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Original article

Ultrasound findings in ocular trauma[☆]



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ABSTRACT

Objective: To evaluate the frequencies of various eye and/or orbital disorders by ultrasound examination in patients with ocular trauma.

Materials and methods: This prospective and descriptive study was conducted on 100 patients with ocular trauma treated in the Conde de Valenciana Institute from March to November 2014. Ultrasound examination was performed primarily using ultrasound B mode, with standardized A mode only used as correlation method. Age, gender, type of trauma, and various ultrasound findings were recorded.

Results: Ocular trauma was more frequent in men (83%) compared to women (17%). The left eye was affected in 55%, and right eye in 45%, with 55% being open traumas and 45% blunt traumas. Most cases were young patients with a mean age of 33.7 years, with the group between 41 and 50 years being the most affected. Among the most frequent injuries found was the vitreous hemorrhage (45%) and posterior hyaloid detachment (38%), followed by retinal detachment (32%), and choroidal detachment (18%).

Conclusion: Ultrasound remains as the investigation method of choice in patients with ocular trauma, since it is a simple, cheap and non-invasive study, and can be very useful in providing diagnostic and prognostic information. This study demonstrated that trauma is more common in young men, with vitreous hemorrhage as the most common finding.

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Hallazgos ecográficos en trauma ocular

RESUMEN

Objetivo: Evaluar las frecuencias de las distintas alteraciones oculares u orbitarias en pacientes con trauma ocular, mediante estudio ecográfico.

Materiales y métodos: Este estudio prospectivo y descriptivo incluyó a 100 ojos evaluados en el Instituto Conde de Valenciana debido a traumatismo ocular desde marzo hasta noviembre del 2014. Se realizó la exploración ecográfica empleando primariamente el ultrasonido modo B y solo el modo A estandarizado como método de correlación. Se recogieron la edad, género, tipo de trauma y los distintos hallazgos ecográficos encontrados.

Palabras clave:

Ecografía

Trauma ocular

Trauma abierto

Trauma cerrado

Hemorragia vítrea

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Resultados: El trauma ocular fue más frecuente en hombres (83%) comparado con mujeres (17%); el ojo izquierdo fue el afectado en el 55% de las veces y el ojo derecho en el 45%; el 55% fueron traumas abiertos y el 45% traumas cerrados. La mayoría de los casos fueron pacientes jóvenes, con un promedio de edad de 33,7 años; el grupo etario más afectado fue entre los 41 y los 50 años. Dentro de las lesiones encontradas las más frecuentes fueron la hemorragia vítrea (45%) y el desprendimiento de hialoides posterior (38%), seguido del desprendimiento de retina (32%) y el desprendimiento coroideo (18%).

Conclusión: La ecografía se mantiene como el estudio de elección en pacientes con trauma ocular, ya que es un estudio sencillo, barato, no invasivo y que puede ser muy útil al brindar información diagnóstica y pronóstica. Este estudio demostró que el trauma es más común en hombres jóvenes y que la hemorragia vítrea es la lesión más comúnmente encontrada.

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Introduction

Ocular trauma is defined as a lesion originated by concussion or open mechanisms over the ocular globe and its peripheral structures, which produces tissue damage in varying degrees, temporarily or permanently compromising visual function.¹

Ocular trauma is a common trauma at the emergency services of hospitals, comprising approximately 3% of all admissions.² Physical aggression, sports, industrial and agricultural work activities, construction and traffic accidents are among the main causes.³

Overall, 80% of ocular traumas occur in males, most of them between 20 and 40 years of age.¹⁻⁴ Contrary to what might be expected, it is known that the place where most ocular injuries occur is at home, followed by the streets, industrial premises and during sporting activities.⁵

These patients are a challenge for ultrasound operators as frequently the study must be carried out through the eyelids due to pain or the possible disorganization of intraocular structures. However, through methodical and careful assessments, a reasonably certain diagnosis can be obtained.^{6,7} In these cases, ultrasound echography is indicated mainly due to opacity and the impossibility of carrying out an adequate ophthalmological exploration.

Despite recent technologies, ultrasound continues to play an irreplaceable role in the diagnostic and follow-up of ocular traumas.^{8,9} The objective of the present study was to determine ocular or orbital alterations utilizing ultrasound studies in patients with ocular trauma who could not be assessed with an ophthalmological exploration.

Materials and methods

The present prospective and descriptive study included 100 eyes examined at the Conde de Valenciana Institute for ocular trauma between March and December 2014, regardless of patient age or gender, to carry out the study by means of an ecographic exploration according to previous medical indication.

All the ultrasound studies were carried out in the Echography Unit of said hospital by equipment with mode A/B,



Fig. 1 – Ophthalmic echography equipment: Aviso de Quantel Medical®, comprising a 10 MHz probe for ultrasound mode B and probe for standardized mode A.

standardized mode A as well as UBM (Aviso S, Quantel Medical®, Cedex, France) (Fig. 1). In all cases, said examination was carried out with the patient lying on a reclined chair and placing the ultrasound probe over the eyelids or cornea or conjunctiva if possible, applying the smallest amount of manipulation and instilling 2% methylcellulose as coupling medium. In open trauma cases, a new and sterile methylcellulose flask was used applying methylcellulose in abundance to avoid exerting pressure over the ocular globe. A systematic echography exploration was carried out and the diagnostics of observed diseases were based on topographic, quantitative and kinetic biometric characteristics, utilizing primarily ultrasound in mode B, while standardized mode A was used as correlation method. Recorded patient data comprised age, gender, injured eye, type of trauma and ecographic findings.

The study excluded cases in which the patient was uncooperative to the point of jeopardizing the reliability of the examination. In addition, the study excluded cases with incomplete ultrasound or ophthalmological report. The study was approved by the Ethics Committee of the hospital in which it was carried out.

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