THE OCCURRENCE AND PATTERN OF SQUAMOUS CELL CARCINOMA
OF CONJUNCTIVA IN HIV/AIDS PATIENTS WITH CONJUNCTIVAL
GROWTHS SEEN AT TWO TERTIARY HOSPITALS IN ZAMBIA

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2009
DECLARATION

THIS DISSERTATION IS MY ORIGINAL WORK AND HAS NOT BEEN PRESENTED FOR A DEGREE IN ANY OTHER UNIVERSITY.

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DEDICATION

This work is dedicated to the person who mattered most in my life, my beloved late wife, Siberia Banda Liche.

“Through it all, God is gracious”
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<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
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<tr>
<td>CIN</td>
<td>Conjunctival Intraepithelial Neoplasm</td>
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<td>HAART</td>
<td>Highly Active Antiretroviral Therapy</td>
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<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>KS</td>
<td>Kaposi's sarcoma</td>
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<td>OSSN</td>
<td>Ocular surface squamous neoplasia</td>
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<td>SCCC</td>
<td>Squamous Cell Carcinoma of Conjunctiva</td>
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<td>Sub-Saharan Africa</td>
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ABSTRACT

Title of study: The occurrence and pattern of Squamous Cell Carcinoma of Conjunctiva in HIV/AIDS patients with conjunctival growths seen at two tertiary hospitals in Zambia

Aims and objectives: To determine the prevalence, clinical and histological pattern of SCCC in HIV/AIDS patients with suspicious conjunctival growths attending the University Teaching Hospital, Lusaka and Kitwe Central Hospital in Zambia.

Methods: This was a hospital based cross sectional study which was conducted over a period of five months at the University Teaching Hospital, Lusaka and Kitwe Central Hospital. The study population was HIV positive patients with suspicious conjunctival growths presenting to the two eye clinics. Only those who consented to participate in the study were included. We also collected 2mls of blood for HIV testing and CD4+ count from patients who did not know their status. All HIV positive patients with conjunctival growths were assessed and counseled on the excision of the growth and the specimens were sent for histopathology examination. Those without HIV test results and Histology results were excluded from the study.

Data Analysis: Data was analysed using SPSS version 11.5. A p-value of less than 0.05 was considered significant.

Ethical approval: Was obtained from UNZA Biomedical research and ethics committee.

Results: On a total of 101 conjunctival lesions from HIV positive patients, excisional/ incisional biopsy was done and tissue sent for histopathological examination: 68 at UTH and 33 at KCH. Out of 101 HIV positive patients with suspicious conjunctival growths, 70 had confirmed histological diagnosis of SCCC. This gave a prevalence of 70%. The mean age was 37.6 years.
and age range was 17 to 61 years. The male to female was 1:3. The mean duration of the growth at presentation was 12.9 months. Recurrence of conjunctival growth was reported in 24 (34.3%) patients. Out of 24 patients, 15 (62.5%) reported fast growing lesions. Only 5 (7%) had bilateral conjunctival lesions. Majority of patients had one conjunctival lesion which tended to be more nasal and were rare in the fornix. Regional lymph node enlargement was noted in 5 (7.1%) patients. Of the 70 patients with SCCC, 17 (24.3%) developed the conjunctival growth while already on HAART. There was no statistical significance between rates of growth and being on antiretroviral therapy. The mean CD4 Count was 247.17, median 209, the range was 10 – 620. There was no statistical significance between the rates of growth and mean CD4+ counts.

Conclusion: SCCC is a highly significant and prevalent condition in HIV positive patients with conjunctival growths in Zambia. It is common in young adults, often affecting women. The lesions are aggressive and fast growing. Cases of recurrences are also high. SCCC bears no correlation with CD4+ counts. It does not seem to regress with HAART. SCCC can now be considered as a marker for HIV infection, a view which is held by many Ophthalmologists in Africa.
1.0 INTRODUCTION

1.1 Background Information

Squamous cell carcinoma of the conjunctiva (SCCC) is the most common malignancy of the conjunctiva. Previously, squamous cell carcinoma of the conjunctiva has been seen as a rare, slow-growing tumour of the eye, normally affecting elderly men around 70 years of age. Multiple case series have noted a higher prevalence in male patients and the elderly, with the most frequently reported location being the limbus.

The global annual incidence of SCCC across all age groups is approximately 17-20 cases/million persons (1 case /700-850). The incidence of SCCC varies geographically (declining with greater distances from the equator). The magnitude of squamous cell carcinoma show significant differences across different parts of the World. In the USA, it is a rare disorder, with an incidence of 0.03 per 100,000 persons per year. In Africa, however, the disease spectrum appears different. The incidence is rising rapidly, affecting young persons (around 35-40 years of age), and often women.

SCCC likely has a multifactorial aetiology. Risk factors are believed to include ultraviolet radiation, Human Papillomavirus, HIV, fair skin pigmentation, and atopic eczema.

Various interventions like surgery, cryotherapy, radiation and chemotherapy exist. However, despite therapy, there is a high recurrence rate (up to 43%) and often poor results in late disease.

Tumour margin-free surgery remains the standard treatment. Cryotherapy, radiation, and chemotherapeutics have been used after excision to reduce recurrence. Topical mitomycin C,
5-fluorouracil, and interferon alpha-2b have been successfully employed for suspicious conjunctival lesions.

Untreated invasive disease may spread to the globe or orbit, and warrant enucleation or exenteration. Intraocular invasion has been reported in 2-15% of all cases, and studies have found orbital invasion in 12-16% of cases. Metastases are rare, with the first site of extraocular involvement being regional lymph nodes. One case study of 287 patients from Mexico reports only two cases of regional nodal metastasis.
2.0 LITERATURE REVIEW

2.1 Pathogenesis of Squamous Cell Carcinoma of Conjunctiva

Squamous cell carcinoma of the conjunctiva is a malignant epithelial neoplasm characterized by invasion of the basement membrane and subepithelial tissues by malignant cells. It is believed to arise from limbal stem cells and typically presents as a mass in the interpalpebral fissure at the nasal or temporal limbus. The pathogenesis of this tumour appears to be disordered maturation of the epithelium induced by various irritants.

Persons with HIV/AIDS tend to develop tumours of the stratified squamous epithelium of the conjunctiva and cornea at a younger age than individuals without this disorder. These tumours also tend to be more aggressive in their mode of growth than those in HIV negative patients.

The etiological role played by HIV infection in the genesis of conjunctival squamous cell carcinoma is not clear and there is no evidence that HIV is directly carcinogenic, but the Human Papilloma Virus (HPV type 16 and 18) has been implicated. It is suggested that the immuno-suppression results in co-infection with the papilloma virus. Immuno-suppression reduces the effectiveness of the immune surveillance system resulting in growth of the tumour.
2.2 Clinical Presentation of Squamous Cell Carcinoma of Conjunctiva

The majority of patients with SCCC complain of a growth in the eye. They may describe a whitish growth which is progressively increasing in size. They often experience a foreign body or a pricking sensation. In some cases they complain of a red, painful eye. Patients with recurrent squamous cell carcinoma may complain of a deep and severe pain around the eye. The pain can be so severe that the patients request enucleation despite good vision 18, 19.

Early manifestations are usually small masses at or around the limbus mimicking pterygia or pinguecula. The tumours usually grow slowly, invading the nearby tissues including the eyeball, eyelids, and orbital tissues leading to severe visual loss, loss of the eye, and severe facial deformities 20.

Generally, the clinical characteristics of conjunctival squamous cell carcinoma are similar in immuno-competent patients and in those with lowered immunity. However, in the immuno-compromised patients the tumours tend to occur at a younger age, growing faster and are more aggressive 21.
There are three main morphological patterns that are commonly observed:

1. **Leukoplakic lesion**: superficial plaque of opaque whitish hyperkeratosis,

2. **Papillomatous lesion**: appears as a highly vascularised soft tissue mass,

3. **Gelatinous and velvety lesion**: appears as an ill-defined translucent mass.

The tumours of the stratified squamous epithelium of the conjunctiva are regarded as malignant when they exhibit anaplasia, invasion of the substantia propria of the conjunctiva, or invasion of the underlying sclera, cornea or both.

Histopathological types of conjunctival squamous cell carcinoma according to Shields are broadly subdivided into:

1. **Conjunctival Intraepithelial Neoplasm (CIN):**
   
   A) **Mild CIN**: is characterized by abnormal cellular proliferation involving only partial thickness of the epithelium (previously called Dysplasia). The surface epithelium is replaced by mildly anaplastic epithelial cells that lack normal maturation.

   B) **Severe CIN**: shows abnormal cellular proliferation involving full thickness of the epithelium, also known as carcinoma in situ.

2. **Invasive Squamous Cell Carcinoma:**
   
   The lesion is composed of invasive cells into substantia propria and possibly into corneal or scleral stroma.
2.3 Gender and Age Variation of Squamous Cell Carcinoma of Conjunctiva

SCCC has been reported to be common in Caucasians and more common in males (75%) than in females (25%). This has been attributed to the outdoor occupations males tend to do more. Traditionally, SCCC has been regarded as a disease of the elderly, with an average age of 60 - 70 years.

McKelvie et al in 2002 conducted a study in Australia on 26 patients with SCCC. Out of 26 patients, 77% were males and 69% were more 60 years of age.

Non-HIV positive patients with SCCC tend to elderly, with an average age of 60 years.

In Africa, however, the disease appear different, affecting younger persons (around 35 years of age), and often women. The clinical presentation has been reported as more aggressive, with a mean duration of three months at presentation. This pattern has been related to the co-existence of the HIV/AIDS pandemic.

Studies in Congo-DR, South Africa and Zimbabwe have shown that the disease is affecting young people with mean ages of 37.3, 37 and 35 years respectively. It is often affecting young women, with a prevalence of 70% in females.

In Tanzania the tumour has been observed to be more aggressive too than it was previously. The mean length of history on presentation is three months.
2.4 Geographic Variation of Squamous Cell Carcinoma of Conjunctiva

Conjunctival Squamous Cell Neoplasia is the most common malignant tumour of the ocular surface. The disease is prevalent in tropical areas.

In 1997, Sun et al found that SCCC was rare in the USA, with an incidence of 0.03 per 100,000 but, interestingly, this rate was approximately fivefold higher among males and whites. Regression analysis suggested a link between ultraviolet B exposure and prevalence of SCCC.

There is also an observation that patients living near the equator present with the disease at an early age as compared to those staying farther away. For every 10° closer to the equator, the chances of suffering from conjunctival squamous cell carcinoma increase by 50%. Solar ultraviolet radiation decreases with increasing latitude, and the incidence SCC of the eye decreases per unit reduction in ultraviolet exposure.
2.5 Squamous Cell Carcinoma of Conjunctiva association with HIV/AIDS and CD4+ count levels

SCCC has been associated with HIV infection in equatorial Africa, but the evidence for association with HIV in developed countries, where SCCC is rarer, is controversial. Guech-Ongey et al noted in their study done in USA that the calculated risk for SCCC was elevated regardless of HIV acquisition category, CD4 lymphocyte count and time relative to AIDS-onset. Relative proportions of SCCC risk were highest with age ≥50 (8 per 100,000), Hispanic ethnicity (7 per 100,000) and residence in regions with high-solar ultraviolet radiation (10 per 100,000). Their study showed a significant increment in the incidence of SCCC among persons with HIV/AIDS in the U.S. The associations with age and geography are in accord with an established etiological role for ultraviolet radiation in SCCC.12

In sub-Saharan Africa (SSA), SCCC has become a highly significant and blinding condition. In ophthalmic outpatient clinics in Harare, Guramantuhu et al found that at least two of every one hundred general patients have squamous cell carcinoma. It is becoming more common, more aggressive, and affecting more young people, especially women. The pattern appears to be associated with the HIV/AIDS pandemic, exposure to solar radiation, and infection with human papilloma virus (HPV).218

Several studies indicate that HIV infection is strongly associated with an apparent increasing incidence of SCCC in Africa. In a smaller study conducted by Progres et al in 2003 in Zimbabwe, noted 12 (92.3%) out of 13 persons with ocular surface squamous neoplasia (OSSN) were HIV-positive.31

A study done in South Africa in 2002 by Mahomed et al found a prevalence of 70.6%, mean age of 37 years and all were younger than 50 years.25
In 1995 Ateenvi-Agaba reported that the incidence of SCCC in Kampala, Uganda, had increased from approximately 6/million/year in 1988 to 35/million/year in 1992. HIV tests were performed on all the patients (n = 48) who presented with SCCC. 75% were found to be HIV seropositive compared to 19% of 48 matched controls. 34

Waddell et al., from the Uganda Eye Project studied patients in Uganda and Malawi presenting to eye clinics with lesions suspicious of SCCC. The study in Uganda was a case-control study, and in Malawi HIV data were collected on consecutive presenting patients. Of Ugandan patients, 27/38 (71%) with SCCC (27 invasive carcinoma, 11 CIN) were HIV positive compared with 12/76 (16%) of controls (odds ratio 13, 95% confidence interval 5-38). Of 32 Malawian patients (20 invasive carcinoma, 12 CIN), 25/29 tested (86%) were HIV positive. 35

Padmamalini et al. studied 4 male patients from Jan 2004 to Feb 2007 with median age of 40.5 years (range 38 – 48 years), with HIV infection and ocular squamous cell carcinoma showed that OSSN is common in younger individuals in case of HIV infected individuals and bears no correlation with CD4 counts. 36

A recent hospital based cross sectional study conducted by Chisi et al. at two major hospitals in Kenya (2003-2004) found a prevalence of 7.8% SCCC in HIV/AIDS patients. A total of 409 HIV positive patients were seen and 103 had conjunctival growths, out of which 32 had histologically proven SCCC. 37
2.6 HIV/AIDS Statistics

In 2007, the United Nations released new AIDS figures that place the number of people living with HIV/AIDS worldwide at 33.2 million down from their previous estimate of 39.5 million. This reduction has been cited with the use of improved methodologies and better surveillance capabilities.\textsuperscript{18}

Global statistics show the number of people (adults and children) with HIV in 2007 to be 33.2 million. However, the number of children living with HIV has increased from 1.5 million in 2001 to 2.5 million in 2007. The report also indicate that 6800 people become infected everyday and over 5700 people die from AIDS everyday.

In SSA, the number of people living with HIV in 2007 is estimated at 22.5 million increasing from 20.9 million in 2001 using re-adjusted figures. According to these statistics SSA accounted for 35% of all people living with HIV and almost one third (32%) of all new HIV infections and AIDS deaths globally in 2007.

Zambia which has an HIV/AIDS prevalence rate of 15.6% is among eight countries in SSA having prevalence rates greater than 15% (Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe).\textsuperscript{19} However, the new figures released in May, 2008 by Zambia Demographic Health Survey indicate that HIV prevalence has dropped from 15.6% to 14.3%. (Appendix A Map1: Location of Lusaka, and Map 2. "heterogeneity of HIV infection in Africa").
3.0 **RATIONALE**

There have been no studies done to establish the pattern of SCCC in HIV/AIDS patients with suspicious conjunctival growths in Zambia.

The prevalence of HIV appears high in Sub-Saharan Africa, Zambia inclusive, and that SCCC appears more common in this population. Thus it is of importance to establish the occurrence and pattern of SCCC in HIV/AIDS patients with suspicious conjunctival growths.

The information gathered from this study will be used for advocacy and sensitization of policy makers, health personnel and the public on the need of early intervention. The results could also be used for advice on “aggressive early excision and histology in the defined risk group. Future research opportunities in the improvement of management of SCCC could as well be beneficiary of this study.
4.0 OBJECTIVES

4.1 Main objective

To determine the prevalence, clinical and histological pattern of SCCC in HIV/AIDS patients with suspicious conjunctival growths attending the University Teaching Hospital, Lusaka and Kitwe Central Hospital in Zambia.

4.1.1 Specific objectives

1. To determine the prevalence of SCCC in HIV/AIDS patients with suspicious conjunctival growths attending the University Teaching Hospital, Lusaka and Kitwe Central Hospital in Zambia.

2. To determine the demographic characteristics of SCCC in HIV/AIDS patients with suspicious conjunctival growths attending the University Teaching Hospital, Lusaka and Kitwe Central in Zambia.

3. To describe clinical features and histological types of SCCC in HIV/AIDS patients with suspicious conjunctival growths attending the University Teaching Hospital, Lusaka and Kitwe Central in Zambia.

4. To establish an association between the occurrences of SCCC in HIV positive patients and the level of CD4 counts.
5.0 METHODOLOGY

5.1 Methods

5.1.1 Study design

This is a hospital based cross sectional study.

5.1.2 Study duration

The study was conducted over a period of seven months:

(a) Base line data collection- five months,
(b) Data analysis and presentation- two months.

5.1.3 Study setting

The study was conducted at the University Teaching Hospital, Lusaka and at Kitwe Central Hospital. Both hospitals have well established Eye clinics and HIV clinics with readily available serology testing and CD4+ count facilities. HIV testing and CD4 counts are free as per government policy in public health institutions. All histopathology tests were done at UTH, where there are qualified Histopathologists.

5.1.4 Study Population

HIV positive patients with defined suspicious conjunctival growths (see 5.1.6) attending the two hospitals during the time of the study were examined, assessed and counseled on the excision of the growth. These were patients referred by the attending physicians from the urban clinics, HIV Clinic and other departments of the two hospitals. HIV positive patients
with conjunctival lesions coming directly to the eye clinic as a self referral were also included in the study.

Those presenting with suspicious conjunctival growth but without knowledge of their HIV status were counseled and offered HIV test. Those found to be HIV positive, were included in the study.

5.1.5 Sample size

There are about 2 exenterations and 5 excisions of suspicious conjunctival growths performed per week at UTH Eye Clinic. A similar number of such surgeries are conducted at KCH Eye Clinic.

The sample size for the study was all HIV positive patients with suspicious conjunctival growths seen at the two tertiary hospitals in the Eye Clinic during the time of the study.

Going by the number of excisions performed per week at the two hospitals, we expected to see a minimum 80 suspicious conjunctival growths during the study period.

\[
n = \frac{t^2 \times P \times (1-P)}{E^2}
\]

Where:

\( n \) = the minimum sample size required (approximation)

\( t \) = standard normal deviation set at 1.96 which correspond to 95% confidence interval

\( P \) = prevalence estimate of CSCC in HIV/AIDS patients with suspicious conjunctival growth in Kenya (KNH and Kikuyu Eye Unit 30%).

\( E \) = is the maximum random sampling error acceptable. \( E = 0.1 \) degrees of precision at 95% level of confidence (at expected prevalence of 30%).

\[
n = \frac{1.96 \times 1.96 \times 0.3 \times 0.7}{0.1 \times 0.1} = 80.
\]
5.1.6 Case definition

Any HIV positive patient with a suspicious conjunctival lesion was considered as a case.

A suspicious conjunctival growth is described as any of these below:

(a) Gelatinous, greyish white and small, rapidly growing with a mean duration of three months.

(b) Leukoplakic lesions which appears as a focal thickening of the stratified squamous cell epithelium with a superficial plaque with white hyperkeratosis.

(c) Papillomatous lesions appear as a highly vascularised soft tissue mass.

(d) Necrotic lesions tend to be bigger and slough off the cornea.

5.1.7 Inclusion criteria

All HIV positive patients with suspicious conjunctival lesions attending the two hospitals in the eye clinic during the time of study were included. The growths were excised and tissues sent for histology. Patients with extensive growths requiring exenteration or incision biopsy for those on waiting list for exenteration were included too.

5.1.8 Exclusion criteria

HIV positive patients with suspicious conjunctival lesion unwilling to consent were excluded from the study.

Patients with suspicious conjunctival lesion but without HIV test results and Histology results were also excluded from the study.
5.1.9 Resource personnel

The following people will be involved at various stages of the study:

Doctors, counselor at VCT center, Theatre personnel, Histopathologists, Biostatistician and Typist.

5.2 Materials

The special equipments which were used in the study included: An ocular excision set, Operating loupes, Operating microscope-Scan Optics, Slit lamp microscope- Haag-Streit AT 900 and other materials and medical supplies are as shown in the appendix B.

5.3 Procedure

Questionnaire: A questionnaire was filled for every patient and the information collected was statistically analyzed for presentation (Appendix C).

Examination and Photo-documentation: HIV positive Patients with conjunctival growths coming or referred to the eye clinic were thoroughly examined, assessed and counseled for excision of the growth. An attempt to photo-document conjunctival lesions on patients enrolled in the study was made where possible before excision biopsy was done.

All patients whether consented to be in the study or not were counseled and offered surgical treatment (excision biopsy or exenteration) and histological examination of the specimen.

Blood specimens for serology test (HIV test) and CD4+ count were taken from patients with suspicious conjunctival lesions who did not know their HIV status before the excision of the growth. 2mls of blood were collected for HIV testing at the UTH virology laboratory and pastoral VCT centre in Kitwe. This was done with the full approval from the patient. Those
who did not consent for the serology tests were also operated and further counseling was conducted during the post operation review.

**Excision of the conjunctival growth:** All patients with suspicious conjunctival growths seen at these two hospitals were taken to eye clinic theatre for excision biopsy under local anaesthesia.

Those with large tumours involving the fornices and sclera or the orbit were prepared for exenteration under general anaesthesia in the main theatre.

The excision of the conjunctival growth was performed according to the usual recommended treatment of margin-free surgery, which remains the Gold standard treatment. 39

1. With patient lying supine on the operating table, topical anaesthesia (tetracaine) was instilled into the affected eye.
2. The surrounding area of affected eye was cleaned with povidone iodine 10%. The fornices were also flushed with diluted povidone iodine solution 5%.
3. Lidocaine 2% was injected adjacent to and under the conjunctival lesion.
4. A small incision was made 3mm from the outer margin of the conjunctival growth, and then undermined. The incision was then completed all round the lesion and excised off under operating microscope or using operating loupes.
5. Lesions adherent to the cornea or sclera, were scraped off with a Bard Parker blade 5-Fluorouracil (25mg/ml) was applied by a soaked small eye swab, on all patients who had excision biopsy, for 3 to 5 minutes then washed off with Normal saline.
6. The excised site was left as a bare sclera.
7. Tetracycline eye ointment and eye pad was applied at the end of the operation.
8. The specimen was sent to histopathology laboratory with a request form (Appendix D) for examination.

**Post-operative treatment and follow-up:**

1. Removal of the eye pad and examination was done the following day.
2. Steroid antibiotic eye drops (Dexamethasone 0.1% and Gentamycin 0.3%) were prescribed on day one post operation. Putting four times per day for two weeks.
3. Histology results were communicated to the patients on their follow-up visit (two weeks post operation).
6.0 DATA MANAGEMENT AND ANALYSIS

The data was collected using a well structured questionnaire and it was entered into computer Access. The data was exported to a statistical package for social scientist (SPSS Version 11.5) for windows and analyzed. Epi info version 3.4.1 was used for the statistical calculations. The results are presented in the format of flow chart, rates, ratio proportion, pie charts, bar charts, histograms and tables. Statistical significance testing was carried out whenever appropriate and a p-value of less than 0.05 was considered significant.
CHAPTER 7

7.0 ETHICAL CONSIDERATIONS

7.1 Ethical Approval

Before the commencement of the study, ethical approval was obtained from the University of Zambia research ethics committee.

7.2 Counseling

Patients found with conjunctival growths were counseled before being included in the study and all relevant information about squamous cell carcinoma was provided to them.

Patients were also counseled on the surgical treatment of the conjunctival growth, those with small conjunctival growths limited to the globe and conjunctiva were counseled for excision while those with large tumours extending to the fornices or orbit were counseled for exenteration.

7.3 Consent

Informed consent was obtained from all patients who were willing to take part in the study. Consent for photo-documentation and surgical procedure under local or general anaesthesia was also obtained. Patients were free to opt out of the study at any time. For those who did not know their HIV status, were counseled for HIV testing and CD4 count. Details of the consent explanation are as shown in Appendix E.
7.4 Drugs, Equipment and Sterilization

All drugs and equipment used are registered in Zambia for this purpose. Sterilization techniques were observed throughout the study. All the equipments for excision of conjunctival growths or exenteration were sterilized. Single use disposable surgical equipment was discarded after use while observing safety regulations.

7.5 Data Confidentiality

Data collected from the patients was kept confidential throughout the process.

7.6 Study Limitation

Majority of patients could not remember their initial CD4+ count and as such the lowest CD4+ count could not be included in the final analysis.
8.0 RESULTS

This study was conducted over a period of five months. During this period, a total of 101 excision/incision biopsies on conjunctival lesions from HIV positive patients were sent for histopathological examination. 68 HIV positive patients were operated at UTH and 33 patients at KCH.

Out of 101 HIV positive patients, 70 had a confirmed histological diagnosis of SCC. This gave a prevalence of 70% in the study population.

Figure 1: Flow Chart of Participants
Prevalence of SCCC at UTH and at KCH was 71% and 67% respectively.

The mean age was 37.6 years; median 38 years, range was from 17 to 61 years.
Male to female ratio was 1:3

Majority of patients presented with ocular pain, itching and reddish eye growth. There was an overlap in the complaints, some patients had more than one complaint.
Table 1: Vision of affected eye (n = 75)

<table>
<thead>
<tr>
<th>Visual Acuity (VA)</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (6/6 - 6/18)</td>
<td>30</td>
<td>52.0</td>
</tr>
<tr>
<td>Impaired (&lt;6/18 - 3/60)</td>
<td>9</td>
<td>12.0</td>
</tr>
<tr>
<td>Blind (&lt;3/60)</td>
<td>27</td>
<td>36.0</td>
</tr>
</tbody>
</table>

A significant number of patients (36%) were blind in the affected eye.

Figure 6: Duration of the Growth (n = 70)

Mean duration of the growth was 12.9 months, median was 5 months and the range was \( \frac{1}{2} \) month to 132 months.
Fast and slow growing lesions were taken as less than 3 months and more than 3 months respectively, as described by the patient.
Out of the 24 patients with recurrent growths, 15 (62.5%) reported fast growing lesions. Aggressive lesions extending into the anterior chamber and the fornices were noted in 11 (45.8%) patients with recurrent growths.
Very few patients had bilateral conjunctival lesions (7%).

The lesions tended to be more nasal (69%) and were rare in the fornix (4%).
Majority of patients had one conjunctival lesion (94.3%).

Table 2: Growth extensions (n = 75)

<table>
<thead>
<tr>
<th>EXTENSION</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCALISED IN BULBAR CONJUNCTIVA</td>
<td>16</td>
<td>21.3</td>
</tr>
<tr>
<td>LIMBAL</td>
<td>19</td>
<td>25.3</td>
</tr>
<tr>
<td>EXTENSION TO CORNEA</td>
<td>23</td>
<td>30.7</td>
</tr>
<tr>
<td>EXTENSION TO A/C</td>
<td>4</td>
<td>5.3</td>
</tr>
<tr>
<td>EXTENSIVE TUMOR( fornix and beyond)</td>
<td>13</td>
<td>17.3</td>
</tr>
</tbody>
</table>

Seven of the 23 patients with extension to the cornea, had necrotic tumours which had affected more than three quarters of the cornea.
Table 3: Gross appearance of lesions (n = 75)

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEUKOPLAKIC-PLAGUE</td>
<td>12</td>
<td>16.0</td>
</tr>
<tr>
<td>PAPILLOMATOUS</td>
<td>22</td>
<td>29.3</td>
</tr>
<tr>
<td>GELATINOUS</td>
<td>17</td>
<td>22.7</td>
</tr>
<tr>
<td>FUNGATING/NECROTIC</td>
<td>24</td>
<td>32.0</td>
</tr>
</tbody>
</table>

A significant number of patients presented with fungating / necrotic tumours (32%).

Figure 12: Lymph node enlargement (n=70)

Enlargement of regional lymph nodes was noted in very few patients (7.1%).
Majority of patients were found to have well differentiated SCCC (41.4%). One rare variant of squamous cell carcinoma was found. Only 10 patients had CIN.
Table 4: HAART (n = 70)

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON HAART</td>
<td>40</td>
<td>57.1</td>
</tr>
<tr>
<td>NOT ON HAART</td>
<td>30</td>
<td>42.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>70</td>
<td>100</td>
</tr>
</tbody>
</table>

Those who were on HAART were 40 (57.1%) with an average duration on HAART being 10.3 months. Nine were also on TB treatment.

Table 5: Association between Rate of Growth and HAART

<table>
<thead>
<tr>
<th>On HAART</th>
<th>Rate</th>
<th>OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fast, n (%)</td>
<td>Slow, n (%)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>27 (56.3)</td>
<td>13 (59.1)</td>
<td>0.9 (0.3 - 2.5)</td>
</tr>
<tr>
<td>No</td>
<td>9 (43.8)</td>
<td>9 (40.9)</td>
<td></td>
</tr>
</tbody>
</table>

There was no statistical significance between rates of growth and antiretroviral therapy. Of the 70 patients with SCCC, 17 (24.3%) developed the conjunctival growth while already on HAART.
Figure 14: Current CD4 Count (n=70)

The mean CD4 Count was 247.17, median 209, the range was 10 - 620.

Table 6: Association between Rate of Growth and CD4 count

<table>
<thead>
<tr>
<th>CD4 count (current)</th>
<th>Rate</th>
<th>Slow, n (%)</th>
<th>OR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fast, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 50</td>
<td>3 (8.3)</td>
<td>2 (9.1)</td>
<td>0.4 (0.0 - 1.3)</td>
<td>1.000</td>
</tr>
<tr>
<td>50-100</td>
<td>4 (8.3)</td>
<td>1 (4.5)</td>
<td>0.5 (0.1 - 5.7)</td>
<td>0.597</td>
</tr>
<tr>
<td>101-200</td>
<td>18 (37.5)</td>
<td>6 (27.3)</td>
<td>0.6 (0.0 - 8.0)</td>
<td>1.000</td>
</tr>
<tr>
<td>201-300</td>
<td>10 (20.8)</td>
<td>4 (18.2)</td>
<td>3.8 (0.2 - 101.0)</td>
<td>0.558</td>
</tr>
<tr>
<td>301-400</td>
<td>2 (4.2)</td>
<td>5 (22.7)</td>
<td>0.8 (0.0 - 12.1)</td>
<td>1.000</td>
</tr>
<tr>
<td>401-500</td>
<td>6 (12.5)</td>
<td>3 (13.6)</td>
<td>0.3 (0.0 - 8.3)</td>
<td>0.545</td>
</tr>
<tr>
<td>500+</td>
<td>5 (10.4)</td>
<td>1 (4.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean CD4+ count for fast growing tumours was 244 (± 23.3). The mean CD4+ count for slow growing tumours was 253 (± 33.8). There was no statistical significance between the rates of growth and mean CD4+ counts.
SCCC is a serious problem with a high impact on public health owing to its relatively high prevalence and the potential to cause severe disability. This study was conducted to determine the prevalence, clinical and histological pattern of SCCC in HIV positive patients with suspicious conjunctival lesions at two tertiary hospitals in Zambia.

The study was designed in such a way that all patients presenting to the eye clinic with a conjunctival lesion were counseled for operation and HIV testing if status was unknown. In this study, 101 HIV positive patients with suspicious conjunctival lesions underwent operation. The specimens were sent for histopathological examination. Of the 101 patients, seventy had a histological diagnosis of SCCC with a variety of stages of the disease, while thirty-one had other histological diagnoses as shown in the flow chart (figure 1).

This gave a prevalence of 70% (n=101) SCCC (10 patients with CIN and 60 patients with invasive carcinoma) in HIV positive patients with suspicious conjunctival lesions in Zambia. This finding provides us with one of the most significant reasons to be aware of SCCC in high risk populations.

Incidence of SCCC has been shown to be increasing in sub-Saharan African countries including Zimbabwe, where one study notes a nine-fold increase in cases over a 5-year period. Pola and colleagues in Zimbabwe reported an increase of prevalence of SCCC, from 33% in 1996 to 57.9% in 2000; the prevalence was higher in women than men.

Another study done in South Africa in 2002 by Mahomed et al reported a prevalence of 70.6% (n=17) of OSSN in HIV positive patients. All 12 patients were younger than 50 years, with a mean age of 37 years.

Other few studies done in the region showed a similar trend in the prevalence of SCCC in HIV positive patients. A case-control study done in Uganda and Malawi by Waddell et al
reported a prevalence of 71% (n=38) and 86% (n=29) respectively. A similar study done in 1995 in Uganda by Ateenyi-Agaba C had reported a prevalence of 75% (n=48). Therefore, the prevalence of SCCC in HIV positive patients with conjunctival growths in Zambia is comparable to the results obtained by other studies in the SSA.

The demographic characteristics of SCCC in HIV positive patients in Zambia showed that the disease is mostly affecting young adults, often young women. The mean age was 37.6 years, median was 38 years and range was from 17 to 61 years with the most affected age range of 25-44 years (figure 3). The finding of SCCC occurring at a younger age in HIV seropositive patients is consistent with the findings of Kaimbo Wa Kaimbo (also based in the Congo).

We also noted that 74.3% of those found with SCCC were females giving a male-female ratio of 1:3 (figure 4). Although there was no statistical significance in the frequency of SCCC in male patients compared to the female patients (OR=0.73, 0.26-2.03, P-value=0.498), we are of the view that this disease affects the young and often females. Other related studies in the region have shown a similar picture in the SCCC distribution by age and sex. Kaimbo Wa Kaimbo in Congo found a mean age of 37.3 years and a female predilection of 70%. Pola in Zimbabwe also found 70% were young female patients with a median age of 35 years.

The clinical features of SCCC in HIV-positive patients were also assessed. All the 70 patients had presented with a history of an eye growth on the conjunctiva. The majority of the patients also presented with ocular pain, itching and reddish eye growth. There was an overlap in the presenting complaints: some patients had more than one complaint (figure 5). Ocular pain which is normally not a typical symptom scored high at 52.9%, this could be attributed to the fact that a significant number of patients presented with late disease i.e. tumours extending into the fornices and beyond, and intraocular involvement.
The other presenting complaint which was worth noting was poor vision in the affected eye. From this study, monocular blindness stood at 36% (table 1) which is an alarmingly high figure. These were patients who had presented with late disease and had exenteration as treatment.

The mean length of history on presentation was 12.9 months. However, majority of patients (54.3%) presented with a conjunctival growth of less than 6 months duration. The minimum and maximum durations were ½ month and 132 months respectively (figure 6). Although half of the patients presented with a growth of less than 6 months, we feel more sensitisation is needed so that our patients in this risk group present much earlier.

It was also noted that the majority of patients reported fast growing lesions (figure 7). Fast and slow growing lesions were taken as less than 3 months and more than 3 months respectively, as described by the patient. This cutting point of 3 months was taken following the results of the study done in Tanzania by Poole et al who reported mean duration of SCCC in HIV-positive patients as 3.1 months.

These results are in agreement with other studies cited in the region (Congo, Zimbabwe, Tanzania, Uganda, Malawi and Kenya) which have documented that the rate of growth of SCCC lesions is faster in HIV-positive patients. 21, 26, 27, 35, 37

In a hospital-based HIV-positive population study in Kenya, 65.6% of those with SCCC reported fast growing lesions. 37

Despite therapy, up to 43% of treated patients experience recurrence at variable times (but usually within two years). 10

In this study, recurrence was found to be 34.3%. Of those with recurrent growths, 62.5% reported fast growing lesions. Aggressive lesions extending into the anterior chamber and fornices were noted in 11 (45.8%) patients with recurrent growths (figure 8). The high recurrence rate may be due to late presentation, poor surgical technique, exposure to solar...
radiation and lack of many of the adjunctive therapies. Cryotherapy and chemotherapy are likely to be found in advanced centres. Chemotherapy involves using a class of drugs called antimetabolites. They act by interfering with the enzymes involved in the intermediary metabolism of replicating cancer cells. An example is 5-Fluorouracil (5-FU) and mitomycin C. Application of mitomycin C to the tumour bed has been suggested to reduce recurrence. However, optimal regime is yet to be established.

The clinical findings of the 70 patients studied did match the findings of other studies done in Congo, Australia and Mexico where it has generally been observed that bilateral involvement is rare. The lesions also tended to be more nasal, often arising from the limbus and were rare in the inferior fornix. On gross inspection, it was observed that the gelatinous and papillomatous lesions were more likely to be SCCC.

Evidence of local extension of the tumour was found in 40 patients (57%), with the cornea being most frequently involved (23 cases [30.7%]). Seven of the 23 patients with extension to the cornea, had necrotic tumours which had affected more than three quarters of the cornea. A third of the patients presented with fungating / necrotic tumours. It was this group of patients that also presented with ocular pain, a symptom that occurs in late disease.

Involvement of the regional lymph nodes was noted in very few patients. The regional lymph nodes in this case were the preauricular and submandibular (figure 12). However, this involvement was not confirmed with histology examination. Like in other studies, metastasis to regional lymph nodes is rare. Cervantes et al conducted a study in Mexico, out of the 287 cases, only 2 had regional lymph node involvement.

All the 70 patients were offered treatment, 46 (65.7%) had simple excision biopsy with application of 5-FU and 24 (34.3%) who had late disease had incision biopsy, and then underwent exenteration after histology results.
The histological pattern of SCCC in HIV-positive patients in this study was as follows: CIN was diagnosed in 14.3% of the patients while invasive carcinoma of the conjunctiva accounted for 84.3% of the cases. One rare histological variant of the carcinoma (spindle cell carcinoma) was found (figure 13).

The histological findings of this study are similar to those from other studies done in the SSA. 21,37

Since the effect, if any, of highly active antiretroviral therapy (HAART) and CD4+ count on this condition is not clearly known, an effort was made to establish an association if at all it exist. Forty (57.1%) patients were on HAART with an average duration of 10.3 months (table 4). The test of association between rate of growth and HAART showed no significant effect of the ART on the rate of growth. Of the 70 patients with SCCC, 17 (24.3%) developed the conjunctival growth while already on HAART (table 5).

The majority of patients were in the CD4+ count range of 101-200. the overall mean CD4+ count was 247.17, median 209 and the range was 10 – 620 (figure 14).The mean CD4+ count for fast growing tumours was 244 (± 23.3). The mean CD4+ count for slow growing tumours was 253 (± 33.8). There was no statistical significance between the rates of growth and mean CD4+ counts (table 6). It is evident from this study that SCCC can occur at even higher CD4+ count.

Guech-Ongey et al found that the calculated risk for SCCC was elevated regardless of HIV acquisition category. CD4+ lymphocyte count and time relative to AIDS-onset. 32

A case series study conducted by Padmamalini et al on 4 male patients from Jan 2004 to Feb 2007 with median age of 40.5 years (range 38 – 48 years), with HIV infection and ocular squamous cell carcinoma showed that OSSN is common in younger individuals in case of HIV infected individuals and bears no correlation with CD4 counts.36
In conclusion, SCCC is an important condition in HIV-positive patients because it is becoming more common as evidenced from the results of this study and other studies done in the region. It is common in the young, often affecting women and is more aggressive. It has become a highly significant and prevalent condition in HIV positive patients with conjunctival growths in Zambia. SCCC has the potential to cause disability and metastasis which eventually could lead to death.

The burden of SCCC is undoubtedly likely to increase further in those countries like Zambia with the most limited resources.

Cases of recurrences have also been noted to be high. Treated best if identified early. If late, it is associated with high recurrence and disability. Patients presenting with late disease, presents an emotionally difficult challenge for both the patient and surgeon.

The hope that many hold that increasing the availability of anti-retroviral drugs may reduce the incidence of SCCC lack evidence. Anti-retroviral drugs do not seem to alter the clinical course of the disease and SCCC bears no significant correlation with the CD4 counts. However, we are of the view that further studies be done to ascertain the effects of ART on the clinical course of SCCC.

Lastly, many Ophthalmologists in Africa; including the author of this study now consider SCCC in young adults to be a marker for HIV infection.
11.0 RECOMMENDATIONS

The results of this study present a high disease burden of SCCC for Zambia with a staggering 70% prevalence of SCCC in HIV-positive patients with suspicious conjunctival growths. The recommendations are therefore in 4-folds

1. To the policy makers; we recommend that SCCC be incorporated fully in the National HIV/AIDS programs. Early detection and treating SCCC should be part and parcel of HIV care. Untreated SCCC threatens vision and survival. Not paying attention to this disease may compromise the gains from other care availed to affected individuals.

2. We implore health personnel to offer HIV counseling and standard surgical services to all patients with suspicious conjunctival growth. Growths should be widely excised and material sent for histopathology to confirm diagnosis and clarity of excision margins. Then close follow-up to facilitate early detection of recurrences.

3. To the community; we recommend that people seek medical attention as soon as they notice a suspicious growth on the eye.

4. We also recommend that randomized controlled trials for treatment of this disease be conducted to provide evidence for the effective interventions for treating conjunctival squamous cell carcinoma.
12.0 APPENDICES

12.1 Appendix A: Map 1: Location of Lusaka and Kitwe.

Map 1: Location of Lusaka and Kitwe.

Map 2: Heterogeneity of HIV infection in Africa

The heterogeneity of HIV in Africa
12.2 Appendix B: Materials

The following materials and medical supplies will be used in the study:

Information sheet for patients

Questionnaire

Pens, pencils, rubbers, torches with batteries and spare bulbs

23 gauge needles

5ml syringes

Eye pads

EDTA bottles and plain bottles

5- Fluorouracil (50mg/ml)

Formalin specimen containers

Formalin 10% solution

Lidocaine 2%

Lidocaine 2% with epinephrine

Povidone Iodine 10% solution

Sterile gauze

Steroid antibiotics eye drops (Dexamethasone 0.1% and Gentamycin 0.3%)

Tetracaine 0.5%

Tetracycline eye ointment
12.3 Appendix C: Questionnaire

THE OCCURRENCE AND PATTERN OF SQUAMOUS CELL CARCINOMA OF CONJUNCTIVA IN HIV/AIDS PATIENTS WITH CONJUNCTIVAL GROWTHS SEEN AT TWO TERTIARY HOSPITALS IN ZAMBIA

PERSONAL DATA

1. Name:
2. Age:
3. Sex: male/ female
4. Marital status: Single/ Married/ Widow/ Divorced
5. File Number:
6. Tribe:

HISTORY

Complaints

8. Vision: Normal (6/6 - 6/18)/ Reduced (<6/18 - >3/60)/ Blind (<3/60)

History of Complaints

9. Duration of the symptoms and signs
10. Rate of growth of conjunctiva lesion: slow growing (>3 months)/ fast growing (<3 months)
11. Have you been treated for the same lesion before? Yes/ No. If No, go to question 14.
12. If yes, what was the treatment? Medical / Surgical.
13. If surgical, what was the Histopathological result of the initial biopsy?
14. Do you know your HIV status? Yes/ No
15. Would you like to be counseled and tested for HIV? Yes/ No
16. Are CD4 results available? Yes/ No.
17. If yes, a) what is latest the CD4 figure? (Within last 6 months)
   b) What has been the lowest CD4.

Associated History
20. Do you suffer from genital, anal, digital or ocular papilloma? Yes/ No.

Current treatment History
21. HAART. Yes/ No.
22 a) Duration on HAART.
   b) Regimen (drugs).

Current treatment History
23. Topical ocular treatment: Yes/ No.

Examination Finding:
24. Laterality of the lesion: Unilateral/ Bilateral.
25. Site of the lesion on the eye: Limbal/ Temporal/ Nasal/ Interpalpebral space/ Extending onto cornea/ Metastasis into anterior chamber/ extensive tumour
26. Characteristic features of the lesion:
Leukoplakic-Plaque/Papillomatous/ Gelatinous/Fungating or necrotic
Other features.................................................................
27. Number of conjunctival lesion: one/ two/ more than two
28. Palpable lymph nodes: Head/ Neck/ None
29. Photo-documentation done: Yes/ No. RE / LE Date..................
30. Histopathological result.................................................
Appendix D: Histology Laboratory Form

Name: .................................................. Age: ............. Sex: .............
File No: .................................................. Date: ..................
Brief history and examination: .....................................................................

Diagnosis: ...........................................................................................................

Specimen: ...........................................................................................................

Examination required: .....................................................................................

(Report whether dysplasia, Carcinoma in-situ, well differentiated, moderately
differentiated, poorly differentiated or any other finding)

Requesting Doctor ........................................ Signature: ..........................

Histopathology Report

I. Gross Appearance: .....................................................................................

II. Microscopic Appearance: ..........................................................................

Comment/conclusion: ..................................................................................

Reporting Histopathologist ................................................ Signature: .............

Date: ........................................
12.5 Appendix E: Information Sheet

(This shall be maintained in English it being the official language. It will be read out and explained to all participants)

Title of study: The Occurrence and Pattern of Squamous Cell Carcinoma of Conjunctiva in HIV/AIDS patients with conjunctival growths seen at two Tertiary Hospitals in Zambia

Principal Investigator: Dr Liche Fatson
BSc (HB), MB Ch B (UNZA), M Med Ophthalmology student, University of Nairobi

Introduction

We are inviting you to participate in this study. The purpose of this study is to determine the magnitude and pattern of cancer of conjunctiva in HIV/AIDS patients with a suspicious growth on the eye.

Explanation of procedure

If you choose to participate in this study, you will be thoroughly examined, assessed and counseled for operation to remove the growth. If you do not know your HIV status but present with a suspicious growth on the eye you will be asked to go for VCT where counseling will be done by a qualified counselor. Only those whose status is HIV positive will participate in the study. Those participating will also be asked for their lowest and current (done in the last 6 months) CD4+ count. Photo-documentation of the eye growth will be done to your approval. Only photographs of the affected eye will be taken, and not the whole face. The growth will be operated under recommended procedure. The removed growth will be sent to the laboratory to confirm whether it is cancer or not.
Risks and discomforts

In a willing and cooperative participant, there should not be any risks or discomfort from this operation. A small amount of pain which only lasts a few seconds may occur when injecting medicine which removes the pain during operation. Although remote, possible risks include injury to the eyeball if participant moves suddenly while cutting off the growth with the blade or scissors. Therefore, all participants will need to remain still and cooperative during the operation. Sight will be lost where the eye with big growth is removed.

Benefits

The benefits will be removal of the growth which will relieve you of the foreign body sensation and improve the cosmetic appearance of your eye. You will also be making a major contribution to the information on this cancer in HIV/AIDS patients.

Confidentiality

All information gathered from the study and your identity will remain confidential throughout the process. The results may be published for planning and awareness to others.
Withdrawal without Prejudice

Participation in this study is voluntary; refusal to participate will involve no penalty as standard treatment i.e. surgical removal and histological examination of the specimen will still be offered to you. You are free to withdraw consent and discontinue participation in this project at any time without prejudice from this institution. Treatment will continue or still be given to you, should you wish to discontinue participation.

Costs and/or Payments to Subject for Participation in Research

Participants will not be paid to participate in this research project.

Questions

If you have any problems or questions about this study, about your rights as a participant, or about any research-related injury, contact the Principal Investigator of this study Dr Liche Fatson on telephone number +260976443900. Email: lifa25@yahoo.com

The Chairman of the Research and Ethics Committee: P.O. Box 50110, Lusaka Telephone number: 256067.

Thank you for your time.

Signature:........................................................................................................

Your full address:........................................................................................................

.......................................................... .............................................................

Tel:........................................................................................................
Consent/Agreement

Your signature on this form means that you understand the information presented, and that you want to participate in the study. You understand that participation is voluntary, and you may withdraw from the study at any time.

- I have read the information sheet concerning this study, (or have understood the verbal explanation).
- My questions have been answered by Dr Liche Fatson.
- I understand that at any time I may withdraw from this study without giving a reason and without it affecting my normal care and management.
- I agree to take part in this study.

Signature of Participant ................................................ Date: ....................

Or Thumb Print:

Name of Participant (printed) .............................................................................

Signature of Witness..................................................... Date: ....................

Signature of Researcher..................................................... Date: ..................

If you have any problems or further questions about this study, about your rights as a participant, or about any research-related injury, contact:

The Chairman of the UNZA-Research and Ethics Committee: P.O. Box 50110, Lusaka. Telephone number: 256067. Or

The Principal Investigator, Dr Liche Fatson on telephone number +260976443900.
12.6 Appendix F: Photographs

Photograph No.1

This 42 years old male patient presented with a rapidly growing conjunctival growth with duration of 2 months. It was gelatinous, grayish white and highly vascularised. Patient had been HAART for 13 months and his current CD4+ count was 80 cells/μl. Histology results showed moderately differentiated CSCC.

Photograph No.2

This was a 33 years old patient who presented with a 12 months history of a slow growing conjunctival growth on the left eye. It was gelatinous, whitish plaque covering the cornea and involving the upper fornix. Patient had been on HAART for 12 months and current CD4+ count was 50 cells/μl. Histology results were poorly differentiated CSCC.
A 33 year old female patient presented with a 24 months history of a grayish white nodule with feeder vessels on the nasal conjunctiva. She also had genital papilloma. Her CD4+ count was 620 cells/μl. Histology results confirmed CSCC.

A 42 year old male patient presented with a fungating tumour on the right orbit. It started as a conjunctival growth 12 months back. At presentation, he did not know his HIV status. Was found HIV positive on testing and his CD4+ count was 543 cells/μl. Histology results showed invasive well differentiated SCC.
A 50 year old male patient presented with a papillomatous conjunctival growth of 6 months duration. Histology results showed poorly differentiated

A 35 year old female patient presented with a fast growing conjunctival mass of 2 months duration. The mass was involving the cornea and had a fleshy, pink papillomatous appearance with areas of leukoplakia. She was on HAART for 2 months. Histology results showed moderately differentiated keratinizing SCC.

Note: All photos taken with consent by Dr Liche Fatson.


Shields JA, Shields C. Eyelid and Conjunctival Tumour. 1999; 227-241


38 Sophie Barton-Knott
