

## **Case report**

### **A missed periorbital foreign body**

#### **Abstract**

Ocular and orbital trauma involving the orbit and periorbital region are commonly seen in cases of road traffic accidents, sports injuries and physical assaults; cases of intraorbital / periorbital foreign body are rare. Early presentation, history of trauma, and imaging help in diagnosis. However, sometimes the diagnosis is missed particularly in cases with late presentation and a vague history of minor trauma and trauma with non-metallic foreign body. A missed foreign body may present later with infection, repeated inflammation, ptosis, and proptosis and motility defect further complicating the management.

Here, we present a case of missed foreign body during the primary repair of facial injury in a 32-year male with polytrauma sustained in a road traffic accident. Evidence of foreign body was reported in CT scan head advised for head injury. Re-exploration of wound and removal of foreign body is performed under local anaesthesia.

#### **Key words:**

Orbital trauma, foreign body, periorbital foreign body, metallic foreign body

## 1. INTRODUCTION

Road traffic accidents are increasing with the increase in road transport vehicles, are well known cause of ocular morbidity and blindness due to ocular injury. Ocular and orbital trauma involving the orbit and periorbital region are commonly seen in cases of road traffic accidents with the facial and head injury. However, cases of intraorbital / periorbital foreign body (FB) are rare. A retrospective study in 1061 patients with maxillofacial injury undergone maxillofacial multi slice CT scan; 250 patients (23.56%) were identified with orbital injuries: 149 (14.0%) suffered from isolated orbital fractures and in three patients intraorbital foreign bodies were identified in extraocular muscles, the optic nerve, and the ocular globe. [1] Periorbital foreign bodies are rarely reported in the literature as case reports [2, 3].

The diagnosis and management of orbital FB may be a challenge particularly in cases with late presentation and a vague history of minor trauma. A missed foreign body may present later with infection, repeated inflammation, ptosis, and proptosis and motility defect further complicating the management. Here we present a case of missed foreign body during the primary repair of facial injury in a 32-year male with polytrauma sustained in a road traffic accident.

## 2. CASE PRESENTATION

A 32-year-old male referred to eye OPD with suspected periorbital foreign body in right eye. He had history of road traffic accident at 9 am morning 4 days back. He stated that his bike slipped when a dog suddenly came in the way. Patient was under influence of alcohol. Patient took initial treatment from primary health centre and referred to this institute for further management. There was history of ear bleed and pain in shoulder. There was no history of loss of consciousness, headache, vomiting, chest or abdominal pain and breathlessness. In emergency clinic periorbital and facial lacerations were sutured. Patient was advised X-ray head, chest and spine; and CT scan head. X-ray head reported a radio opaque density in periorbital area suggestive of foreign body, more clearly seen in lateral view (Figure 1 a, b).

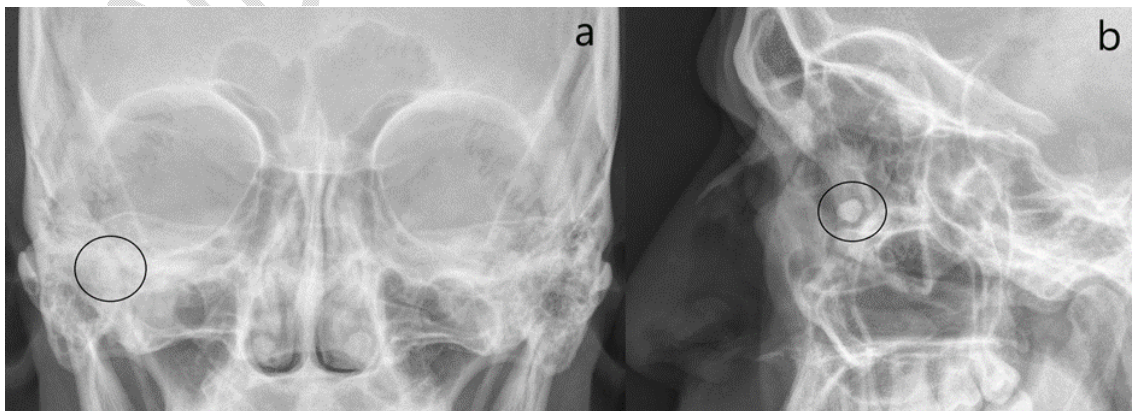


Figure 1: X-ray Orbit showing foreign body in right orbit (a) AP (b) Right Lateral view.

CT head showed evidence of soft tissue injury involving right periorbital tissues with a well-defined hyperdensity approximately 6 x 6 mm sized with perifocal oedema in preseptal region likely a foreign body (Figure 2). There was evidence of few haemorrhagic contusions and minimal subarachnoid haemorrhage in left temporal region with subtle perifocal oedema. There was longitudinal fracture of right mastoid part of temporal bone associated with hemotympanum and partial opacification of mastoid air cells. Un-displaced fracture of floor of orbit on right side with minimal pneumo-orbit was noted. Patient was referred to eye OPD after primary repair by maxillofacial surgeon and treatment from neurology and ENT department.

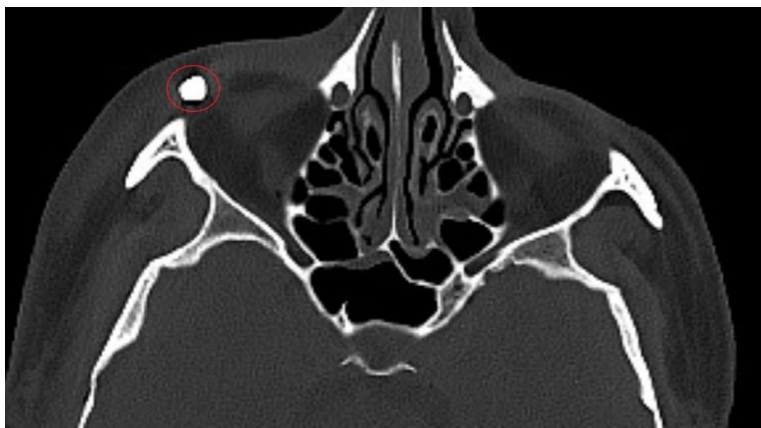


Figure 2: Non-contrast axial CT image showing a well-defined hyperdense foreign body

Ocular examination showed a mild diffuse swelling in temporal lower periorbital area around the stitched wound. Palpation revealed a hard swelling with ill-defined margins. Exploration of wound and removal of foreign body is planned under local anaesthesia. The wound was reopened, foreign body identified beneath the muscle layer was exposed and removed through blunt dissection of orbicularis muscle. It was piece of stone used for road and building construction (Figure 3).



Figure 3: A stone foreign body

### 3. DISCUSSION

The orbital foreign body may be associated with serious injuries as well as minor injuries. If patients present early, with clinical suspicion and help of imaging it may be easily diagnosed like in this case. However, the diagnosis and management of orbital foreign body may be a challenge particularly in cases with late presentation and a vague history of minor trauma. A retained intraorbital / periorbital foreign body commonly present with the signs of orbital cellulitis (swelling, pain, and abscess), orbital hematoma, optic atrophy, motility defect, proptosis, visual field loss etc.

The reasons for the missed diagnosis of orbital foreign body are vague history especially among children, and intoxicated patients who cannot describe details of circumstances, type of injury and injury objects; and diverse imaging findings of different foreign body material such as small FB and non-metal foreign body lack typical imaging findings. During emergency management, doctors often concentrate on suturing the lacerations and secure the wound also result in missed diagnosis like in this case the foreign body was missed during primary closure of lacerations. This patient was a case of polytrauma with head and facial injury; was advised CT scan head which revealed the presence of FB at an early stage and managed promptly. A missed foreign body have been reported to be present later on after variable time (days to several months) with infection, repeated inflammation, ptosis, and proptosis and motility defect further complicating the management.[4]

Radiological imaging helps in detection and localization of the foreign body, assessment of consistency and size of foreign body and evaluation of the response of surrounding orbital tissue. Plain radiography is easily accessible and widely used to detect orbital foreign body. It may be useful in identifying and locating the metallic and glass foreign bodies; however, the detection rate for organic material, such as wood, is low [5, 6]. CT scanning is considered the standard imaging technique in cases of suspected foreign body and orbital fracture [7]. It is highly sensitive and specific for detection of foreign bodies, provide precise anatomic localisation of foreign body compare to plain radiograph. However, CT scans may produce false-negative findings, particularly if the size of the foreign body is less than 0.5 mm and especially in the case of wooden objects [8, 9].

Ultrasonography is able to detect and localize superficial foreign bodies with low radiopacity in the tissues of the body more effectively than CT and conventional plain radiography [9, 10]. It can be used to detect wood and plastic Orbital FBs, where X-ray and CT imaging may fail [11, 12]. MRI is useful to detect organic FBs if the metallic foreign body is ruled out. It can detect the radiolucent objects lodged in deeper tissues which are inaccessible to ultrasound scanning [13].

Management of retained intra/ periorbital foreign body is individualized, Many factors present a diagnostic and therapeutic challenge such as the size and nature of the object, difficulty of access, and proximity of the foreign body to vital structures [14-16]. Retention of organic FB has a much higher rate of infection and inflammation than nonorganic FB and

should be removed in all cases. Anteriorly placed FBs can be easily removed, should be removed in all cases. The removal of metallic foreign bodies allows patients to undergo MRI scanning if required in future. Posteriorly located foreign bodies have an increased risk of motility disturbances or optic neuropathy after surgical removal. Nonorganic inert FBs located more posteriorly without any clinical features may be left under observation [14]. Nonorganic Metallic compounds containing copper, iron and lead may cause further complications [17]. Copper can incite intense inflammatory reaction therefore should be removed, Iron may cause siderosis with loss of vision, if not removed patient should be monitored for photoreceptor function with electroretinography [16]. Lead pellets may cause systemic toxicity; however, it is unlikely in cases of orbital FB [18].

#### 4. CONCLUSION

A careful examination of the wound site is important to look for any foreign body and should be removed before suturing the lacerations. However, an impacted foreign body should be removed after clinical examination and radiologic evaluation that helps in determination of the exact size of object and its location relative to vital structures.

#### CONSENT

Written informed consent was obtained from the patient's parents.

#### ETHICAL APPROVAL

Not applicable

#### REFERENCES

1. Goelz L, Syperek A, Heske S, Mutze S, Hosten N, Kirsch M. Retrospective Cohort Study of Frequency and Patterns of Orbital Injuries on Whole-Body CT with Maxillofacial Multi-Slice CT. *Tomography (Ann Arbor, Mich.)* vol. 7,3 373-386. 17 Aug. 2021, doi:10.3390/tomography7030033
2. Kang S J, Jeon, S P. Surgical Treatment of Periorbital Foreign Body. *Journal of Craniofacial Surgery*, 2012;23(6), e603–e605. doi:10.1097/scs.0b013e31826bf5d8
3. Moretti, A., Laus, M., Crescenzi, D. *et al.* Peri-orbital foreign body: a case report. *J Med Case Reports* **6**, 91 (2012). <https://doi.org/10.1186/1752-1947-6-91>
4. Zhou L, Li SY, Cui JP, Zhang ZY, Guan LN. Analysis of missed diagnosis of orbital foreign bodies. *Exp Ther Med*. 2017 Apr;13(4):1275-1278.

5. Bray LC, Griffiths PG: The value of plain radiography in suspected intraocular foreign body. *Eye (Lond)* 1991, 5:751-754.
6. Wilson WB, Dreisbach JN, Lattin DE, Stears JC: Magnetic resonance imaging of nonmetallic orbital foreign bodies. *Am J Ophthalmol* 1988,105:612-617.
7. Fulcher TP, McNab AA, Sullivan TJ. Clinical features and management of intraorbital foreign bodies. *Ophthalmology* 2002;109:494-500.
8. Finkelstein M, Legmann A, Rubin PA. Projectile metallic foreign bodies in the orbit: A retrospective study of epidemiologic factors, management, and outcomes. *Ophthalmology* 1997;104:96-103.
9. Roberts CF, Leehey PJ 3rd. Intraorbital wood foreign body mimicking air at CT. *Radiology* 1992;185:507-8.
10. Aras MH, Miloglu O, Barutcuoglu C, Kantarci M, Ozcan E, Harorli A (2010) Comparison of the sensitivity for detecting foreign bodies among conventional plain radiography, computed tomography and ultrasonography. *Dentomaxillofac Radiol* 39:72-78
11. Javadrashid R, Fouladi DF, Golamian M et al (2015) Visibility of different foreign bodies in the maxillofacial region using plain radiography, CT, MRI and ultrasonography: an in vitro study. *Dentomaxillofac Radiol* 44:20140229
12. Ginsburg MJ, Ellis GL, Flom LL (1990) Detection of soft-tissue foreign bodies by plain radiography, xerography, computed tomography, and ultrasonography. *Ann Emerg Med* 19:701-703
13. Kornreich L, Katz K, Horev G, Zeharia A, Mukamel M (1998) Preoperative localization of a foreign body by magnetic resonance imaging. *Eur J Radiol* 26:309-311
14. Fulcher TP, McNab AA, Sullivan TJ: Clinical features and management of intraorbital foreign bodies. *Ophthalmology* 2002, 109:494-500.
15. Santos TS, Melo AR, Moraes HHA, et al. Impacted foreign bodies in the maxillofacial region: diagnosis and treatment. *J Craniofac Surg* 2011;22:1404Y1408
16. Siedlecki AN, Tsui E, Deng J, Miller DM. Long-Term Retention of an Intraorbital Metallic Foreign Body Adjacent to the Optic Nerve. *Case Rep Ophthalmol Med*. 2016;2016:3918592. doi: 10.1155/2016/3918592
17. Cooper WC, Haik BG, Brazzo BG: Management of orbital/foreign bodies. In *Smith's Ophthalmic Plastic and Reconstructive Surgery*.. 2 edition. Edited by: Nesi FA, Levine MR, Lisman RD. St Louis: Mosby; 1998:260-269.
18. Jacobs NA, Morgan LH. On the management of retained airgun pellets: a survey of 11 orbital cases. *Br J Ophthalmol* 1988;72:97-100.