



Case report

Concurrent impalement of two orbits in a child: A case report

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ABSTRACT

Introduction: Orbital impalement is a serious and potentially life-threatening trauma if the brain or vessels at the base of the skull are affected. The authors report the results and aftermath of the management of a case of post-traumatic retention of an intra-orbital metallic foreign body.

Case presentation: A 5-year-old boy was struck by a motorcycle while crossing a road. His head struck the handlebars of the motorcycle with a left facial-orbital impact point. The examination revealed a foreign body penetrating the orbit at the level of the left upper eyelid with limitation of adduction. The radiological assessment confirmed the intra-orbital presence of the foreign body with probable fracture of the inner wall of the eyeball. Surgical exploration through the palpebral wound revealed an intact eyeball and an incarceration of the medial rectus muscle by a fracture of the internal wall. After delicate and meticulous removal of the foreign body, hemostasis was ensured and the wound was sutured. The evolution was satisfactory, without sequelae or visual prejudice.

Discussion: Imaging, i.e. a CT scan and a standard X-ray, is necessary to evaluate the lesions before adapting a therapeutic attitude. The choice of the approach for extraction must meet two cardinal concerns: extraction of the foreign body and minimal dissection or manipulation of the noble structures of the eye and its adnexa.

Conclusion: Intra-orbital foreign bodies are rare but potentially serious. The type of the foreign substance, its intra-orbital extension and related lesions, as well as the extraction process, all influence the prognosis.

1. Introduction

Transorbital trauma accounts for up to 25% of penetrating head injuries in adult patients. It usually occurs after a high-velocity injury such as a gunshot or an industrial accident, even a trivial trauma can cause it [1]. Orbital impalement is a serious and potentially life-threatening trauma if the brain or vessels at the base of the skull are affected. It can also be responsible for functional disorders if the eyeball and its adnexa are damaged [1,2]. Orbital foreign bodies are more common in males and children and their nature is varied [1]. The particularity of orbital anatomy means that this cavity is at the crossroads of several specialties [2]. This raises the problem of whether or not to extract these materials and how to extract them [1,3]. Their management is delicate and requires expertise and especially a preoperative lesion

assessment.

The purpose of this article is to report our experience in the management of a case of massive orbital foreign body in a 5-year-old child.

This work has been reported in line with the SCARE 2020 criteria [4].

2. Case presentation

A 5-year-old boy, with no known pathological history, was the victim of a traffic accident. This child was hit by a motorcycle while crossing a road. The boy's head collided with the handlebars of the motorcycle with a left facial-orbital point of impact; the handbrake handle of the motorcycle, which broke in the process, was responsible for causing orbital trauma at the level of the left upper eyelid. The child was

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admitted to the emergency surgical service of the referral hospital in Maradi, 3 h after the trauma. The interrogation did not reveal any notion of initial loss of consciousness or vomiting, nor any nausea or dizziness. The neurological evaluation revealed a conscious patient, Glasgow 15/15. He was hemodynamically stable. Clinical examination revealed a foreign body penetrating the orbit at the level of the left upper eyelid above the medial canthus, 3 mm below the superciliary arch, and orienting inward and downward. There is no exit orifice and the left eyeball is pushed down and out, resulting in forced extorsion (Fig. 1). There is an important palpebral edema preventing spontaneous opening with a limitation of eye movements and an uncorrected visual acuity of 3/10. There is a slight contralateral palpebral edema with an easy opening without limitation of movements and a visual acuity without correction of 8/10. The ophthalmoscope examination revealed a normal anterior segment and fundus in both eyes. Palpation of the orbital rims is normal without step, and there is no skin hypoesthesia. There is no rhinorrhea or epistaxis. The radiograph of the orbit (face and profile) shows a curvilinear metallic foreign body in the left intraorbital region, perforating the inner wall of the orbit and whose distal tip, rounded and foamy, sits about 2 mm outside the inner wall of the right orbit. It appears to sit at the level of the ethmoidal cells (Fig. 2). Because of a technical problem, we did not perform a CT scan. Under general anaesthesia, the intra-operative finding was a wound in the upper eyelid of about 4 cm, from the medial canthus to the middle third, housing the perforating foreign body. Because of the loose, rounded nature of the distal end of the foreign body, we proceeded to gently remove it by levering on the nasal bridge (Fig. 3). Surgical exploration through the palpebral wound revealed an intact eyeball and an incarceration of the medial rectus muscle through a fracture of the inner wall. The medial rectus muscle was released, with the removal of two small bone fragments. Hemostasis was assured and the wound was overtrimmed. A left nasal packing with biogas was placed to ensure hemostasis and was removed after 72 h. The patient was treated with amoxicillin and clavulanic acid 250 mg \times 2 per day for 8 days, oral corticosteroids 30 mg per day for 5 days, eye drops, and ocular pomade based on a combination of antibiotics and corticosteroids, analgesics, and paracetamol 250 mg \times 3 per day for 5 days with daily dressing changes. The postoperative check-up on day 3 showed no bleeding, no epistaxis, no rhinorrhea, and no anosmia. There was no abnormality in the eye movements, with an uncorrected visual acuity of 8/10. The patient was declared discharged and followed up as an outpatient every week for one month, then every month for six months. No postoperative complications or sequelae were noted, the orthoptic assessment at 4 weeks post-op found no oculo-motor anomaly.



Fig. 1. Preoperative view of a patient with the metallic foreign body in place (arrow).

3. Discussion

In any ophthalmologic practice, orbital trauma is a common clinical situation. A foreign body is found in approximately one in six cases of penetrating ocular injury [3]. Approximately 16% of orbital trauma cases are associated with a foreign body [1].

Intraorbital foreign bodies, although commonly encountered in routine ophthalmologic practice, may have unusual presentations. They may occasionally accompany innocuous trauma, as in children at play [1]. In our case, the child was hit by a motorcyclist. This circumstance is often reported in public road accidents and reveals their degree of severity.

Different clinical presentations have been reported depending on the type of trauma and the nature of the foreign body [1,5]. The clinical symptomatology depends on the anatomical structures affected [2,5,6]. Often, it is the clinical symptomatology that reveals an unrecognized or overlooked old foreign body when it is not clinically visible or accessible [5,6].

Imaging is therefore important, especially with CT. If not available, a good frontal and lateral skull radiograph can help in the localization of metallic BFs [2,7–9]. MRI is the most effective examination for soft tissue, but unfortunately, it is contraindicated in the presence of metallic foreign bodies, as in our patient's case.

The decision to remove the BF must be weighed against the risk of iatrogenic damage to orbital structures [1]. Optimal visualization of the impaction site and the entire path of the foreign body are essential to operating in such cases [3]. Large foreign bodies can slide between the globe and the orbital walls, causing little or no damage to intraocular structures. However, the impact of immediate direct trauma can damage intraocular structures, such as the optic nerve. A periosteal breach by a foreign body may result in hematoma formation and increase the risk of intracranial damage through the superior orbital fissure or optic nerve foramen [3]. Therefore, it is very important to carefully assess the location of the foreign body and its intra-orbital extension before undertaking an ablation procedure. But when this is not possible, it is imperative to be delicate in the technical approach during the extraction in order to be as minimally traumatic as possible and to avoid iatrogenic lesions or their aggravation. It is then necessary to make a good intra-operative assessment and to make an inventory of the lesions, some of which must be treated immediately in order not to compromise the vital or visual prognosis [3,5,7]. In our case, the foreign body was anterior with a posterior direction. Although we did not have a CT scan to establish the lesion assessment, the radiography of the orbit allowed us to see the rupture of the internal wall and the effraction of the ethmoidal cells. At its distal end, it appeared distant from the apex, but we could not rule out compression of the optic nerve or adjacent vessels. However, exploration of the wound after removal of the foreign body found all the noble structures of the globe intact. Only a minor fracture of the inner wall with two detached fragments was noted. This significantly improved the prognosis.

Post-operative follow-up includes eye care with assessment of residual visual function, which may be normal or compromised after the extraction procedure, which can often be deleterious, but also the search for extra-ocular complications, especially cerebral ones [2,8].

4. Conclusion

Orbital impalement is rare but potentially serious. The type of the foreign substance, its intra-orbital extension and related lesions, as well as the extraction process, all influence the prognosis. The best treatment remains prevention and awareness. There is a need for an alternative means of exploration that can replace MRI to evaluate soft tissue lesions.

Consent

Written informed consent was obtained from the patient for

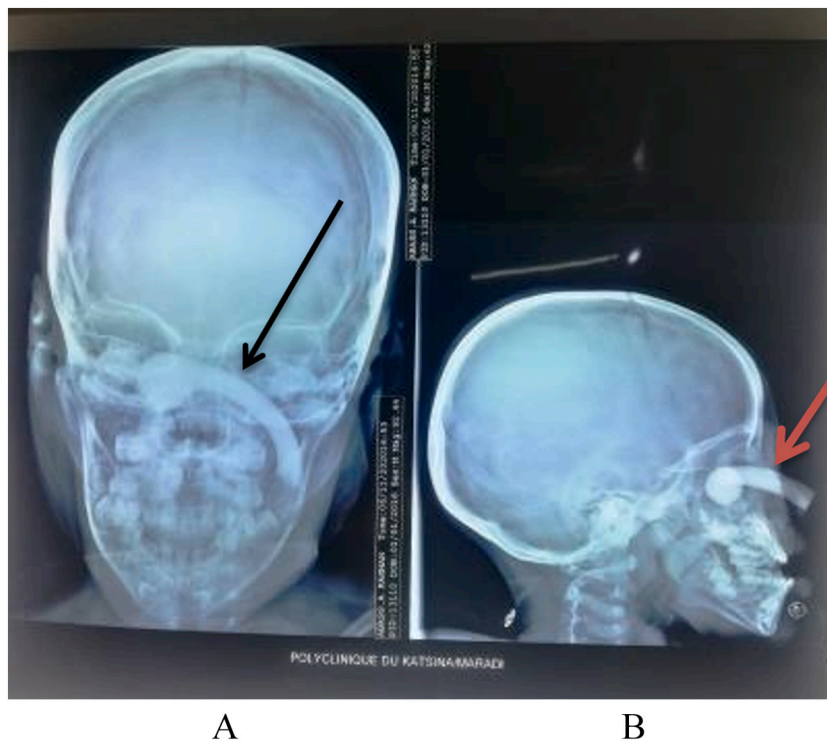


Fig. 2. Radiograph of the child's skull, front (A), and side (B), showing the presence of an intra-orbital metallic foreign body (red arrow) with a rounded blunt end in contact with the adjacent orbit (black arrow).

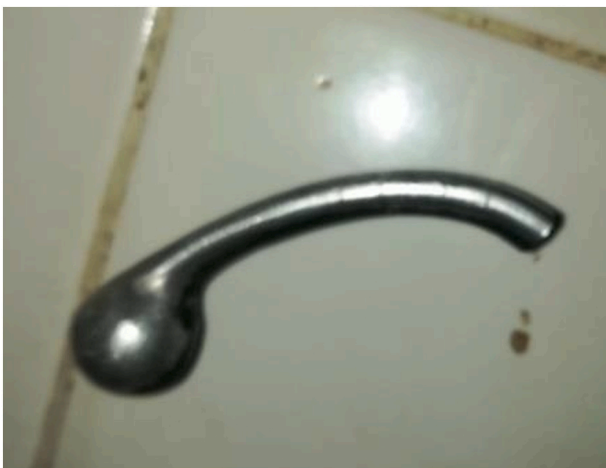


Fig. 3. View of the foreign body after extraction.

publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Ousseini Adakal: writing the paper
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Declaration of competing interest

Authors of this article have no conflict or competing interests. All of the authors approved the final version of the manuscript.

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