

## Trauma Related Glaucoma

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### INTRODUCTION

Trauma related glaucomas are a mixed bag of conditions that raise the intraocular pressure (IOP) and hence compromise the optic nerve function. When we talk about trauma we tend to think about blunt trauma and penetrating trauma (as well as chemical, electrical and radiation traumas). Most of the secondary glaucomas are a result of blunt trauma. It can occur acutely or more often delayed as in angle recession.

### BLUNT TRAUMA

Blunt frontal trauma causes the corneal apex to indent and consequently, the limbal ring gets stretched. The peripheral cornea is pushed outward and the iris root rotates backwards. The zonules are stretched pushing the lens (lens iris diaphragm) backwards. When this happens violently enough that would tear tissues to detach from their attachment at the limbus - leading to Iridodialysis, trabecular meshwork tears, angle recession, cyclodialysis, zonulolysis. This would first open up blood vessels and cause a hyphaema.

### HYPHAEMA

Hyphaema is presence of blood in the anterior chamber. It occurs after trauma due to a tear into a blood vessel bounding the anterior chamber - most often in the angle recess. Hence one should always suspect angle recession in any case of traumatic hyphaema.

Hyphaema causes a rise in intraocular pressure via a few mechanisms. Primarily it causes an increase in resistance to aqueous outflow by the blood cells (predominantly RBCs) blocking the trabecular meshwork. Viscosity of aqueous is also marginally increased by the blood proteins. To add to this there is inflammation due to the trauma itself causing a trabeculitis and swelling of the trabecular meshwork reducing the pore spaces in the same. If the clot covers the pupil then it will occlude the same and cause pupillary block glaucoma as well. If the situation continues long enough then peripheral anterior synechiae can form due to pupillary block over a wide area or due to the inflammation per se in limited areas. Both can compromise aqueous outflow over long term.

The angle recession is seen on an exam as a tear at the base of the iris where the drainage canals are. Angle recession glaucoma can be difficult to treat. Treatments can include medications that reduce

fluid production in the eye, laser surgery or filtering surgery.

### PENETRATING EYE INJURY

Traumatic glaucoma can also be caused by penetrating injuries to the eye, such as those caused by a sharp instrument or flying debris. The eye pressure is usually lower right after the injury occurs. Once the wound is closed, tissue inside the eye can become swollen and irritated, and bleeding can occur, causing the eye pressure to rise.

Short term rises in eye pressure are controlled in ways similar to cases of blunt trauma. However, damaged tissue and scarring from a penetrating eye injury can lead to blocked drainage canals.

Glaucoma due to a penetrating eye injury is best treated by preventive measures when the initial wound occurs. Corticosteroid therapy to help prevent tissue damage and scarring and antibiotics are an important component of initial treatment. Initial treatment can also include surgery to remove excess eye fluid or reduce swollen tissue [1-5].

### CONCLUSION

Significant blunt trauma usually causes a hyphaema. Glaucoma can appear immediately, weeks later or even years later. So every patient with hyphaema needs IOP monitoring and at least one gonioscopy to rule in/out angle recession. In this setting the patient needs to be monitored for life.

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