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Intracranial foreign body in a child

Luis Rafael Moscote-Salazar[1], Amit Agrawal[2], Marticela Cabeza-Morales[3], Nasly Zabaleta-Churio[4], Willem Guillermo Calderon-Miranda[5], Alfonso Pacheco-Hernandez[6], Gabriel Alcala-Cerra[7], Andres M. Rubiano[6]

[1]Neurosurgery, RED LATINO, Organización Latinoamericana de Trauma y Cuidado Neurointensivo, Bogota, COLOMBIA; [2]Department of Neurosurgery, Narayna Medical College Hospital, Chinthareddypalem, Nellore, Andhra Pradesh, INDIA; [3]University of Cartagena, Cartagena de Indias, COLOMBIA; [4]Nurse, Universidad Popular del Cesar, Valledupar, COLOMBIA; [5]Department of Radiology, Universidad Nacional Autonoma de Mexico, Ciudad de Mexico, MEXICO; [6]Neurosurgery, RED LATINO, Organización Latinoamericana de Trauma y Cuidado Neurointensivo, Bogota, COLOMBIA; [7]Neurosurgery, Hospital Universitario CARI, Barranquilla, COLOMBIA

Abstract: Intracranial foreign bodies are rare events that occur accidentally and depending on the extent and involvement of the brain parenchymal, generate focal neurological deficit, bleeding and even long-term complications. In present article we describe a case of 4 year child and discuss the approach, management and prognosis.
Key words: Head Injuries, penetrating; craniocerebral trauma; complications

Introduction

The presence of intracranial foreign bodies is a rare event. It occurs more frequently in men under 30 years of age (1), with children and adults being more prone to intoxication (2) Within these events, a variety of modalities have been reported, some more unusual than others (3-5). The main risk of these is the generation of brain damage, which in many cases will depend on the speed with which the object enters the skull and the depth it reaches. (2).

Case report

A 4-year-old boy attending the emergency department of the Hospital de Arauca for presenting a 4-hour clinical presentation consisting of a low-velocity intracranial penetrating lesion with a punctured foreign body in the temporal region. On physical examination, hemodynamic parameters were stable, Glasgow 15/15, both the pupils were normal in size and reacting well to light, there was mild left brachiocrural hemiparesis. There was profuse bleeding from the scalp wound. X-rays revealed a foreign body that was

penetrating the cranial vault (Figure 1) and compromises part of the cerebral parenchyma in the right temporal region. In the computerized axial tomography, there is an intracranial fragment (not available). This is followed by surgery to remove a foreign body, and a right temporal craniotomy, foreign body removal, and duroplasty. Postoperative the child recovered well without any neurological deficits.

Figure 1 a and b
Intracranial foreign body before surgery

Discussion

Intracranial penetrating lesions present a variety of clinical pictures, approaches and prognoses, depending on the nature and extent of the injury to the cranial vault (Table 1) (1). In our case a low speed injury caused the injury, with mainly penetrating force of the object. Many objects have been described as causing these pictures, from knives, pencils, nails (4-9), to umbrellas. (1) The penetration of these elements into the skull will depend on several factors, however to penetrate the skull the exerted forces must be > 522 N in the temporal region, ie. he fontanelles and the natural foramina (orbits, foramen Magno, nostrils, and oral cavity) (1, 10) The temporal zone is also considered a vulnerable region because it is thinner and requires a shorter distance to cross the vital brain structures and the vasculature (1), when these lesions are directed towards the posterior region, they present with a worse prognosis. (1) The extent of these lesions does not depend only on the type, but also on the impalement trajectory (it refers to lesions where the subject in motion is impacted with the object in the form of a rod, generating a longitudinal canal) (2) and vascular lesions. (15)

The diagnosis of these lesions is evident when the foreign body is observed in situ, and the ideal is not to remove it without having made an assessment of the compromised structures. (1) These patients can enter with hemodynamic alterations depending on the presence or absence of vascular lesion and according to the involved vessel. (3) The ideal is to keep the patient hemodynamically stable,

with a permeable airway, until the following behavior is determined. (1) Physical examination may suggest from asymptomatic pictures to paralyzes of cranial nerves (mainly III-VI), dysphasias and hemiparesis. (1) Rapid assessment is required because the patient may enter subdural and extradural hematomas, cerebral edema, cerebral contusion, pneumocephalus, hydrocephalus, and fractures, which require early attention to avoid irreversible damage. (1)

The evaluation of these lesions is done through imaging studies, depending on the center of attention, radiographs and / or CT scan are used as the main studies, the latter being the one that allows a better evaluation of the adjacent structures affected. (1, 2, 11, 12) In turn the effectiveness of these will depend on the material of the object, since elements such as wood because of its low density are difficult to identify (1) and usually require the use of other aids such as magnetic resonance imaging (MRI). If you suspect vascular injury, an angiogram is recommended. (1, 13)

The medical treatment of these patients consists of early anticonvulsive treatment (which continues at least one week after the injury), accompanied by antibiotic (1) and if indicated anticonvulsant prophylaxis. (6) After performing the above measures the foreign body must be removed, the approach for its extraction depend on the anatomical location, compromised intracranial structures and surgeon preference. (3) In contrast to the rest of the body, the extensive area of debridement and irrigation is not recommended; on the contrary, it should be sought to preserve as much brain tissue as possible (1), and bleeding control after extraction. (1) It is recommended if there is no intracranial vascular alteration, nor associated lesions, no craniotomy after extraction. (13) Some authors recommend post-surgery, leaving a subarachnoid lumbar drainage to avoid an increase in intracranial pressure. (3)

When these objects are not removed early, there are remains or inadequate antibiotic coverage, there are infectious pictures that may even lead to brain abscesses in the following months. (3) In fact the post-event infection rates are higher than 40% in children. (1) Among the complications are arteriovenous fistulas, occlusion (7), vasospasm, vascular transection (1) and even death in patients due to cerebral ischemia and edema secondary to arterial injury. (3) For follow-up of the patient, if penetration into the brain tissue is suspected, angiography should be repeated within 2 to 4 weeks, regardless of the method of removal used, in order to detect intracranial hemorrhage or pseudoaneurysm formation, a potentially fatal complication. (13) Additionally, follow up with imaging studies. (2)

Conclusion

The presence of intracranial objects is uncommon and requires a high index of suspicion and proper management, to prevent major neurological injuries, sepsis and unfavorable outcome.

Correspondence
Luis Rafael Moscote-Salazar
e-mail: rafaelmoscote21@gmail.com

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