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Original article

Ophthalmological sequelae due to paintball injuries: Case studies[☆]

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ABSTRACT

Objective: Describe the ophthalmological sequelae of patients diagnosed with blunt eye injury by paintball.

Material and methods: There were a total 14 cases with a diagnosis of blunt trauma by paintball were treated at the ophthalmology emergency department of the Barraquer Clinic in Bogotá, Colombia. All patients underwent a complete ophthalmological examination with their respective controls according to their outcome.

Results: The frequency of eye trauma by paintball was 3.01%. Fourteen eyes were evaluated, age range from 9 to 49 years. Cases were unilateral, 1 woman and 13 men, initial visual acuity less than 20/30 in 12 eyes. Only 5 eyes progressed satisfactorily, and 3 were surgically intervened. The cases that did not show any improvement in visual acuity were related to posterior pole problems, with the most frequent being macular alterations, choroidal rupture, choroidal detachment, retinal tear, and retinal folds. In 3 eyes, clinical improvement of visual acuity was evidenced secondary to hemorrhagic processes that resolved with medical treatment. One of them underwent surgical treatment of the lens with an intraocular lens implant. In 2 eyes, the visual recovery was very satisfactory and 100% in another.

Conclusion: Paintball has increased as a sport and recreational activity, where paint projectiles are fired with compressed air weapons. It carries risks of suffering various trauma that can lead to catastrophic episodes, in terms of visual health, and repercussions on the quality of life of those affected.

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Secuelas oftalmológicas por traumatismo con paintball: estudio de casos

R E S U M E N

Palabras clave:

Traumatismo contundente

Traumatismo ocular

Paintball recreativo

Objetivo: Describir las secuelas oftalmológicas de pacientes con diagnóstico de traumatismo ocular contuso por *paintball*.

Material y métodos: Se incluyeron 14 casos con diagnóstico de traumatismo ocular contuso por *paintball*, que fueron atendidos en el Servicio de Consulta Prioritaria de la Clínica Barraquer en Bogotá, Colombia. A todos los pacientes se les realizó un examen oftalmológico completo con sus respectivos controles según su evolución.

Resultados: La frecuencia de los traumatismos oculares por *paintball* fue del 3,01%. Se evaluaron 14 ojos, rango de edad de 9 a 49 años. Los casos fueron unilaterales, una mujer y 13 hombres, agudeza visual inicial menor a 20/30 en 12 ojos. Solo 5 ojos evolucionaron satisfactoriamente, a 3 se les intervino quirúrgicamente. Los casos que no experimentaron mejoría de su agudeza visual estuvieron relacionados con problemas de polo posterior, siendo las más frecuentes las alteraciones maculares, la rotura coroidea, el desprendimiento coroideo, el desgarro retiniano y los pliegues en retina. En 3 ojos se evidenció mejoría clínica de la agudeza visual secundaria a procesos hemorrágicos que se resolvieron con tratamiento médico. En uno de ellos se realizó tratamiento quirúrgico del cristalino con implante de lente intraocular. En 2 ojos la su recuperación visual fue muy satisfactoria y en otro el 100%.

Conclusión: El *paintball* ha tomado fuerza como deporte y recreación utilizando proyectiles de pintura que se disparan con armas de aire comprimido, conlleva riesgos de presentar diversos traumatismos que pueden generar episodios catastróficos en términos de salud visual y con repercusiones en la calidad de vida de los afectados.

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Introduction

Paintball is a strategy game with several modalities, one of which is recreational and consists in fast, 20–30 min games with different objectives like capturing the flag of the opposing team. The projectiles are balls of paint fired at a speed of approximately 90 m/s by compressed air guns called markers. Impacts at this speed can generate bruising or skin ruptures. In some places, players opt for lowering the speed to 65 m/s to diminish the possibility of injury.

Paintball has gained popularity as a sport in our country as a family recreational activity with more than 5 million participants per year.¹ Nowadays, approximately 70 people per week play in one of the more than 30 facilities for practising this sport in Bogotá. Although most injuries in other parts of the body consist of hematomas and self-healing lesions without other alterations, kidney hematomas, urological traumas and scrotal rupture have been documented. In the literature¹ ocular trauma characterized by a wide variety of ocular globe alterations, with different degrees of severity and visual compromise has been reported. Several studies show that ocular trauma by *paintball* projectiles can cause severe eye damage, significant loss of vision and in extreme cases the complete loss of the eye.² The most frequently found lesions are: hyphema, vitreous hemorrhage, iridodialysis, retinal contusions and retinal detachment.^{3–11} Most of these injuries require priority ophthalmological attention to reduce the possible catastrophic consequences. It is worth noting that in most ocular trauma cases adequate protection was absent.^{1,3–8,10,11}

In ballistic studies in pig eye models in which the orbit is recreated to determine damage by impact, multiple lesions were found that could explain the unfortunate outcome for some patients who presented with this type of trauma. A central ocular impact could involve ocular globe rupture, taking into account the force of the projectile and the increase of intraocular pressure which, in the case of pig eyes, is higher compared to humans.¹² An off-center impact could lead to optic nerve ablation damage.¹³ However, lesions such as retinal detachments were also found in control eyes (without impacts), so the probability rate of this problem due to traumatic injuries is not known.¹²

The purpose of the current study was to present the ophthalmological sequelae of patients that presented traumas in the recreational practice of *paintball*.

Methods

A series of 14 cases is presented in a period between January 1, 2011 and March 31, 2014 in the Priority Consultation Service of the Barraquer Clinic in Bogotá, Colombia.

All patients initially underwent a distance visual acuity test by Snellen chart, orbit evaluation, physical examination with slit lamp assessing eyelids, ocular surface and cornea, anterior chamber, iris, reflexes and pupillary shape, cameral angle with Goldmann lens unless contraindicated, lens, vitreous and funduscopy with 90 diopter lens when possible.

In a second consultation, an optometric evaluation was performed to obtain visual acuity (retinoscopy, subjective),

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