

# Clinical management of hyphaema

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## Introduction

Hyphaema is the presence of red blood cells in the anterior chamber.<sup>1-5</sup> A minimal amount of tiny red blood cells suspended in the aqueous humour is termed a microhyphaema. Microhyphaema may be visible only with the slit lamp, in the form of erythrocytes floating and circulating in the aqueous humour. Slightly larger amounts of red blood cells settle as variously shaped masses on the surface of the iris, lens or vitreous. Still larger volume of red blood cells gravitates to the anterior aspect of the interior chamber, producing a grossly visible layered hyphaema, which may be partial or complete.

The management of hyphaema can present a challenge to a clinician, because medical treatment is of little value for hyphaema itself but is useful for complications.

## Traumatic hyphaema

The vast majority of cases occur as a result of significant blunt trauma to the eye, although a hyphaema can still occur because of a seemingly trivial injury.<sup>1-4</sup> Common causes include air-bag injuries, blows to the eye during fist, belt or stick fights. Projectiles to the orbit, such as baseballs, stones, explosions and other small objects are other common agents of injury. Ocular trauma is a major cause for monocular vision impairment and blindness worldwide.<sup>2-4</sup>

## Spontaneous hyphaema

Hyphaemas that occur with no obvious history of trauma are known as spontaneous hyphemas.<sup>5</sup> It can be caused by vascular abnormalities, inflammatory processes, vascular erosions, haematological disorders or following surgery.

## Symptoms

The symptoms of a hyphaema vary depending on the severity.<sup>6,7</sup> Patients may present with blurred vision, pain,

photophobia, lacrimation, headache, vomiting, nausea and somnolence/lethargy.

## Classification

Description and classification of hyphaema in terms of several variables are important in evaluating severity, monitoring and management. A general classification system exists that has universal acceptance which is best classified according to the amount of red blood cells in the anterior chamber.<sup>1-6</sup> It consists of grading the amount of blood layering present. Documentation of blood layering is made by drawing the hyphaema, recording the percentage of layering or by direct measurement (in mm) of the layering from the lower limbus. A grade may then be assigned according to the following guidelines:

- Grade 0: microhyphaemal, circulating red blood cells only
- Grade 1: less than  $\frac{1}{4}$  of anterior chamber
- Grade 2: more than  $\frac{1}{4}$  to  $\frac{1}{2}$  of anterior chamber
- Grade 3: more than  $\frac{1}{2}$  to  $\frac{3}{4}$  of anterior chamber
- Grade 4: total filling or "eight-ball" hyphaema

## Patient's history

The ophthalmic examination focusing on hyphaema should begin with a complete history. Circumstances surrounding the event, current medications, past medical history and previous ocular history must be addressed. Bleeding in the eye warrants questioning concerning systemic blood disorders (haemoglobinopathies) such as sickle cell anaemia, haemophilia and von Willebrand's disease (vascular haemophilia), because they may affect the course of the hyphaema, its management and the long term outcome.<sup>8,9</sup> Unreliable historians should be screened for coagulopathic disorders with appropriate testing (sickle

prep or dex, prothrombin time (PT) and partial thromboplastin time (PTT).

## Examination

Inspection for gross ocular injury, evaluation of the adnexae and the assessment of visual acuity, visual fields, pupillary function, ocular motility and the position of the globes should be undertaken. Perform uncorrected, corrected and pinhole (if indicated) visual acuities depending on the extent of the hyphaema and other ocular injuries that may affect vision. Pupil evaluation will help determine the extent of any traumatic injury to the surrounding adnexae. Ecchymosis and lid oedema often accompany contusion injuries to the eye. Disproportionate conjunctival edema or haemorrhage may indicate a scleral rupture, and restriction in ocular motility may suggest an orbital blow out fracture.<sup>10</sup> For unknown reasons, many patients diagnosed with traumatic hyphaema may appear drowsy, thus the mechanism of injury should be clearly established so that a head injury will not go undiagnosed.

## Management

The overall management for hyphaema should be directed toward minimizing secondary haemorrhage and reducing the incidence of secondary glaucoma. Many different supportive therapeutic and medical regimens continue to be tried in an attempt to avoid complications and promote hyphaema restoration. Clinicians should not feel obliged to use ritualistic therapy that they consider to be of uncertain value.

The conventional treatment of patients with traumatic hyphaema has included hospitalization, bed rest, bilateral eye patching, sedation and avoidance of any strenuous activity.<sup>3-5</sup> Although most patients and families prefer outpatient care for the management of hyphaema, the decision to hospitalize should be based on clini-

cian preference. Several authors<sup>4,5</sup> have recommended hospitalization for patients with rebleeding, positive sickle cell trait or anaemia, hyphaema greater than 50%, severe loss or decrease in vision or noncompliant patients.

Advantages of hospitalization are the ease of follow-up examination, medical compliance and early diagnosis of complications.<sup>1-4</sup> The outpatient management safety depends on compliance with activity restrictions, medical delivery and ability to return for initial daily follow-up.<sup>1</sup>


In case of traumatic hyphaema, the injured globe requires adequate protection with a patch and shield<sup>10</sup>. If the patch promotes bacterial growth by raising the temperature in the conjunctival sac, topical antibiotic application may be indicated. Elevating the head of the bed 30-40 degrees while at rest facilitates settling and layering of the hyphaema in the inferior anterior chamber. Sedation should be recommended only for the extremely apprehensive (agitated, hyperactive or anxious) individuals. If analgesics are required for pain relief, narcotic analgesics are preferred.<sup>10,11</sup> The antiplatelet effect of aspirin tends to increase the incidence of rebleeding in patients with traumatic hyphaema. This also includes non-steroidal anti-inflammatory medications, such as naproxen (Aleve®), ibuprofen (Motrin®) or mefenamic acid (Ponstel®).


Cycloplegics, miotics, corticosteroids, beta-adrenergic antagonists, carbonic anhydrase inhibitors and hyperosmotic agents have all been advocated individually or in combination to increase patient comfort, reduce intraocular inflammation, decrease the incidence of secondary haemorrhage, reduce intraocular pressure (IOP) and promote clearance of traumatic hyphaema.<sup>2,3</sup>

Drops of 1% topical atropine, an antimuscarinic cycloplegic, in the affected globe result in mydriasis and cycloplegia, thereby increasing patient comfort by reducing ciliary spasm.<sup>10</sup> Published data show that patient treated with systemic steroids had an incident of secondary haemorrhage equal to that of patients treated with systemic aminocaproic acid.<sup>2,12</sup> Topical aminocaproic acid use does not produce the side effects typically associated with systemic aminocaproic acid or tranexamic acid, such as nausea, vomiting and hypotension.<sup>2</sup>

### Conclusion

The eye is an organ that represents only 0.3% of the total surface area of the human body. However, loss of vision in one or both eyes has been classified as 24% or 85% whole person impairment or disability, respectively.<sup>10</sup> Obtain complete ocular and medical history. Evaluate the entire eye in an organised manner. Rule out ruptured globe, orbital fracture, retinal

detachment and systemic bleeding disorders. 

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