Choroidal detachment. Epidemiological and ultrasound characteristics in an Ophthalmological center in Mexico City

Desprendimiento coroideo. Características epidemiológicas y ecográficas en un centro oftalmológico de la Ciudad de México

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Abstract

Background: To describe the ultrasound features and disease history of patients with a diagnosis of choroidal detachment evaluated in the Ultrasound Department of the Instituto de Oftalmología "Fundación Conde de Valenciana IAP" of Mexico City from January 2015 to December 2017. **Design:** Observational, descriptive and retrospective. **Methods:** All the medical records with a diagnosis of choroidal detachment by ultrasound were analyzed. Exclusion criteria were missing and/or incomplete records. The information obtained was classified by causal disease, type, shape and extension of the choroidal detachment. **Results:** One hundred and forty-one patients were studied (89 [63.1%] men and 52 [36.9%] women). The average age was 52.92 years in men and 60.98 years in women. Cases related to inflammatory diseases were the most common (76 cases [53.9%]). A total of 102 cases (72.3%) showed a serous choroidal detachment. From all the serous choroidal detachments, 74 cases (52.5%) were observed as flat elevations and 87 cases (61.7%) affected more than six meridians. The average intraocular pressure was 7.63 mmHg. **Conclusions:** Ultrasound characteristics (shape, type and extension) of choroidal detachments depend on the cause. Flat detachments (mostly inflammatory) show a serous content and extend less than 6 diameters, while hemorrhagic detachments (mainly traumatic) tend to be dome-shaped and have a greater extension.

Key words: Choroidal detachment. Ultrasound. Suprachoroidal space.

Resumen

Objetivo: Describir las características ecográficas y antecedentes patológicos de los pacientes con diagnóstico de desprendimiento coroideo evaluados en el Servicio de Ecografía del Instituto de Oftalmología Fundación Conde de Valenciana, Institución de Asistencia Privada (IAP), de la Ciudad de México durante el periodo de enero de 2015 a diciembre de 2017. **Diseño:** Observacional, descriptivo y retrospectivo. **Métodos:** Se analizaron los expedientes con diagnóstico ecográfico de desprendimiento coroideo. Fueron criterios de exclusión los expedientes de pacientes que no se encontraron en el archivo durante la recolección de datos y/o incompletos. La información obtenida fue clasificada por enfermedad causal, tipo, forma y extensión del desprendimiento coroideo. **Resultados:** Se estudiaron 141 pacientes (89 [63.1%] hombres y 52 [36.9%]

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mujeres). La edad promedio fue de 52.92 años en hombres y de 60.98 años en mujeres. Los casos relacionados con enfermedades inflamatorias fueron los más comunes (76 casos [53.9%]). Un total de 102 casos (72.3%) presentaron desprendimiento coroideo seroso. Del total de desprendimientos coroideos serosos, 74 casos (52.5%) fueron planos y 87 casos (61.7%) ocuparon más de 6 meridianos. El promedio de presión intraocular fue de 7.63 mmHg. **Conclusiones:** Las características ecográficas (forma, tipo y extensión) del desprendimiento coroideo se relacionan con el antecedente. Los desprendimientos planos (inflamatorios en su mayoría) muestran un contenido seroso y una extensión menor a 6 diámetros, mientras que los desprendimientos hemorrágicos (principalmente traumáticos) son más prominentes y de mayor extensión.

Palabras clave: Desprendimiento coroideo. Ultrasonido. Espacio supracoroideo.

Introduction

Choroidal detachment (CD) occurs when a serous fluid, blood or inflammatory remains accumulate in the suprachoroidal space¹. Under normal conditions, the suprachoroidal space is a potential space between the choroid and the sclera. The borders of this space are the scleral spur anteriorly and the optic disc posteriorly².

In the literature, CD reports are very variable, with ranges between 4 and 34%, depending on the cause^{1,2}. However, most of the data published in the Hispanic population correspond to case reports or refer to a single cause.

CD presents after different surgeries and in some non-surgical disorders like scleritis³, pars planitis⁴, Hara-da disease, acquired immunodeficiency syndrome and nanophthalmos⁵. Trauma can lead to CD after repair of a penetrating wound⁶ or after scleral buckling⁷.

Another surgical procedure that can be associated with CD is filtering surgery for the treatment of glaucoma. After filtering surgery, CD occurs in 22 to 30% of cases, mainly due to postoperative hypotonia⁸.

By B-scan ultrasound, CD is observed as a thin, dome-shaped peripheral membrane with a smooth surface (Fig. 1 A), with spikes of 100% amplitude by A-scan. In a careful inspection at low gain, a double peak can be observed (Fig. 1 B). Kinetic evaluation usually shows little or no subsequent movement (aftermovement)¹.

The objective of our study is to describe the ultrasound features and pathological history of patients with a diagnosis of CD evaluated in the Ultrasound department of our Institution. Although CD is usually transitory and resolves spontaneously, obtaining data on its behavior can be useful when considering follow-up or deciding the need for therapy.

Methods

We performed a descriptive study of 141 cases with a diagnosis by ultrasound of CD reported during the period

from January 2015 to December 2017. All subjects underwent ultrasound examination using the AVISO S III ultrasound equipment (Quantel Medical, France).

Data on sex, age, previous surgical interventions, trauma or inflammatory history and intraocular pressure were collected from the medical records of each patient.

Statistical analysis was performed using a commercially available statistical software package SPSS (Statistical Package for the Social Sciences) version 19 (Chicago, Illinois, USA).

The study was reviewed and approved by the Ethics Committee of the Instituto de Oftalmología Conde de Valenciana in Mexico City.

Results

A total of 141 eyes were studied, 89 (63.1%) were male and 52 (36.9%) were female. The average age was 51.63 years (52.92 male vs. 60.98 female).

The most common cases were those related to inflammatory diseases (76 cases [53.90%]) and in both sexes, a greater number of cases were observed after 60 years of age. Second in frequency, cases related to previous trauma were observed (43 cases [30.50%]). This was the most common history in young adult men (18-30 years). The remaining 15.6% corresponded to postoperative complications (4 cases after cataract surgery, 6 cases after glaucoma surgery, 4 cases after combined glaucoma and cataract surgery, and 8 cases after retinal surgery).

Of all the cases, 103 showed serous CD. Of these, 61.3% were associated with inflammatory diseases, 23.3% with previous trauma and 15.5% with previous surgery. In the 29 cases with hemorrhagic CD, 55.2% were associated with a history of trauma, 31% with inflammatory diseases and 13.8% with previous surgery. Finally, of the 9 cases with mixed CD, 44.4% were associated with inflammatory diseases, 33.3% with a history of trauma and 22.2% with previous surgery. Table 1 shows the results.

Figure 1. Hemorrhagic choroidal detachment. **A:** B-mode ultrasound showing a typical dome configuration. **B:** 100% amplitude spike mode A echogram, double peak.

Table 1. Distribution of the different types of choroidal detachment (CD) according to history. Patients evaluated at the Instituto de Oftalmología Fundación Conde de Valenciana, IAP, from January 2015 to December 2017

	History			Total
	Previous surgery	Previous trauma	Associated with inflammatory disease	
Serous CD	16 (15.5%) 4 Cataract surgery 4 Glaucoma surgery 2 Combined glaucoma and cataract surgery 2 Retinal surgery	24 (23.3%)	63 (61.2%)	103 (100%)
Hemorrhagic CD	4 (13.8%) 2 Glaucoma surgery 2 Retinal surgery	16 (55.2%)	9 (31.0%)	29 (100%)
Mixed CD	2 (22.2%) 2 Combined glaucoma and cataract surgery	3 (33.3%)	4 (44.4%)	9 (100%)
Total	22 (15.6%)	43 (30.5%)	76 (53.9%)	141 (100%)

When analyzing all the cases according to their form by ultrasound (Table 2), 74 cases of flat CD were observed (58.1% associated with inflammatory diseases, 25.7% associated with a history of trauma and 16.2% associated with previous surgery). The bullous form was second in frequency and occurred in 55 cases (49.1% associated with inflammatory diseases, 34.5% associated with a history of trauma and 16.4% associated with previous surgery). We found 9 cases with wreath-like appearance and 3 cases of kissing choroidal detachment. The latter was twice as frequent in patients with previous trauma.

Of the 141 cases analyzed, 85 cases occupied more than 6 meridians and 56 cases less than 6 meridians.

When analyzed according to the type of detachment, of the 56 cases with an extension of less than 6

meridians, 47 (83.9%) were serous CD, 7 (12.5%) hemorrhagic CD and 2 (3.6%) corresponded to mixed CD. In the 85 cases with an extension greater than 6 meridians, 56 (65.9%) were serous CD, 22 (25.9%) hemorrhagic CD and 7 (8.2%) mixed CD (Fig. 2).

The average intraocular pressure was 7.63 mmHg (range: 0-61 mmHg). A total of 68 from 141 cases (48.2%) showed pressures below 5 mmHg (hypotonia), 31 cases (22%) mild hypotonia, 34 cases (24.1%) intraocular pressures within the normal range and 8 cases (5.7 %) showed hypertension.

Discussion

The Instituto de Oftalmología Fundación Conde de Valenciana is a tertiary care center, and this may

Table 2. Distribution of the different types of choroidal detachment according to history. Patients evaluated at the Instituto de Oftalmología Fundación Conde de Valenciana, IAP, from January 2015 to December 2017

Previous surgery		History			Total
		Previous trauma	Associated with inflammatory disease		
	Flat CD	12 (16.2%) 2 Cataract surgery 2 Glaucoma surgery 3 Combined glaucoma and cataract surgery 5 Retinal surgery	19 (25.7%)	43 (58.1%)	74 (100%)
	Bullous CD	9 (16.4%) 1 Cataract surgery 4 Glaucoma surgery 1 Combined glaucoma and cataract surgery 3 Retinal surgery	19 (34.5%)	27 (49.1%)	55 (100%)
	Wreath-like CD	1 (11.1%) 1 Cataract surgery	3 (33.3%)	5 (55.6%)	9 (100%)
	Kissing CD	0 (0%)	2 (66.7%)	1 (33.3%)	3 (100%)
Total		22 (15.6%)	43 (30.5%)	76 (53.9%)	141 (100%)

Figure 2. Distribution of the different types of choroidal detachment (CD) according to history. Patients evaluated at the Instituto de Oftalmología Fundación Conde de Valenciana, IAP, from January 2015 to December 2017.

explain the greater number of cases associated with inflammatory diseases and traumas.

The difference found between the different forms of choroidal detachment could also be the effect of chance.

CD has been associated with several surgical procedures^{4,9}. It is not clear which mechanism triggers it. It is possible that a sudden decompression during surgery associated with surgical trauma and individual predisposition interact in a complex way⁴.

Secondary inflammation and hypotonia may play a role in its development. The transudate fluid crosses the capillaries of the choroidal wall and accumulates in the potential space between the uvea and the sclera. Hypotonia can stimulate the development of uveal inflammation and an increase in fluid content within the choroidal stroma, which in turn leads to CD. This coincides with the highest number of serous CD observed in cases of inflammatory diseases.

Hemorrhagic CD seems to represent a change in the integrity of the capillary membranes that allows red blood cells and high molecular weight proteins to enter the suprachoroidal space¹⁰. Among the cases analyzed, 55.2% had a history of previous trauma.

Usually, flat serous CD does not extend posteriorly to the equator, while hemorrhagic CD can extend to the posterior pole¹. In our study we also observed a greater extension in hemorrhagic CDs compared to serous CDs.

In most cases, CD is transient and resolves spontaneously. As a retrospective descriptive study, we cannot give data on follow-up and evolution as well as resolution time for this complication.

Conclusion

History seems to be related to the type of choroidal detachment that may develop. In cases of scheduled surgery, with minimal trauma, or in patients with a history of inflammation, a transudate and, consequently, a serous choroidal detachment is more likely to occur. Choroidal hemorrhagic detachments are more frequent after trauma.

The shape of the choroidal detachment is related to the type. The vast majority of flat detachments are serous, while choroidal hemorrhagic detachments usually show a bulging choroid.

Serous choroidal detachments usually have an extension of less than 6 meridians and choroidal

detachments with blood and/or mixed contents show a greater extension. Intraocular pressure does not appear to correlate to the type of detachment.

Conflicts of interest

The authors declare no conflicts of interest.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

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