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Review of 306 evisceration surgeries performed between 2005 and 2013

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Background/aim: The purpose of the present study was to evaluate the reasons for eye evisceration surgeries performed from 2005 to 2013 in our clinic.

Materials and methods: The medical records of patients who underwent evisceration surgery over the past 9 years were retrospectively evaluated. Detailed data were reviewed, with a focus on the first precipitating factor for evisceration.

Results: Of the 306 patients who underwent evisceration surgery in the studied period, 111 (36.27%) were female (with a mean age of 41.56 ± 21.38 years) and 195 (63.73%) were male (with a mean age of 37.76 ± 21.92 years). The most common cause of evisceration was ocular trauma (184 patients; 60.1%). Male patients experienced significantly more trauma, while glaucoma was more common in female patients.

Conclusions: Eye removal is devastating for both patients and their relatives, and its most important and preventable cause is ocular trauma.

Key words: Endophthalmitis, enucleation, evisceration, eye injury, ocular trauma

1. Introduction

Despite improvements in diagnosis, treatment methods, and microsurgical devices, ophthalmologists are faced with many challenges. Today, ophthalmologists successfully perform difficult procedures including microincision cataract surgery, 25-G transconjunctival sutureless pars plana vitrectomy, anterior/posterior lamellar keratoplasty, endonasal endoscopic dacryocystorhinostomy, and glaucoma valve implant surgery. Recommending eye removal is a complex and difficult therapeutic decision for an ophthalmologist. The removal of an eye is required in patients with painful end-stage ocular disease, unresponsive to medical or surgical treatment. Evisceration and enucleation are the most commonly performed procedures, and exenteration is very rare. Evisceration is the removal of the intraocular content; enucleation is the removal of the entire eyeball; and exenteration is the removal of the eyeball, the orbital tissues, and (if necessary) the bony structures and the eyelids (1).

As evisceration affords better movement of the remaining eye and is associated with a degree of cosmetic acceptance by the patient, we prefer evisceration to enucleation, except in cases with advanced-stage tumors. A similar tendency is evident in other countries, especially over the past 3 to 4 decades (1–4). Hansen et al. (2) reported a remarkable reduction in enucleation cases from 358 in 1975–1976 to 214 in 1995–1996, coupled with a notable rise in eviscerations (from 5 to 83) in the same respective periods. Similarly, Yousuf et al. (5) reported a remarkable reduction in enucleation cases from 22 in 1990–1999 to 9 in 2000–2009.

The removal of an eye can cause a decrease in self-confidence and depression in the patient. Ophthalmologists can help by providing psychological support to their patients. Postoperative monocular vision does not create difficulties in the physical activity of the individual, but initially the patient must be careful with the loss of visual field (6,7).

Indications for surgical removal of eyes include a severely traumatized globe, painful blind eyes, intraocular malignancies, phthisis bulbi, secondary glaucoma, endophthalmitis, and other miscellaneous causes. Tumors and painful blind eyes are the most common indications for eye removal in developed countries, whereas trauma is the most common one in developing countries such as Turkey (1,3).

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In the present study we aimed to investigate the reasons for eviscerations performed from 2005 to 2013 in our clinic.

2. Materials and methods

In this retrospective study the medical records of patients who underwent evisceration surgery over the last 9 years were evaluated in detail. We collected data on demographic features, clinical histories, and the first precipitating factors (trauma, eye surgery, keratitis, glaucoma, or phthisis bulbi) for evisceration (i.e. the causes of evisceration, not indications for evisceration).

The study protocol was approved by the Ankara Training and Research Hospital Review Board. The study and data collection protocols complied with all local laws and the principles of the Declaration of Helsinki.

Data analysis was performed using IBM SPSS version 21.0 for Windows. All variables are presented as means ± standard deviation (SD). They were compared using the independent samples t-test and the chi-square test. $P < 0.05$ was considered significant.

3. Results

We evaluated the records of 306 patients, comprising 111 (36.27%) women and 195 (63.73%) men, who underwent evisceration surgery between 2005 and 2013. The median age of the female patients was 41.56 ± 21.38 (with a range of 4–87) years and that of the male patients was 37.76 ± 21.92 (with a range of 4–88) years; this difference was not significant. The mean evisceration ages, the sex of the patients, and the causes of evisceration are summarized in Table 1. Evisceration surgery following trauma was significantly more frequent in male patients, whereas such surgery necessitated by glaucoma was significantly more common in female patients (Table 1).

The causes of evisceration between 2005 and 2013 were trauma in 184 patients (60.1%), glaucoma in 39 (12.7%), postoperative endophthalmitis in 36 (11.8%), keratitis in 26 (8.5%), and phthisis bulbi of unknown etiology in 21 patients (6.9%). The distributions by year of these causes are shown in Figure 1.

The causative agents of eye trauma were as follows: sharp objects in 77 patients (41.8%), fighting in 24 (13.0%), entry of wood in 23 (12.5%), flammable/explosive substances in 23 (12.5%), stones in 19 (10.3%), and road accidents in 18 (9.8%) patients (Figure 2).

Eye surgeries causing endophthalmitis are shown in Figure 3. Half (18) of all patients underwent cataract surgery; 30.56% (11 patients) underwent vitreoretinal surgery; 11.11% (4 patients) underwent keratoplasty; and 8.33% (3 patients) underwent glaucoma surgery (Figure 3).

The time interval between eye trauma and evisceration ranged widely (1–500 months); the mean value was 117.93 ± 107.88 months. When the interval was shorter than 24 months, trauma caused by flammable/explosive substances was significantly more prevalent ($P = 0.047$) and the mean patient age was also significantly higher ($P = 0.043$; Table 2).

4. Discussion

Eye removal is a delicate operation triggering primary psychosocial trauma and ensuing physical disability (8). The many indications for eye removal include severe eye trauma, painful blindness, blind eye ugliness, phthisis bulbi, intraocular tumors, and infections (e.g., endophthalmitis and panophthalmia) that do not respond to medical treatment (3). Such indications differ with the developmental level of a country. In developed countries the two most common causes of eye removal are tumors

Table 1. Demographic characteristics of patients and reasons for evisceration.

Reasons for evisceration	Frequency (%)	Sex (%)	P	Mean evisceration age ± SD	P
Trauma	60.1	F = 44.1 M = 69.2	<0.05	F = 31.94 ± 16.14 M = 30.91 ± 18.18	>0.05
Glaucoma	12.7	F = 19.8 M = 8.7	<0.05	F = 52.73 ± 20.05 M = 48.41 ± 23.31	>0.05
Postoperative endophthalmitis	11.8	F = 13.5 M = 10.8	>0.05	F = 55.33 ± 17.12 M = 65.24 ± 15.02	>0.05
Keratitis	8.5	F = 12.6 M = 6.2	>0.05	F = 56.36 ± 15.52 M = 52.83 ± 19.74	>0.05
Phthisis bulbi	6.9	F = 9.9 M = 5.1	>0.05	F = 24.45 ± 23.83 M = 36.30 ± 22.53	>0.05
Total	100	F = 36.3 M = 63.7	<0.001	F = 41.56 ± 21.38 M = 37.76 ± 21.92	>0.05

F: female, M: male, SD: standard deviation.

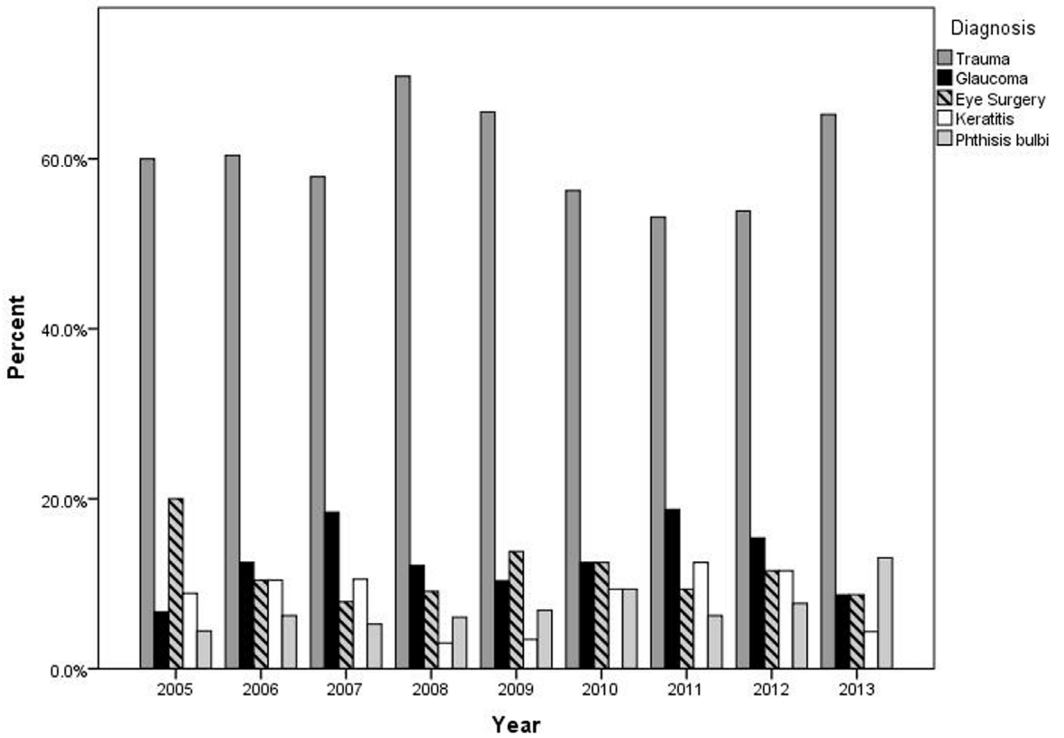

Figure 1. A distribution graphic of causes of evisceration by years. The most important reason for evisceration was trauma in all years.

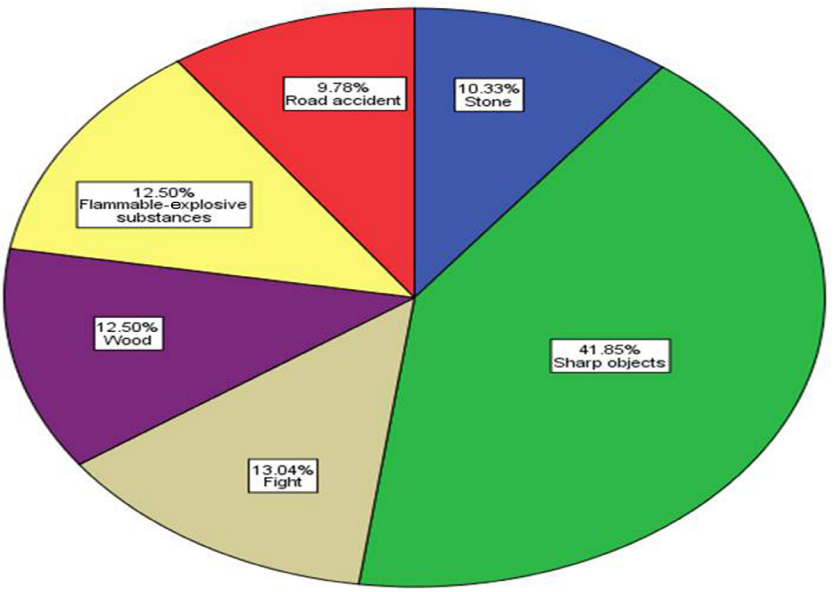

Figure 2. Causative agents of ocular trauma.

and painful blind eyes, whereas in developing countries trauma and infections predominate (3). Rasmussen et al. (1) found that the two most common causes of eye removal among 345 eye amputations conducted in Denmark between 1996 and 2003 were painful blind eyes (127 patients) and neoplasms (119). De Gottrau et al. (9) found that the two most important causes of enucleation were trauma (428 eyes) and malignant tumors (225 eyes) in a clinicopathological review of 1146 eye enucleations performed in Germany between 1980 and 1990.

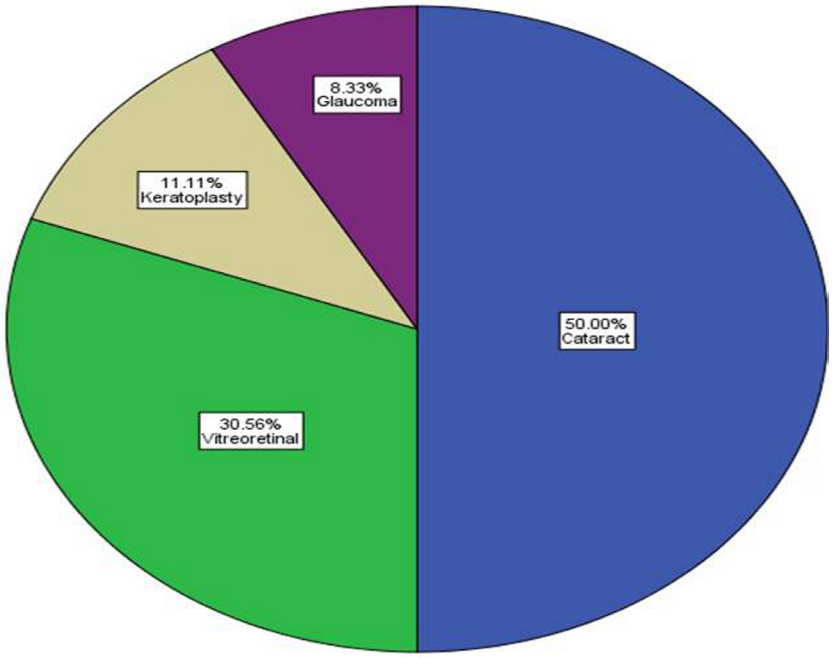

Figure 3. Types of surgical operations causing endophthalmitis.

Table 2. Agents causing eye damage and the mean patient age at the time of trauma, listed by the elapsed time between trauma and evisceration.

Causative agents	≤24 months (n = 41) (%)	>24 months (n = 143) (%)	P
Sharp objects	41.5	42.0	
Fights	7.3	14.7	
Wood	7.3	14.0	
Flammable/explosive substances	24.4	9.1	
Stones	4.9	11.9	<0.05
Road accident	14.6	8.4	
Mean age at the time of trauma ± SD (min–max) (year)	27.24 ± 21.89 (3–83)	19.65 ±15.33 (1–70)	<0.05

Consistent with these data, we found that the most common cause of evisceration was trauma (60%) and the second most common cause was infection (20%) [the sum of the rates of infection after eye surgery (11.8%) and keratitis (8.5%)]. We usually refer patients with tumors to a tertiary care university hospital as we never perform evisceration surgery on such patients; therefore, we lack data on tumor patients. Citing studies on a total of 164 patients treated between January 1990 and December 1999 in northern India, Dada et al. (4) found that the two most common indications for evisceration were panophthalmitis and severe ocular injury.

One feature is constant across countries (8–12): male patients predominate in terms of ocular trauma, being more prone to such trauma than female patients in all age groups, including children. In our series, approximately 65% of the patients were male and their mean age was 42 years, which could be called the most productive period.

The type and the severity of eye injury are well known to affect the rate of development and the progression of phthisis bulbi (9,10,13). Coşkun et al. (13) found that the size of incision, its anatomical location, the presence of concomitant anterior and posterior segment pathologies, and endophthalmitis were important factors triggering the development of phthisis bulbi. Given that the time interval between eye trauma caused by flammable/explosive substances and evisceration was less than 24 months in our study, this contention is plausible. However, we do not know why our mean patient age was significantly higher in the flammable/explosive group.

Postoperative endophthalmitis is a prime cause of evisceration. In Turkey, as elsewhere, cataract surgery is the most frequently performed eye surgery, and thus the fact that postoperative endophthalmitis is a notable cause of evisceration is not surprising (14,15).

In the present study we aimed to determine the causes of evisceration because we think that these are more important than the indications for evisceration. If the cause of evisceration can be eliminated, a worthy goal could be attained. Trauma was the most common cause of evisceration by a significant margin (60.1%), and evisceration caused by trauma never fell below 53% in any year. Moreover, the rate of trauma was very high at 70% in 2008. Trauma is eminently preventable, while eye loss in young and middle-aged patients during their most active and productive years is extremely distressing (9). Most eye injuries can be prevented by simple measures implemented at home, at work, and in traffic; children must be kept away from dangerous toys and substances; workers must use protective eyewear; and traffic rules must be obeyed.

Medicolegal concerns also deserve mention. In our clinic, we insist on informed written consent from the patient and a relative, along with an absolute requirement that the patient hand-writes the following text on the consent form: "I give approval to take my painful eye, which is blind and has no prospect of seeing again". Moreover, we never perform evisceration as initial surgery in cases with penetrating eye trauma; we initially seek to repair, as informed by medicolegal issues.

In conclusion, eye removal is very disruptive and stressful for patients and relatives, and is a last resort for ophthalmologists. Whatever causes such a loss must be stopped, if at all possible. In fact, initially preventing the cause of loss is easier than the management of all those complicated operations. In the current study, trauma was the major cause of evisceration.

Although we analyzed a large number of cases in detail, the retrospective nature of our work is a limitation.

References

1. Rasmussen ML, Prause JU, Johnson M, Kamper-Jørgensen F, Toft PB. Review of 345 eye amputations carried out in the period 1996-2003, at Rigshospitalet, Denmark. Acta Ophthalmol 2010; 88: 218–221.
2. Hansen AB, Petersen C, Heegaard S, Prause JU. Review of 1028 bulbar eviscerations and enucleations. Changes in aetiology and frequency over a 20-year period. Acta Ophthalmol Scand 1999; 77: 331–335.
3. Ibanga A, Asana U, Nkanga D, Duke R, Etim B, Oworu O. Indications for eye removal in southern Nigeria. Int Ophthalmol 2013; 33: 355–360.
4. Dada T, Ray M, Tandon R, Vajpayee RB. A study of the indications and changing trends of evisceration in north India. Clin Experiment Ophthalmol 2002; 30: 120–123.
5. Yousuf SJ, Jones LS, Kidwell ED. Enucleation and evisceration: 20 years of experience. Orbit 2012; 31: 211–215.
6. Bary FB. A Singular View: The Art of Seeing with One Eye. 6th ed. Vienna, VA, USA: Michael O. Hughes; 2004.
7. Coday MP, Warner MA, Jahrling KV, Rubin PA. Acquired monocular vision: functional consequences from the patient's perspective. Ophthal Plast Reconstr Surg 2002; 18: 56–63.
8. Soares IP, França VP. Evisceration and enucleation. Semin Ophthalmol 2010; 25: 94–97.
9. de Gottrau P, Holbach LM, Naumann GO. Clinicopathological review of 1146 enucleations (1980-90). Br J Ophthalmol 1994; 78: 260–265.
10. Acar U, Tok OY, Acar DE, Burcu A, Ornek F. A new ocular trauma score in pediatric penetrating eye injuries. Eye (Lond) 2011; 25: 370–374.
11. Rahman I, Maino A, Devadason D, Leatherbarrow B. Open globe injuries: factors predictive of poor outcome. Eye (Lond) 2006; 20: 1336–1341.
12. Acar U, Yıldız EH, Ergintürk Acar D, Altıparmak UE, Yalnız Akkaya Z, Burcu A, Unlü N. Posttraumatic intraocular pressure elevation and associated factors in patients with zone I open globe injuries. Ulus Travma Acil Cerrahi Derg 2013; 19: 115–118.
13. Coşkun M, Ataş M, Akal A, Ilhan O, Keskin U, Tuzcu EA. The factors affecting the development of phthisis bulbi after penetrating eye injuries. Ulus Travma Acil Cerrahi Derg 2012; 18: 317–320 (article in Turkish with an abstract in English).
14. Porela-Tiihonen S, Kaarniranta K, Kokki H. Postoperative pain after cataract surgery. J Cataract Refract Surg 2013; 39: 789–798.
15. Durand ML. Endophthalmitis. Clin Microbiol Infect 2013; 19: 227–234.