

# Eye Injury and Sports

## Mini Review

Among one of several daily activities, practicing sports might raise the rate of ocular trauma. A normal eye is expected to tolerate exertion and strong indirect pressure. Ocular anatomy and its adnexa are designed to protect from most of the trivial injuries. A high boney eye brow, a strong orbicular contraction, a fairly elastic outer coat as well as many other inherited properties, offer a safe position to the globe. However, a vulnerable one might not resist the stress of normal activity. Any deviation from normal raises the odd for eye damage. This starts from a protruding globe as in exophthalmos, an exposed one as in lagophthalmos or interruption of the outer coat continuity due to a previous surgery.

During sports, eye injury might result from a direct contact, either with an opponent or an instrument (racket or ball) used in practice. The rate of injury varies according to the type of sports practiced. The type and extent of damage also vary from one accident to the other. Golf, hockey, squash and tennis rackets are well known causative agents for trauma. Tennis and squash balls are also famous of causing rupture globe with a blunt trauma. Direct contact with the opponents in martial arts, rugby and American football without the protective gadgets raises the risk of injury by many folds. Even without contact, practicing sports in extreme environment, like running in cold wind and scuba diving offer an additional stress to the ocular surface.

Usually, the boney protection, represented in the orbit, and the surrounded adnexa, represented in the lids, carry the majority of the burden. We might encounter fissure fracture of the orbital margin, with or without extension to the orbital walls, especially the floor. In case of lid injury, it presents mostly as variable degrees of contusions and hematomas. Transverse cut wounds and vertical ones including the lid margin might also be encountered. In the globe itself, the most common finding is hyphema followed by vitreous hemorrhage. Corneal abrasion with or without stromal edema occur with cases of trauma with open lids. Ruptured globe is characteristically presented by "coup-contrecoup" mechanism. The globe is squeezed by a high speed agent (typically a ball), that is larger than the orbital entrance. The equatorial diameter increases at the expense on the anteroposterior one. A scleral wound is then created that is neither anterior to reach the limbus, nor appears at the posterior pole.

There are also several delayed complications to be dealt with, whether the primary injury was completely handled or not. Naming, posterior cortical cataract, angle recession glaucoma and unresolved vitreous hemorrhage. Handling damage after a sports injury is the same for that caused by any other blunt trauma. First aid consists mainly of excluding an open wound and its protection, if necessary. Then imaging might be requested to outline the extent of damage, especially for the boney orbit. Finally, handling specific organ damage will be decided according to final diagnosis. The majority of cases require conservative

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treatment. Prophylactic antibiotics are used in open wounds and abrasions. Corticosteroid drops are necessary to reverse the inflammatory reaction. The course and intensity depend on the extent of damage and response to medication. Monitoring IOP is of utmost importance in cases of hyphema. A surgical intervention is required to repair open wounds, or to remove a clotted hyphema with IOP rise. Later intervention might be needed to deal with cases like cataract.

It is well established in every sports, that safety comes first. This applies for both the player and the opponent. So rules have been issued to minimize any accidents that will jeopardize the essence of the game. For most fighting sports, the head generally has a special protection. A penalty is given for a non authorized move. Depending on the aggressiveness of a sport and the likelihood for trauma, basic gears are requested during practice. This includes helmets and goggles. Furthermore, eye protection must not introduce additional or secondary hazards (for instance, fracturing into sharp fragments on impact) and not introduce features that would deter the wearing of eye protection (for instance, restricting field of view to impede playing the sport). Although it is nearly impossible to eradicate completely eye injury during sports, adherence to regulations minimizes greatly the chances for trauma. Also an instantaneous reaction and a professional handling of the situation diminish the seriousness of the sequelae and improve the practice.

## Suggested Readings

1. Easterbrook M (1981) Eye Injuries in Racket Sports: A Continuing Problem. *Phys Sportsmed* 9(1): 91-101.
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3. Dain SJ (2016) Sports eyewear protective standards. *Clin Exp Optom* 99(1): 4-23.
4. Cope TA, Kropelnicki A (2015) Eye injuries in the extreme environment ultra-marathon runner. *BMJ Case Rep pii: bcr2015210432*.