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To Treat or not to Treat? Multiple Asymptomatic Intracorneal and Subconjunctival Gunpowder Foreign Bodies

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To Treat or not to Treat? Multiple Asymptomatic Intracorneal and Subconjunctival Gunpowder Foreign Bodies*

¿Tratar o no tratar? Múltiples cuerpos extraños de pólvora intracorneales y subconjuntivales asintomáticos

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ABSTRACT

We examined a male patient with multiple corneal and conjunctival foreign bodies. The composition of the material seemed not to be toxic due to the non-inflammatory, calm appearance of the eye and the asymptomatic course. Therefore, the removal of the foreign bodies was not necessary. Currently, the patient remains asymptomatic.

Keywords: Gunpowder, corneal foreign bodies, conjunctival foreign bodies.


Palabras clave: Pólvora, cuerpos extraños corneales, cuerpos extraños conjuntivales.

RESUMEN

Examinamos a un paciente masculino con múltiples cuerpos extraños corneales y conjuntivales. La composición del material no parece ser tóxica debido a la apariencia tranquila y no inflamatoria del ojo, y al curso asintomático. Por tanto, no fue necesaria la extracción de los cuerpos extraños. Actualmente, el paciente permanece asintomático.

* Case report.

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INTRODUCTION

Intracorneal and subconjunctival foreign bodies are not rare. Reported incidences vary approximately from 2 to 3 per 1000 persons (1) and are a significant amount of the ocular trauma-related emergency department visits in the United States (2).

On the other hand, gunpowder injuries are rare, and only a handful of case reports have been published on the subject (3-6). Gunpowder ocular injuries are reported to produce not only metallic foreign bodies (bullets), but also gunpowder is released at high force (7).

The usual presentation of intracorneal and subconjunctival foreign bodies are similar (8). Signs and symptoms are associated with eye pain, foreign body sensation, red eye, reduction in visual acuity, photophobia and corneal edema.

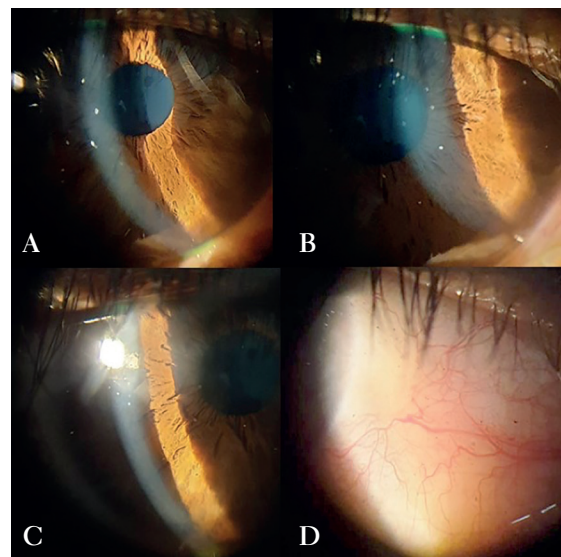
Examination is usually done with biomicroscopy, in which fluorescein staining is helpful to rule out aqueous leaks (Seidel's sign). Both upper and lower eyelid eversion is usually done to evaluate the tarsal and forniceal conjunctiva.

CASE PRESENTATION

A 70-year-old man went to the emergency department with a history of a subconjunctival hemorrhage in his left eye associated with a foreign body sensation. The patient has a history of aspirin use and severe facial spasms treated with botulinum toxin. In the examination his best corrected visual acuity (BCVA) was 20/50 in both eyes. Examination of the anterior segment of the left eye showed a subconjunctival hemorrhage in all quadrants with a fluorescein tear breakup time (FBUT) of 4 seconds. Examination of his right eye showed multiple intraepithelial foreign bodies (15+) associated with temporal subconjunctival foreign bodies (10+) (Figure 1). There are also symmetric nuclear cataracts in both eyes (NO3NC3C0P0).

When re-questioned about past ocular injuries, the patient informs that he used to work in a "tejo" playfield. Tejo is a traditional throwing sport in Colombia that consists in throwing a metal puck (called a "tejo") onto a clay covered board. There are multiple targets on this board containing gunpowder. In this game the aim is to hit these targets with the subsequent explosion of the gunpowder. The patient tells to have not had any symptoms or past treatment in his right eye.

FIGURE 1. Slit Lamp photographs showing numerous foreign bodies in the cornea (A-C) and in the subconjunctival area (D)



Source: own work

DISCUSSION

Gunpowder consists mainly of nitrocellulose combined with nitroglycerin, which in turn is formed with small spherical balls, cylinders or flakes using a solvent such as ether. This substance combusts in compression and burns rapidly to produce hot pressurized gases capable to propel bullets and projectiles (7). Factors related to the body's response to ocular foreign bodies include: the host response, organic material, and the location of the foreign body.

The mainstay in the treatment of corneal foreign bodies is to remove it. However, similarly to glass

and fiberglass, in all reports of gunpowder eye injuries, no toxic or inflammatory responses were reported, which suggests that this substance is well tolerated in the eye (3-6).

The patient's history and symptoms are important in determining their management. Organic material is more likely to get infected and metallic material can leave a rust ring within 6 hours, thus, making the removal necessary (8). Even though organic material is more likely to get infected, there are reports of 40-year-old wood foreign bodies that were well tolerated (9).

Several reports describing chronic intracorneal foreign bodies have been published. In the majority of cases, observation was the treatment of choice. However other interventions have been reported such as penetrating Keratoplasty for significant glare (9), and phototherapeutic Keratectomy (PTK). When there is a commitment of visual acuity, PTK can be an easy, effective and low-cost method for the treatment of diffuse foreign bodies, a technique that can be successful in 68% of cases (3). Before considering a photoablation procedure such as PTK, it is important to have an objective measurement of corneal thickness as well as the localization of the foreign bodies on the corneal/conjunctival surface (3). In the context of a patient with multiple chronic foreign bodies the indication of PTK is based on the clinical judgment of the specialist, being the best candidates those with opacities in 10-20% of the anterior cornea and/or conjunctiva, without significant irregularities and thinning (10). The possible adverse effects of PTK like any other method of photoablation such as refraction error and secondary infections must be considered. Corneal topography, ultrasound biomicroscopy (UBM) and optical coherence tomography (OCT) are very useful in these cases to plan and manage the postoperative result (10).

Corneal ulcers, recurrent erosions and endophthalmitis are some of the complications associated with intracorneal foreign bodies. Although not

frequently, some complications of intracorneal foreign bodies can potentially develop long-term and sight threatening effects (1).

Nevertheless, it is not uncommon to discover an asymptomatic patient who has a subepithelial foreign body. Thus, the question arises whether to remove it, or if only observation is appropriate. In this particular case, due to the large number of foreign bodies and the asymptomatic course, it was decided not to remove them and to only observe the patient, who remains asymptomatic to date.

CONCLUSION

Gunpowder ocular injuries produce not only metallic foreign bodies, but also gunpowder is released at high force. Gunpowder foreign bodies are chronically well tolerated in the eye. An open and critical question remains on what the best choice for treatment is. Experience and close observation are key for the wellbeing of the patient. Even though new techniques such as PTK have successful results in these patients, prevention is still the most cost-effective treatment for treating ocular foreign bodies and to prevent its complications.

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