heart has a faint systolic murmur at the base. What is the most likely diagnosis in this patient?

- ☐ A. Allergic conjunctivitis
- ☐ B. Anterior uveitis
- ☐ C. Atopic keratoconjunctivitis
- ☐ D. Bacterial conjunctivitis
- ☐ E. Endophthalmitis
- ☐ F. Kawasaki disease
- ☐ G. Optic neuritis
- ☐ H. Orbital cellulitis
- ☐ I. Viral conjunctivitis
- ☐ J. Viral keratitis

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there is bilateral injection with granular appearance of the conjunctiva. Mild eyelid swelling and clear discharge are also noted. Pupils are equally round and reactive to light. The lungs have a few scattered wheezes, and the heart has a faint systolic murmur at the base. What is the most likely diagnosis in this patient?

- ☒ A. Allergic conjunctivitis [60%]
- ☐ B. Anterior uveitis [6%]
- ☐ C. Atopic keratoconjunctivitis [8%]
- ☐ D. Bacterial conjunctivitis [2%]
- ☐ E. Endophthalmitis [0%]
- ☐ F. Kawasaki disease [1%]
- ☐ G. Optic neuritis [0%]
- ☐ H. Orbital cellulitis [0%]
- ☐ I. Viral conjunctivitis [19%]
- ☒ J. Viral keratitis [1%]

Incorrect

Correct answer



60%

Answered correctly



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Tutorial



Lab Values



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Text Zoom



Differentiation of conjunctivitis

	Viral	Bacterial	Allergic
Eye involvement	Unilateral; often progressing to bilateral	Unilateral; possibly progressing to bilateral	Bilateral
Eye "stuck shut" in morning	Yes	Yes	Yes
Discharge	Watery; scant stringy mucus	Purulent; white, yellow, or green; thick	Watery; scant stringy mucus
Discharge reappearing after wiping	No	Yes	No
Other symptoms	Burning, sandy or gritty feeling; viral prodrome	Unremitting ocular discharge	Itching; history of allergy
Conjunctival appearance	Diffuse injection; follicular or "bumpy"	Diffuse injection; nonfollicular	Diffuse injection; follicular or "bumpy"; conjunctival edema (chemosis)

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Previous



Next



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Lab Values



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Text Zoom



Red flag that suggest against one of the etiologies: Copious purulent discharge, decreased visual acuity, photophobia, ciliary flush, foreign body sensation, corneal opacity or infiltrate, fixed or distorted pupil, trouble keeping eye open & severe headache with nausea.

Allergic conjunctivitis (AC) is an acute hypersensitivity reaction caused by exposure to environmental allergens such as pollen, animal dander, dust, and mold spores. **Episodic itching, hyperemia, tearing, and edema of the conjunctiva and eyelids** are characteristic. Some patients complain of mild photophobia or a dry-eye sensation. There is often a family or personal history of atopic disorders such as asthma or seasonal allergies.

The condition usually subsides in **24 hours**, even without treatment. For persistent or recurrent symptoms, AC can be treated with a variety of topical agents, including antihistamines, vasoconstrictors, mast cell stabilizers, and artificial tears, that are available over the counter or by prescription. Oral antihistamines are less effective for acute episodes but can be helpful if taken seasonally, prior to allergen exposure.

(Choice B) Anterior uveitis (iritis) is inflammation of the anterior uveal tract, especially the iris. Discharge is uncommon and, if present, is not profuse. Iritis usually has significant pain, miosis, and photophobia; visual loss may be present. A gritty sensation and itching are not present in iritis but are common with AC.

(Choice C) Atopic keratoconjunctivitis is a severe form of ocular allergy. The most common symptoms are itching, tearing, thick mucus discharge, photophobia, and blurred vision. It can be differentiated from AC by more severe symptoms with a prolonged course, potential visual impairment due to corneal involvement, and thickening of the eyelids and surrounding skin.

(Choice D) In contrast to viral conjunctivitis and AC, patients with bacterial conjunctivitis will have a grossly



19



Feedback



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Previous



Next



Tutorial



Lab Values



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(Choice D) In contrast to viral conjunctivitis and AC, patients with bacterial conjunctivitis will have a grossly purulent exudate and are likely to have more significant pain, erythema, and possibly fever.

(Choice E) **Endophthalmitis** is an invasive infection of the globe (bacterial or fungal) and is due to disruption of the external surface of the eye (eg, trauma). Endophthalmitis may show conjunctival irritation as well, but patients will usually have purulent haziness of the ocular contents and may have a layering-out of pus in the anterior chamber (hypopyon).

(Choice F) **Kawasaki disease** is a vasculitis of medium-sized arteries that affects young children (age usually <5). Symptoms may include conjunctivitis as well as fever, lymphadenopathy, and mucocutaneous inflammation (erythema of lips, tongue, and palate; peripheral edema, desquamation, and generalized rash).

(Choice G) Symptoms in optic neuritis typically include visual loss, with or without eye pain. Uveitis may occur (uncommonly), but the conjunctiva is not typically affected.

(Choice H) **Orbital cellulitis** is infection of the fat and extraocular muscles surrounding the eye and is a medical emergency. Patients usually have erythema, edema, and tenderness of the eyelids, often with impaired extraocular movement.

(Choice I) Viral conjunctivitis ("pink eye") symptoms are similar to those of allergic conjunctivitis but last longer (several days) and usually are preceded by typical nasopharyngeal symptoms. Viral conjunctivitis is most common in the late summer and fall, and may occur in clusters or small epidemics.

(Choice J) **Viral keratitis** is infection of the cornea related to herpes simplex virus or varicella zoster. Patients typically have corneal vesicles, opacification, and/or dendritic ulcers.



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(Choice G) Symptoms in optic neuritis typically include visual loss, with or without eye pain. Uveitis may occur (uncommonly), but the conjunctiva is not typically affected.

(Choice H) **Orbital cellulitis** is infection of the fat and extraocular muscles surrounding the eye and is a medical emergency. Patients usually have erythema, edema, and tenderness of the eyelids, often with impaired extraocular movement.

(Choice I) Viral conjunctivitis ("pink eye") symptoms are similar to those of allergic conjunctivitis but last longer (several days) and usually are preceded by typical nasopharyngeal symptoms. Viral conjunctivitis is most common in the late summer and fall, and may occur in clusters or small epidemics.

(Choice J) **Viral keratitis** is infection of the cornea related to herpes simplex virus or varicella zoster. Patients typically have corneal vesicles, opacification, and/or dendritic ulcers.

Educational objective:

Allergic conjunctivitis is an acute hypersensitivity reaction caused by environmental exposure to allergens. It is characterized by intense itching, hyperemia, tearing, and edema of the conjunctiva and eyelids.

References

- [Conjunctivitis: a systematic review of diagnosis and treatment.](#)

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Lab Values



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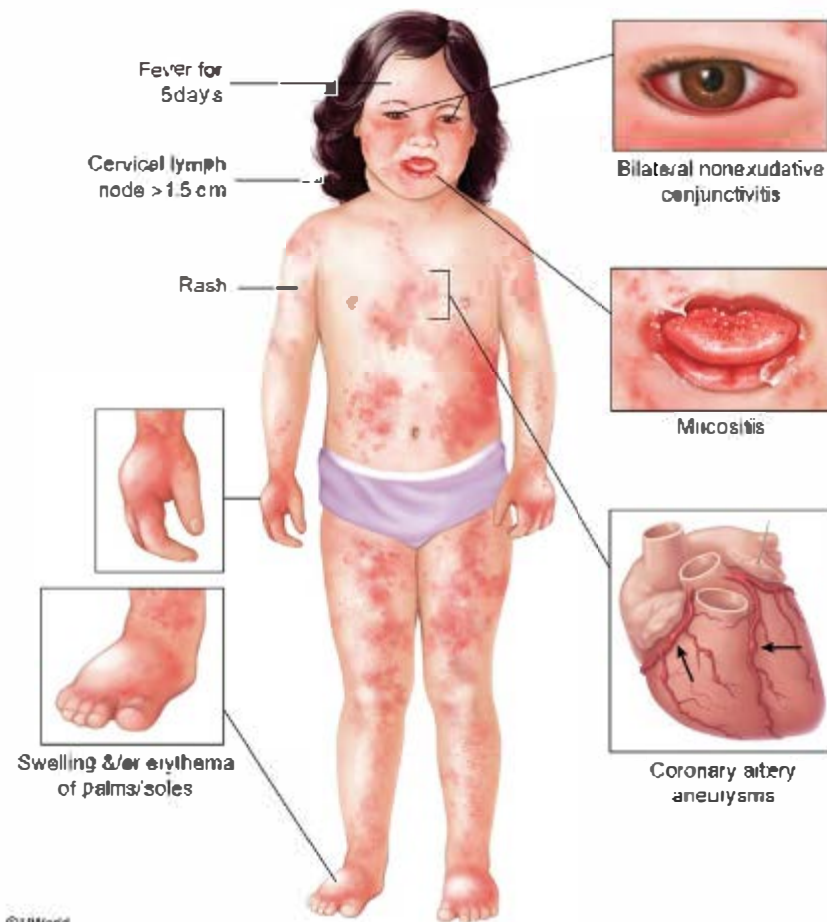


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Kawasaki disease



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Item 31 of 36

Question Id: 2849



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Previous



Next



Tutorial



Lab Values



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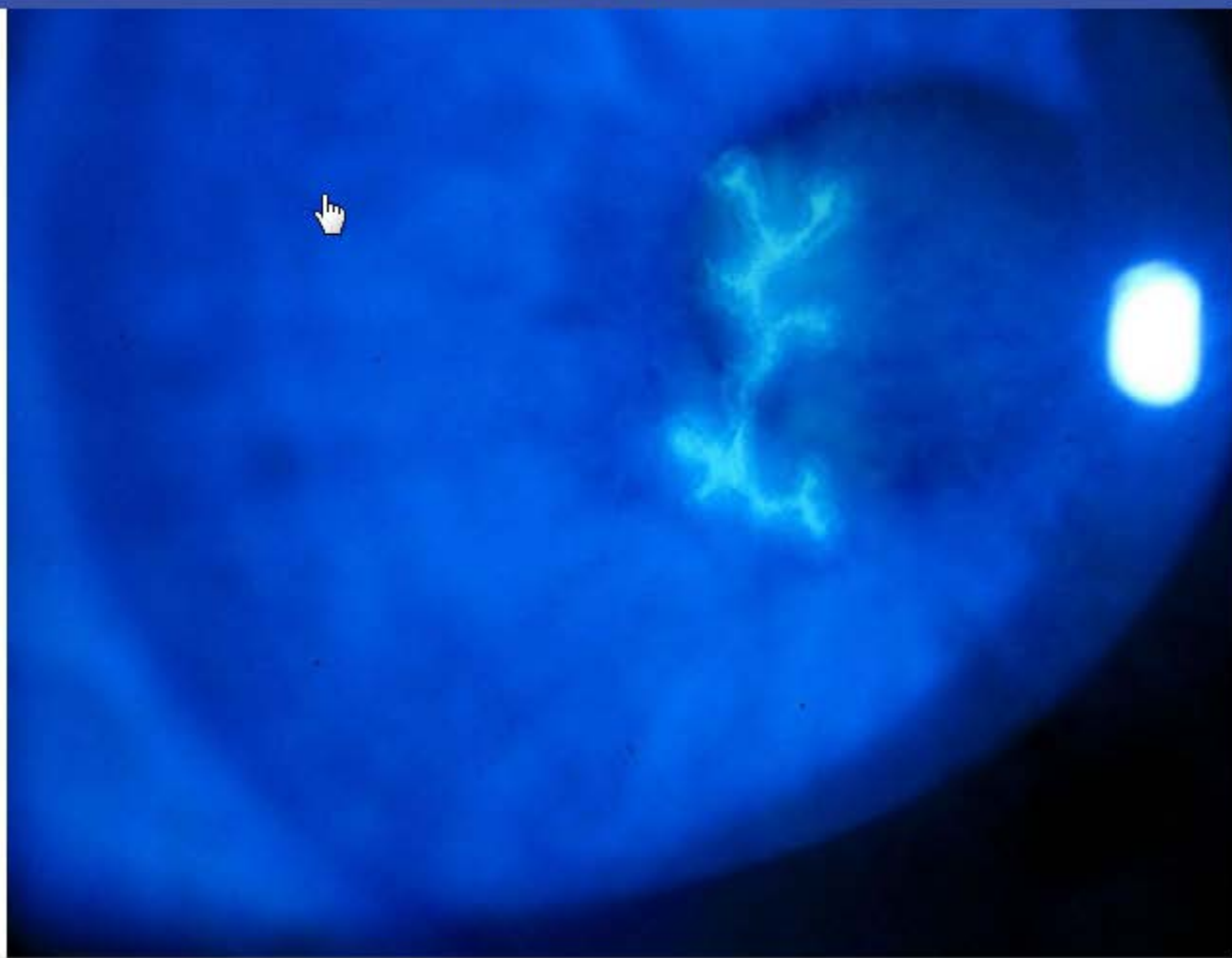


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(erythema of lips, tongue, and palate; peripheral edema; desquamation; and generalized rash).

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A 65-year-old female is complaining of seeing a sudden burst of flashing lights and blurred vision in her left eye. These symptoms started this morning. She now sees small spots in her field of vision. She felt "like a curtain came down" over her eye. She had a successful cataract extraction in her left eye 4 months ago. Her vital signs are stable. Examination shows a sluggish left pupil. Ophthalmoscopy reveals retinal tears and a grayish-appearing retina. What is the most probable diagnosis?

- ☐ A. Choroidal rupture
- ☐ B. Retinal detachment
- ☐ C. Central retinal artery occlusion
- ☐ D. Proliferative diabetic retinopathy
- ☐ E. Exudative macular degeneration

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Block Time Remaining: 00:51:41

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Previous



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Tutorial



Lab Values



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Text Zoom



A 65-year-old female is complaining of seeing a sudden burst of flashing lights and blurred vision in her left eye. These symptoms started this morning. She now sees small spots in her field of vision. She felt "like a curtain came down" over her eye. She had a successful cataract extraction in her left eye 4 months ago. Her vital signs are stable. Examination shows a sluggish left pupil. Ophthalmoscopy reveals retinal tears and a grayish-appearing retina. What is the most probable diagnosis?

- ☒ A. Choroidal rupture [2%]
- ☐ B. Retinal detachment [79%]
- ☐ C. Central retinal artery occlusion [15%]
- ☐ D. Proliferative diabetic retinopathy [1%]
- ☐ E. Exudative macular degeneration [1%]

Incorrect

Correct answer



79%

Answered correctly



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10/05/2018

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Previous



Next



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Text Zoom



Settings

Retinal detachment refers to the separation of the layers of the retina. It usually occurs in people aged 40-70 years. Patients complain of photopsia (flashes of light) and floaters (spots in the visual field.). The most classic description is that of "a curtain coming down over my eyes." Usually, the inciting event occurs months before retinal detachment. Myopia or trauma can cause retinal breaks, through which fluid seeps in and separates the retinal layers. In this patient, ocular trauma most likely occurred due to her cataract surgery. Ophthalmoscopic examination reveals a grey, elevated retina. Laser therapy and cryotherapy are done to create permanent adhesions between the neurosensory retina, retinal pigment epithelium, and choroid.

{Choice A} Choroidal rupture occurs due to blunt ocular trauma. Examination reveals central scotoma, retinal edema, hemorrhagic detachment of the macula, subretinal hemorrhage, and crescent-shaped streak concentric to the optic nerve. The usual complaint is blurred vision following blunt trauma.

{Choice C} Central retinal artery occlusion (CRAO) is also characterized by a sudden painless loss of vision in one eye, but its funduscopy findings differ. Ophthalmoscopy of patients with CRAO reveals pallor of the optic disc, cherry red fovea, and boxcar segmentation of blood in the retinal veins.

{Choice D} Proliferative diabetic retinopathy in the initial stage is asymptomatic. Patients may later complain of decreased visual acuity. Neovascularization is the hallmark of proliferative diabetic retinopathy. The other findings are vitreous hemorrhage and macular edema. These changes may lead to retinal detachment.

{Choice E} Exudative macular degeneration typically presents as painless, progressive blurring of central vision, which can be acute or insidious. It occurs bilaterally. Testing reveals central scotoma. Ophthalmoscopy reveals growth of abnormal vessels in the retinal space. Sudden visual loss may occur if it is complicated by retinal

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Tutorial



Lab Values



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Reverse Color



Text Zoom



adhesions between the neurosensory retina, retinal pigment epithelium, and choroid.

{Choice A} Choroidal rupture occurs due to blunt ocular trauma. Examination reveals central scotoma, retinal edema, hemorrhagic detachment of the macula, subretinal hemorrhage, and crescent-shaped streak concentric to the optic nerve. The usual complaint is blurred vision following blunt trauma.

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{Choice D} Proliferative diabetic retinopathy in the initial stage is asymptomatic. Patients may later complain of decreased visual acuity. Neovascularization is the hallmark of proliferative diabetic retinopathy. The other findings are vitreous hemorrhage and macular edema. These changes may lead to retinal detachment.

{Choice E} Exudative macular degeneration typically presents as painless, progressive blurring of central vision, which can be acute or insidious. It occurs bilaterally. Testing reveals central scotoma. Ophthalmoscopy reveals growth of abnormal vessels in the retinal space. Sudden visual loss may occur if it is complicated by retinal detachment.

Educational Objective:

Retinal detachment usually presents with a sudden onset of photopsia and floaters. The most classic description is that of "a curtain coming down over my eyes."

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Block Time Remaining: 00:51:39

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20/11/10



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Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

A 60-year-old woman comes to the emergency department due to decreasing vision and a dull ache over her left eye for the past 12 hours. She had a successful surgical cataract extraction in her left eye 5 days ago. Temperature is 38.1 C (100.6 F), blood pressure is 140/90 mm Hg, pulse is 92/min, and respirations are 14/min. Examination of the left eye reveals a swollen eyelid, edematous conjunctiva, and exudates in the anterior chamber. Testing with Snellen's chart demonstrates decreased visual acuity in her left eye. What is the most likely diagnosis?

- ☐ A. Conjunctivitis
- ☐ B. Corneal ulceration
- ☐ C. Uveitis
- ☐ D. Postoperative endophthalmitis
- ☐ E. Cavernous sinus thrombosis

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Block Time Remaining: 00:51:38

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20/11/10



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Tutorial



Lab Values



Notes



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Text Zoom



Settings

A 60-year-old woman comes to the emergency department due to decreasing vision and a dull ache over her left eye for the past 12 hours. She had a successful surgical cataract extraction in her left eye 5 days ago. Temperature is 38.1 C (100.6 F), blood pressure is 140/90 mm Hg, pulse is 92/min, and respirations are 14/min. Examination of the left eye reveals a swollen eyelid, edematous conjunctiva, and exudates in the anterior chamber. Testing with Snellen's chart demonstrates decreased visual acuity in her left eye. What is the most likely diagnosis?

- ☒ A. Conjunctivitis [6%]
- ☐ B. Corneal ulceration [2%]
- ☐ C. Uveitis [19%]
- ☒ D. Postoperative endophthalmitis [68%]
- ☐ E. Cavernous sinus thrombosis [2%]

Incorrect

Correct answer



68%

Answered correctly



3 Seconds

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08/09/2018

Last Updated

Explanation

Block Time Remaining: 00:51:36

TIMEDTUTOR



19



Feedback



Suspend



End Block

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20/11/18



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Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

Postoperative endophthalmitis is the most common form of endophthalmitis. It usually occurs within 6 weeks of surgery. Endophthalmitis refers to a **bacterial or fungal** infection within the eye, particularly the vitreous. Patients usually present with pain and decreased visual acuity. Examination reveals swollen eyelids and conjunctiva, hypopyon, corneal edema and infection. The vitreous can be sent for Gram stain and culture. Based on the severity, intravitreal antibiotic injection or vitrectomy is done.

(Choice A) Conjunctivitis presents with excessive tearing, burning sensation, mild pain, conjunctival, and eyelid edema. Vision is not affected.

(Choice B) Corneal ulceration presents as a foreign body sensation, blurred vision, photophobia, and pain. A history of contact lens use, recent trauma, or ocular disease may be present. The eye is erythematous, and ciliary injection is present. Purulent exudates are seen in the conjunctival sac and on the ulcer surface.

(Choice C) Uveitis (ie, viral or parasitic infection within the eye) presents as blurred vision with moderate pain, conjunctival injection, and constricted pupils. Hypopyon (cell layering within the anterior chamber) is seen in severe anterior uveitis. Keratic precipitates ("mutton fat") and iris nodules may be seen. It is associated with HLA B27-related conditions.

(Choice E) Cavernous sinus thrombosis is characterized by proptosis, ophthalmoplegia, chemosis, and visual loss. It occurs due to hematogenous spread from an infected, inflamed sinus.

Educational objective:

Postoperative endophthalmitis is the most common form of endophthalmitis. It usually occurs within 6 weeks of surgery. Patients usually present with pain and decreased visual acuity. Examination reveals swollen eyelids and



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Feedback



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Tutorial



Lab Values



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Calculator



Reverse Color



Text Zoom



Settings

hypopyon, corneal edema and infection. The vitreous can be sent for Gram stain and culture. Based on the severity, intravitreal antibiotic injection or vitrectomy is done.

(Choice A) Conjunctivitis presents with excessive tearing, burning sensation, mild pain, conjunctival, and eyelid edema. Vision is not affected.

(Choice B) Corneal ulceration presents as a foreign body sensation, blurred vision, photophobia, and pain. A history of contact lens use, recent trauma, or ocular disease may be present. The eye is erythematous, and ciliary injection is present. Purulent exudates are seen in the conjunctival sac and on the ulcer surface.

(Choice C) Uveitis (ie, viral or parasitic infection within the eye) presents as blurred vision with moderate pain, conjunctival injection, and constricted pupils. Hypopyon (cell layering within the anterior chamber) is seen in severe anterior uveitis. Keratic precipitates ("mutton fat") and iris nodules may be seen. It is associated with HLA B27-related conditions.

(Choice E) Cavernous sinus thrombosis is characterized by proptosis, ophthalmoplegia, chemosis, and visual loss. It occurs due to hematogenous spread from an infected, inflamed sinus.

Educational objective:

Postoperative endophthalmitis is the most common form of endophthalmitis. It usually occurs within 6 weeks of surgery. Patients usually present with pain and decreased visual acuity. Examination reveals swollen eyelids and conjunctiva, hypopyon, corneal edema and infection.

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A 35-year-old man comes to the emergency department with a 3-day history of pain and redness in the left eye. He is a school bus driver and was exposed to a child with pink eye. The patient has no associated fever, headache, nasal congestion, or sore throat. However, he has experienced episodic abdominal discomfort and diarrhea over the past several months. The patient has no other medical problems and takes no medications. Family history is notable for glaucoma in his mother. Ocular examination findings are shown in the exhibit. During the examination, the patient keeps the eye closed and says, "It is painful to look at the light." There is increased tearing from the left eye but no mucoid or purulent discharge. Right eye examination is normal. Visual acuity is 20/50 in the left eye and 20/20 in the right eye. There is no nasal discharge and the pharyngeal mucosa is not erythematous. An aphthous ulcer is present on the buccal mucosa. Abdominal examination shows tenderness in the right lower quadrant on deep palpation. The remainder of the physical examination is normal. Which of the following is the most likely cause of this patient's eye symptoms?

- ☐ A. Acute angle-closure glaucoma
- ☐ B. Anterior uveitis
- ☐ C. Bacterial conjunctivitis
- ☐ D. Episcleritis
- ☐ E. Viral conjunctivitis





Item 34 of 36

Question Id: 13351



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Previous



Next



Tutorial



Lab Values



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Text Zoom



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Exhibit Display



Zoom In

Zoom Out

Reset

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Block Time Remaining: 00:51:22

TIMEDTUTOR



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Feedback



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Previous



Next



Tutorial



Lab Values



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Text Zoom



A 35-year-old man comes to the emergency department with a 3-day history of pain and redness in the left eye. He is a school bus driver and was exposed to a child with pink eye. The patient has no associated fever, headache, nasal congestion, or sore throat. However, he has experienced episodic abdominal discomfort and diarrhea over the past several months. The patient has no other medical problems and takes no medications. Family history is notable for glaucoma in his mother. Ocular examination findings are shown in the exhibit. During the examination, the patient keeps the eye closed and says, "It is painful to look at the light." There is increased tearing from the left eye but no mucoid or purulent discharge. Right eye examination is normal. Visual acuity is 20/50 in the left eye and 20/20 in the right eye. There is no nasal discharge and the pharyngeal mucosa is not erythematous. An aphthous ulcer is present on the buccal mucosa. Abdominal examination shows tenderness in the right lower quadrant on deep palpation. The remainder of the physical examination is normal. Which of the following is the most likely cause of this patient's eye symptoms?

- ☒ A. Acute angle-closure glaucoma [6%]
- ☐ B. Anterior uveitis [71%]
- ☐ C. Bacterial conjunctivitis [1%]
- ☐ D. Episcleritis [9%]
- ☐ E. Viral conjunctivitis [10%]



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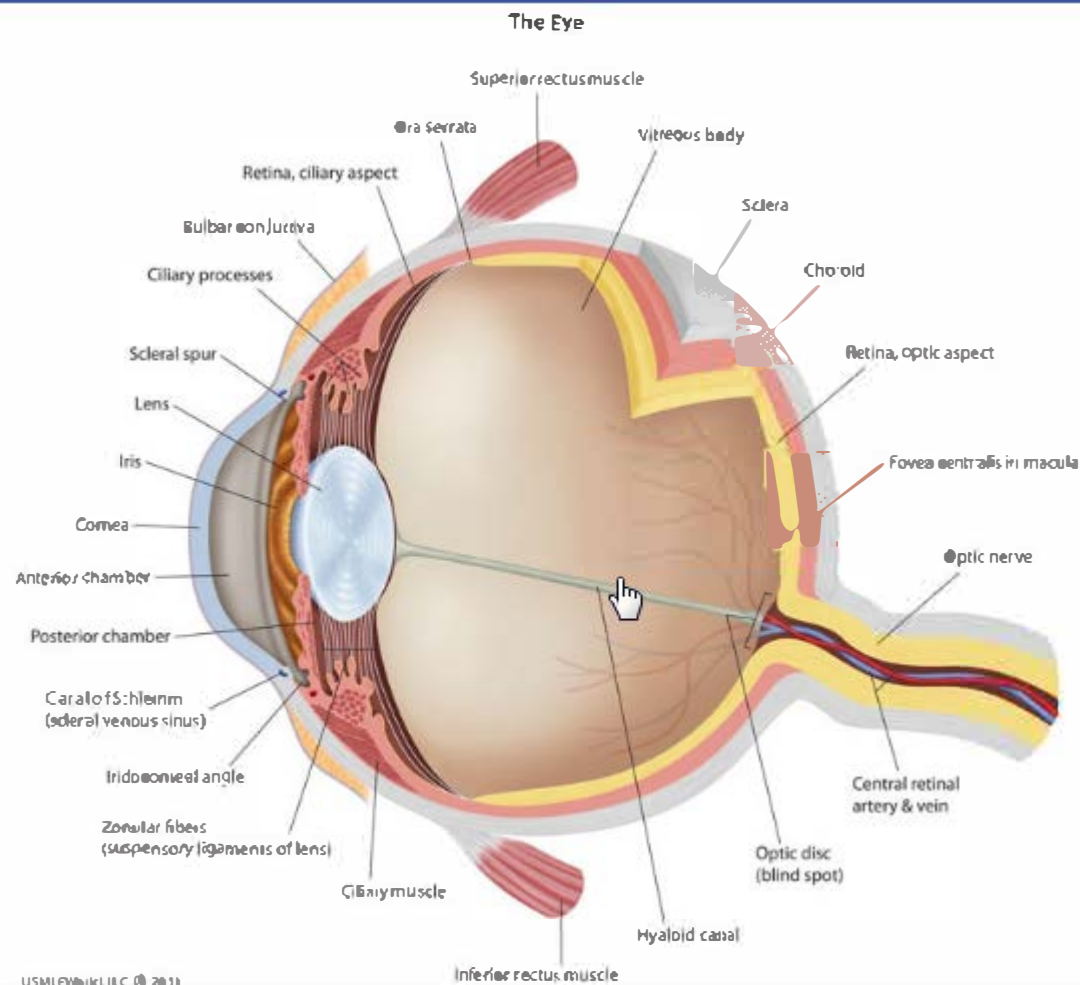


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The Eye Exhibit Display



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Previous



Next



Tutorial



Lab Values



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Text Zoom



Settings

This patient has **anterior uveitis**, which presents with a painful, red eye associated with photophobia, tearing, and diminished visual acuity. The uvea is the tissue layer between the cornea/sclera and the retina; the anterior uvea consists of the iris and ciliary body and the posterior uvea consists of the choroid. Anterior uveitis is inflammation of the anterior uveal tract and is sometimes termed "**iritis**" (or "iridocyclitis" if the ciliary body is involved). It is much more common than posterior uveitis, which involves the choroid. **Examination findings** in anterior uveitis can include hyperemia concentrated at the junction of the sclera and cornea (ciliary flush), pupillary constriction, a hazy "flare" in the aqueous humor, and layering of white cells in the anterior chamber (hypopyon).

Anterior uveitis is most often idiopathic or traumatic, but it can be associated with systemic inflammatory diseases such as certain infections (eg, herpesviruses, toxoplasmosis), sarcoidosis, spondyloarthritis (eg, ankylosing spondylitis, reactive arthritis), and **inflammatory bowel disease**. This patient's oral aphthous ulcer, abdominal tenderness, and intermittent gastrointestinal symptoms suggest possible Crohn disease.

(Choice A) Acute angle-closure glaucoma can cause a red, painful eye with diminished visual acuity. However, it is more common in older patients (predominantly age 55-70), and most patients have headache, nausea, and vomiting.

(Choices C and E) Bacterial conjunctivitis is characterized by conjunctival edema and hyperemia and a purulent discharge, whereas viral conjunctivitis (pink eye) causes conjunctival redness with a watery or mucoid discharge. Patients with either type of conjunctivitis may also experience morning matting of the lids. This patient has dilation of the conjunctival vessels, but his decreased visual acuity and photophobia are not consistent with conjunctivitis.

(Choice D) Episkleritis is characterized by acute redness and tearing with injection of conjunctival and episcleral



Feedback



Suspend



End Block



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

(Choice A) Acute angle-closure glaucoma can cause a red, painful eye with diminished visual acuity. However, it is more common in older patients (predominantly age 55-70), and most patients have headache, nausea, and vomiting.

(Choices C and E) Bacterial conjunctivitis is characterized by conjunctival edema and hyperemia and a purulent discharge, whereas viral conjunctivitis (pink eye) causes conjunctival redness with a watery or mucoid discharge. Patients with either type of conjunctivitis may also experience morning matting of the lids. This patient has dilation of the conjunctival vessels, but his decreased visual acuity and photophobia are not consistent with conjunctivitis.

(Choice D) Episcleritis is characterized by acute redness and tearing with injection of conjunctival and episcleral vessels. Patients may have mild irritation, but overt pain and diminished visual acuity, as seen in this patient, are not consistent with episcleritis.

Educational objective:

Anterior uveitis (iritis and iridocyclitis) is characterized by a painful, red eye with tearing and decreased visual acuity. Examination findings include ciliary flush, pupillary constriction, a hazy "flare" in the aqueous humor, and hypopyon. Anterior uveitis is most often idiopathic or traumatic but can be associated with systemic inflammatory diseases such as certain infections, sarcoidosis, spondyloarthritis, and inflammatory bowel disease.

References

- [Diagnosis and management of red eye in primary care.](#)

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Feedback



Suspend



End Block

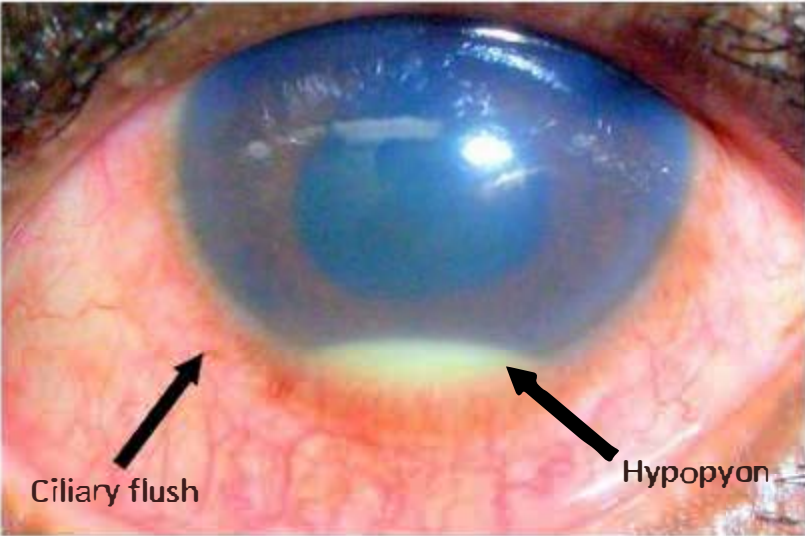
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Exhibit Display



Ciliary flush

Hypopyon

Zoom In

Zoom Out

Reset

Add To Flash Card

A 60-year-old woman comes to the emergency department due to a sudden onset of severe pain in her left eye with blurred vision, nausea, and vomiting. The symptoms began a few minutes ago, while she was watching a movie in a nearby theater. Her temperature is 36.8C (98.4F), blood pressure is 140/90 mm Hg, pulse is 82/min, and respirations are 14/min. Examination reveals decreased visual acuity. Her left eye appears red, with a hazy cornea, shallow anterior chamber, and dilated, fixed pupil. Her left eye is stony hard to touch. What is the most likely diagnosis?

- ☐ A. Primary open angle glaucoma
- ☐ B. Conjunctivitis
- ☐ C. Acute angle closure glaucoma
- ☐ D. Anterior uveitis
- ☐ E. Corneal abrasion

Submit



A 60-year-old woman comes to the emergency department due to a sudden onset of severe pain in her left eye with blurred vision, nausea, and vomiting. The symptoms began a few minutes ago, while she was watching a movie in a nearby theater. Her temperature is 36.8C (98.4F), blood pressure is 140/90 mm Hg, pulse is 82/min, and respirations are 14/min. Examination reveals decreased visual acuity. Her left eye appears red, with a hazy cornea, shallow anterior chamber, and dilated, fixed pupil. Her left eye is stony hard to touch. What is the most likely diagnosis?

- ☐ A. Primary open angle glaucoma [2%]
- ☐ B. Conjunctivitis [0%]
- ☒ C. Acute angle closure glaucoma [94%]
- ☒ D. Anterior uveitis [1%]
- ☐ E. Corneal abrasion [0%]

Incorrect

Correct answer
C



94%
Answered correctly



3 Seconds
Time Spent



11/04/2018
Last Updated

Explanation





Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

Angle closure glaucoma occurs with closure of a pre-existing narrow anterior chamber angle. It predominantly occurs in people aged 55-70 years. It presents with an acute onset of **severe eye pain** and blurred vision associated with **nausea and vomiting**. It usually occurs following pupillary dilation, which may occur in darkened movie theaters, during times of stress, or due to drug intake. Examination reveals a red eye with steamy cornea and moderately **dilated pupil** that is non reactive to light. The anterior chamber is shallow with inflammatory changes. Tonometry reveals increased intraocular pressure. Intravenous acetazolamide (with subsequent oral administration) may lower the intraocular pressure. Permanent cure is offered with laser peripheral iridotomy.

(Choice A) Open angle glaucoma has an insidious onset, with gradual loss of peripheral vision resulting in tunnel vision. Other characteristic features are persistently increased intraocular pressure and pathologic cupping of the optic disc.

(Choice B) Conjunctivitis is characterized by very mild pain. The cornea is clear. Pupillary size and response to light is normal. Visual acuity is not affected.

(Choice D) Uveitis presents with moderate pain and blurred vision. Cornea may be hazy. The anterior chamber shows flare and cells on slit lamp examination. The pupil is constricted with a poor light response (In acute glaucoma, the pupil is dilated and is nonreactive to light).

(Choice E) Corneal abrasion presents with severe pain and photophobia. There is usually a history of trauma to the eye. Slit lamp examination with fluorescein will reveal the corneal abrasion.

Educational objective:

Angle closure glaucoma occurs predominantly in people aged 55-70 years. It presents with an acute onset of



19



Feedback



Suspend



End Block



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

and moderately dilated pupil that is non reactive to light. The anterior chamber is shallow with inflammatory changes. Tonometry reveals increased intraocular pressure. Intravenous acetazolamide (with subsequent oral administration) may lower the intraocular pressure. Permanent cure is offered with laser peripheral iridotomy.

{Choice A} Open angle glaucoma has an insidious onset, with gradual loss of peripheral vision resulting in tunnel vision. Other characteristic features are persistently increased intraocular pressure and pathologic cupping of the optic disc.

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{Choice D} Uveitis presents with moderate pain and blurred vision. Cornea may be hazy. The anterior chamber shows flare and cells on slit lamp examination. The pupil is constricted with a poor light response (In acute glaucoma, the pupil is dilated and is nonreactive to light).

{Choice E} Corneal abrasion presents with severe pain and photophobia. There is usually a history of trauma to the eye. Slit lamp examination with fluorescein will reveal the corneal abrasion.

Educational objective:

Angle closure glaucoma occurs predominantly in people aged 55-70 years. It presents with an acute onset of severe eye pain and blurred vision associated with nausea and vomiting. Examination reveals a red eye with steamy cornea and moderately dilated pupil that is non reactive to light.

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Feedback



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End Block

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Tutorial



Lab Values



Notes



Calculator



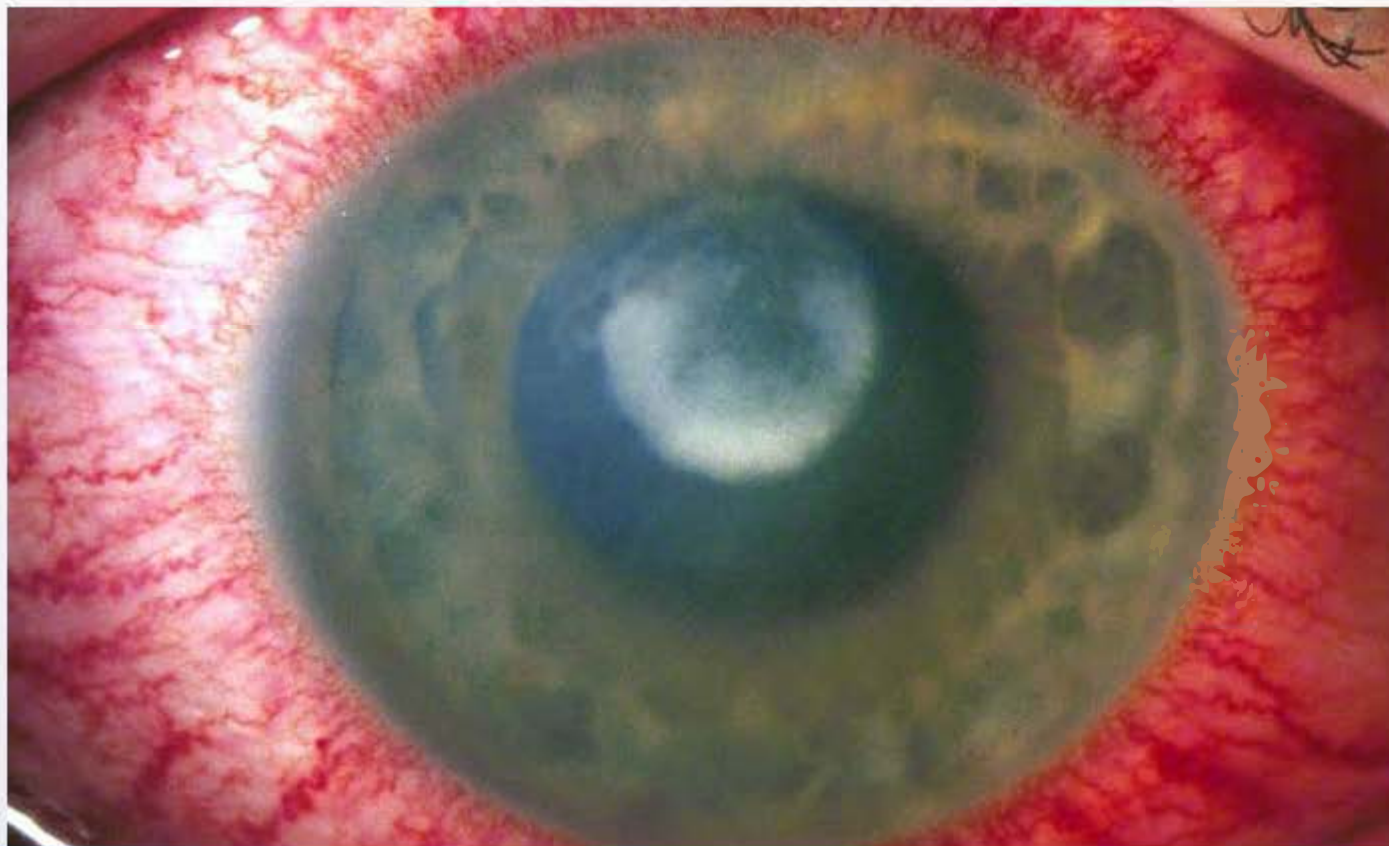
Reverse Color



Text Zoom



A 32-year-old man complains of right eye pain and discharge. His symptoms began acutely on awakening in the morning. He uses extended-wear contact lenses and has had difficulty removing the lenses for the last week. His past medical history is significant for obesity, chronic back pain, asthma, and acid reflux disease. On examination, thick, globular yellow discharge is present at the medial eye corner and on the lid margins. The cornea is edematous, hazy, and ulcerated and there is extensive scleral injection, as shown in the image. What is the most likely diagnosis in this patient?



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Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



- ☐ A. Angle-closure glaucoma
- ☐ B. Anterior uveitis
- ☐ C. Episcleritis
- ☐ D. Pneumococcal conjunctivitis
- ☐ E. Pseudomonal keratitis
- ☐ F. Subconjunctival hemorrhage
- ☐ G. Viral conjunctivitis

Submit

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Feedback



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End Block

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20/11/10



- ☒ A. Angle-closure glaucoma [3%]
- ☐ B. Anterior uveitis [15%]
- ☐ C. Episcleritis [13%]
- ☐ D. Pneumococcal conjunctivitis [12%]
- ☒ E. Pseudomonal keratitis [50%]
- ☐ F. Subconjunctival hemorrhage [1%]
- ☐ G. Viral conjunctivitis [2%]

Incorrect
Correct answer

50%
Answered correctly

10 Seconds
Time Spent

06/12/2018
Last Updated

Block Time Remaining: 00:51:02
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19

Feedback

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End Block



Mark



Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

This patient with a painful, red eye and opacification and ulceration of the cornea has typical features of **contact lens-associated keratitis**. Most cases are due to Gram-negative organisms such as *Pseudomonas* and *Serratia*, but can also be due to Gram-positive organisms as well as certain fungi and amoebas. Contact lens-associated keratitis is a **medical emergency** and can lead to corneal perforation, scarring, and permanent vision loss if not addressed promptly. In addition to removal and discarding of the contact lens, most patients require topical broad-spectrum antibiotics.

(Choice A) Acute angle-closure glaucoma, usually seen in older patients (age >40), may also present with a red, painful eye and blurred vision. Corneal opacification can be present, but ulceration is not typical. The pupil is fixed and mid-dilated. Extraocular symptoms such as headache and nausea are common.

(Choice B) Anterior uveitis (iritis) is inflammation of the anterior uveal tract, especially the iris. Patients often have associated conjunctival inflammation adjacent to the cornea, but the cornea itself is usually spared.

(Choice C) Episcleritis is a common cause of red eye and is distinguished by its localized or patchy distribution and generally mild associated pain and discharge. It may occur in association with rheumatoid arthritis and other autoimmune disorders, but many cases are idiopathic. Episcleritis is usually self-limited and does not affect vision or involve the cornea.

(Choice D) Patients using extended-wear contact lenses are at risk for both bacterial conjunctivitis and keratitis. Involvement of the cornea indicates keratitis, and the cornea is generally spared in uncomplicated conjunctivitis. The infection in this patient is likely due to *Pseudomonas*.

(Choice F) Subconjunctival hemorrhage is usually caused by local trauma or Valsalva maneuver (eg, coughing,



Feedback



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Previous



Next



Tutorial



Lab Values



Notes



Calculator



Reverse Color



Text Zoom



Settings

(Choice C) **Episcleritis** is a common cause of red eye and is distinguished by its localized or patchy distribution and generally mild associated pain and discharge. It may occur in association with rheumatoid arthritis and other autoimmune disorders, but many cases are idiopathic. Episcleritis is usually self-limited and does not affect vision or involve the cornea.

(Choice D) Patients using extended-wear contact lenses are at risk for both bacterial conjunctivitis and keratitis. Involvement of the cornea indicates keratitis, and the cornea is generally spared in uncomplicated conjunctivitis. The infection in this patient is likely due to *Pseudomonas*.

(Choice F) **Subconjunctival hemorrhage** is usually caused by local trauma or Valsalva maneuver (eg, coughing, sneezing, vomiting). Patients will have a well-demarcated patch of extravasated blood beneath the conjunctiva. Most cases are benign and require no specific therapy.

(Choice G) Viral conjunctivitis ("pink eye") is usually preceded by typical nasopharyngeal symptoms. Corneal involvement is uncommon. Viral conjunctivitis is most common in the late summer and fall and may occur in clusters or small epidemics.

Educational objective:

Contact lens-associated infectious keratitis is a medical emergency that causes a painful, red eye and opacification and ulceration of the cornea. Most cases are due to Gram-negative organisms but can also be due to Gram-positive organisms as well as certain fungi and amoebas. Most cases require topical broad-spectrum antibiotics.

References

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Feedback



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Exhibit Display



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Add To Flash Card

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Feedback



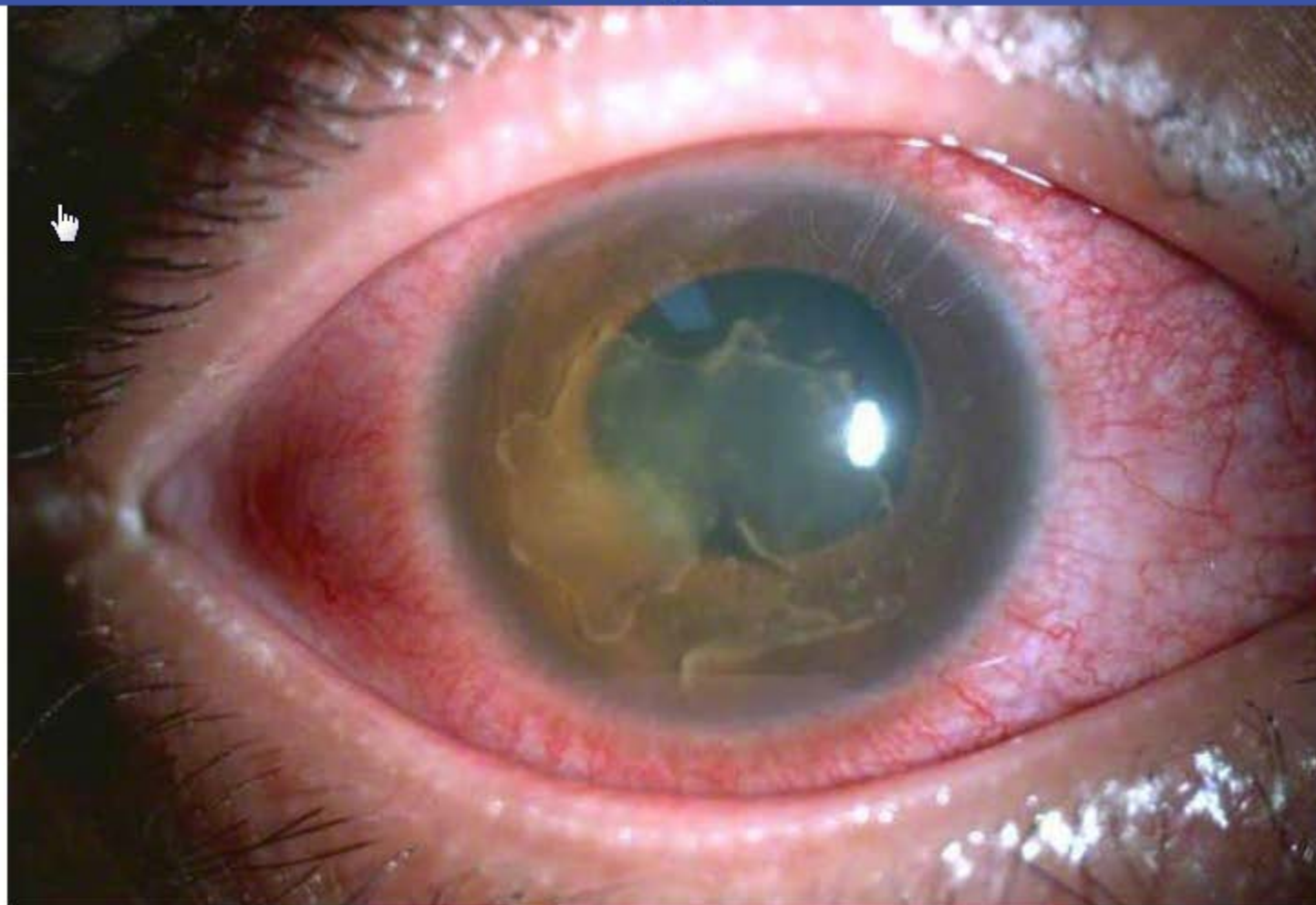
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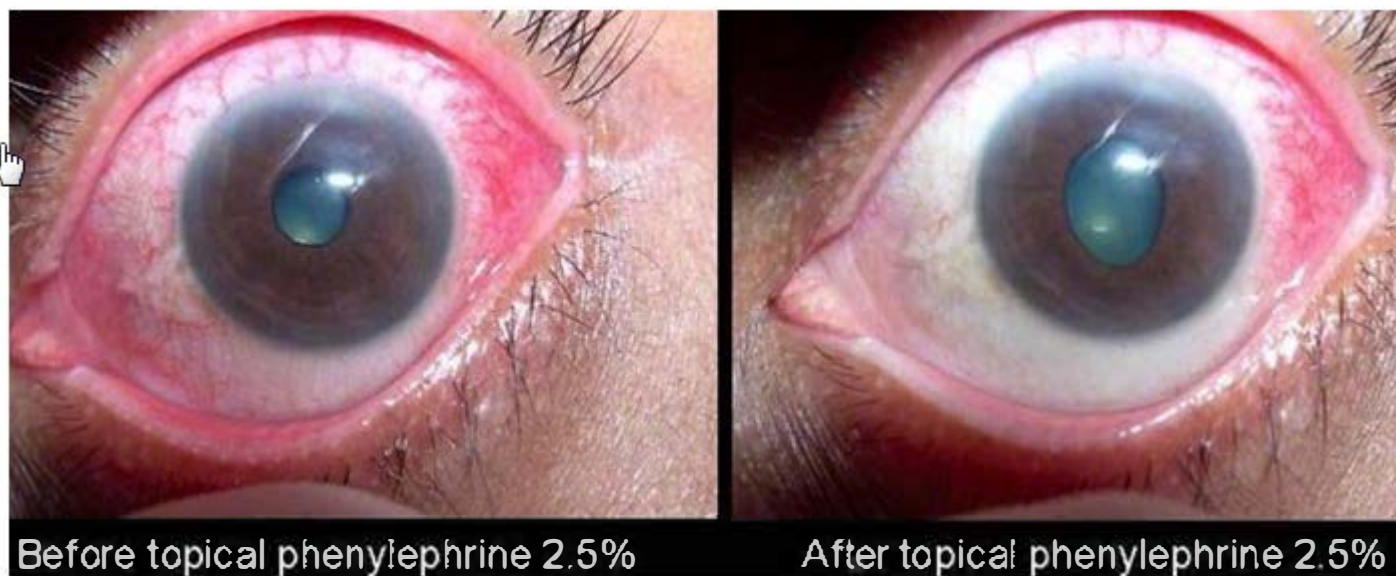
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