

# Clinical presentation of head and neck skin malignancies among albinos and value of basic surgical intervention

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Received: 28 February 2015 / Accepted: 10 June 2015 / Published online: 3 July 2015  
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## Abstract

**Background** Radiation from sunlight may play a role in the clinical presentation of head and neck skin cancers in albinos. This study assesses the clinical presentation of such cancers and outcome of basic surgical treatment without primary repair of resulting defects.

**Methods** An analysis of sites from head and neck affected by cancers using traditional anatomical landmarks was carried out. The frequency of involvement of each division in malignant skin changes was also documented and compared.

**Results** The eyes were not involved with any malignancy. With the head and neck region partitioned by a transverse line using the lateral canthus of the eye as landmark, the superior portion was found to be involved in 209 lesions, all (100 %) of which were successfully treated. The inferior portion had 119 but enjoyed 92.4 % success rate. With the head and neck region partitioned in the coronal plane using the lateral canthus of the eye as landmark, the posterior portion was involved in 282 lesions, of which 273 (96.8 %) were successfully

treated. The anterior portion was involved in 46 lesions, all (100 %) of which were successfully treated.

**Conclusions** Hair appears to protect the skin beneath it from actinic damage and cancers among albinos. Failed treatment was recorded only among lesions on the cheek and neck.

Level of evidence: Level IV, risk / prognostic study.

**Keywords** Malignancies · Albino · Surgery · Cutaneous · Head · Neck

## Introduction

The incidence of head and neck skin cancers is high among albinos [1, 2]. Their skin lacks the pigment melanin which confers protection against carcinogenic rays from the environment. Ultraviolet radiation from sunlight is the major aetiological factor [3]. Some parts of the head and neck may be more involved in the resultant malignant changes than others. The clinical presentation of these malignancies needs to be documented. Albinism and sunlight affect African countries more than others [4]. Basic surgery is often the only modality of treatment available to patients afflicted with head and neck cancer in these low-income countries. Under such conditions, it has been suggested that defects resulting from wide excision of skin cancer lesions should not be repaired immediately, but be allowed to granulate; skin grafting may be done only after a negative biopsy result for cancer is obtained from the granulation tissue [5].

This study analyzes the clinical presentation of head and neck skin cancers in albinos and outcome of basic surgical treatment without primary repair of resulting defects.

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**Fig. 1** Shows division of the head and neck by *horizontal and vertical lines* with the lateral of the eye as center point

## Methods and patients

This prospective study was carried out using data obtained from consecutive patients managed at the maxillofacial surgery unit and ophthalmology department of National Hospital

Abuja between August 2007 and July 2013, following approval by Hospital Ethical Committee. All head and neck skin cancer cases judged to be amenable to surgical treatment only were documented. Patients for whom other cancer treatment modalities were indicated were excluded. Inoperable cases were also excluded.

An analysis of sites affected by cancers using traditional anatomical landmarks, such as the eyes and eye lids, forehead, nose, lips, ears, nose, cheek, scalp, and neck, was done.

In another analysis, the head and neck were divided into quadrants bilaterally with the lateral canthus of the eye as center point, and the head abducted to the contralateral side so that the vertical line drawn through the lateral canthus bisects the sternum as shown in Fig. 1. The horizontal line is the extension of one that joins the lateral canthus to the most superior point of attachment of the pinna to the skull. The frequency of involvement of each quadrant in skin cancer was documented and compared.

The head and neck region was again partitioned into two divisions in each of three planes of space (transverse, coronal, and sagittal) using the lateral canthus of the eye as landmark for division.

**Table 1** Distribution of albino skin cancer lesions in the head and neck region

		Treatment		Total
		Successful (no, %)	Failed (no, %)	
Gender	Male	30 90.9 %	3 9.1 %	33
	Female	27 90 %	3 10.0 %	30
ANATOMIC DIVISION		SITE OF LESION		
Transverse	Superior	209 100 %	0 0 %	209
	Inferior	110 92.4 %	9 7.6 %	119
Coronal	Posterior	273 96.8 %	9 3.2 %	282
	Anterior	46 100 %	0 0 %	46
Sagittal	Lateral	251 96.5 %	9 3.5 %	260
	Medial	68 100 %	0 0 %	68
Quadrants	Upper lateral	155 100 %	0 0 %	155
	Upper medial	54 100 %	0 0 %	54
	Lower lateral	96 91.4 %	9 8.6 %	105
	Lower medial	14 100 %	0 0 %	14
Scalp		2 100 %	0 0 %	2
Forehead		31 100 %	0 0 %	31
Temple		124 100 %	0 0 %	124
Eyes		0 (Not Applicable)	0 (Not Applicable)	0
Eye Lids	Upper	6 100 %	0 0 %	6
	Lower	1 100 %	0 0 %	1
Ear (pinna)		57 100 %	0 0 %	57
Nose		2 100 %	0 0 %	2
Lips	Upper	5 100 %	0 0 %	5
	Lower	1 100 %	0 0 %	1
Cheeks		64 90.1 %	7 9.9 %	71
Neck		26 92.9 %	2 7.1 %	28



**Fig. 2** Same patient shown in Fig. 1 before surgery

The frequency of involvement of each division in malignant skin changes was similarly documented and compared.

All lesions were excised along with a margin of 1 cm of normal tissue and allowed to granulate. Biopsy of granulation tissue was done 1–2 weeks following excision. Further excision was carried out when a cancer-positive result was obtained. Split skin graft was done only after a negative biopsy result for cancer was obtained from the granulation tissue. No other modality of cancer treatment apart from basic surgery was carried out.

Outcome of treatment was classified as successful when patient remained cancer-free for 12 months after discharge. Data was summarized using numbers and percentage of values obtained.



**Fig. 3** Actinic damage of the skin of pinna. Note older and larger cancerous lesion on temple and a subsequent one on the skin over zygomatic arch



**Fig. 4** Forehead, cheek, and neck lesions in female with low-cropped hair. Note actinic keratosis on upper pole of pinna

## Results

Sixty-three patients with 328 lesions were included in the study. The average number of lesions per patient was 5.2. Thirty-three males with a mean age of 38.9 years and 30 females with a mean age of 35.6 years were included. Thirty (90.9 %) males and 27(90.0 %) females were successfully treated.

When the head and neck region was partitioned by a transverse line, the superior portion was found to be involved in 209 lesions which were all (100 %) successfully treated. The inferior portion was involved in 119 lesions, out of which 110 (92.4 %) were successfully treated.

When the head and neck region was partitioned in the coronal plane, the posterior portion was found to be involved in 282 lesions, of which 273 (96.8 %) were successfully treated. The anterior portion was involved in 46 lesions, all of which were successfully treated.



**Fig. 5** Forehead and cheek lesions without scalp involvement. Note actinic keratosis of the skin of pinna



**Fig. 6** Temple lesion before treatment (a), granulation of postexcision site 2 weeks later ready for split thickness skin graft (b), and successfully treated patient 19-month posttreatment (c)

When the head and neck region was partitioned in the sagittal plane, the lateral portion was found to be involved in 260 lesions, of which 251 (96.5 %) were successfully treated. The medial portion was involved in 68 lesions, all (100 %) of which were successfully treated.

When the head and neck region was divided into quadrants, the upper lateral quadrant was involved in 155 lesions which were all successfully treated. The upper medial quadrant was involved in 54 lesions which were all successfully treated. The lower lateral quadrant was involved in 105 lesions, of which 96 (91.4 %) were successfully treated. The lower medial quadrant was involved in 14 lesions which were all successfully treated. The scalp, forehead, and temple, respectively, had 2, 31, and 124 lesions that were all treated successfully.

The ear, nose, and lower and upper lips, respectively, had 57, 2, 1, and 5 lesions that were all treated successfully. Forty-six (80.7 %) out of 57 lesions which affected the ear were located at the upper pole of the pinna. All of 1 lower and 6 upper eye lid lesions were treated successfully. Twenty-six (92.9 %) out of 28 neck lesions were successfully treated. Sixty-four (90.1 %) out of 71 cheek lesions were successfully treated as shown on Table 1.



**Fig. 7** Upper cheek lesion. Note previously excised forehead lesion

The eyes were not found to be involved with any malignancy.

## Discussion

Our study shows a male to female ratio of 1.1:1 and a mean age of 38.9 years for males and 35.6 years for females.

The majority of albinos had malignant skin lesions superior to and lateral to the eye. It is not known why this is so; it may possibly be due to flexion or abduction of the head when confronted by sunlight. When the head and neck region was assessed according to its traditional component parts, the globe of the eye was found not to be involved in any malignant changes in spite of its components lacking melanin. The upper eye lids were involved with cancers 6 times more frequently than the lower. It may be deduced that apart from the upper being closer to the sun, the lower is kept further away



**Fig. 8** Familiar distribution of skin cancer lesions



**Fig. 9** Temple lesion in female patient

from sunlight when the head is flexed and may also enjoy further protection, being under the shadow of eye lashes. Hair appears to protect the skin beneath it from the effects of sunlight. Hair-bearing portions of the head were found to be seldom involved in skin cancers as seen in Figs. 2, 3, 4, 5, 6, 7, 8, 9, and 10.

The scalp was involved in 2 malignant lesions while the normally hairless forehead and temple were involved in 31 and 124, respectively.

Lesions that had eroded but not perforated the cranium were excised while the bone of the cranium was cauterized. The dead bone subsequently flaked away as shown in Fig. 10 and was physiologically replaced as healing took place.

The upper pole of the ear (pinna) was often involved in primary malignancies. This was common in men. It was rarely involved in primary malignancies among women who wear long hair covering the ear. This part of the pinna is projected toward sunlight.

The upper lip was 5 times more involved in malignancies than the lower. This is a reversal of the tendency known to occur in normal-pigmented persons. This may be explained by



**Fig. 10** Successfully treated temple lesion. Note new lesion on cheek 29 months after first discharge



**Fig. 11** Cauterized bone flaking-off scalp during healing

the fact that the lower lip enjoys better protection from the sun's rays when the head is flexed while avoiding sunlight.

The hairless part of the upper neck inferior to the mastoid was found to be frequently involved in cancer as shown in Figs. 11, 12, 13, and 14. Treatment failures were recorded only among lesions of the neck and cheek (Fig. 12).

When the head and neck region was divided into quadrants with the lateral canthus of the eye as center point, the skin of the lower medial part was found to be by far the least frequently involved in malignancy. This was followed by the upper medial, and then the lower lateral quadrant. The upper lateral quadrant was the most affected. Lesions affecting the lower lateral quadrant were the only ones involved in treatment failure. Those affecting the other quadrants were all successfully treated. This may be attributed to the more complex anatomy of the structures in the lower lateral quadrant, which contains much fewer ossified tissues. Periosteum is known to resist spread of cancer cells [6].

The area superior to a horizontal line passing through both lateral canthi in the axial (transverse) plane was involved in 209 lesions despite having a lower surface area, while the inferior had 119. It was the rule that when a lesion was found



**Fig. 12** Female patient with upper neck lesion and actinic keratosis of the skin of pinna. She habitually wore short hair



**Fig. 13** Male patient with similar distribution of lesion as in Fig. 11

in the inferior area, an earlier cancerous lesion was found in the superior or would have been treated earlier.

The area lateral to a vertical line drawn in the sagittal plane and passing through the lateral canthus of the eye was involved in 260 malignant skin changes, while the medial area had 68. This is in spite of the lateral area having less skin tissue by surface area.

The area posterior to a vertical line dropped from the lateral canthus of the eye in the coronal plane, which has been shown in our study to be more often involved in primary malignancies than the area anterior to it. The posterior area was involved in 282 lesions while the anterior had 46. This is in spite of the fact that much of the posterior area is usually covered by the hair, which appears to protect the skin from actinic damage.

A study of clinical presentation and outcome of treatment of cancer may enable better focused preventive and curative measures against it. This study has the potential to offer



**Fig. 14** Successfully treated patient shown in Fig. 8

direction to policy makers on surgical protocol for squamous cell carcinoma in low-income countries. The cheek and neck were the parts involved in failed surgical treatment: This may serve as a prognostic index.

In conclusion, the hair appears to protect the skin beneath it from actinic damage and cancers among albinos. Also, wide surgical excision without primary repair of surgical defect appears very successful in curtailment of sequelae of skin cancer, although lesions on the cheek and neck have been shown to have a failure rate approaching 10 %. The findings of this study suggest that albinos should keep as much hair as possible and wear it long to cover as much of the exposed head and neck region as possible in order to benefit from its apparent protection from the effects of sunlight on the skin. Further studies to evaluate the effects of the suggestions made and conclusions reached above are called for.

**Acknowledgments** We are indebted to Dr. Godwin Biachi, and Dr. Amos Vaachia, Dr. Sadiya Nuru Yakubu, and Dr. Chijioke Emedike for their clinical assistance.

**Conflict of interest** Bayo Aluko-Olokun, Ademola Abayomi Olaitan, Regina Enubi Morgan, Oluseun Abidemi Aluko-Olokun, Chinwe Kenechukwu Umerah, Oluwaseyi Ibukun-Obaro, Funmilola Seun Adenaike, Uchechukwu Nneka Shagaya, Tosin Olayemi Babarinde declare that they have no conflict of interest.

**Patient consent** Consent for inclusion in this study was given by all patients. Further written informed consent was obtained for the use of images of patients in this article.

**Ethical standards** This study has been carried out with approval from ethical committee of National Hospital Abuja in accordance with the ethical standards set forth in the 1964 Declaration of Helsinki and its later amendments. However, for this retrospective study a formal consent is not required.

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