

The rate of and indications for enucleations at Sekuru Kaguvi Eye Unit in Harare: a comparative analysis

E EPEE, R MASANGANISE

Abstract

Objectives: To determine the rate of and indications for enucleation at Sekuru Kaguvi Eye Unit (SKEU) in Zimbabwe and compare the findings with those from other tertiary eye care centres in the developing world.

Design: Descriptive retrospective cross sectional study.

Setting: Sekuru Kaguvi Eye Unit, Parirenyatwa Hospital, Harare, Zimbabwe.

Subjects: Records of patients who had undergone enucleation at Sekuru Kaguvi Eye Unit, between January 1988 to December 2000.

Main Outcome Measures: Rate and indications of enucleations done at SKEU during the study period.

Results: Ocular tumours (64.2%) and ocular infections (26.4%) were the leading indications for enucleation and the crude incidence rate for enucleation at SKEU was 0.17%

Conclusion: Indications for enucleation at the SKEU in Harare are similar to those experienced by other developing countries.

Introduction

Traditionally the indications for surgical enucleation of the eye are intra-ocular malignant neoplasia, penetrating wounds with intra-ocular inflammation and, extensive ocular damage which leaves the eye without useful vision, blind, painful and unsightly.¹ The advent of advanced techniques employed in the management of some of the above conditions has transformed absolute indications for enucleation to relative indications. A combination of early tumour detection with advanced and more focused treatment modalities namely photocoagulation, cryotherapy, radiotherapy, thermotherapy and chemotherapy in the management of retinoblastomas has marginalised enucleation to advanced disease involving the optic nerve, choroid and orbit.² Although uveal melanomas are rare tumours in Zimbabwe their current management has drifted from enucleation in preference to more conservative forms of treatment such as trans-scleral / trans-retinal local resection, radiotherapy and phototherapy.^{3,4} Unfortunately the drift towards conservative management is seen more among the developed nations who can afford the cost of treatments, while they are out of reach of most developing nations.

Erie and colleagues showed that the incidence of enucleations in Olmsted County for various ocular pathology namely trauma, tumours and blind painful eyes decreased by more than 60% from an incidence of 5.6 per 100 000 person-years for 1956 to 1966 to 2.62 per 100 000 person-years for the period 1978 to 1988. This was partly accounted for by the introduction of laser photocoagulation to prevent neovascular glaucoma and the use of radiotherapy in the treatment of uveal melanomas and retinoblastomas.⁵ Batten showed that the rate of enucleations among new outpatient attendees at St John Ophthalmic Hospital in Jerusalem during the period 1965 to 1969 was 0.29% and the three commonest underlying diseases of enucleated eyes were painful blind eye (25%), corneal disease (25%) and trauma (18%).⁶ On the contrary, a recent study done in India (January 1995 to July 1998) showed an enucleation rate of 0.17% and ocular tumours (49%), staphylomas (25%) and trauma (13%) were the three commonest indications for the procedure.⁷

The rate of and indications for enucleations in Zimbabwe have not been analysed before. The purpose of this study was to determine the rate of and indications for enucleation at Sekuru Kaguvi Eye Unit (SKEU) in Harare and compare the findings with those from other centres in the developing world.

Cent Afr J Med 2003; 49 (1/2): 161-163

Department of Surgery
Sekuru Kaguvi Eye Unit
University of Zimbabwe Medical School

Correspondence to:
Mr R Masanganise
Department of Surgery
University of Zimbabwe Medical School
P O Box A178
Avondale, Harare, Zimbabwe
Tel: 263 (4) 791631 ext. 2169
Fax: 263 (4) 724912
E-mail: surgery@healthnet.zw

Materials and Methods

Data was collected from theatre and outpatient registers at Sekuru Kaguvi Eye Unit, Parirenyatwa Hospital in Harare for patients whose eyes had been enucleated between January 1998 and December 2000. Histological diagnosis was reviewed and matched with the clinical diagnosis for each patient. Our findings were compared with those from three other centres where similar studies had been performed. A convenient selection of the other three tertiary eye care centres was based on locally available published literature. The time difference in the study periods was employed to demonstrate whether SKEU is in keeping with the changing trends in enucleation over time.

A hypothesis generated to facilitate statistical analysis of data from different centers stated that: "in a population of new eye outpatient department attendees seen at tertiary eye care centres, the risk of enucleation is associated with the eye care centre, assuming uniformity of expertise and equipment available at the various eye care centres in developing countries." A Chi-squared test was used to test the null hypothesis.

Results

A total of 33 491 new ophthalmic patients were seen at SKEU outpatient department between 1998 and 2000. Of these patients 4 323 had major eye operations, 56 of which were enucleations. All enucleated eyes had no useful visual function at the time of surgery. The incidence rate for major eye operations and enucleations among new eye patients were 12.9% and 0.17% respectively. Table I shows the frequency distribution of indications for the 56 enucleations. Information on the histological nature of ocular pathology and clinical diagnosis was not obtainable for three cases. It is important to note that clinical diagnosis matched with histological findings in all the remaining 53

cases. The two trauma cases with ruptured globes had been enucleated to reduce the risk of developing sympathetic ophthalmitis at a later date.

Table I: Frequency distribution of indications for the 56 enucleations at SKEU.

Indication	Number of cases	Frequency
Ocular tumours	34	60.7%
Ocular infections	14	25%
Phthisis bulbi	3	5.4%
Trauma	2	3.5%
Unspecified	3	5.4%
Total	56	100%

Ocular tumours include: 24 squamous cell carcinomas of conjunctiva and 10 retinoblastomas.

Ocular infections include endophthalmitis of various aetiologies. Unspecified: there were no case records found for three, enucleated patients.

The mean age for patients with squamous cell carcinoma of the conjunctiva was 37 years (range 24 to 67 years) and that of endophthalmitis/infections was 26 years (range five to 79 years).

Table II compares published crude incidence rates for enucleation from tertiary eye care centres in various developing countries with that for SKEU, Harare.

A Chi-squared test performed on the data in Table II showed a statistically significant association between centre and risk of enucleation ($\chi^2=45.9698$, $p=0.000$) thus rejecting the null hypothesis.⁹

Discussion

Zimbabwe has two tertiary eye care centres serving about 12 million people. The majority of patients requiring major ocular surgery are referred to these tertiary centres for further management. Enucleation in Zimbabwe is done as

Table II: Comparative analysis of crude incidence rates from various centres.

Centre/ country	Period of study	Total New cases	Total enucleations	Incidence rate
SKEU, Harare, Zimbabwe	Jan. 1998–Dec. 2000	33491	56	0.17%
Prasad Eye Institute, India ⁷	Jan. 1995–July 1998	88991	151	0.17%
St John, Jerusalem ⁸	1965–1969	142490	409	0.29%
Mulago Hospital, Uganda ⁸	1963–1967	10598	207	0.2%

Table III: Comparison of the top three indications for enucleation in the four countries.

Centre	First	Second	Third
SKEU, Zimbabwe	Ocular tumours 64.2%	Infections 26.4%	Phthisis bulbi 5.7%
Prasad, India	Ocular tumours 49%	Staphyloma 25%	Trauma 13%
St John, Jerusalem	Painful blind eye 25%	Infections 25%	Trauma 18%
Mulago, Uganda	Trauma 50%	Corneal disease 18%	Painful blind eye 9.2%

NB : the SKEU frequencies are for the 53 cases whose information was available.

a last resort management option when the globe cannot be preserved in any way. This strict management protocol has been adopted partly because of lack of orbital implants and artificial eyes on the local market, both of which are essential for good cosmetic outcome.

In this study 14 out of 56 enucleated eyes had endophthalmitis of various aetiologies. The reason for enucleating these eyes instead of eviscerating them was that their presentations were not clear cut and malignant disease was included on the list of differential diagnoses in all cases. Clinical and histological records for three out of 56 eyes (5.4%) could not be found. De Gottrau and colleagues in Germany had a similar problem of being unable to classify 3.4% of their cases.¹⁰ This highlights the need for great care in ensuring proper documentation of patient medical details and records keeping.

A study done by de Gottrau and colleagues in Germany showed that the leading indications for enucleation were: secondary angle closure glaucoma (34.9%), ocular malignant tumours (21.7%), *phthisis bulbi* (18.7%) and ocular infections (14.7%) respectively.¹⁰ The patterns of ocular pathology differ from those seen in India, Uganda, Jerusalem and Zimbabwe as illustrated in Table III and serves to confirm that the indications for enucleation are centre dependent.

The significant association between eye care center and the risk of enucleation demonstrated above is confounded by various factors namely: the long time lag between the various studies, socio-economic status of the nation, war, violence and prevalence of HIV infection in the community. However, our study shows that the rate of and indications for enucleation at SKEU Zimbabwe are similar to those of other centres in the developing world. In fact our results are particularly comparable to those from the Prasad Eye Institute in India.⁷

It is important to note that due to circumstances beyond our control the comparative analysis was based on crude incidence rates, which falls short of the ideal. However, a number of useful observations have been made, namely: the patterns of pathology necessitating enucleation are eye care centre dependent, these patterns have changed with time because of the advent of new treatment modalities for various disease conditions and the influence of diseases like HIV infection which is associated with squamous cell carcinoma of the conjunctiva in sub-Saharan Africa.¹¹⁻¹³

Conclusion

The results of this retrospective study have shown that the crude incidence of enucleation at SKEU, Harare is comparable with those of other centres and the pattern of indications for enucleation is centre dependent.

References

1. Roper-Hall MJ. Stallard's eye surgery. 7th ed. London: Wright, 1989:425.
2. Shields CL, Shields JA, De Potter P. New treatment modalities for retinoblastoma. *Current Opinion in*

Ophthalmol 1996;7:20-6.

3. Damato BE. Time to treatment of uveal melanoma in the United Kingdom. *Eye* 2001;15:155-8.
4. Damato BE. Ocular tumours: diagnosis and treatment. Oxford: Butterworth-Heinmann, 2000:74-87.
5. Erie JC, Nevitt MP, Hodge D, Ballard DJ. Incidence of enucleation in a defined population. *Am J Ophthalmol* 1992;113:138-44.
6. Batten KL. Causes of enucleation as seen in Jerusalem. *Br J Ophthalmol* 1971; 55:174-6.
7. Vemuganti GK, Jalali S, Honavarr SG, Shekar GC. Enucleation in a tertiary eye care centre in India: prevalence, current indications and clinicopathological correlation. *Eye* 2001;15:760-5.
8. Davanger M. Causes of enucleation in Uganda. *Br J Ophthalmol* 1970;54:252-5.
9. Pagano M, Gauvreau K. Principles of biostatistics. Belmont, California: Duxbury Press, 1993:257-66.
10. de Gottrau P, Holbach LM, Naumann GOH. Clinicopathological review of 1 146 enucleations (1980-90). *Br J Ophthalmol* 1994;78:260-5.
11. Poole TRG. Conjunctival squamous cell carcinomas in Tanzania. *Br J Ophthalmol* 1999;83:177-9.
12. Ateeyi-Agaba C. Conjunctival squamous cell carcinoma associated with HIV infections in Kampala, Uganda. *Lancet* 1995;345:695-6.
13. Waddell KM, Lewallen S, Lucas S, Ateenyi-Agaba C, Harrington CS, Liomba G. Carcinoma of conjunctiva and HIV infection in Uganda and Malawi. *Br J Ophthalmol* 1996;80:503-8.