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Original Research Paper

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CASE SERIES ON OCULAR TRAUMA: OCCUPATIONAL HAZARDS

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ABSTRACT Ocular trauma is most commonly seen in both rural and urban set up as an occupational hazard. Many people have lost their vision due to eye trauma and lead a miserable life. Here I am going to discuss some cases of eye injuries sustained while doing their jobs, their treatment and how to prevent them in future. Preventive measures are very important at work place to avoid eye as well as other injuries sustained by workers.

KEYWORDS : ocular trauma, eye injury, occupation, hazard, prevention

INTRODUCTION:

Eyes are the window to the soul and to the outer world. Ocular trauma is the major cause of preventable monocular or binocular blindness and visual impairment in the world, more likely in the developing countries. A report by World Health Organization (WHO), shows 55 million eye injuries causing restriction of daily activities, out of which 1.6 million go blind everyday [1]. Birmingham Eye Trauma Terminology (BETT) is the standard system of classification of ocular trauma and also widely accepted [2]. Injuries are sustained most likely by the children and young adults. Injuries are mostly sustained at workplace, sports and fall; here we are discussing workplace injuries.

Cases:

Case 1: Corneal foreign body: corneal foreign body is the very commonly seen injury in developing countries, especially in workers involved in welding arc work. Around 20 patients in a year, all were males with superficial corneal iron foreign bodies came to our centre. All injuries were sustained at workplace. Corneal foreign bodies easily removed with 26 gauge needle and cotton bud. [Figure A]

Case 2: Subconjunctival hemorrhage: this is also very commonly observed. Subconjunctival hemorrhage can be traumatic or spontaneous. Many old age hypertensive patients and patients on blood thinners report with subconjunctival hemorrhage. We had around 6 patients in a year reported with subconjunctival hemorrhage due to trauma sustained at workplace and all were males. All were managed with antibiotic and lubricants. No other associated eye injuries were seen in these patients. [Figure B]

Case 3: Black eye: Periorbital ecchymosis or black eye is very commonly observed in patients sustained head injury at work place. Three patients, 2 males and 1 female with head injury and black eye in a year reported to our center; fortunately the vision was normal and there was no associated other eye injuries. [Figure C]

Case 4: Anterior chamber Hyphaema: one patient reported with blunt trauma sustained at workplace and having diminution of vision in right eye. On examination he had visual acuity of counting finger at 2 meters, anterior chamber hyphaema with normal intraocular pressure. He was managed with antibiotics and steroids. His complete fundus examination with indirect ophthalmoscope and scleral depression, measuring of intraocular pressure, examination of anterior chamber angles for angle recession was done at one month after injury. As he had 180 degree angle recession so he was kept on routine lifelong follow up, as these patients are susceptible for angle recession glaucoma. [Figure D]

5. Other reported injuries were: one patient with lid laceration (managed surgically), 2 with chemical injuries (managed conservatively).

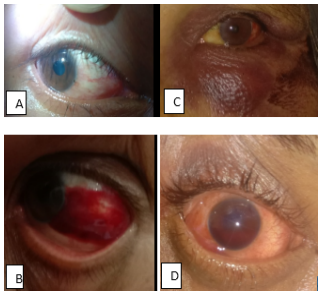

Figure A shows corneo-scleral foreign body in right eye nasal limbus.

Figure B shows subconjunctival hemorrhage in left eye.

Figure C shows black eye with periorbital edema in left eye of patient with head injury.

Figure D shows right eye of patient with anterior chamber hyphaema with mid dilated pupil.

DISCUSSION: Ocular trauma is the major cause of preventable monocular blindness and visual impairment in the world, especially in developing countries. Ocular trauma and resultant loss of vision lead to economical, psychological and professional crippling of the patient. BETT standard system classified open globe injury into five types: 1) Rupture 2) Penetrating. 3) Intraocular 4) Perforating 5) Mixed; Visual acuity graded as: 1) ≥20/40. 2) 20/50 to 20/100. 3) 19/100 to 5/200. 4) 4/200 to light perception. 5) No light perception; Zone of injury defined as: 1) Zone I- isolated to cornea (including the corneoscleral limbus). 2) Zone II- Corneoscleral limbus to a point 5 mm posterior into the sclera. 3) Zone III- posterior to the anterior 5 mm of sclera; Pupil involvement is mentioned as presence or absence of relative afferent pupillary defect (RAPD) in affected eye [2]. Potential visual acuity outcomes categorized by ocular trauma score (OTS) [3]. Most of the work place injuries occur due to non compliance with use of protective shield and goggles. History is very important, to know about type of injury either chemical or mechanical, type of chemical used, nature of foreign body, use of glasses or protective shield done or not, changes in vision, previous injuries or surgeries. Systemic examination is must to rule out associated injuries. In examination we must record visual acuity, slit lamp examination, ophthalmoscopic examination (both direct and indirect), location of injury (anterior segment or posterior segment), proper documentation and medico legal case registration. Intraocular pressure recording must be deferred until nature of injury is established- open globe or closed globe. Careful examination of conjunctiva, cornea, fornices, seidel's test, anterior segment and posterior segment is must. Examination of cornea for abrasion, foreign body,

ulcer, tear, laceration; anterior chamber for foreign body, iridodialysis, angle recession, hyphaema, hypopyon, cortical matter, dislocated lens, vitreous in anterior chamber; iris for iridodonesis, iris prolapse, foreign body, sphincter tears, traumatic iritis; pupil for RAPD, traumatic mydriasis; lens for subluxation, dislocation, cataract, vossius ring; vitreous for tobacco dusting, hemorrhage, foreign body, weiss ring; choroid for choroidal rupture and detachment; optic nerve for edema, haemorrhage, avulsion and retina for Berlin's edema, Intraocular foreign body(IOFB), retinal tears, holes, dialysis or detachment. Investigations like Xray, Ultrasonography (USG), computerized tomography (CT) scan and magnetic resonance imaging (MRI) is indicated if IOFB is suspected. MRI is contraindicated in case of metallic foreign body, pacemakers and implants. Treatment consists of first aid by thorough washing, cleaning the wound, apply a shield in case of open globe injury and don't apply undue pressure on eyeball if open globe injury suspected. In case of blunt trauma give analgesic, anti-inflammatory and local antibiotic ointment followed by close monitoring of the patient. Subconjunctival haemorrhage can be traumatic or spontaneous, so first rule out causes of spontaneous subconjunctival haemorrhage like valsalva maneuvers-coughing, sneezing, vomiting, weight lifting; acute bacterial and viral conjunctivitis; systemic hypertension and use of anticoagulants. Treatment for subconjunctival haemorrhage is wait and watch, lubricating and antibiotic eye drops. Corneal foreign bodies mostly seen at workplaces of grinding, drilling, hammering, welding and while driving; so history is important. Rule out IOFB; superficial foreign bodies can be removed by cotton bud or swab; deep foreign bodies can be removed by 26 gauge needle by tangential approach; very deep foreign bodies to be removed under operating microscope as may need suturing and we should encourage use of protective eye shield at workplace. Traumatic mydriasis is a frequent complication of ocular trauma due to injury to iris sphincter, dilator muscle and cilliary body lead to pain, photophobia, paralysis of accommodation, ocular fatigue and blurred vision. Treatment by pilocarpine eye drops, tinted contact lenses or surgical repair. Hyphaema, blood in anterior chamber is very commonly observed following blunt trauma. It can vary from microhyphaema to full chamber hyphaema. Management of hyphaema consist of USG-B scan to rule out posterior segment involvement; topical steroid, cycloplegics and antiglaucoma eyedrops; propped up posture and should be warned about signs of re-bleeding. Surgical drainage of hyphaema is indicated for corneal blood staining, an IOP more than 25 mm hg or more for 5 days with a total hyphaema, an IOP of >60 mmhg or more for 2 days, any hyphaema failing to resolve to less than 50% of anterior chamber volume by 8 days is also an indication due to peripheral anterior synechiae formation [4]. Other common presentations which need treatment are traumatic cataract, traumatic vitreous haemorrhage, suprachoroidal haemorrhage, traumatic retinal detachment, traumatic optic atrophy, choroidal rupture, commotio retinae and orbital trauma. Open globe injuries may lead to traumatic endophthalmitis and sympathetic ophthalmia later on. Occupational hazard may also present as chemical, thermal, ultrasonic, electrical and radiational injuries [5]. Immediate treatment for occupational trauma is directed at preventing further injury or vision loss, proper documentation of visual acuity and maintenance of records. We should make workers aware for wearing protective eye shield. The Occupational Safety and Health Administration (OSHA) requires workers to use eye and face protection whenever there is reasonable probability of injury that could be prevented by such equipment personal protective eyewear, such as goggles, face shields, safety glasses or full face respirators must be used when an eye hazard exists. The necessary eye protection depends upon the type of hazard, the circumstances of exposure, other protective equipment used and individual vision needs. There are four things which can be done to protect our eyes from injuries: 1) know the eye safety dangers at your workplace. 2) Eliminate hazards before starting work by using machine guards, work screens or other engineering controls. 3) Use proper eye protection. 4) Keep your safety eyewear in good condition and have it replaced if it becomes damaged [6].

CONCLUSION: We should make these workers aware about occupational hazards and necessary protective measures to be taken.

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