Case report

Fronto-orbital cranio-encephalic foreign body secondary to an unusual accident at work

ABSTRACT

The authors report here a rare case of fronto-occipital rare foreign body that enter the skull during professionnal activity. First aid, clinical evaluation and tomodensidometry were done prior to surgery. Burns et traumatic lesions concerning the skin, the skull, the frontal lobe the eye and the eyelid. Unger general anesthesia, the foreign body has been removed by two teams, neurosurgical and ophtalmologic. We had no complication on the crânio –encephalic aspect. The eye was completely destroyed, removed and is covered by the ptosis. The patient resume work after one month and is well 6 months after surgery. This rare case raise the importance of safety measure at worksite.

Key words : Foreign body – Fronto –orbital traumatism – Cylinder

Introduction

An orbitocranial injury with a penetrating Intraorbital Foreign Body is listed as a rare cause of penetrating trauma. Since this type of trauma is considered a surgical emergency, taking a thorough history along with careful examination to find out the mechanism and cause of the trauma is crucial towards correct diagnosis and management of the disease [7]. Orbital injuries with a foreign body may result in severe structural and functional damage to the eye or orbital contents [8]. The present case study highlights the Fronto-orbital cranio-encephalic foreign body secondary to an unusual accident at work.

Case presentation

Mr. D G, 30 years old, is a metal carpenter with no particular background, residing in Dschang, West region in Cameroon.

He came to consult for a large right fronto-orbital foreign body that had been evolving for approximately one hour before his admission.

He declares that he suffered a work accident at his place of work located in Foréké Dschang, on May 20, 2022, around 12 p.m. while working with a machine, and without protective equipment.

He wanted to weld a cylindrical screen to the inlet of a truck's tank to prevent the fuel from being stolen. But the tank was not empty and the weld next to the fuel triggered a violent explosion, throwing the cylinder against its right fronto-orbital region.

This was followed by frontal cranioencephalic and right oculo-orbital trauma.

After the first aid provided in a nearby district hospital (tetanus serum, local care, venous route), he was immediately transferred to the Kouekong Regional Hospital where he received multidisciplinary care. He did not lose consciousness and complained of right craniofacial pain.

On arrival, the clinical-biological evaluation made it possible to note a preserved general state and stable vital parameters.

Locally, on inspection, the large metallic foreign body was implanted around the right eye, hemorrhagic and very painful. The scanner made it possible to better

visualize the foreign body and the lesions it had created. We did not do an angiogram.
After having stabilized him on the respiratory, circulatory and neurological levels, he was immediately taken to the operating room.
We performed in the operating room under general anesthesia an initial prewash followed by disinfection. There was a large circular scalp wound encircling the orbit and more deteriorating on its frontal part, an arciform fracture of the frontal bone, a lesion of the meninges and of the right frontal lobe with minimal hemorrhage. The right eye was destroyed by the explosion and the heat. There were superficial second degree burn injuries on his face, covering 4% of his body surface area.
The foreign body was removed by two teams, neurosurgical and ophthalmological, after a direct approach and without enlargement craniectomy or flap. The right eye was totally destroyed by the explosion and the burn.
After hemostasis, abundant lavage and drainage, the meningeal lesions were repaired directly without plasty or flap and the scalp sutured.
Frontal drainage of the residual hematoma was performed for 48 hours. There were no intraoperative incidents and the patient remained stable. He received intensive perioperative resuscitation care, general anesthesia, 3 antibiotics (ceftriaxone, metronidazole and gentamycin) at a meningeal dose for 5 days without obvious signs of infection, tetanus vaccine, analgesics and local care.
The postoperative course was simple regarding the involvement of the frontal lobe: no hematoma, no CSF leak, no meningitis, no frontal syndrome. However, he has complete monocular blindness and paralysis of the levator oculi muscle on the right side. At one month postoperative he resumed his work and is doing well at 6 months postoperative. This case emphasizes protective equipment, safety rules and multidisciplinary collaboration.

Discussion

Cranioencephalic wounds represent between three and eight percent of cranioencephalic trauma [1,2,3]. The diagnosis of a craniocerebral wound is confirmed during surgery by the demonstration of dural crossing by the injuring agent. Several cranioencephalic wounds with foreign body in place are reported in the recent literature [1-6]. There is a male predominance. CT angiography should be done if the injuring agent passes into the vascular zone. Removal may require an enlargement craniectomy or a flap. The closure must be done under drainage. Closure of the dura mater may require autologous grafting of the scalp or the aponeurosis of the temporalis muscle [4]. These artifices were not necessary in our case.
Medical treatment should include intensive care, tetanus serum and vaccine therapy, antibiotics and local care as performed in our case. The prognosis is pejorative if the Glasgow is low, which was not the case for our patient. We saw our patient 6 months postoperatively and obtained his permission to publish the images.

Conclusion

Cranio-encephalic wounds are a fairly common neuro-traumatic entity, the main complication of which is hemorrhage and meningeal infection. Early management with debridement and antibiotic prophylaxis and drainage would provide satisfactory results in the African context.

References

1. PARE P.E. Study of cranio-cerebral wounds in Senegal from the experience of the neurosurgical clinic of the University Hospital of Dakar. About 148 cases. Med thesis. Dakar 1986 6.

2. SAMI A., CHOUKRI M., ACHOURI M., AIT BENALI S. Cranio-cerebral wounds about 150 cases. Magreb Medical 1994;278:38-9 7.

3. SANON T. Cranio-encephalic trauma in Senegal. Apropos of 1039 cases at the neurosurgery clinic in Dakar. Thesis of Med. Dakar 1980 n° 38 8.

4. DIOP Abdul Aziz, TINE Ibrahima, HODE Luphin. Cranio-encephalic wounds: epidemiological-clinical and therapeutic aspects in Dakar. AJNS 2011 Vol. 30, No. 1

5. Agaly. H, Ndzie Essomba L D., Diallo. M, Dama.M, Sogoba. B, Sogoba. Y, Kanikomo. D. Unusual Cranio-Encephalic Foreign Body with Orbital Entry Point: Apropos of a Case. Health Sci. Dis: Vol 22 (2) February 2021 pp 89-91 Available free at www.hsd-fmsb.org

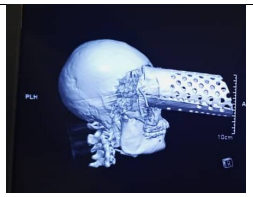
6. DIALLO Moussa, SOGOBA Youssouf, KANIKOMO Drissa. Non-projectile penetrating head trauma by nails: an unusual case. AJNS 2019 Vol. 38, No. 1.

7. Mirzaei F, Salehpour F, Shokuhi G, Asvadi Kermani T, Salehi S, Parsay S. An unusual case of intra orbital foreign body; diagnosis, management, and outcome: a case report. BMC surgery. 2019 Dec;19(1):1-6.

8. Santos TD, Melo AR, Moraes HH, Almeida Júnior P, Dourado E. Impacted foreign bodies in orbital region: review of nine cases. Arquivos Brasileiros de Oftalmologia. 2010;73:438-42.

Figure 1 : Iconography

A. Aspect on admission

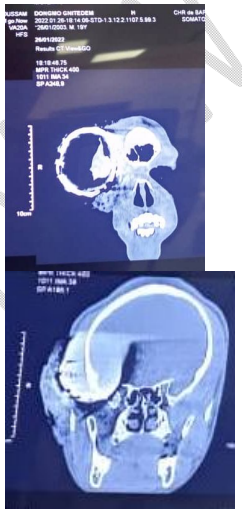


B. 3D Reconstruction

C. Horizontal section

D. Immediate post operative aspect

E. 3D and sagital view



F. Frontal view

G. Removed foreign body (Fuel lock cylinder)

H. Two weeks post op

I. Six months post op