

Impact Injury-Causing Bilateral Hyphema: A Case Report

Mandeep kaur

Department of ophthalmology, INDIA

*Corresponding author: Mandeep kaur, Department of ophthalmology, India.

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Abstract

Hyphema is a term used to refer presence of blood in the anterior chamber of an eye. Usually, the anterior chamber contains clear fluid known as aqueous humor. Various aetiologies can lead to hyphema like blunt trauma, penetrating injuries, child abuse and certain blood dyscrasias. Blunt trauma is the leading cause of hyphema and more commonly occurs in children. We are discussing a case report of a 45- year-old female who presented to the emergency department of our hospital with lacerations and edema on the right side of the face with bilateral hyphema after a high- impact roadside accident.

Keywords: Anterior Chamber, Blunt Trauma, Bilateral Hyphema

Hyphema defines the presence of blood in the anterior chamber (AC) of an eye. It may range from microhyphema to complete hyphema [1]. The bony orbital rim naturally protects an eye, but injuries are common and even cause fractures in orbital bone in case of high-impact injuries. Hyphema can result from different injuries or insults to an eye and sometimes from certain ocular and systemic diseases. Various traumatic causes leading to hyphema are blunt trauma, projectile or missile injury, injury during sports activity from the ball, fist, gun pellets and even child abuse [2,3]. In addition, spontaneous hyphema can occur in certain diseases like neoplasm, uveitis, sickle cell anemia, juvenile xanthogranuloma and intraocular surgeries [1,4].

The most common cause of unilateral blindness worldwide is trauma to an eye [1]. Patients frequently present to an emergency room after blunt trauma leading to hyphema. Persons involved in sports activity are more prone to traumatic injuries of an eye. Young males (<30 years) are more common as compare to females contributing around 80% of cases [5,6].

A most common complication of traumatic hyphema is an increase in intraocular pressure (IOP). Increased IOP for an extended period can cause damage to the optic nerve leading to decrease visual acuity [1]. We are discussing a case report of a 45-year-old female who presented to an emergency department of our hospital after a roadside accident having lacerations on the right side of the face along with bilateral hyphema.

Case Report

The patient's relatives brought a 45- year-old female to an emergency room after a high-impact roadside accident. She was calm, cooperative, and conscious and well oriented to time, place, and person. On general examination, multiple lacerations and edema were present on the right side of the face.

Lacerations were already sutured under aseptic conditions in the primary health center, after which they referred the patient to a tertiary health center. Neuroimaging, i.e. CT scan head and orbit, was advised immediately to rule out any intracranial injuries, orbital fractures, optic nerve damage, proptosis, any foreign body or globe damage.

On ophthalmic examination, periorbital edema and ecchymosis are present in the right eye, whereas the adnexa of the left eye appear normal. Visual alignment was parallel; head posture was erect and ocular movements were normal in both eyes. Mild temporal subconjunctival hemorrhage was present in the left eye. Both the pupils were sluggishly reacting to light and round in shape. Bilateral hyphema was present on torchlight examination. She was admitted to the eye ward, and a detailed ophthalmic examination was performed.

On Snellen's chart, visual acuity was 6/18 in the right eye and 6/12 in the left eye. IOP was normal, i.e. 14 mmHg in the right eye and 12 mmHg in the left eye. On slit-lamp examination, right eye shows mild conjunctival injection, cornea with endothelial dusting, blood in the anterior chamber (AC) was seen (Grade 1 hyphema) with +3 AC cells. Iris shows normal contour and pattern, no iridodesis and no sphincter tear was noticed. Lens was clear, and no placidness seen. The left eye shows mild temporal subconjunctival hemorrhage, clear cornea, blood in AC (Grade 1 hyphema), +2 AC cells were present. Iris and lens were normal. Fluorescein staining was done in both eyes and turned out to be negative. Complete Fundus examination was done to rule out any vitreous hemorrhage, retinal tear, pre-retinal and subretinal hemorrhage, and retinal edema. Indirect ophthalmoscopic analysis showed clear and well-defined disc margins, cup disc ratio (CDR) 0.3:1, shining foveal reflex and periphery within normal limits in both eyes. Optical coherence tomography (OCT) of the macula was done to rule out any anatomical disruption. No relevant past medical, surgical, family and social history present.

Treatment with a topical anti-inflammatory drug, i.e. eye drop prednisolone 1% and cycloplegic plus mydriatic, i.e. eye drop atropine 1% BD, was started.

On day 3, the patient complains of sudden pain, mild blurring of vision and mild photophobia in the left eye. Tonometry was

performed, and it revealed an elevated IOP in the left eye, i.e. 26 mmHg whereas, IOP in the right eye was 16 mmHg. Pupils were pharmacologically dilated in both eyes. Hyphema was still present left eye more than in the right eye. Topical anti-glaucoma drug-like beta-blocker (0.5% timolol) was started BD for the left eye. Carefully and gently, gonioscopy

Was Performed to Rule out Any Angle

Day 1: Bilateral Hyphema with Subconjunctival Haemorrhage in Left Eye Is Present

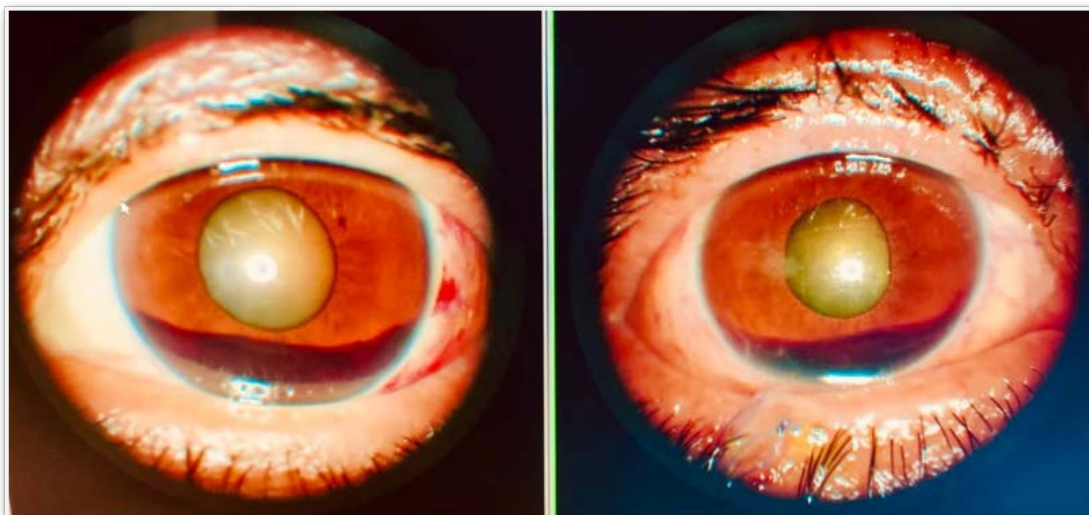


Figure: 1

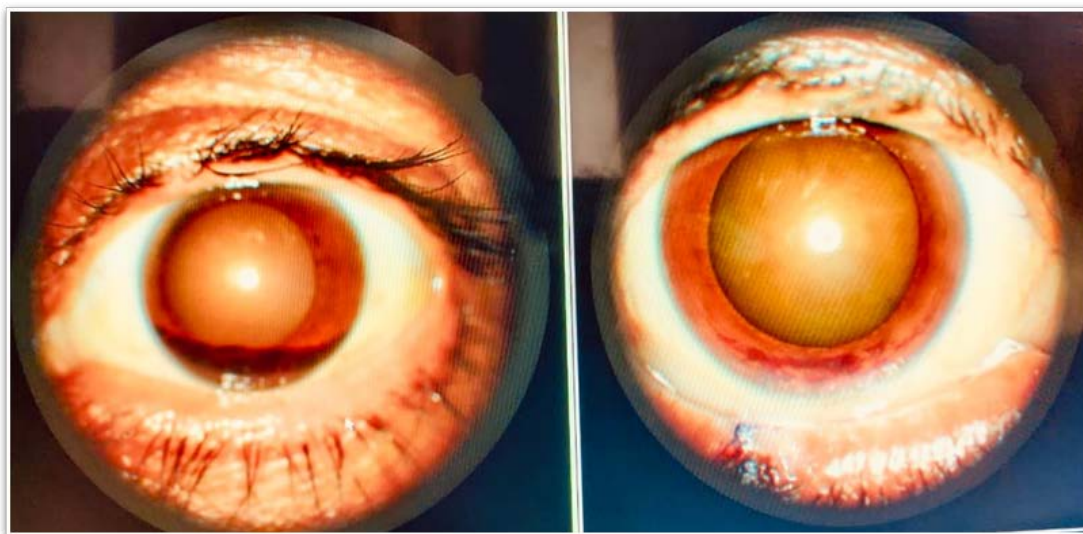


Figure: 2

Day 7: Hyphema in Left Eye Still Present with Pharmacologically Dilated Pupils in Both Eyes

Recession related to blunt trauma in both eyes. AC angle was showing inflammatory debris in the trabecular meshwork. Daily monitoring of visual acuity and IOP were done in both eyes till the patient was in the hospital. She was discharged on the 7th day on request. On discharge, hyphema of the right eye was cleared, whereas the left eye still has it. Initial follow-ups were weekly for two weeks and then fortnightly. We called her for follow-ups till two months; medication was tapered slowly and advised for regular IOP monitoring later.

Discussion

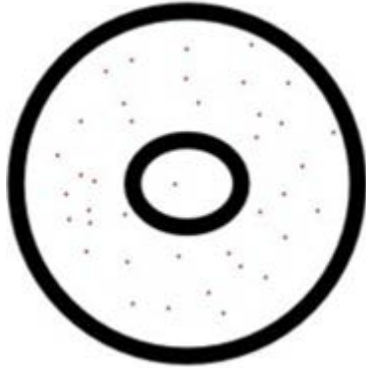
The yearly incidence of hyphema diagnosed in an emergency room is around 5.2/10,000 [5]. The most frequently associated cause of traumatic hyphema is blunt trauma from sports and recreational activities contributing, >50% of cases [7]. Non-traumatic hyphema occurs most commonly due to neovascularization of the iris secondary to diabetic retinopathy [8].

Ocular trauma can be mechanical, including penetrating injury, and blunt trauma or non-mechanical, including thermal, ultrasonic, electrical, or radiational damage.

Nowadays, recreational activities using paintball guns, airlift guns, and toys can also cause blunt trauma to an eye in children [9]. In addition, spontaneous hyphema can also occur due to certain medications like aspirin and warfarin [10]. During mechanical injury to an eye, there is anteroposterior compression

of the closed globe and equatorial expansion. In addition, due to shear stress on anterior chamber structures, iris stromal and ciliary blood vessel tear leading haemorrhage. Secondary haemorrhage is called rebleeding, which can occur due to clot lysis and retraction from injured vessels [10].

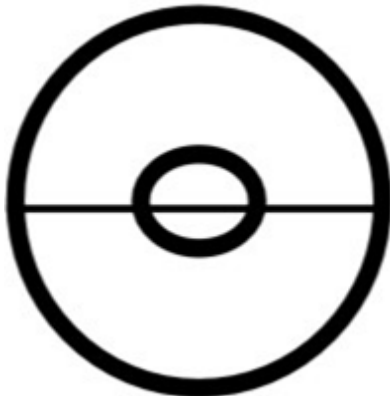
Grading of hyphema (8,11)



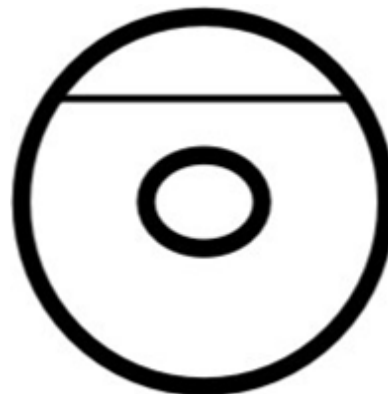
Grade 0: Micropipe. circulating Red blood cells present with No visible layering of blood in AC.



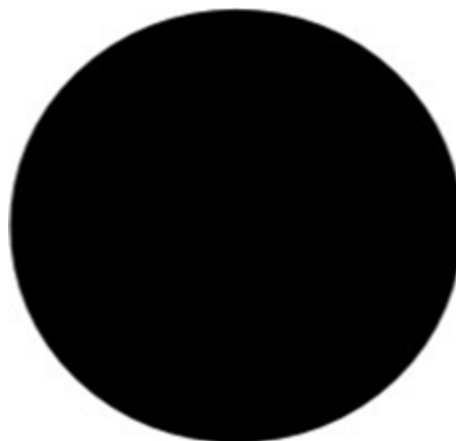
Grade 1: blood layers occupying <1/3rd of AC.



Grade 2: blood layers occupying >1/3rd to 1/2 of AC.



Grade 3: blood layers occupying 2/3rd of AC.



Grade 4: Total hyphema covering full AC. Also known as “Eight- ball” hyphema or “Red ball” hyphema.

Various complications related to hyphema are an increase in IOP, rebleeding, posterior synechiae, peripheral anterior synechiae, corneal blood-staining, and optic atrophy [9].

Glaucoma is the most common complication related to hyphema. Glaucoma can occur in >30% cases of traumatic hyphema and >95% in total hyphema [12]. Different types of mechanisms are related to the development of glaucoma after traumatic hy-

phema. Inflammatory cells and erythrocytes in AC will cause blockage of the trabecular meshwork, leading to the decreased outflow of aqueous humour and an increase in IOP. In case of large hyphema and clotted blood in AC, even pupillary block glaucoma can occur. Sometimes glaucoma may also be related to angle recession of greater than 180 degrees and peripheral anterior synechiae [12,13].

Rebleeding can occur due to clot retraction in 2-5 days after trauma in >35% cases and is more severe than the initial episode. In addition, the chances of secondary hemorrhage are higher in the case of large hyphema and young patients [13]. Patients with certain blood dyscrasias like sickle cell disease are more prone to increasing IOP and challenging to manage.

Defective RBCs are rigid due to sickling and difficulty crossing trabecular meshwork, leading to a rise in IOP. These patients are more prone to optic nerve damage due to microvascular infarctions, even with a moderate increase in IOP [13].

Treatment

The principal aim of treatment is to prevent recurrent trauma, rebleeding, and control IOP. Medical management is often sufficient until and unless total hyphema is present, leading to visual defects from markedly increased IOP, rebleeding and corneal staining, then may consider surgical options. Minimal physical activity should be allowed, and refrainment from sports should be advised. A protective eye shield can be used as the patient will be more careful while using them.

The patient should avoid certain systemic medications like aspirin, warfarin, and non-steroidal anti-inflammatory drugs [13]. Lifting the head end of the patients' bed is advised as to clear visual axis, and hospitalization is required in cases of large hyphema due to the risk of rebleeding and secondary glaucoma [14].

Medical management mainly includes topical corticosteroids (i.e. prednisolone 1%) to handle traumatic anterior uveitis and topical cycloplegic drugs (i.e. atropine 1%). The use of antifibrinolytic drugs like aminocaproic acid and tranexamic acid is still controversial, but many specialists believe that they decrease the chance of rebleeding [5-15].

Surgical management to clear AC is considered in patients with non-absorbing hyphema causing markedly increased IOP or corneal staining, threatening visual loss. Surgical washout and clearing of AC are done via simple paracentesis [5-15].

Continuous monitoring of IOP is required for timely intervention to prevent optic atrophy. The anti-glaucoma drugs mainly decreasing aqueous production should be used, like topical beta-blockers (timolol) and topical alpha-2 agonists (brimonidine). The use of systemic anti-glaucoma drugs like oral acetazolamide or intravenous mannitol infusion is considered if IOP is markedly high. In the case of sickle cell disease, carbonic anhydrase inhibitors are relatively contraindicated as they worsen the sickling of RBCs [5-9].

Summary

Hyphema is a common complication related to blunt trauma of the eye. Management of hyphema is challenging if it is related to complications affecting the vision of a patient. In most cases,

it is self-limiting and clears within few days but will depend on the grade of hyphema. Close monitoring is required to prevent glaucomatous vision loss and timely intervention. Long-term follow-ups with an ophthalmologist are advised to the patient in case of secondary glaucoma.

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