



Causes and Results of Eye Removal Surgery in Yazd, Iran

Nasim Oveisi¹, Tohid Emami Meybodi¹, Mohammad Reza Besharati^{1*}, Mohammad Reza Shoja¹, Farkhonde Khaleghi Dehshiri¹, Elahe Abbasi Shavazi¹, Sajad Besharati¹

1. Geriatric Ophthalmology Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

*Corresponding Author: Mohammad Reza Besharati, MD, Professor of Ophthalmology, Shahid Sadough Hospital, Ophthalmology Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
Email: ophth@ssu.ac.ir

Abstract

Introduction: Removing eyes has different indications. We surveyed the causes and results of eye removal surgery in Yazd, Iran.

Methods: We retrospectively reviewed the profile of 102 patients who had undergone eye removal surgery for any reason in the Shahid Sadoughi hospital during the last 10 years. The demographic characteristics, causes of enucleation, the interval between an accident and an eye surgery, and postoperative complications were analyzed.

Results: In 102 patients (males, 68.6% and females, 31.4%) most cases were laborers (21.6%). The two most common causes of eye enucleation were trauma (60.9%) and painful blind eye (15.7%). Trauma was the most frequent cause in the age group of ≤ 20 years old (78.9%) (P -value < 0.001). In 30.4% of the cases, our management was Sympathetic ophthalmia prevention.

Conclusion: The first cause of eye removal surgery in our study was trauma, especially in the young men. To reduce the rate of this surgery, protective proceeding, early diagnosis, and treatment of many diseases will be useful.

Keywords: Wounds and Injuries, Eye Enucleation, Ophthalmologic Surgical Procedures

Article History: Received: 20 Jun 2014 Revised: 25 Jul 2014 Accepted: 3 Aug 2014

Cite this article as: Oveisi N, Emami Meybodi T, Besharati MR, Shoja MR, Khaleghi Dehshiri F, Abbasi Shavazi E, Besharati S. Causes and results of eye removal surgery in Yazd, Iran. Int J Travel Med Glob Health. 2014;2(3):119-22.

1. Introduction

The eye removal surgery including evacuation of eyeball contents, eyeball itself, or eyeball with orbital contents has different indications based on age, sex, and population according to previously published studies. Eye removal surgery may be necessary as the endpoint of severe eye trauma, pain relief in a blind painful eye, orbital malignancies, intractable endophthalmitis, and cosmetic reasons in a disfigured eye [1]. Studies have shown different indications of eye removal surgery and posed different causes including trauma, painful blind eye, and disfigured eye as the most prevalent causes [2-4].

Dealing with eye removal surgery is psychologically difficult for both the patient and the ophthalmologist. This surgery not only psychologically affects the patients, but also disturbs their Activities of Daily Living (ADL) and socio-economic status due to the physical disability resulting from eye removal surgery. Regarding the frequent consequences of eye removal surgery and the fact that some of the diseases that finally result in eye removal surgery are preventable or treatable, this study investigated the causes of eye removal surgery in Yazd-Iran to increase awareness to prevent this surgery.

2. Methods

This retrospective study investigated clinical records of all the patients referred to the Yazd Shahid Sadoughi Hospital during a period of 10 years (2000-2010) for eye removal surgery and implantation for any reason. A questionnaire was

designed and the patients' data were recorded. The questionnaire included the patients' demographic characteristics, causes of eye enucleation including trauma (penetrating, blunt, accident, or foreign body), a painful blind eye, endophthalmitis, tumors, congenital anomalies, and miscellaneous causes (such as mucormycosis), interval between accident and surgery, and postoperative complications. Cases of retinoblastoma were referred to Tehran and excluded from the study.

The postoperative complications including blepharoptosis, infection and excessive discharges, atrophy of the fornixes, implant exposure, pyogenic granuloma, red eye with pain, edema, and eyelid hematoma were followed for six-months. Data was collected and analyzed by SPSS-16 based on the study's aim. The χ^2 test and two-tailed p -value tables were calculated.

3. Results

In this study, 102 patients which included 70 males (68.6%) and 32 females (31.4%) had eye removal surgery. Right eye in 62.7% of the cases and left eye in 37.3% was involved. The more frequent rate of surgery was amongst the range of 20-50 years (53.9%), and most cases were laborers (21.6%) and housekeepers (18.6%). The most common causes of eye removal surgery were trauma (60.9%) including penetrating trauma (39.3%), blunt trauma (10.8%), and accident (10.8%); and painful blind eye in 16 cases (15.7%) (Table 1).

Table 1. Frequency of eye removal surgery based on the causes

Cause	Number	Frequency
Penetrating trauma	40	39.3
Painful blind eye	16	15.7
Non-penetrating trauma	11	10.8
Accident	11	10.8
Congenital anomaly	6	5.9
Tumor	5	4.9
Miscellaneous	8	7.8
total	102	100.0

There was no statistically significant difference between these frequencies (p -value = 0.198) indicating that eye trauma in both genders, especially in males, is the most frequent cause of eye removal surgery (Table 3). Most patients referred to the ophthalmologists for eye removal surgery due to trauma (81.6%) with time interval of less than two weeks after accident, while trauma accounts for 45.5% and 50% causes of surgery, respectively in time intervals of 2 weeks to

5 years and >5 years (Table 4). This difference was statistically significant ($p = 0.011$).

In this study, various measures were taken based on the causes of trauma and interval between accident and eye removal surgery. The frequency of management in patients who underwent eye removal surgery included sympathetic ophthalmia prevention (30.4%), treatment of painful red eye (33.3%), infection treatment (6.9%), malignancy eradication and improving survival rate (4.9%), and cosmetic reasons (24.5%). In the follow-up, about one third of the patients suffered from one of the complications which infection and discharge were the most frequent (15.7%). The other frequent complication was eyelid edema and hematoma (3.9%), implant exposure (3.9%), injection and pain (2.9%), pyogenic granuloma (2.9%), blepharoptosis (2%), and fornix shortening (1%).

Table 2. Causes of eye removal surgery in patients based on their age group

Surgery	Age groups	Less than 20 years	20-50 years	More than 50 years	Total
		Number (Percent)	Number (Percent)	Number (Percent)	Number (Percent)
Trauma		15 (78.9%)	41 (74.5%)	6 (21.4%)	62 (60.8%)
Painful blind eye		1 (5.3%)	7 (12.7%)	8 (28.6%)	16 (15.7%)
Congenital anomaly		1 (5.3%)	5 (9.1%)	0 (0%)	6 (5.9%)
Endophthalmitis		0 (0%)	0 (0%)	5 (17.9%)	5 (4.9%)
Malignant tumor		0 (0%)	0 (0%)	5 (17.9%)	5 (4.9%)
Miscellaneous		2 (10.5%)	2 (3.6%)	4 (14.3%)	8 (7.8%)
Total		19 (100%)	55 (100%)	28 (100%)	102 (100%)

P -value=0.000 $\chi^2=46.414$

Table 3. Causes of eye removal surgery in patients based on gender

Causes of Surgery	Gender		Total (Percent) Number
	Male (Percent) Number	Female (Percent) Number	
Trauma	48 (68.6%)	14 (43.8%)	62 (60.8%)
Painful blind eye	7 (10%)	9 (28.1%)	16 (15.7%)
Congenital anomaly	4 (5.7%)	2 (6.3%)	6 (5.9%)
Endophthalmitis	3 (4.3%)	2 (6.3%)	5 (4.9%)
Malignant tumor	3 (4.3%)	2 (6.3%)	5 (4.9%)
Miscellaneous	5 (7.1%)	3 (9.4%)	8 (7.8%)
Total	70 (100%)	32 (100%)	102 (100%)

P -value=0.198 $\chi^2=7.321$

Table 4. Causes of eye removal surgery in patients based on time interval between accident and surgery

Causes of Surgery	Time interval	Less than 2 weeks	2 weeks-5 years	More than 5 years	Total
		Number (Percent)	Number (Percent)	Number (Percent)	Number (Percent)
Trauma		31 (81.6%)	15 (45.5%)	16 (50%)	62 (60.8%)
Painful blind eye		3 (7.8%)	7 (21.2%)	6 (18.8%)	16 (15.7%)
Congenital anomaly		0 (0%)	1 (3%)	5 (15.6%)	6 (5.9%)
Endophthalmitis		2 (5.3%)	3 (9.1%)	0 (0%)	5 (4.9%)
Malignant tumor		0 (0%)	4 (12.1%)	1 (3.1%)	5 (4.9%)
Miscellaneous		2 (5.3%)	3 (9.1%)	3 (9.4%)	8 (7.8%)
Total		38 (100%)	33 (100%)	31 (100%)	102 (100%)

P -value=0.011 $\chi^2=22.815$

4. Discussion

A total of 102 cases referred to the Yazd Shahid Sadoughi Hospital for eye removal surgery were studied. The most common cause of eye removal surgery was trauma which was more frequent in men than in women. It seems that trauma has been the most frequent cause of eye removal surgery in Iran and some other countries [2, 3, 5-8]. Furthermore, men underwent eye removal surgery due to trauma more frequently [3, 5, 8] indicating more risk of trauma in men due to their type of activity. Studies demonstrate that despite modern facilities and technologies in the developed countries, trauma is still the leading cause of eye removal surgery. Some other studies report causes other than trauma as the most common cause of enucleation which is inconsistent with our findings in this study [4,9,13]. In the Sengupta study [9] in 2012, retinoblastoma accounted as the most common cause of eye removal surgery, while trauma accounted for 15% of the causes. Based on this study, enucleation due to trauma has significantly decreased over a 15-year period, probably because of the progress in surgical technologies for trauma management and the increase of people's awareness. It seems that enucleation surgery centers in these studies have been the referral centers and traumatic patients were less frequently referred to these centers. This frequency difference is justifiable. In Gunalp's study [10], phthisis bulbi (33.8%), in Vemuganti [11], tumor (74.49%), and in Tariq [12], pediatric retinoblastoma (42.85%) accounted for the most frequent cause of eye removal surgery. In the case of painful blind eye due to disabling pain, without vision and malformation, eye removal surgery is the first choice [14]. The most frequent causes of the painful blind eye are glaucoma, trauma, uveitis, and keratopathy [15]. The most common causes of eye discomfort have been phthisis, and glaucoma [16]. The second leading cause of eye removal surgery in our study was painful blind eye (15.7%) accounting for 57.7% of the most common causes in Nakra's study [13] and 47.4% of the most common causes in Christmas' Study [4]. Probably because 81.6% of our patients underwent enucleation within a time interval of less than two weeks after trauma, the frequency of painful blind eye was lower. In our study, 62.7% of right eyes and 37.3% of left eyes were removed which is consistent with the findings of some other studies [3, 12]. The rate of complications was 33.3% in our study. This was 21% in Viswanathan's study [17] and 21.8% in Bagheri's [3]. In Yuan's study [18], conducted at Zang Shan Ophthalmic Center, no complications have been reported and primary evisceration with hydroxyapatite implant is considered as a safe and effective method for treating the patients with phthisis painful blind eye. In Nakra's study [13], the rate of enucleation and evisceration was 21.9% and 13.5%, respectively ($p < 0.001$). In Jung's study [2], the rate of enucleation complications was 72.1% and in evisceration was 27.1%. In this study, the most frequent complications were infection and discharge (15.7%) that were treated with topical antibiotics in most patients. Park's study [19] reported

one case of conjunctival ulcer discharge and one case of implant infection which was less than our study. In Jung's study [2], the most common complication was blepharoptosis (10.5%). This was 2% in our study. Discharge accounted for 6.4% and infection for just 1% in the recent study, which was less than our study. Finally, in Su et al's study [20], the most common complication was pyogenic granuloma (13.7%) as compared to 2.9% in our study. Discharge was reported to be just 7.5%.

5. Conclusion

According to our results, the first cause of eye removal surgery is trauma especially in young men. So, proceedings such as using protective goggles in industrial, educational and sports centers, safety belts and air bags in vehicles, and public education by media is necessary to reduce the ocular trauma. In addition, the rate of this surgery will be reduced by appropriate medical care, early diagnosis, and treatment of many diseases resulted in eye enucleation.

Acknowledgments

We would like to thank the staff of the Shahid Sadoughi Hospital who facilitated our access to patients' folder and information.

Authors' Contributions

All authors involved in all steps including design, data gathering, analyzing the data and manuscript preparation.

Financial Disclosure

Not declared.

Funding/Support

Not declared.

References

- Migliori EM. Enucleation versus evisceration. *Curr Opin Ophthalmol* 2002;13(5):298-302.
- Jung SK, Cho WK, Paik JS, Yang SW. Long-term surgical outcomes of porous polyethylene orbital implants: a review of 314 cases. *Br J Ophthalmol*. 2012;96(4):494-8.
- Bagheri A, Mirbabaei-Ghafghazi F, Abrishami M, Saloor H. Causes of enucleation and results of different implants used in Labbafinejad Hospital during 1988-89. *Bina J Ophthalmol*. 2001;6:294-302.
- Christmas NJ, Gordon CD, Murray TG, Tse D, Johnson T, Garonzik S, O'Brien JM. Intraorbital implants after enucleation and their complications: a 10-year review. *Arch Ophthalmol*. 1998;116(9):1199-203.
- Khataminia GR, Ghaderpanah M, Chenary M, Saidi Z. The incidence and causes of enucleation and evisceration in Khuzestan province. *Sci Med J*. 2010;9(3):205-21.
- Etezzad-Razavi M, Daneshvar-Kakhki R, Zarei-Ghanavati S, Nobakht-Rad M. Long-term complications of enucleated or severely traumatized eyes in War Veterans. *Bina J Ophthalmol*. 2007;12(3):373-9.
- Saeed MU, Chang BYP, Khandwala M, Shivane AG, Chakrabarty A. Twenty year review of histopathological findings in enucleated/eviscerated eyes. *J Clin Pathol*. 2006;59(2):153-55.
- Boguseviciene R. An eleven-year experience of eye enucleation caused by severe ocular injuries. *Medicina (Kaunas)*. 2005;41(5):375-81.
- Sengupta S, Krishnakumar S, Biswas J, Gopal L, Khetan V. Fifteen-year trends in indications for enucleation from a tertiary care center in South India. *Indian J Ophthalmol*. 2012;60(3):179-82.
- Gunalp I, Gunduz K, Ozkan M. Causes of enucleation: a clinicopathological study. *Eur J Ophthalmol*. 1997;7(3):223-8.

11. Vemuganti KG, Jalali S, HonavarGS, Shekar CG. Enucleation in a tertiary eye care centre in India: prevalence, current indications and clinicopathological correlation. *Eye*. 2001;15:760-5.
12. Tariq BF, Mahfooz H, Mir Z. Clinico-pathologic study of 70 Enucleations. *J Pak Med Assoc*. 2009;59(9):612-4.
13. Nakra T, Ben Simon JG, Douglas SR, Schwarcz MR, McCann DJ, Goldberg AR. Comparing outcomes of enucleation and evisceration. *Ophthalmol*. 2006;113(12):2270-5.
14. Merbs SL. Management of a blind painful eye. *Ophthalmol Clin North Am*. 2006;19(2):287-92.
15. Shah-Desai SD, Tyers AG, Manners RM. Painful blind eye: efficacy of enucleation and evisceration in resolving ocular pain. *Br J Ophthalmol*. 2000;84:437-8.
16. Custer PL, Reistad CE. Enucleation of blind, painful eyes. *Ophthalm Plast Reconstr Surg*. 2000;16(5):326-9.
17. Viswanathan P, Sagoo MS, Olver JM. UK national survey of enucleation, evisceration and orbital implant trends. *Brit J Ophthalmol*. 2007;91(5):616-9.
18. Yuan Z, Huang D, Zheng Y. Clinical analysis of evisceration with hydroxyapatite implant. *Yan Ke Xue Bao*. 2000;16(4):267-9.
19. Park YG, Paik JS, Yang SW. The results of evisceration with primary porous implant placement in patients with endophthalmitis. *Korean J Ophthalmol*. 2010;24(5):279-83.
20. Su GW, Yen MT. Current trends in managing the anophthalmic socket after primary enucleation and evisceration. *Ophthalm Plast Reconstr Surg*. 2004;20(4):274-80.