A TEN- YEAR RURAL EXPERIENCE OF SURGICAL EYE REMOVAL IN A PRIMARY EYE CARE CENTER SOUTH-EASTERN NIGERIA. (original research)

ABSTRACT

Introduction

Surgical removal of the eye is usually a reflection of the pattern of severe ocular diseases and the level of development and socio-cultural dynamics of each specific setting. In Nigeria, there have been several reports on the causes of surgical removal of the eye in urban tertiary eye care centers. This study determined the pattern of surgical removal of the eye in Presbyterian joint hospital, Uburu, Ohaozara, a rural primary eye care facility in South eastern Nigeria.

Methods

A retrospective chart review was performed for all patients who had surgical removal of the eye between January 2002 and January 2012 at the eye unit of the Presbyterian Joint Hospital, Ohaozara, Ebonyi state, south eastern Nigeria. Data collected included age, sex, diagnosis and the eye affected. The diagnosis was further categorized into degenerative lesions, infections, trauma and neoplasm. The statistical package for social sciences (SPSS) was used for data analysis.

Results

Two hundred and twenty six eyes of 226 patients were surgically removed within the study period comprising 52.2% (n=118) males and 47.8% (n=108) females (ratio: 1.1:1, p=0.5). The mean age of the cohort was 47.6+/- 20.2 (range: 2 to 82 years). Children aged 0-10 years constituted 8.4% while the elderly > 60 years comprised 23.4% of the study population. The 3 commonest causes of surgical removal of the eyes were severe eye infections 60.6% (n=137), degenerative eye diseases (staphyloma) 13.3% (n=30), severe eye injury 11.5% (n=26). Retinoblastoma 6.2% (n=14) was the commonest tumour type seen in the patients.

Conclusion

The commonest cause of surgical eye removal was severe ocular infections followed by degenerative eye diseases. More males than females had their eyes surgically removed. Over half of those who had their eyes removed were aged 51 to >60 years. The commonest cause of eye removal among the children was retinoblastoma. These causes are largely preventable and
avoidable. With intensive eye health education and provision of adequate eye care facilities this trend can be reversed.

Key words: Enucleation, Evisceration, Exenteration, Eye removal, Nigeria, Primary care, Rural
Introduction

The decision to surgically remove the eye is difficult for both the surgeon and the patient. This is because of the profound psychological effect of loss of the eye on the patient. This procedure is therefore done as a last resort.

Removal of the eye may be necessary after severe ocular trauma, to control pain in a blind eye, to treat some intraocular malignancies, in severe eye infections unresponsive to medical therapy, and for cosmetic improvement of a disfigured eye[1]. The choice of procedure to accomplish this is best made by an informed patient.

Different methods of surgically removing the eye are evisceration, enucleation and exenteration. Evisceration is the surgical removal of the internal content of the eye with the sclera shell intact; enucleation is the removal of the globe from the orbit; exenteration is the removal of the globe including all or part of the orbital soft tissues[2]. Unlike enucleation, evisceration potentially causes exposure of uveal antigens therefore, there has been a concern about sympathetic ophthalmic associated with evisceration[3].

The causes of surgical removal of the eye vary from place to place and tend to reflect the pattern of severe ocular disease[4] and the level of development and socio-cultural dynamics of each specific setting[5].

Several local studies[4-6,11] have reported patterns of indication and causes of removal of the eye in urban tertiary eye care facilities. One of the most urgent healthcare challenges internationally is ensuring that people living in rural areas have access to appropriate and equitable health care[12]. This study aims at determining the pattern of indication surgical eye removal in rural primary eye care setting in Nigeria in order to generate data to be used as a tool to formulate appropriate intervention to reduce the trend.
Methods

Study design and area

In this non-comparative case-series, a chart review was performed for all patients who underwent enucleation, evisceration and exenteration at the eye unit of Presbyterian joint hospital Ohaozara, Ebonyi State between January 2002 and January 2012. This is a rural-based and only eye hospital in Uburu, Ohaozara which is one of the 13 local government areas of Ebonyi State, South eastern Nigeria. Established in 1912 it provides eye care services to 8 rural local government areas of Ebonyi state and parts of rural Enugu state of southeastern Nigeria. These communities are predominantly farmers with motor bike and bicycles as their major means of transportation.

Data collected included age, sex, diagnosis and the eye affected. The aetiology responsible for eye removal was determined from the history and findings after examination as recorded in the patient’s medical record. The diagnosis was categorized into painful blind eye, degenerative lesions, infections, trauma and neoplasm.

The data was analyzed using the statistical package for social sciences (SPSS-IBM, Armonk, New York, USA. www-03.ibm.com). Univariate analysis and parametric method were used to calculate frequency, percentage, and 95% confidence intervals (CI). A p-value of <0.05 was considered statistically significant.

Case definition

In this study, surgical removal of the eye was defined as the removal of part or whole of the globe for the intent of saving the fellow eye, cosmesis following severe eye injury, relief of pain in a non-seeing eye, and in severe eye infections unresponsive to medical treatment. All procedures such as removal of fibrovascular degeneration of the conjunctiva (pterygium) and excision biopsies for histological examinations were excluded from the study.

Ethical approval was obtained from the Health Research and Ethics Committee of Presbyterian Joint hospital board Ohaozara. Approval number is not usually issued to approved researches.
Results

Over the 10-year study period, a total of 4,562 new patients had surgeries of various types. Of these, a total of 226 eyes of 226 patients representing 5% (p = 0.001*, C.I =1.04-1.06) had surgical removal of the eye. The types of eye removal are shown in figure 1.

All the excisions were monocular and were of eyes which were considered blind with corrected visual acuity of less than 3/60. The right and left eyes were affected in proportions of 108 and 118 respectively (p = 0.51, C.I =1.41-1.54).

Age and sex distribution (table 1)

There were more males (n=118, 52.2%) than females (n=108, 47.8%) with a ratio of 1.1:1 (p = 0.50, C.I=1.41-1.54). The mean age of the cohort is 47.6 +/- 20.2 (range 2 years to 82 years). The peak age group was 51-60 years (27%). Children aged less than 10 years constituted 8.4% among whom 4.9% were under age of 5 years. On the contrary, elderly patients (>60 years) constituted 23.4%.

Indications for surgical removal of the eyes (table 2)

Panophthalmitis characterized by gross infection of the uvea and sclera was the commonest cause of eye removal (n=137, 60.6%), followed by degenerative lesions of the eyeball (staphyloma 13.3%), trauma (11.5%) and then neoplasm (8.7%). Of the 137 cases of panophthalmitis 3 (2.2%) were post surgical.

Traumatic cases were characterized by extensive injuries to the globe potentially dangerous to be preserved due to sympathetic ophthalmia and cosmetic outlook. Included here were cases of globe rupture, laceration and perforation. Causes of ocular injuries included farm-related (62%), road traffic accidents (14%), assault (12%), others (12%).

Twenty eyes were removed due to tumors. Of these 14(70%) were due to retinoblastoma, 3 (15%) squamous cell carcinoma of the conjunctiva and 3 (15%) due to non-specific orbital malignancy. All the cases of retinoblastoma were confirmed with histologic evaluation.

Late presentation of the patients was common with 69.7% presenting 2 weeks after the onset of symptoms.
Discussion

In this study, there was a slight preponderance of males, with a male to female ratio of 1.1:1. This is similar to other studies in Turkey, Ethiopia, Southwest Nigeria and Southeast Nigeria\[4,11,13,14\]. This could be as a result of the involvement of males in high risk activities that predispose them to injuries to ocular structures.

The age group 51-60 years was most frequently affected, accounting for 27% of the cases. This age group is higher than that of other studies in urban southeast Nigeria[11], and Cameroun[15]. The difference could be accounted for by the difference in study area and type of health care facility. While the southeast Nigeria study was done in an urban tertiary healthcare facility, the Cameroun study was conducted in a pediatric specialty hospital where the most frequently affected age group was 0-10 years. It is common in rural Nigeria to find a preponderance of elderly people as most young people tend to migrate to urban areas in search of corporate job. In addition, the age group 51-60 years is considered an active age group in rural Nigeria where most of them are involved in agricultural work and are at risk of farm-related ocular health problems. In this study farm-related ocular injuries were responsible for 62% of all ocular traumas.

Types of surgery

Evisceration was the most common method of eye removal done accounting for 85.8% (n=194) of all destructive eye procedures done (Figure 1). This is followed by enucleation 11.9% (n=27) and exenteration 2.2% (n=5). This is in keeping with the global trend where in developing countries, evisceration is more likely to be performed for the more common scenario of ocular trauma and infection[16].

Causes of eye removal

Severe eye infection (panophthalmitis): The leading cause of eye removal in this study was panophthalmitis accounting for 60.6% of cases (Table 2). The dominant causative role of severe eye infection in the indication of eye removal has been reported[5,15,17-19]. However, the proportion of patients presenting with panophthalmitis was higher in this study when compared with these studies. This is a reflection of the poor socioeconomic environment in which these rural communities thrive. The rural dwellers are more likely to have reduced access to modern hospital eye care services occasioned by unavailability of transportation means and poverty. This hospital lack adequate laboratory services required for effective management of microbial keratitis which was the dominant primary aetiology of panophthalmitis in this study.
Overall, there is increased use of traditional eye medication in rural areas which tends to increase the prevalence of infection-related destructive eye procedures due to its potentially toxic effects and promotion of late presentation. In a similar rural Indian study[20], Prajna et al reported that 47.7% of the patients with corneal ulcer had applied traditional eye medication prior to presentation at the eye center. This is likely the scenario in this part of Nigeria.

**Staphyloma**: This was the second leading cause of eye removal constituting 13.3% of all cases. Often the underlying cause was not evident hence the inclusion in this group. Other studies[5,13,14,21,22] have reported varying significance of staphyloma in eye removal. This finding however differed from that in other studies in south eastern Nigeria by Nwosu[7] and Eze et al[11] where staphyloma did not result in any eye removal. Both studies were done at urban tertiary eye centers while this study was done at a rural primary care center. The higher acceptance of surgical eye removal for cosmetic purpose in our cohort may be due to the difference in cultural beliefs of Ohaozara and its environs where this study was done. While it is true that the predominant Ibos of southeastern Nigeria believed that removal of the eye would lead to the recurrence of the defect during reincarnation[11], the Ohaozara Ibos believe that severe ipsilateral eye problems will involve the contralateral good eye if not removed.

**Tumors**: Orbitoocular malignancies were the indication for eye removal in 8.9% of cases. Consistent with the finding in other series[4,5,9,11,15] histologically confirmed retinoblastoma was the commonest tumor type in the pediatric age group accounting for 100% of all the tumors in the age group 0-15 years in this study. All the patients had enucleation as the primary form of treatment. This is due to late presentation and unavailability of alternative modern treatment modalities such as radiotherapy, cytotoxic drugs and laser treatment which may be necessary for the few patients that presented early. Moreso, the effect of poverty tends to negatively affect their willingness to be referred to the modern facilities in the city. In a study by Adeoye and Onakpoya[4], 6 out of the 92 (6.5%) patients studied unfortunately were blind in the second eye. This was largely preventable. The high person blind years and psychosocial implications associated with pediatric sight loss cannot be overstated[5]. The high incidence among such a vulnerable group is a reflection of the lack of comprehensive capacity to manage such cases in developing countries.

**Painful blind eye**: In this study, 5.8% of cases of eye removal were due to painful blind eye. Most cases were due to absolute glaucoma. This is less than that in Eze’s (13.5%) cohort[11], but higher than Olurin’s (0.84%), Dawodu and Faal (5.56%) and Vemuganti et al (3%)[6,19,23]. Severe ocular pain is an intolerable condition resulting from various ocular diseases and can be treated with topical steroids, cycloplegics, ocular hypotensives, bandage contact lens and retrobulbar alcohol injection[24,25]. However, if pain is unresolved with treatment, then the
eye is surgically removed. Significant in this study area was the cultural belief that one sick eye would damage the other good eye. This explains the significant acceptance rate of eye removal following painful blind eye.

Limitations

The limitations of this study included it being retrospective and hospital-based.

Conclusion

The commonest reason for removal of the eye in rural eyecare practice southeast Nigeria is severe ocular infection (panophthalmitis). This is followed by degenerative globe disorders (staphyloma), and severe eye trauma. More males than females had their eyes surgically removed. Over half of those who had their eyes removed were aged 51 to >60 years. The commonest cause of eye removal among the children was retinoblastoma. These causes are largely preventable and avoidable. Provision of a system that enhances better access to modern eye care at all levels is important. Education of the rural populace on hazards of ocular injuries, early presentations and avoidance of traditional medication/self medication will stem the trend of eye removal in rural Nigeria.

Acknowledgement

The medical director of Presbyterian hospital Ohaozara Dr Egwu Ebeyi is thanked for his support and assistance. The nurse in charge of records Mrs Nnenna Onyeabor is hereby appreciated for assisting in retrieving medical records of the patients.


Figure 1: Distribution of type of surgical removal of the eye.
### Table 1: Age and Sex distribution of patients

<table>
<thead>
<tr>
<th>Age Range (Years)</th>
<th>Sex</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>0-10</td>
<td>12</td>
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</tr>
<tr>
<td>11-20</td>
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<td>4</td>
</tr>
<tr>
<td>21-30</td>
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<td>12</td>
</tr>
<tr>
<td>31-40</td>
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<td>6</td>
</tr>
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<td>41-50</td>
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<td>23</td>
</tr>
<tr>
<td>51-60</td>
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<td>31</td>
</tr>
<tr>
<td>&gt;60</td>
<td>28</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>118</td>
<td>108</td>
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Table 2: Indication for eye removal

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>NUMBER (%)</th>
</tr>
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<tbody>
<tr>
<td>Trauma</td>
<td>26(11.5)</td>
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<tr>
<td>Painful blind eye</td>
<td>13(5.8)</td>
</tr>
<tr>
<td>Infection (panophthalmitis)</td>
<td>137(60.6)</td>
</tr>
<tr>
<td>Tumors (neoplasm)</td>
<td>20(8.9)</td>
</tr>
<tr>
<td>Staphyloma(degenerative)</td>
<td>30(13.3)</td>
</tr>
<tr>
<td>Total</td>
<td>226(100)</td>
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