

EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

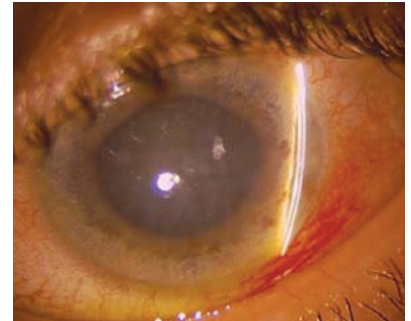
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Acute Primary Angle Closure Glaucoma

A 64-year-old Asian female with no past medical or ocular history presents to the ED with left eye pain for the past 12 hours. She has never experienced this before. Pain is described as pounding 9/10 pain. Nothing alleviates the pain. She also admits decreased vision, seeing halos, and redness in the left eye (OS). No complaints in her right eye (OD). Denies any flashes, floaters, curtains over her vision. She admits headache, nausea and vomiting. She has never had cataract surgery. Patient is afebrile and vitals are within normal limits. Her vision is 20/30 OD, 20/100 OS; pupils are reactive OD, mid-dilated, sluggish OS; pressure is 14 OD, 40 OS by Tonopen. On exam, her left eye had 2+ injection, corneal edema, and a shallow anterior chamber; right eye WNL. You have consulted ophthalmology, but they have not yet arrived. Which of the following is the most appropriate initial treatment for this patient's condition?

- A. Timolol 0.5% OS, Predforte 1% OS, Brimonidine 0.1% OS.
- B. Pilocarpine 1% OS, Pilocarpine 0.5% OD, Timolol 0.5% OS, Predforte 1% OS, Brimonidine 0.1% OS.
- C. Acetazolamide 250mg IV, Pilocarpine 1% OS, Pilocarpine 0.5% OD, Timolol 0.5% OS, Predforte 1% OS, Brimonidine 0.1% OS.
- D. Laser Iridotomy in both eyes (OU).
- E. Anterior chamber paracentesis OS.



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Acute Angle Closure Glaucoma

Acute Angle Closure Glaucoma will present with unilateral decreased vision with halos and eye pain. It is one of the few ophthalmologic emergencies.

Confirm diagnosis with acutely increased IOP in affected eye and shallow anterior chamber. May also see decreased acuity, mid-dilated pupil, and injection.

EM Case of the Week is a weekly "pop quiz" for ED staff.

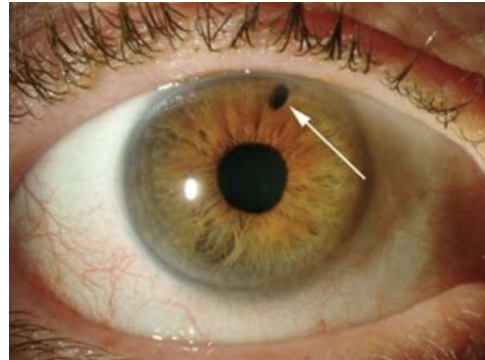
The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

BROWARD HEALTH MEDICAL CENTER

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The correct answer is B. Pilocarpine 1% OS, Pilocarpine 0.5% OD, Timolol 0.5% OS, Predforte 1% OS, Brimonidine 0.1% OS.

Answer A includes the baseline drops given for acute angle closure glaucoma. Pilocarpine is added to both eyes if the patient has never had cataract surgery (Answer B). If the IOP is greater than 50 or if the vision is counting fingers or worse, then Acetazolamide is given (Answer C). An ophthalmologist will perform a laser iridotomy on each eye but the ED does not have the necessary equipment (Answer D). A paracentesis is a rarely used treatment (Answer E).



(www.willseye.org/health-library/laser-peripheral-iridotomy)

Treatment

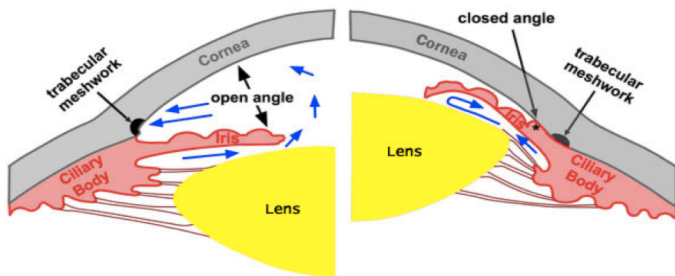
Acute primary angle closure glaucoma is an ophthalmologic emergency. Please consult an ophthalmologist immediately.

However, in the ED, the patient should be given pressure lowering eye drops, including 1 drop of Timolol 0.5% (caution with asthma or COPD), Predforte 1%, and Brimonidine 0.1% in affected eye with the goal to lower the pressure within the normal range (<22). Acetazolamide is added if the IOP is greater than 50 or if the vision is counting fingers or worse.

Pilocarpine is only used if patient has never had cataract surgery, as the artificial lens implanted in cataract surgery prevents pupillary block because it is much thinner than a natural lens. Pilocarpine is used to break the block by inducing miosis, which pulls the iris away from the trabecular meshwork.

If no improvement in pressure or vision after 1 hour, give IV Mannitol 1-2g/kg over 45 minutes and repeat drops.

The ophthalmologist will perform gonioscopy to confirm angle closure and attempt to break the block. A laser iridotomy is also indicated in both eyes, as the contralateral eye is at high risk, which will create a hole in the iris to prevent pupillary block.



(<http://medlibes.com/entry/acute-angle-closure-glaucoma>)

Acute primary angle closure glaucoma is due to a blockage of the trabecular meshwork that prevents aqueous humor from draining. This is due to pupillary block – when the iris approximates with the lens and blocks aqueous flow. This causes a pressure gradient and forces the iris forward and blocks the meshwork. This causes an acute rise in IOP that quickly damages the optic nerve, which can result in blindness.

The incidence in Caucasians is 1/1000 and 1/100 in Asians. There are features of the eye that predispose patients to attacks, including narrow angles, anterior iris insertion and short axial length. The populations at increased risk are elderly, Asian, female, far-sighted, and family history. Acute angle closure attacks may be precipitated by topical dilating drops, anticholinergics, antihistamines, dim light or reading.

For a list of educational lectures, grand rounds, workshops, and didactics please visit BrowardER.com and click on the **“Conference”** link.

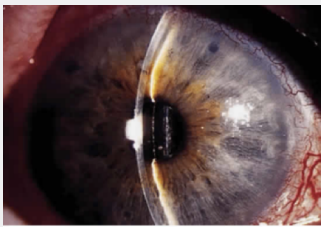
All are welcome to attend!

Warriors

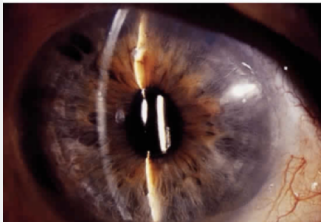
Discussion

There are key findings in the diagnosis of acute angle closure glaucoma that require some training to be accurate. These include an increased IOP measured by Tonopen, shallow angles seen in a slit lamp examination, and decreased visual acuity.

Measuring visual acuity: measure one eye at a time using their corrective lenses. Can use a near card at 14 inches from face or distance at 20 ft. If a patient gets 3 letters on a line, that counts as passing. If the patient cannot read any letter, have them count fingers, followed by motion, then finally light.



Slit lamp examination: make the beam narrow and angle the light so can see the anterior chamber depth. The top image shows a shallow anterior chamber as there is no space between the two beams of light. The bottom image is a normal deep anterior chamber.



(<http://www.oculist.net/downaton502/prof/ebo/ok/duanes/graphics/figures/v6/0240/006f.jpg>)

Measuring IOP by Tonopen: First, anesthetize the eye. Then, calibrate the Tonopen by holding down the button and following instructions. Next, have patient hold both eyes open and look straight ahead. You want to gently tap the Tonopen right over the pupil to get an accurate reading. You will hear clicking when pressure is being recorded and the Tonopen will give you an accuracy reading after. Repeat multiple times as there can be user error.

Take Home Points

- Acute angle closure glaucoma is an ophthalmologic emergency. Please consult an ophthalmologist immediately.
- Patients typically present with unilateral eye pain, decreased vision, halos around light, headaches, nausea and vomiting.
- Confirm the diagnosis by measuring the IOP (elevated), vision (decreased acuity), pupils (mid-dilated, sluggish), and slit lamp exam (shallow anterior chamber).
- Acute angle closure glaucoma is treated with Timolol, Predforte, and Brimonidine. If patient has never had cataract surgery, add Pilocarpine in both eyes. If IOP is over 50 or vision is counting fingers, add Acetazolamide. If vision or IOP not improved in 1 hour, add Mannitol IV and repeat the drops.
- Patient must see an ophthalmologist for laser iridotomy in both eyes.



ABOUT THE AUTHOR

This month's case was written by Logan Vander Woude. Logan is a 4th year medical student from NSU-COM. He did his emergency medicine rotation at BHMC in February 2017. Logan will be pursuing a career in Ophthalmology after graduation.

REFERENCES

- Glaucoma: Basic and Clinical Science Course. American Academy of Ophthalmology. 2015. 114-120.
- Elhers JP, Shah CP. Acute Angle Closure Glaucoma. Wills Eye Manual. 214-219.
- Medscape: Acute Angle Closure Glaucoma.
- Waller N. Eye Emergencies. UNC Department of Emergency Medicine. 2010.