Slovenian Medical Journal

Posterior intraorbital bullet

Posteriorni intraorbitalni izstrelek

Marko Bašković,[1] Neda Striber,[2] Miroslav Gjurašin[3]

[1] Department of pediatric surgery, Children's hospital Zagreb, Zagreb, Croatia
[2] Department of ophthalmology, Children's hospital Zagreb, Zagreb, Croatia
[3] Department of neurosurgery, Children's hospital Zagreb, Zagreb, Croatia

Correspondence/ Korespondenca:
Marko Bašković, e: baskovic.marko@gmail.com

Key words:
bullet; orbit; gunshot wound

Ključne besede:
izstrelek; orbita; strelna rana

Received: 16. 6. 2019
Accepted: 15. 8. 2019

Abstract

Indeed, nowadays there is no clear agreement about the ideal treatment (conservative or surgical) of posterior intraorbital bullet in view of possible serious damage to vital structures such as the possibility of compromising the optic nerve. The decision to remove an orbital foreign body should always be made on an individual basis, with due consideration of the benefits and dangers of surgery.

Izvleček

Danes ni jasnega dogovora o idealni obravnavi (konzervativno ali kirurško) posteriornega intraorbitalnega izstrelka glede na možno resno poškodbo vitalnih struktur, kot je možnost ogrožanja optičnega živca. Odločitev o odstranitvi orbitalnega tujega telesa mora biti vedno na individualni osnovi ob ustreznem premisleku o koristih in nevarnostih operacije.

Cite as/Citirajte kot: Bašković M, Striber N, Gjurašin M. Posterior intraorbital bullet. Zdrav Vestn. 2021;90(1–2):91–5.

DOI: https://doi.org/10.6016/ZdravVestn.2963

1 Introduction

Gunshot wounds can cause serious organ damage. Prognosis depends on numerous components, including the size, kinetic energy, entry and trajectory of the penetrating object (1). Guns create three crucial wound types: penetrating, perforating, and avulsion (2). Detainment of a bullet between the orbitand the eyeball is due to either a low-velocity bullet, or a high-velocity bullet, shot from a long distance or slowed by intermediate impacts (3). We show the case of a twelve-year-old girl with a posterior infraorbital bullet, who was wounded by an air rifle.

2 Case report

A 12-year-old girl presented to the emergency department after being shot with a .177 (4.5 mm) air gun stuffed diabolo pellet. The pellet shot the girl's left infraorbital. The entry wound in a size of 3 mm was barely noticeable, located

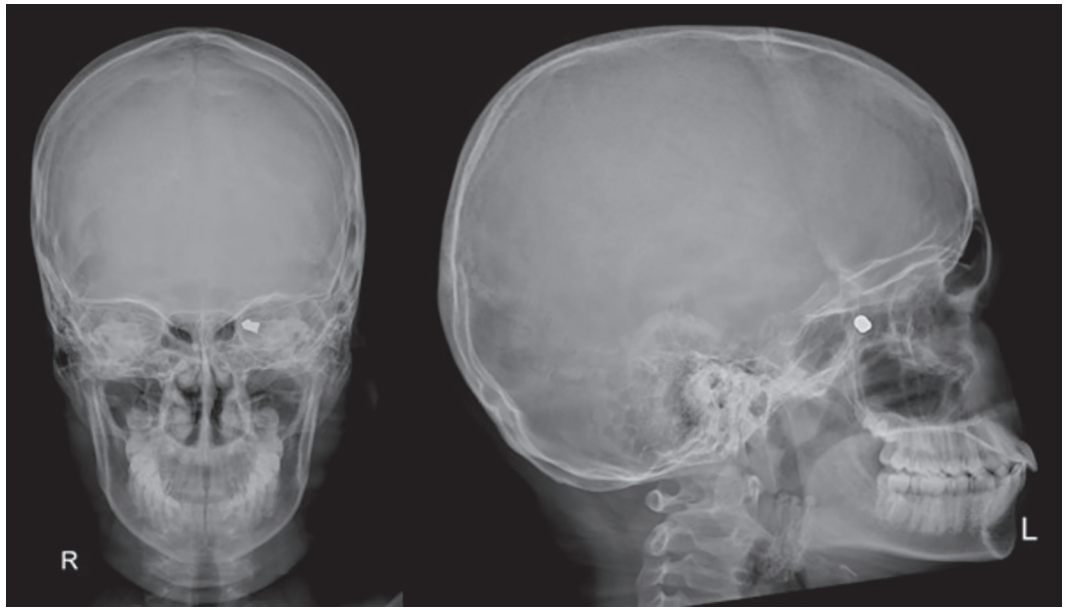

Figure 1: Skull x-ray with a foreign body (bullet) in the left orbit (AP and LL projection).

0.9 cm below the lower eyelid and 3.6 cm laterally to the nasal sidewall. Before the accident, her ocular history included diplopia (anamnestically, the girl's mother said that the girl had diplopia before but she was never referred to an ophthalmologist). At the first examination, the mydriasis and ptosis on the left eye were noticed. The left pupil did not react to the light. The right eye status was normal. After an emergency craniogram was performed, a foreign body was verified in the projection of the left orbit (Figure 1). Upon the arrival of an ophthalmologist, the eye status was as follows: visus oculi dextri (VOD) sine correctione (sc) 1.0, visus oculi sinistri (VOS) sine correctione (sc) 0.5, left bulbus in exodeviation of 10 PD with convergence insufficiency, double vision in the direction of looking straight, occasionally in elevation and depression, with no double vision in the terminal abduction right and left. The girl did not notice the pain. The pupil was in the mydriasis with a very slow motion in the light. Other status of the anterior eye segment as well as of the eye fundus was normal. A computed tomography scan showed a metallic foreign body in the left orbital conus, without fractures or intracranial intrusion (Figure 2). Immediate tetanus prophylaxis, antimicrobial therapy (amoxicillin/clavulanic acid, metronidazole), neuroprotective therapy (methylprednisolone) and local therapy (tobramycinum) were introduced. Given the high risk of surgical treatment, the girl was conservatively treated and monitored. The girl was relieved of physical activity at school due to the possibility of moving the foreign body. Three years after the injury, the girl has only a pupil in semi mydriasis and a slower reaction to direct light. The visual acuity is as follows: VOD sc 1.0, VOS sc 0.9. Other eye status is normal.

Figure 2: Computed tomography - metallic foreign body (bullet) in the left orbital conus, without fractures or intracranial intrusion.

3 Discussion

In spite of the fact that intraorbital foreign bodies (IOrbFbs) are associated with serious ocular and orbital injuries (ocular injuries are both more common and serious in patients with posteriorly located foreign bodies) (4), we show a case in which this statement is not entirely correct. By reviewing the literature, we have determined that this is the first described case with regard to the type and position of the bullet and considering the age and sex of the child. Fulcher et al. noted that posteriorly located inorganic IOrbFbs ought not to be treated surgically, unless they are causing critical orbital complications that can irreparably harm the vision. Loss of vision is by and large related to the starting annihilating injury and is not a result of complications of the IOrbFb. In our case, the status of the eye is due to the initial compressive oculomotor nerve damage. Because of compression of the parasympathetic fibres (parasympathetic fibres act on the outside of the nerve), mydriasis ("puffy" pupil) may occur as a result of parasympathetic compression of the fibres prior to lid ptosis and "down and out" positions as a result of the motor fibres disruption. Prognosis of an oculomotor palsy depends on the aetiology. Posttraumatic oculomotor palsy may partially or completely recover spontaneously. As a possibility of complication, in a series of conservatively treated patients, one patient lost discernment of light from an optic neuropathy related to a metallic foreign body at the orbital apex (5). Simon et al. affirm that retained intraorbital metallic foreign bodies are well tolerated and ordinarily have negligible adverse visual prognosis, as is the case in our patient. They support a conservative approach in the absence of specific indications for removal (6). In this type of injury, attention should be paid to the chorioretinitis sclopetaria which is the result of shock waves that burst the choroid and retina, but leave the sclera intact (7). As in our case, most IOrbFBs are metallic, resulting from little particles penetrating the orbit through high-velocity injury. Inorganic nonmetallic FBs are often inert. However, some metallic FBs, particularly iron, copper, and lead, can cause particular complications such as retinopathy, siderosis, chalcosis, or systemic toxicity (8), but there is no report where the bullet from an air rifle caused toxic side effects. Surgery may be chosen after assessment of a few parameters, such as accessibility, the organic or inorganic nature of the foreign body, anatomical relations with the optic nerve and eyeball, the infectious

potential and the clinical impact of the foreign body (3,9,10). In our case, after expert counselling (neurosurgeon, ophthalmologist, maxillofacial surgeon), it was concluded that surgical removal of the bullet was not recommended due to the high risk of optic nerve damage. As with our patient, Vinodh et al. and Peralta et al. also employed the same strategy with their patient (11,12).

4 Conclusion

We concur with the fact that intraorbital metallic foreign bodies which are well tolerated and do not cause visual deterioration should be managed conservatively. So, a metallic foreign body located deep in the posterior orbit may only be observed and given appropriate supportive care, thus avoiding potential iatrogenic injury to the eye and surrounding structures.

5 Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient's parents have given their consent for images and other clinical information to be reported in the journal. They understand that the patient's name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

6 Acknowledgment

We are thankful to the family of our patient for their support and cooperation.

References

1. Polini F, Robiony M, Toro C, Costa F, Sembronio S, Politi M. Penetrating injury of the facial skeleton through the orbit, by a massive metallic shotgun block: A case report. Br J Oral Maxillofac Surg. 2007;45(7):586-7. DOI: 10.1016/j.bjoms.2006.08.007 PMID: 17027129
2. Dimitroulis G. An unusual bullet trajectory to the face. J Oral Maxillofac Surg. 2006;64(1):137-9. DOI: 10.1016/j.joms.2005.09.022 PMID: 16360872
3. Gönül E, Akbörü M, Izci Y, Timurkaynak E. Orbital foreign bodies after penetrating gunshot wounds: retrospective analysis of 22 cases and clinical review. Minim Invasive Neurosurg. 1999;42(4):207-11. DOI: 10.1055/s-2008-1053401 PMID: 10667828
4. 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(1):96-103. DOI: 10.1016/S0161-6420(97)30355-8 PMID: 9022111
5. Fulcher TP, McNab AA, Sullivan TJ. Clinical features and management of intraorbital foreign bodies. Ophthalmology. 2002;109(3):494-500. DOI: 10.1016/S0161-6420(01)00982-4 PMID: 11874750
6. Ben Simon GJ, Moisseiev J, Rosen N, Alhalel A. Gunshot wound to the eye and orbit: a descriptive case series and literature review. J Trauma. 2011;71(3):771-8. DOI: 10.1097/TA.0b013e3182255315 PMID: 21909007
7. Romero-Trevejo JL, Rachwani-Parshotam N, Morillo-Sánchez MJ. Chorioretinitis sclopetaria caused by an intraorbital metallic foreign body. Arq Bras Oftalmol. 2018;81(3):247-9. PMID: 29924198
8. Pinto A, Brunese L, Daniele S, Faggian A, Guarnieri G, Muto M, et al. Role of computed tomography in the assessment of intraorbital foreign bodies. Semin Ultrasound CT MR. 2012;33(5):392-5. DOI: 10.1053/j.sult.2012.06.004 PMID: 22964405
9. Clarós P, Fokouo JV, Clarós A. Intraorbital foreign body: A rifle bullet removed 20 years after the accident. Eur Ann Otorhinolaryngol Head Neck Dis. 2017;134(1):63-5. DOI: 10.1016/j.anorl.2016.04.003 PMID: 27118438
10. Koo Ng NK, Jaberoo MC, Pulido M, Olver JM, Saleh HA. Image guidance removal of a foreign body in the orbital apex. Orbit. 2009;28(6):404-7. DOI: 10.3109/01676830903074087 PMID: 19929670

11. Vinodh VP, Sellamuthu P, Harun RH, Zenian MS. Posterior intraorbital metallic foreign body: a case discussion. Med J Malaysia. 2014;69(2):89-91. PMID: 25241819
12. Peralta RJ, Zoumalan C, Lelli GJ. Posterior Intraorbital Foreign Body: take it or Leave it? Open Reconstructive and Cosmetic Surgery. 2008;1(1):1-3. DOI: 10.2174/1876976400801010001