

## EYE INJURIES IN SPORT

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Eye injuries are usually dramatic, often giving rise to immediate loss of effective vision and are often very serious and painful.

The eyeball is a fragile structure which would seem to be vulnerable to frequent injury in contact sports. Fortunately, surrounded by orbital fat, shielded by the bridge of the nose and the bony cavity with overhanging margins, its protected position minimises the effect of direct impact, or transfers the oncoming force to the surrounding area.

It is readily apparent that the small size of the marginal entrance to the eye, (approximately 3.5cms. high and 4.0cms. wide) will deflect large objects; that is, the golf ball and squash ball are more likely to be offenders than the basketball or football, and the finger is more dangerous than the elbow. Furthermore, small missiles frequently travel at a very much faster speed than a large missile (ball).

Anatomically, sports injuries to the eye can be divided into three main categories: lids, globe and orbit.

### Lid Injuries

Bruising of the lids is not a serious injury and resolves quite quickly.

Laceration of the lids, both horizontal and vertical occurs in contact sports. Vertical tears are the worst, as they often involve the canaliculi. Intercanalicular and intercanthal lacerations frequently involve the tear sac region and result in scarring that may occlude the canals, or obliterate the tear sac. Early surgery before oedema occurs is most likely to lead to accurate approximation of the canaliculi and minimise scarring.

In the upper lid, severing the levator may result in ptosis.

### Globe Injuries

**Subconjunctival Haemorrhages:** foreign bodies or trivial injuries to the conjunctiva may cause subconjunctival haemorrhage. Such injuries may be caused by lightly touching the eye with a finger, scorecard or brushing with a jumper. The bright red and localised appearance of this subconjunctival haemorrhage is characteristic. No treatment is required, but other associated injury should be sought. The subconjunctival haemorrhage usually disappears over a period of ten to fourteen days.

### Corneal and Conjunctival Foreign Bodies

These may be blown into the eye especially in windy conditions on dusty pitches and courts. There is an immediate sensation of pricking in the eye with watering and redness.

In good light (daylight, or using a good torch) the foreign body can usually be seen resting on the cornea or conjunctiva. Corneal foreign bodies invariably cause an associated corneal abrasion, and this abrasion will show up as a bright green mark when a small fluorescent drop is instilled.

Eversion of the upper eyelids should always be performed as foreign bodies commonly lodge in the groove of the tarsal conjunctiva lining the upper eyelid.

### Corneal Abrasions

These occur frequently in sports such as water polo, wrestling and boxing, which involve a close physical contact. They are due to fingers catching the eye (in water polo especially), and the sportsman experiences a sudden sharp pain in the eye. After a few minutes the eye becomes very red, photophobic and waters a great deal.

Diagnosis is easily made by instilling a drop of fluorescein into the eye and this stains the area of the abrasion a bright green colour (the fluorescein stains only the part of the cornea where the epithelium is absent). First aid treatment is to place a firm pad and bandage over the eye, ensuring the eyelids are closed behind the pad.

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### **Hyphaema (*haemorrhage into the anterior chamber*)**

Concussion injuries to the eyes such as with a squash, tennis or football can cause haemorrhage into the anterior chamber of the eye. The haemorrhage comes from damage to the small vessels on the iris and should always be regarded as potentially serious.

The patient immediately experiences severe blurring of vision and an aching pain in the eye. Within minutes the eye becomes red and photophobic. A corneal abrasion is often present. Examination reveals fresh blood in the anterior chamber, preventing a clear view of the pupil and iris. The haemorrhage settles quickly to form a 'fluid level' of blood if the patient keeps still.

An eye pad should be applied to the eye and the patient sent directly to a hospital ophthalmic department. Secondary haemorrhage into the anterior chamber may occur in the first few days after the injury, and admission to hospital is usually necessary for bed rest to help avoid this complication. The secondary haemorrhage can be more severe than the primary hyphaema and give rise to secondary glaucoma.

Most hyphaemas absorb within a week of the injury, providing a secondary haemorrhage has not occurred. After absorption of the hyphaema the pupil should be dilated to inspect the retina for associated damage.

### **Penetrating Injuries**

Any moderately sharp object or high velocity small ball may cause penetration of the globe. A broken racquet, a fall skiing, or a hard-hit squash ball can cause rupture of the globe and urgent hospital admission is required for the patient.

There is immediate loss of vision in the eye, pain and redness. There is usually prolapse of iris through the wound and hyphaema.

Emergency treatment is to cover the eye with a clean pad and arrange for the patient to be admitted to hospital urgently.

### **Retinal Detachments and Retinal Injuries**

A concussion injury to the eye causes retinal haemorrhages, ruptures in the choroid, retinal breaks (tears and disinsertions), and rarely, avulsion of the optic nerve. All give rise to sudden failure of vision.

Retinal haemorrhages and breaks (usually in the form of a disinsertion or dialysis) should be suspected in any severe concussion injury to the eye. Balls, fists, racquets, sticks and boots are all liable to give rise to concussion injuries.

### **Retinal Haemorrhages**

These are fairly easy to recognise if a clear view of the retina is possible with the ophthalmoscope. The retinal haemorrhages and oedema occur most commonly in the macular area, or sometimes in the part of the retina adjacent to the blow, the temporal part of the retina being the most vulnerable. Retinal oedema and haemorrhages following injury usually resolve in a few weeks without treatment and with complete recovery of vision in many cases.

### **Choroidal Ruptures**

These occur frequently in association with traumatic retinal haemorrhages. Their ophthalmoscopic appearance is of whitish circumscribed areas close to the disc, the whitish colour being due to sclera exposed by the choroidal rupture. Choroidal ruptures and retinal haemorrhages can only be treated by the patient resting at home or in hospital and avoiding strenuous physical activity for two or three weeks.

### **Retinal Detachments**

They are always associated with a break in the retina, and following a concussion injury to the eye, the retinal break takes the form of a retinal dialysis or disinsertion. The disinsertion of the retina probably occurs at the time of injury but the retinal detachment which follows this may not occur for weeks or months after the injury.

The retinal dialysis appears as a red area, well demarcated, in the extreme periphery of the retina, almost invariably temporally because of the vulnerability of this area to injury. When there is an associated detachment, the detached retina looks greyish in colour and the vessels almost black when seen with the ophthalmoscope.

If the retinal dialysis can be diagnosed before the retinal detachment occurs, then the prognosis for vision is greatly improved. A retinal dialysis can be sealed off using the technique of photocoagulation (light coagulation) or cryotherapy to the retina. Once a retinal detachment has occurred, then a surgical operation is required to replace the retina.

Where severe penetrating injuries to the eye occur the retina is frequently torn in several places with immediate detachment occurring. The prognosis for vision in such cases is very poor and treatment is initially directed at repairing the penetrating wound.

### Orbital Injuries

Severe concussion blows to the orbital region usually cause bruising and oedema of the eyelids. This swelling may be so severe that the eyelid cannot be opened either by the patient or the examiner. Such patients should be seen by a specialist as soon as possible to exclude the presence of an associated injury to the eye.

Retrobulbar haemorrhage causes proptosis of the eye which in turn hinders the opening of the eyelids; this makes an examination of the globe of the eye difficult. Patients with severe eyelid and orbit haematomas require X-rays of the orbit to exclude fractures of the orbital walls and floor ('blow-out' fractures).

'Blow-out' fractures are caused by concussion injuries to the orbit giving rise to fracturing of the orbital floor. This gives rise to:

- (a) enophthalmos (the soft tissues of the orbit herniate through the fracture causing the eye to sink back in the orbit).
- (b) diplopia, often on looking upwards (the inferior rectus muscle is bruised or possibly tethered to the fractured floor).
- (c) Anaesthesia or hypoaesthesia of the skin of the cheek (due to damage of the inferior orbital nerve).

No emergency treatment is usually required, but as with all severe concussion injuries to the orbit, the patient should be examined by a specialist, preferably within a few hours of the injury so that damage to the globe can be excluded, and correction of any deformity of the bones carried out.

In conclusion, eye injuries do occur in sport. Many are relatively minor, but some are severe. Early first aid, recognition and treatment of injuries ensures that adequate follow-up treatment is instigated. Careful examination of the eye with good illumination is essential for diagnosis.