CASE REPORT

Case Report: Facial injury due to a firearm projectile in a Brazilian adolescent [version 1; peer review: awaiting peer review]

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Abstract

Background: Deaths and injuries from firearms are significant public health problems. This article presents a case of face injury caused by a firearm projectile with atrial involvement.

Case report: A 13-year-old male Black patient was admitted as an emergency victim of an accident caused by a firearm projectile. On physical examination, a hemorrhage was diagnosed in the right ear pinna region from the wound, and an increase of volume, of hardened consistency, in the right genic region, suggestive of local infection. On radiographic examination, a radiopaque, dense, foreign body was identified in the right zygomatic process region. The patient underwent surgery to remove the projectile.

Conclusion: The care provided to the victim of a firearm injury depends on the systemic conditions, the available professional staff, the resources and the infrastructure of the environment. Prior to initiating therapy, it is important to stabilize the patient to ensure survival.

Keywords
violence, firearms, facial injuries, maxillofacial injuries.
Introduction

Firearms are one of the leading causes of injury and death in children and adolescents in the world, constituting a public health problem that affects mainly large urban centers. Costly treatment, long length of hospital stay, and considerable decreased productivity are significant factors related to this health issue.

The lesions can range from small lesions to large tissue avulsions, depending on the amount of energy released at the moment of impact. The characteristics and severity of the lesions are determined by several factors such as load power, number and shape of the projectiles, distance and path of the shot, as well as elasticity and vascularization of the affected tissue. Reduced distances, high-velocity projectile wounds, and gunshot wounds can result in devastating aesthetic and functional consequences.

Traumas produce irreversible damages, which can incapacitate individuals, leaving them unable to work, and generates demands for care to the health sector in services of various levels of complexity, from prehospital to physical and mental rehabilitation. Thus, they increase costs for the Brazilian Unified Health System and other sectors, the national social security system and for the families themselves. This article presents a case of face injury caused by a firearm projectile with atrial involvement.

Case report

A 13-year-old male Black patient, was taken to emergency department in April 2014 to a local hospital of Picuí, Paraíba, Brazil. He was victim of an intentional firearm injury and suffered one gunshot wound. At admission, he was cooperative and fully conscious. His vital signs and neurological examination were normal when he arrived at the hospital.

On physical examination, a hemorrhage was diagnosed in the right ear pinna region from the wound (Figure 1), and an increase of volume, of hardened consistency, in the right genic region. On radiographic examination (Figure 2), a radio-opaque, dense, foreign body image was identified in the right zygomatic process region. The patient was diagnosed with a face lesion caused by penetration of a firearm projectile through the skin requiring urgent surgical intervention.

The surgical procedure was performed under general anesthesia with orotracheal intubation and local infiltration of 2% lidocaine (Xylestesin 2.0% with vasoconstrictor, Cristália Prod. Quím. Farm. Ltda., São Paulo, Brazil). Then, a linear incision was made immediately at the entry wound of the projectile, followed by divulsion of the fascial planes, exposure and subsequent removal of the projectile. Surgical cleaning of the area was performed using irrigation with 0.9% sodium chloride. The wounds were sutured (Ethicon™, Johnson & Johnson, São José dos Campos, Brazil) a penrose drain no.1 installed and skin sutured (Shalon™, Goiânia, Brazil) with single interrupted stitches.

After the surgery (immediately postoperative), the patient was treated with anti-tetanus serum 1000 UI/mL (Butantan Institute, São Paulo, Brazil).

Cephalothin (Keflin) 1 gram intravenously every 6 hours and after discharge 500 mg every 6 hours orally for 10 (ten) days) and an analgesic (Tylenol, 500 mg orally every 6 hours for three days) were prescribed. On the second postoperative day, the patient was discharged from the hospital and was advised about the medication prescription and the care related to hygiene and antiseptic treatment of the wounds, as well as when to return for follow-up (after seven days) for removal of the sutures and drain. The region around the wound’s appearance has significantly improved at follow up.

Discussion

This work is important because it provides guidance on how to proceed with emergency care in patients with firearms, as there are no specific treatment protocols. For the treatment of
gunshot wounds, it is essential to know the ballistics of the wound in order to establish the prognosis and the treatment. Ballistics studies the movement of firearm projectiles and the trauma caused by the impact such projectiles on the human body. This knowledge results in better treatment and reduces the occurrence of complications related to the trajectory of the projectile.

The first objective of the trauma team is to stabilize the patient maintaining free airways through intraoral aspiration, posi-
tioning and tongue trapping. When necessary, orotracheal or nasotracheal intubation should be performed and, when indicated, a cricothyrotomy or tracheostomy performed.

In the case reported, accurate medical care was given to the victim at admission to the hospital, which reduced potential risks to life and enabled immediate medical treatment. The availability of qualified and experienced professionals in this setting and, the access to imaging equipment, allowed the detection of the agent firearm projectile quickly. The patient was immediately referred for surgery after diagnosis.

Surgical removal of the projectile should be considered when it is superficial or compromises the function of affected structures. However, when it is close to vital structures or is difficult access, the surgeon can choose to maintain it and follow-up (using radiographs, CT scans or digital arteriography’s). Computed tomography (CT) is the gold standard for determining the nature of complex head and neck injury.

In this case, complete removal of the firearm projectile was performed because it was superficially housed in the auricular region. A drain was placed due to the wound being infected and the presence of edema. Postoperative antibiotic therapy was imperative to assist in the elimination of the existing infection and to prevent further infection. The use of anti-tetanus serum was necessary due to the elimination of the existing infection and to prevent further tetanus serum protocols should be followed in order to prevent postoperative complications.

Injuries to the face should not be seen only as a medical problem, but also social and economic. The costs incurred in providing care to the victims by the health teams and the losses to the patient (loss of wages, permanent or transitory disabilities) can limit the social reintegration of the victims and their return to the labor market. In addition, psychological issues should also be considered.

The limitations of the study are that although we have been following the patient for a short time, and have employed this treatment protocol on all firearm patients who reach the maxillofacial complex, this is only a report of a clinical experience in which this protocol was used. Therefore, further study is required to evaluate the effectiveness of this protocol.

Conclusion
The care provided to the victim of a firearm depends on the systemic condition of the patient, available professional staff, resources and infrastructure of the healthcare center. Prior to initiating therapy, it is important to stabilize the patient to ensure survival. In cases involving head and neck injuries, it is important that a oral and maxillofacial surgeon be part of the team. In addition, surgical cleansing, antibiotic therapy and anti-
tetanus serum protocols should be followed in order to prevent postoperative complications.

Consent
Written informed consent for publication of the patients’ clinical details and clinical images was obtained from the parents of the patient.

Data availability
Underlying data
All data underlying the results are available as part of the article and no additional source data are required.

References

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