

Characteristics of eviscerated patients in an ophthalmological center in the Colombian Caribbean

Características de pacientes eviscerados en un centro oftalmológico del Caribe colombiano

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Abstract

Background: Patients submitted to eye evisceration present varied clinical and sociodemographic characteristics that determine surgical motivation. In Colombia, there are still gaps in information describing this population on the Caribbean coast. **Objective:** To characterize patients undergoing eye evisceration in an ophthalmologic referral center in the Caribbean. **Methods:** Retrospective cross-sectional study of patients undergoing evisceration in the period 2014-2021 in a Colombian Caribbean reference center. Descriptive and bivariate analyses were performed to find differences between groups. **Results:** Forty-two eyes were included in the period 2014-2021. About 69% of the patients were male, 83.3% were from low socioeconomic strata, and 76.2% lived in urban areas. The population was characterized as infantile age for the congenital cause, adult for trauma, and older adult for pathological. Regarding evisceration, the most common cause was pathological, with 57.1% related to the presence of diseases such as glaucoma and corneal ulcer. The most relevant presenting signs were ocular pain, which was associated with the pathological group ($p = 0.003$) and phthisis bulbi with trauma ($p = 0.008$). **Conclusion:** Pathological ocular evisceration due to glaucoma and corneal ulcers was the most frequent cause. At least 75% of cases received implants and more than 68% prostheses.

Keywords: Eye evisceration. Glaucoma. Orbital implants. Eye injuries. Colombia.

Resumen

Antecedentes: Los pacientes sometidos a evisceración ocular presentan diferentes características clínicas y sociodemográficas que determinan la motivación quirúrgica. En Colombia aún existen vacíos de información que describan a esta población en la costa del Caribe. **Objetivo:** Caracterizar a los pacientes sometidos a evisceración ocular en un centro de referencia oftalmológica en el Caribe. **Método:** Estudio transversal retrospectivo de pacientes sometidos a evisceración en el periodo de 2014 a 2021 en un centro de referencia del Caribe colombiano. Se realizaron análisis descriptivos y bivariantes para encontrar diferencias entre grupos. **Resultados:** Se incluyeron 42 ojos en el periodo 2014-2021. El 69% de los pacientes eran hombres, el 83,3% pertenecía a estratos socioeconómicos bajos y el 76,2% vivía en zona urbana. La población se caracterizó como edad infantil para la causa congénita, adulta para la traumática y adulta mayor para la patológica.

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En cuanto a la evisceración, la causa más común fue patológica, con un 57,1%, relacionada con la presencia de enfermedades como glaucoma y úlcera corneal. Los signos de presentación más relevantes fueron dolor ocular, que se asoció con el grupo patológico ($p = 0,003$), y tisis bulbi con traumatismo ($p = 0,008$). **Conclusión:** La evisceración ocular patológica por glaucoma y úlceras corneales fue la causa más frecuente. Al menos el 75% de los casos recibieron implantes y más del 68% prótesis.

Palabras clave: Evisceración ocular. Glaucoma. Implantes orbitales. Lesiones oculares. Colombia.

Introduction

Eye evisceration is a palliative procedure used by ophthalmologists when other therapeutic options have failed. It consists of removing the ocular contents through a keratotomy that preserves structures such as the sclera, extraocular muscles, orbital fat, conjunctiva, and optic nerve¹. The result of the procedure is an anophthalmic cavity that allows cosmetic rehabilitation for the patient^{1,2}. Evisceration has been characterized as a simpler technique than enucleation and offers different benefits that include fast surgical times, better recovery and results for patients, and possibilities of esthetic improvement, among others³.

Regarding the causes that lead to evisceration of the eye, studies conducted in countries such as Turkey, China, and Jordan found that the main reason is trauma, representing 40% of the cases⁴⁻⁶. On the other hand, in investigations carried out in Mexico, the United States of America, Iran, and Saudi Arabia, the most frequent causes are non-traumatic, among which endophthalmitis and painful blind eye stand out^{2,7,8}.

In Colombia, studies have been carried out to define the profile of the patient who most frequently undergoes evisceration of the eyes^{9,10}. These investigations have focused on different regions of the country, identifying that the male sex predominates in the frequency of evisceration and that the main cause is ocular trauma^{9,10}.

Although the previous studies describe the situation of evisceration in a large part of the national territory, there are still gaps in the knowledge describing this population on the Caribbean coast. This type of information is considered important to guide decision-making and the elaboration of public policies. Thus, this study aims to characterize patients undergoing eye evisceration in an ophthalmologic center in the Caribbean region of Colombia.

Materials and methods

Design

The design involves observational, descriptive, cross-sectional.

Population and sources of information

A retrospective review of the medical records of patients who underwent evisceration of the eye in the period from 2014 to 2021 and who attended an ophthalmologic center in the Colombian Caribbean was carried out. Patients who underwent other procedures such as enucleation, exenteration, or operated in other institutions were excluded.

Technique and procedure

Under general anesthesia or sedation with a periocular block, the cornea is completely removed, and the ocular contents are emptied. Lateral sclerotomies are performed to allow the placement of an orbital implant of the necessary size to maintain an adequate ocular volume while keeping the extraocular muscles in place, leading to an optimal cosmetic and functional result.

Variables

Sociodemographic variables such as age, sex, socioeconomic strata, health system affiliation, area of residence, and occupation were included. Furthermore, included were clinical variables such as laterality of the eviscerated eye, cause of evisceration, type of surgical procedure, and subsequent treatment-clinical management. Within this group were also included: the presence of symptoms and signs. Finally, there are variables related to the patient's post-operative evolution, such as type of complications and time to event, type of prosthesis used and adaptation time, and requirement of surgery.

Statistical analysis

The descriptive analysis was performed using measures of central tendency and dispersion for quantitative variables depending on the frequency distribution. For categorical variables, relative and absolute frequency measures were used. For bivariate analysis, the Chi-square test (X^2) was used for categorical

variables. If the observed values were < 5 , Fisher's test was used. For continuous variables, analysis of variance was performed. The value used in the statistical significance tests was $p < 0.05$. Statistical analyses were performed using R software version 3.6 (R Foundation for Statistical Computing, <http://www.r-project.org/>)¹¹.

Ethical considerations

This research was evaluated and approved by the ethics committee of Dexa Diab on September 1, 2022, with code 002-2021, complying with the national law¹². It also considered the postulates of the Helsinki Declaration¹³ and the Nuremberg Code¹⁴.

Results

A total of 42 eyes were included from the same number of patients who met the inclusion criteria from 2014 to 2021. Overall, the study population was mostly adults with a mean age of 49.4 years [range = 1-89] years. Sixty-nine percent ($n = 29$) of the patients corresponded to the male sex and 83.3% were identified in the lower socioeconomic strata. Finally, 76.2% ($n = 32$) of the patients were located in urban residences.

Regarding clinical and evisceration characteristics, the most affected eye was the left eye 64.3% ($n = 27$), the most common causes were pathological 57.1% ($n = 24$), and traumatic 38.1% ($n = 16$). Regarding the former, the reasons leading to pathology were glaucoma and the presence of a corneal ulcer. Other important variables at the clinical level were the presence of ocular pain in 57.1% ($n = 24$) of the cases, phthisis bulbi in 64.3% ($n = 27$), implant placement was performed in 81% ($n = 34$) of the cases and was described as polymethyl-methacrylate type with frequent size between 16 mm and 18 mm. **Table 1** summarizes the general characteristics of the collected sample including sociodemographic, clinical, treatment, and outcome variables of eviscerated patients.

In terms of follow-up and outcome, only 16.7% ($n = 7$) presented complications, the most frequent being implant exposure and extrusion; these complications appeared at an average of 17 weeks. On the other hand, at the time of the revision, 73.8% ($n = 31$) had a prosthetic adaptation, of these only 14.3% ($n = 6$) needed a reoperation, before 20 weeks, 95.2% ($n = 40$) had an ocular conformer, 73.8% ($n = 31$) had a tarsorrhaphy and, finally, the follow-up of each case was an average of 79 weeks.

Table 1. General characteristics of the population and variables of interest

Variables	Total (n = 42)
Age (years)	
Mean (SD)	49.4 (25.6)
Median [Min, Max]	53.5 [1;89]
Sex - n (%)	
Male	29 (69)
Socioeconomic strata - n (%)	
One	16 (38.1)
Two	19 (45.2)
Three	7 (16.7)
Area of residence - n (%)	
Urban	32 (76.2)
Rural	10 (23.8)
Laterality - n (%)	
Right	27 (64.3)
Occupation - n (%)	
Housewife	5 (11.9)
Driver	5 (11.9)
Student	5 (11.9)
Farmer	4 (9.5)
Merchant	3 (7.1)
Contractor	1 (2.4)
Messenger	1 (2.4)
Pensioner	1 (2.4)
General services	1 (2.4)
No occupation	16 (38.0)
Cause of evisceration - n (%)	
Pathological	24 (57.1)
Trauma	16 (38.1)
Congenital	2 (4.8)
Pathological cause - n (%)	
Glaucoma	8 (19)
Corneal ulcer	6 (14.3)
Infection	4 (9.5)
Surgical complication	2 (4.8)
Retinal detachment	2 (4.8)
Endophthalmitis	1 (2.4)
Vitreous hemorrhage	1 (2.4)
Ocular pain - n (%)	24 (57.1)
Phthisis bulbi - n (%)	27 (64.3)
Implant - n (%)	34 (81.0)
Implant size - n (%)	
12 mm	1 (2.4)
14 mm	3 (7.1)
16 mm	13 (31)
18 mm	12 (28.6)
20 mm	5 (11.9)
Prosthesis - n (%)	11 (26.2)
Complications	7 (16.7)
Type of complications - n (%)	
Implant exposure	3 (7.1)
Implant extrusion	3 (7.1)
Dehiscence	1 (2.4)
Time of onset of complications	
Mean (SD)	17.4 (22.4)
Median [Min, Max]	8 [1;66]
Reintervention due to complication - n (%)	6 (14.3)

(Continues)

Table 1. General characteristics of the population and variables of interest (*continued*)

Variables	Total (n = 42)
Reoperation time - n (%)	
< 20 weeks	3 (7.1)
< 50 weeks	1 (2.4)
< 70 weeks	1 (2.4)
< 90 weeks	1 (2.4)
Ocular conformer - n (%)	40 (95.2)
Tarsorrhaphy - n (%)	31 (73.8)
Follow-up in weeks	
Mean (SD)	79 (91.2)
Median [Min, Max]	36.6 [1.43;356]

Secondary analysis by cause of evisceration and differences between groups is shown in [table 2](#); in addition, [figure 1](#). shows images of two cases before and after treatment. In general, there are differences between the groups for the average age $p \leq 0.000$. The average age of the congenital group was 12.5 years, the trauma group adult age with an average of 36.4 years, and the pathological group conformed by older adults with an average of 61.2 years. In all groups by cause, there was a predominance of men, urban residence, and left lateral involvement.

Among the causes contemplated for evisceration in this study, a statistically significant difference was found in the proportion of patients with ocular pain in the three comparison groups ($p = 0.003$). As for the presence of phthisis bulbi or ocular degeneration, it showed significant differences ($p = 0.008$) in the trauma group. Regarding the variable of tarsorrhaphy or suture of the eyelid margin, which was performed in all cases of evisceration regardless of the cause, it showed a marked statistical difference very significant in the trauma group ($p = 0.031$).

Discussion

Ocular evisceration as a technique has been increasing worldwide^{2,5,15}. Based on this increase, we proposed to characterize the patients undergoing eye evisceration in an ophthalmological center in the Caribbean region of Colombia. Thus, during the last 8 years of our study identified a total of 42 eviscerations, which have been characterized by adult age averages: 49.4 years, similar to those reported in countries such as Iceland or Saudi Arabia: 50 years^{2,16}, lower than in Mexico: 62 years⁷ but higher than those previously reported by a study in the country: 43.4 years¹⁰, or Turkey: 41.5 years⁴.

The main cause of evisceration in our study is pathological with 57.1%. This result is similar to that reported in studies that identify non-traumatic causes as predominant in Saudi Arabia with 65%² and Jordan with 66.8%⁵; higher than in the previous Colombian study with 32%¹⁰ but lower than in a Latin American reference such as Mexico with 77.8%⁷. A possible explanation for the pathological etiology as the main cause of evisceration in our study may be due difficulties to in accessing specialized ophthalmologic health services on the northern coast of Colombia where diseases such as glaucoma, which in this study represents eight cases¹⁷, can be diagnosed and treated.

The reasons underlying the pathological cause in our study focus on diseases such as glaucoma 19%, corneal ulcer 14.3%, and ocular infections 9.5%. These results are slightly higher than those reported in studies that report glaucoma in the range of 7-12%^{2,4,5}, corneal ulcers in the range of 8-13%^{2,6,7}, and infections in the range of 4-8%^{2,4}.

Although the traumatic cause was not the main cause in our study with 38.1% of cases, this percentage is similar to that found in Jordan with 33.3%⁵ and Saudi Arabia with 34.5%²; higher than in Mexico with 22.2%⁷ but lower than the Colombian study with 51%¹⁰, Turkey 60.1%⁴, and China with 67%⁶. In general, traumatic causes related to accidents at work patients; however, in our study, most of the patients reported not having an occupation or belonging to the informal economy, which draws attention and opens the need to delve into the possible reasons for the trauma and would explain in part the predominance of the pathological cause.

Among the clinical characteristics and main signs, ocular pain was predominant in the traumatic group, which is similar to reports of evisceration worldwide and derives from the need for a careful report of this symptom in the clinical record of the candidate or eviscerated patient^{2,5,15,18,19}.

Another outstanding characteristic was phthisis bulbi, which was identified predominantly in the traumatic group (93.8%) and a representation of 45.8% in the pathologic group, which correlates with the normal healing responses in the eye due to trauma injuries, surgery, inflammation, and infection, among others; and to the esthetic intervention process for the proportion of ophthalmic rehabilitation in patients²⁰.

The outcomes, follow-up, and rehabilitation after the surgical technique are outstanding points in this study since they allow a global view of the patient eviscerated for any cause. Regarding the former,

Table 2. Analysis by cause of evisceration and associations between groups. Categorical variables were analyzed using X² and continuous variables using ANOVA

Variables	Trauma (n = 16)	Congenital (n = 2)	Pathological (n = 24)	p-value
Age (years)				< 0.000*
Mean (SD)	36.4 (22.1)	12.5 (16.3)	61.2 (21.3)	
Median [Min, Max]	31 [5;89]	12.5 [1;24]	65.5 [11;85]	
Sex - n (%)				0.619
Male	11 (68.8)	2 (100)	16 (66.7)	
Socioeconomic strata - n (%)				0.338
One	5 (31.3)	1 (50)	10 (41.7)	
Two	10 (62.5)	1 (50)	8 (33.3)	
Three	1 (6.3)	0 (0)	6 (25)	
Area of residence - n (%)				0.228
Urban	14 (87.5)	2 (100)	16 (66.7)	
Rural	2 (12.5)	0 (0)	8 (33.3)	
Laterality of the commitment - n (%)				0.445
Left	11 (68.8)	2 (100)	14 (58.3)	
Ocular pain - n (%)	5 (31.3)	0 (0)	19 (79.2)	0.003*
Phthisis bulbi - n (%)	15 (93.8)	1 (50)	11 (45.8)	0.008*
Implant - n (%)	14 (87.5)	2 (100)	18 (75)	
Complications - n (%)	3 (18.8)	1 (50)	3 (12.5)	0.377
What complications - n (%)				0.539
Dehiscence	1 (6.3)	0 (0)	0 (0)	
Implant exposure	1 (6.3)	0 (0)	2 (8.3)	
Implant extrusion	1 (6.3)	1 (50)	1 (4.2)	
Time of onset of complications				0.525
Mean (SD)	8.33 (7.51)	7 (NA)	30 (32.2)	0.625
Median [Min, Max]	8 [1;16]	7 [7;7]	20 [4;66]	0.335
Prosthesis - n (%)	11 (68.8)	2 (100)	18 (75)	
Reintervention due to complication - n (%)	2 (12.5)	1 (50)	3 (12.5)	
Reoperation time - n (%)				0.587
< 20 weeks	1 (6.3)	1 (50)	1 (4.2)	0.906
< 50 weeks	0 (0)	0 (0)	1 (4.2)	0.031*
< 70 weeks	0 (0)	0 (0)	1 (4.2)	
< 90 weeks	1 (6.3)	0 (0)	0 (0)	
Ocular conformer - n (%)	15 (93.8)	2 (100)	23 (95.8)	
Tarsorrhaphy - n (%)	15 (93.8)	2 (100)	14 (58.3)	
Follow-up in weeks				0.394
Mean (SD)	60.9 (94)	149 (154)	85.2 (85.7)	
Median [Min, Max]	25.7 [1.43; 356]	149 [40.3; 258]	63.3 [4.14; 292]	

Significant values * p ≤ 0.05 are in bold. ANOVA: analysis of variance.

more than 75% received implants and more than 68% received ocular prostheses; receiving implants as an outcome is lower than that reported in the study of Ruiz-Suárez et al., 2017 in Mexico with 83% but higher in terms of prosthesis since they reported only 46%⁷. Undoubtedly, the images in [figure 1](#) reveal successful treatments together with the prosthetist that improve the patient's quality of life, allowing the recovery of confidence, self-esteem, and relationship with their daily life²¹.

Among the strengths of this study are those related to the determination of the main causes of evisceration

in the specific population addressed and through these establishing guidelines, and protocols for health care, treatment, and rehabilitation of evisceration in the northern coast of Colombia. The limitations of this study include a small sample size with the possible recruitment of patients in the city of Cartagena. It is necessary to state that our data come from clinical records that may differ from other reports. Undoubtedly, it is necessary to strengthen hospital registries in search of detailed information that will allow us to fully describe the patients who undergo ocular evisceration and their subsequent functionality.

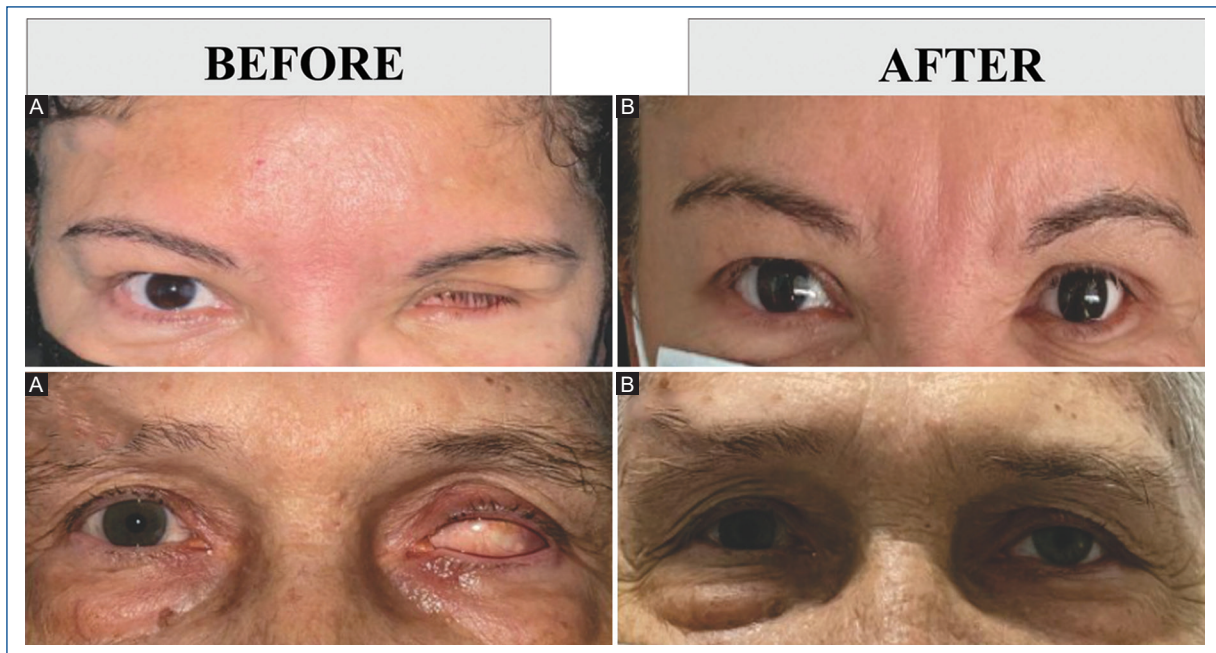


Figure 1. Patients undergoing evisceration of the eye after prosthetic rehabilitation. **A:** 47-year-old female patient after evisceration of the left eye due to sequelae of penetrating trauma. **B:** patient after successful prosthetic adaptation in the left anophthalmic cavity. **C:** 79-year-old female patient after evisceration of the left eye due to painful blind eye secondary to terminal glaucoma. **D:** patient after prosthetic adaptation with good functional and esthetic results in the left anophthalmic cavity.

Conclusion

The main cause of ocular evisceration identified in the study was pathological, caused by glaucoma and corneal ulcer. Although the traumatic cause was representative, the limitations in access to health services and treatment to avoid evisceration are striking in all cases. Eye pain and phthisis bulbi draw attention as important signs of traumatic and pathological etiologies. In our follow-ups, more than half of the patients received implants or prostheses as part of their comprehensive care process. It is important to highlight that in a country like Colombia, there are different causes of evisceration and a national study would help consolidate data for the management of this procedure and its results at the population health level.

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Conflicts of interest

The authors declare no conflicts of interest.

Ethical disclosures

Protection of people and animals. The authors declare that no experiments have been carried out on humans or animals for this research.

Data confidentiality. The authors declare that they have followed their workplace's protocols regarding the publication of patient data.

Right to privacy and informed consent. The authors have obtained approval from the Ethics Committee for the analysis and publication of routinely obtained clinical data. Informed consent from the patients was not required as it was a retrospective observational study.

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