Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/mjafi

Case Report

A case of orbitocranial foreign body

Col V.K. Baranwal^{a,*}, Col R.P. Gupta (Retd)^b, Maj Gen Sharat Johri, vsm^c,
Maj Gen Ajay K. Dutta (Retd), vsm^d, Brig P.K. Murthy (Retd)^e,
Lt Col Avinash Mishra^f

^a Senior Adviser (Ophthalmology), Command Hospital (Northern Command), C/O 56 APO, India

^b Professor (Ophthalmology), D Y Patil Medical College, Pune, India

^c Commandant, Military Hospital (Cardio Thoracic Centre), Pune 4110040, India

^d Ex-Commandant, Command Hospital (Central Command), Lucknow, India

^e Ex-Deputy Commandant, Command Hospital (Central Command), Lucknow, India

^f Classified Specialist (Ophthalmology), Military Hospital, Ahmedabad, India

ARTICLE INFO

Article history:

Received 29 August 2012

Accepted 19 March 2014

Available online 4 August 2014

Keywords:

Intraorbital intracranial foreign body

Computerized tomography

Combined surgical approach

Introduction

Penetrating injuries of eye and orbit are not uncommon nowadays. These injuries result mainly due to accidents, assaults, terror attacks and war. Foreign body/bodies (FB) due to such injuries may be lodged in the eye, orbit and/or brain. However, FB lying partly in the orbit and partly intracranially is rarely noted.¹ There is very limited literature in this field. We report a rare case of orbitocranial FB managed by us and supported by valuable imaging.

Case report

A 27-year old patient presented with history of penetrating injury to his left eye by a metallic splinter from artillery gun firing. There was no history of unconsciousness, any other illness or injury. He had sudden onset loss of vision in his left eye along with pain, redness, watering and blood discharge. The patient reported to our hospital after 7 h of injury. On admission, the patient was fully conscious and well oriented with Glasgow Coma Scale (GCS) of 15/15. The visual acuity was 6/6 and no perception of light in right and left eye respectively. Right eye did not show any abnormality on examination. However, both left eyelids showed multiple abrasions, bruises and lacerations. The left eyeball was totally shattered with loss of eye contents. There were no signs of meningitis. Radiograph of skull was done which revealed a linear metallic density FB near the orbital apex. Fracture of the orbital roof with extension of the FB intracranially was also noted (Fig. 1). In view of shattered left eyeball with no vision, evisceration of left eye was planned under General anaesthesia on the same day. However to our surprise, we could not feel the FB during evisceration. Then, we resorted to CT scan examination, which confirmed the location of the FB and the fracture of the orbital roof. Soft tissues including the brain tissue and optic nerve could not be commented upon due to artefacts caused by the metallic density FB. In addition there was fracture of the floor of the orbit with likely blood in the left maxillary antrum

* Corresponding author. Tel.: +91 (0) 9419917569 (mobile).

E-mail address: mamtabar@rediffmail.com (V.K. Baranwal).

<http://dx.doi.org/10.1016/j.mjafi.2014.03.010>

0377-1237/© 2014 Published by Elsevier B.V. on behalf of Director General, Armed Forces Medical Services.

Fig. 1 – Radiograph of the skull (lateral view) shows a linear metallic FB near the apex of the orbit with fracture of the orbital roof and partial intracranial extension of the FB.

(Figs. 2 and 3). The case was taken up for surgery again after 24 h of first surgery and body was removed by frontal craniotomy by the neurosurgeons. There was no CSF leak and the gap was closed by mesh plating of the orbital roof. He was put on broad spectrum systemic antibiotics and analgesics postoperatively.

Discussion

Penetrating injuries of eye and orbit are not uncommon nowadays. Most penetrating brain injuries result from gunshots, either self-inflicted or related to armed conflicts and

Fig. 2 – CT scan (lateral scanogram) confirms the orbitocranial FB.

Fig. 3 – CT scan (Coronal reconstruction) confirms location of the FB. Note fracture of the roof as well as floor of the orbit with soft tissue density material within the left maxillary sinus likely hemosinus.

warfare.² Civilian gunshot wounds of brain have a fatality rate of over 90%–95%.^{3,4} The inciting foreign body/bodies lie in most cases either intraorbitally or intracranially. However, FB lying partly in orbit and partly intracranially is rare.¹ The ability of an object to penetrate the bone and to enter the intracranial cavities is based on a number of factors: energy, features of the object (tip shape, velocity) and angle of approach. The initial impact causes separation and cavitation. However, most of the damage in the target tissue is caused by the radially redirected kinetic energy of the expanding tissue itself.⁵ Studies of cranio-cerebral gunshot victims demonstrate mortality twice as high as in patients after road accidents and threefold higher than other penetrating head traumas.^{6,7} In our case, the potentially devastating effects of this penetrating injury were decreased as the projectile did not dislodge large portions of the bone and did not cause fatal bleeding from adjacent vessels. Intracerebrally it did not lead to any focal neurological deficits after removal of the metallic FB. Furthermore, the patient did not show any decline in his level of consciousness after the injury and had a GCS of 15/15, which is an excellent prognostic factor. The origin, size, and trajectory of this injury placed the patient at risk for infection. However, the patient was sufficiently treated with the empirical broad spectrum antibiotic coverage.

It was possibly incorrect on our part to go for evisceration and try removal of FB based on radiograph alone. Since we could not locate the FB intra-op, we did not attempt removal of the same during evisceration which could, otherwise, have proven to be disastrous. In view of above, it is recommended that CT scan evaluation is a must before taking up any case of orbital FB for surgery. Team approach comprising of ophthalmologist, radiologist, anaesthesiologist and neurosurgeon is mandatory for managing these cases scientifically and

efficiently. In addition, aggressive and timely workup as well as expeditious surgical management are crucial in these settings and can generate exceptional outcomes despite major trauma.

Conflicts of interest

All authors have none to declare.

Acknowledgement

We acknowledge the invaluable contribution of Col Samar Chatterjee, Senior Advisor (Radiology), Command Hospital (NC) and Gp Capt K K Yadav, Senior Advisor (Surgery & Neurosurgery) Command Hospital (SC), for the timely & accurate diagnosis & successful management of the case.

REFERENCES

1. Kasper EM, Luedi MM, Zinn PO, Rubin PA, Chen C. Retained transorbital foreign body with intracranial extension after pipe bomb explosion. *Surg Neurol Int.* 2010;1:94.
2. Tagliaferri F, Compagnone C, Korsic M, Servadei F, Kraus J. A systematic review of brain injury epidemiology in Europe. *Acta Neurochirurgica.* 2006;148:255–268.
3. Benzel EC, Day WT, Kesterson L, et al. Civilian craniocerebral gunshot wounds. *Neurosurgery.* 1991;29:67–71.
4. Kaufman HH. Civilian gunshot wounds to the head. *Neurosurgery.* 1993;32:962–964.
5. Karger B. Penetrating gunshots to the head and lack of immediate incapacitation. I. Wound ballistics and mechanisms of incapacitation. *Int J Leg Med.* 1995;108:53–61.
6. Aharonson-Daniel L, Waisman Y, Dannon YL, Peleg K. Epidemiology of terror-related versus non-terror-related traumatic injury in children. *Pediatrics.* 2003;112:e280.
7. Patel HC, Menon DK, Tebbs S, Hawker R, Hutchinson PJ, Kirkpatrick PJ. Specialist neurocritical care and outcome from head injury. *Intensive Care Med.* 2002;28:547–553.