

Gunshot Related Binocular Injuries

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Abstract: Ocular gunshot injuries are usually severe, resulting in poor visual outcome especially blindness in binocular cases. The need to assess the prevalence of such binocular loss of vision among the cases of ocular gunshot injuries in our center informed the decision to carry out the study. A retrospective review of cases of ocular gunshot injuries. Patients seen with injuries to both eyes from gunshot at the Eye Clinic of the University of Ilorin Teaching Hospital (UITH), Ilorin, Nigeria, over a 5-year period between April 2000 and March 2005 were reviewed. Twelve eyes of six patients were reviewed. The patients' age range was between 20 and 50 years. There were 5 males and 1 female and the injuries occurred either during an armed robbery attack or game hunting. All the patients had one or both eyeballs ruptured with retained intraocular metallic foreign bodies (gun burner) in some of them. The patients had evisceration of the worse affected eyes while the other was managed conservatively, albeit with a poor visual acuity. Only 3 (25%) eyes in 3 patients had visual acuity of between 6/36 and 6/12 in the better eye. The need for control of violence, use, availability and improvement in the local gun manufacturing technology is emphasized.

Key words: Binocular • gunshot • gun burner • blindness

INTRODUCTION

Ocular trauma is one of the avoidable causes of blindness or visual impairment, often caused by various kinds of objects used in different settings. Males are more commonly at risk [1]. Ocular injuries from gunshot are usually severe and associated with extensive intraocular tissue damage [2, 3] retained intraocular/orbital foreign bodies (IOFB) and often result in significant visual impairment or blindness in some instances [2-4]. Destructive surgery, either evisceration or enucleation is often employed in their management [1-4]. The poor visual outcome becomes more devastating when both eyes are involved in the injuries which could arise from accidental explosion (self infliction) of the gun during hunting expedition [6] or as a result of assault in scuffle, civil unrest or armed robbery attack. Often the injuries transcend the oculo-orbital compartment necessitating co-management with other specialists. The use of these weapons has become very rampant recently in Nigeria [6] especially among students of tertiary institutions, who are involved in secret cult activities and also among people involved in political thuggery.

Six cases of gunshot injury involving both eyes seen at the eye clinic of the University of Ilorin Teaching Hospital, Ilorin, Nigeria are presented, 3 of which are used as illustration. The injuries occurred over a 5-year period between April 2000 and

March 2005. The 6 cases constitute part of a larger group of ocular gunshot injuries seen during the same period.

The need for strict supervision of the manufacture and control of availability and use of guns in general is emphasized. We are unaware of previous reports of this study from our center.

METHODS

The case notes of patients that had gunshot ocular injury and were admitted to the accident and emergency unit and the ophthalmic ward of the University of Ilorin Teaching Hospital (UITH), Ilorin, Nigeria over a 5-year period, between April 2000 and March 2005, were retrospectively reviewed. Excluded were patients with uniocular gunshot injuries or injuries to other part of the body other than the face.

Data obtained included the demographic profile of the patients, the circumstances surrounding the injuries and the ocular findings on ophthalmoscopy (both direct and indirect). Slit lamp biomicroscopy where possible and visual acuity assessment using the Snellen system in meters were also carried out. The nature of injuries, interventions and the outcome were recorded.

The results were analyzed using Epi info 2000 statistical package.

Table: Ocular characteristics and treatment outcome of the patients

Serial Number	Laterality	Presenting visual acuity	Treatment	Final visual outcome
1	Bilateral (R>L)	RE-NLP LE-2/60	Evisceration RE	Blind RE; LE-6/36
2	Bilateral (R>L)	RE-NLP LE-6/24	Evisceration RE	Blind RE LE-6/12
3	Bilateral (L>R)	RE-6/60 LE-NLP	Evisceration LE	RE-6/24 Blind LE
4	Bilateral	RE-NLP LE-HM	Evisceration RE	Blind BE
5	Bilateral	RE-NLP LE-NLP	Evisceration BE	Blind BE
6	Bilateral	RE-NLP LE-HM	Evisceration RE	Blind BE

RESULTS

Twelve eyes of six patients with gunshot injuries involving both eyes were reviewed. There were 5 males and one female, M: F ratio 5:1. Age range was between 20 years and 50 years. Three eyes (25%) had contusion injuries while the remaining 9 (75%) eyes had either corneo-scleral laceration with intraocular haemorrhage or globe rupture.

Ocular injuries in two of the patients were sustained from accidental discharge of gun burner or multiple gun pellets during game hunting and in the remaining 4 patients was from armed robbery attack. Instructive that none of the patients injured during game hunting was wearing a protective eye shield. The types of guns used ranged from the locally manufactured Dane gun to the more sophisticated high velocity assault rifle like AK 47. All the patients lost sight in one or both eyes. The worse affected eye had evisceration done, while the corneal/corneo-scleral lacerations were repaired and the contused eyes managed conservatively. Only one of the patients had a visual acuity better than 6/18 in one of the eyes. Three (50%) of the patients were blind in both eyes on discharge.

The presenting ocular characteristics and management outcomes are as shown in the Table. Three of the injured patients are also presented as illustration. Figure 1 shows the first patient. Figure 2 is an X-ray of the left orbit showing a metallic foreign body. Figure 3 shows the metallic part (burner) of a locally manufactured Dane gun that often gets dislodged during backfiring or gun explosion.

Case 1: A 20-year old male technician who sustained injuries to both eyes from a Dane gun which exploded on his face during a hunting expedition. He presented at the hospital within 24 h of the accident. Ocular examination revealed a visual acuity of no light perception (NLP) and 2/60 in the right and left eye, respectively. There was a right upper eyelid avulsion and a ruptured eyeball. The left eye showed peri-orbital ecchymosis, clear cornea, normal anterior chamber depth, dilated, unreactive pupil, clear lens and severe commotio



Fig. 1: Patient number 1 with ruptured RE and contused LE

retinae (Fig. 1). Skull x-ray revealed a metallic foreign body in the right orbit. The right eye was debrided and the foreign body removed under general anaesthesia while the left eye was managed conservatively. The visual acuity in the left eye improved to 6/36 at six-month follow up. The complication noted in the left eye was a fibrous traction band in the posterior pole. The left eye visual acuity has stabilized at 6/36 one year after the accident.

Case 2: A 50-year old female trader who sustained injuries to both eyes during an armed robbery attack about a week before presentation. She was referred on account of poor vision in both eyes. She also had CSF rhinorrhoea that was managed by Otorhinolaryngological (ORL) and Neurosurgical units of the hospital. Ocular examination revealed a visual acuity of No Light Perception (NLP) and 6/24 in the right and left eye respectively. The right eyeball was ruptured with a sub-total extrusion of the intraocular tissues. The left eye had marked lid oedema, conjunctival chemosis and a sluggishly reactive pupil. The posterior segment was normal. X-ray of the skull showed multiple rounded metallic foreign bodies within the right parietal bone, sphenoid sinus and anterior clinoid process. The right eye socket was debrided under general anaesthesia while the left eye

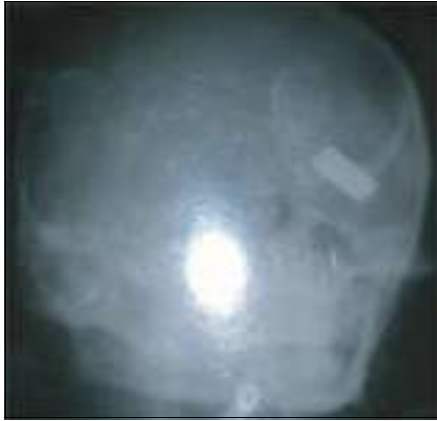


Fig. 2: Orbital X-Ray showing a metallic foreign body in the left orbit

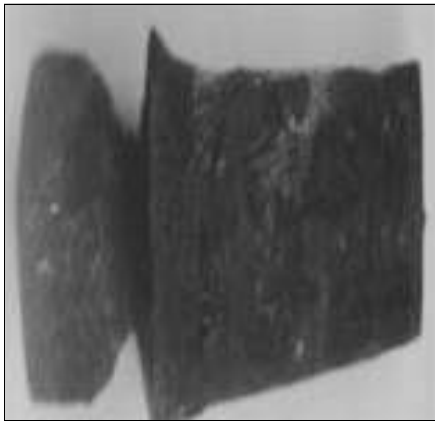


Fig. 3: Photograph of burner of a local Dane gun

was managed conservatively. At follow up the right eye socket was fitted with prosthesis while the visual acuity in the left eye improved to 6/12

Case 3: A 48-year old male farmer who presented 6 days after he was injured in both eyes by a locally manufactured Dane gun which exploded while he was trying to kill a bird. The patient presented with poor vision in both eyes. The visual acuity at presentation was 6/24 and NLP in the right and left eye, respectively. The patient also had a left supra-orbital laceration, conjunctival chemosis, sealed stellate corneal laceration, fibrinous material in the anterior chamber, shrunken eyeball with hypotony and restricted extraocular muscle movement. The right eye had conjunctival chemosis and early lens opacity. The posterior segment of the right eye was normal. The skull x-ray showed a left intra-orbital metallic foreign body (Fig. 2). The foreign body was removed via a supra-ciliary approach under general anaesthesia. Evisceration of the left eye was performed. The Patient was lost to follow up.

DISCUSSION

Disruption of the ocular anatomy in cases of gun shot injuries often result in poor visual acuity, globe perforation and retained foreign body. There is usually a need to remove the affected eyeball-7 eyes (58.3%) as seen in this study. This is similar to those reported by other workers [1-3], who reported about 60% evisceration/enucleation in their series on eye injuries. Visual outcome post injury is usually a reflection of the extent of damage, presenting visual acuity and ocular anatomical disruption and damage to the macular and or the optic nerve [4, 5].

Ocular injuries from low velocity bullets of locally manufactured dane guns are usually massive with a tendency to be localized to the orbit as shown in cases 1 and 3 as a result of scattered gun pellets or rupture by the burner; while those from sophisticated high velocity guns of armed robbers like AK 47, usually result in perforating eye injuries with involvement of several other organs of the body as in case 2. This pattern of injury often increases the morbidity and mortality in such cases as their use is often intentional often at a close range, or self-inflicted due to improper handling of the firearm [6].

The socio-economic impact of injury occurring to both eyes simultaneously is usually enormous to the individual, their families and the society. The situation is worse especially when the injury occurred in young adults and middle age individuals as shown in the 3 cases reported. The involved age groups in this study constitute the major workforce and the future of any society. Although not all the injuries in this study could have been prevented with the use of a protective eye shield, often the decision not to use protective eye shields arises from non-availability and affordability of the shield as well as low perception of risk among the people and “macho image phenomenon”.

Eye health promotion-to prevent eye injuries-involves raising community awareness and involvement through availability of clearly worded leaflets and posters displayed in clinics, drama sketches in public places and eye safety program in both the print and electronic media. The acquisition and use of eye protective shields should be legislated and appropriate measures put in place in case of established criminal negligence. This often is the responsibility of individuals, legislators, manufacturers/retailers and eye health workers among others.

In conclusion, ocular gunshot injuries are usually severe, with multiple tissue disruption, visual impairment and possibly visual loss. Avoidance of violence and improved security may curb the menace of armed robbery attack. Also, the manufacturing, acquisition and education in the use and maintenance of the locally manufactured Dane guns must be ensured in order to reduce the incidence of

accidental discharge from these weapons. The use of protective eye shield during hunting expedition should also be encouraged.

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