

## Dermatological malignancies at a University Teaching Hospital in north-western Tanzania: a retrospective review of 154 cases

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**Abstract:** Dermatological malignancies are among the most common form of cancers and the global incidence has been increasing at an alarming rate. A retrospective study was conducted to determine the prevalence, histopathological pattern, anatomical distribution and treatment outcome of dermatological malignancies at Bugando Medical Centre in North-western Tanzania. Data were collected from patients' files kept in the Medical record department; the surgical wards, operating theatre and histopathology laboratory and analyzed using Statistical package for social sciences system. A total of 154 patients with a histopathological diagnosis of dermatological malignancy were studied. Generally, males outnumbered females by a ratio of 1.4:1. The majority of patients were in the 5th and 6th decades of life. Malignant melanoma was the most common dermatological malignancy (67.5%) followed by Kaposi's sarcoma (10.4%), Squamous cell carcinoma (8.4%) and Basal cell carcinoma (7.8%). The lower limbs were the most frequent site accounting for 55.8%. Wide local excision was the most common surgical procedure performed in 79.2% of cases. Post-operative wound infection was the most common complication in 58.3% of patients. Mortality rate was 3.8%. Dermatological malignancies are more prevalent in our setting. A high index of suspicion is needed to avoid labelling malignancies "chronic ulcers" and all suspected lesions should be biopsed.

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**Keywords:** cancer, dermatological malignancies, prevalence, histopathology, treatment outcome, Tanzania.

### Introduction

Dermatological malignancies are among the most common form of cancers and the global incidence has been increasing at an alarming rate (Diepgen & Mahler, 2002). They are more common in western countries than in developing countries (Marks, 1995). In the United States, more than 1 million new cases of dermatological malignancies are reported each year (Ochicha *et al.*, 2004). The incidence of dermatological malignancies has been reported to be higher in white-skinned populations than in dark-skinned individuals of African descent (Marks, 1995; Boni *et al.*, 2002; Diepgen & Mahler, 2002; Ochicha *et al.*, 2004). The major reason for this racial difference in the distribution of dermatological malignancies is the protection from ultra violet radiation provided by melanin in the darker pigmented races (Koh, 1991; Boni *et al.*, 2002; Diepgen & Mahler, 2002; Ochicha *et al.*, 2004).

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Various reports from the literature show wide variations in the prevalence and histological types of dermatological malignancies (Urbach, 1991; Amir *et al.*, 1992; Yakubu & Mabogunje, 1995; Adayi & Banjo, 1996; Mandong *et al.*, 2000; Mann & Russel, 2002; Ochicha *et al.*, 2004). While Basal cell carcinoma is undisputedly the commonest dermatological malignancy among Caucasians in Europe, North America and Australia (Urbach, 1991; Mann & Russel, 2002), several studies in Africa reveal a preponderance of squamous cell carcinoma (Amir *et al.*, 1992; Yakubu & Mabogunje, 1995; Adayi & Banjo, 1996; Mandong *et al.*, 2000; Diepgen & Mahler, 2002). Even among Africans there are significant differences in the pattern of skin cancer. Plantar melanomas are quite common in sub-Saharan Africa but much less common among African-Americans (Koh, 1991; Ochicha *et al.*, 2004). Previous studies from Tanzania reported Kaposi's sarcoma as the second commonest dermatological malignancy (Amir *et al.*, 1992) whereas Nigerian studies revealed melanomas as more common in Nigeria (Yakubu & Mabogunje, 1995; Adayi & Banjo, 1996; Mandong *et al.*, 2000; Nggada *et al.*, 2003).

Sun exposure is the major etiological factor for skin malignancies in whites, whereas the non-solar factors such as chronic ulceration, inflammation and burn scars appear to be the leading risk factors in blacks (Amir *et al.*, 1992; Yakubu & Mabogunje, 1995). Albinism is a risk factor for skin cancer and squamous cell carcinoma and basal cell carcinoma are the most common dermatological malignancy among African albinos (Kromberg *et al.*, 1989, Yakubu & Mabogunje, 1993). More recently immunodeficiency states such as AIDS have also been reported to have direct association with some types of cutaneous malignancies (Samaila & Adewuyi, 2005).

In spite of being a surface malignancy and more amenable not only to early detection, but also to a potential cure, the outcome of treatment in most developing countries including Tanzania has been poor because the majority of these patients present late to the hospital with advanced stage. This is partly due to paucity of local data regarding this condition and lack of community awareness on the importance of early reporting to hospital for early diagnosis and treatment. This study was therefore, conducted to determine the prevalence, histopathological pattern, anatomical distribution and treatment outcome of dermatological malignancies in our local setting and compare with what is documented in literature.

## **Materials and Methods**

### ***Study design and setting***

This was a descriptive retrospective study of histopathologically confirmed cases of dermatological malignancies seen at the department of Surgery of Bugando Medical Centre (BMC) over a period of 3-years between July 2007 and June 2010. BMC is a consultant, tertiary care and teaching hospital for the Catholic University of Health and Allied Sciences- Bugando and has a bed capacity of 1000. The study included all histopathologically confirmed cases of dermatological malignancies seen at BMC during the period studied. Patients with incomplete data were excluded from the study.

### ***Data collection and analysis***

The details of patients were collected from patients' files kept in the Medical record department, the surgical wards, operating theatre and histopathology laboratory. Information was collected using preformed questionnaire. Data included in the questionnaire were demographic data, histological types, anatomical site, treatment modalities, management complications, length of hospital stay and mortality. Data were analyzed using SPSS computer software version 15.

### *Ethical consideration*

Ethical approval to conduct the study was obtained from the WBUCHS/BMC Joint Institutional Ethic Review Committee before the commencement of the study.

### **Results**

During the studied period, total of 1203 malignancies were registered. Of these, 154(12.8%) were dermatological malignancies which formed the study population. 146 (94.8%) were blacks and 8 (5.2%) were albinos, all of them were of African heritage. Males were 89 (57.8%) and females were 65 (42.2%). The male to female ratio was 1.4:1. Their ages ranged from 10 to 98 years (mean  $54.5 \pm 17.65$  years). The modal age group was 51-60 years. The duration of illness ranged from 2 to 60 months (mean  $24.16 \pm 12.14$ ) and the majority of patients, 110(71.4%) presented between 2 and 24 months of onset of illness. 114(74.0%) of patients had undergone some form of intervention in peripheral dispensaries and hospitals before being referred, with dressing and inadequate surgical resection being the most common intervention.

The most common dermatological malignancy was malignant melanoma (MM) which afflicted 104 (67.5%) patients. Of these, 39 (37.5%) were nodular malignant melanoma, 29 (27.9%) superficial spreading malignant melanoma, 9 (8.1%) amelanotic malignant melanoma, 4(3.8%) lentigo maligna melanoma and 1(1.0%) each were acral lentiginous malignant melanoma, and metastatic malignant melanoma respectively. The histopathological types of malignant melanoma were not documented in 21 (20.2%) of cases. Regarding histopathological grading, 29 (27.9%) patients had Clark's grade III, 28(26.9%) patients had Clark's grade V and 18 (17.3%) had Clark's grade IV. Clark's grade was not documented in 29(27.9%) of cases. Kaposi's sarcoma, which ranked as the second most common dermatological malignancy affected 16 (10.4%) patients. Of these, 11 (68.8%) were HIV positive.

Squamous cell carcinoma (SCC) ranked third at 8.4 percent of cases. Of these, 9 (69.2%) occurred secondary to chronic ulcers (6 patients) and burn scars (3 patients) and in the remaining 3 patients (including 1 albino and 2 patients, 1 each with genital and perineal tumours) the tumour did not arise from any previous lesion. Six (46.2%) of SCC were poorly differentiated, four (30.8%) were well differentiated and three (23.1%) were moderately differentiated. Basal cell carcinoma (BCC) comprised 12(7.8%) patients and ranked fourth. Of these, 7(58.3%) were albinos and 5 (41.7%) blacks. Other rare dermatological malignancies accounted for 9 (5.8%) of cases and included neurofibrosarcoma in 3 (33.3%), malignant schwannoma, liposarcoma and fibrosarcoma in 2 (22.2%) patients each respectively (Table 1).

**Table 1: Histopathological types of various dermatological malignancies**

Histopathological type	Sex		Total N/%
	Males N/%	Females N/%	
Malignant melanoma	51(33.1)	53(34.4)	104(67.5)
Kaposi's sarcoma	10(6.5)	6(3.9)	16 (10.4)
Squamous cell carcinoma	12(7.8)	1(0.6)	13(8.4)
Basal cell carcinoma	8(5.2)	4(2.6)	12(7.8)
Others	8(5.2)	1(0.6)	9(5.8)
Neurofibrosarcoma	3(33.3)	–	3(33.3)
Malignant schwannoma	2(22.2)	–	2(22.2)
Liposarcoma	1(11.1)	1(11.1)	2(22.2)
Fibrosarcoma	2(22.2)	–	2(22.2)
Total	89(57.8)	65(42.2)	154(100)

The lower limb was the most common site found in 86 (55.8%) patients. The head and neck ranked second in 25 (16.2%) patients. Of the lower limb, the foot was commonly affected in 52 (60.5%) of cases, followed by the leg and thigh in 24(27.9%) and 10(11.6%) respectively. The scalp and the face were the most common sites affected in the head and neck accounting for 13(56.5%) and 8(34.8%) respectively. The lower limb was the most frequent site of MM, KS, and SCC in 66(42.9%), 11(7.1%) and 6(3.9%) patients respectively, whereas BCC was most common on the head and neck in 11(7.1%). Involvement of regional lymph node was recorded in 30(19.5%) patients (Table 2).

**Table 2: Anatomical distribution of lesions versus histopathological types**

Anatomical site	Histopathological types					Total
	MM	KS	SCC	BCC	Others	
Head / neck	10(6.5%)	–	2(1.3%)	11(7.1%)	2(1.3%)	25(16.2%)
Upper limbs	7(4.5%)	2(1.3%)	–	–	–	9(5.8%)
Trunk	3(1.9%)	2(1.3%)	2(1.3%)	–	4(2.6%)	11(7.1%)
Lower limbs	66(42.9%)	11(7.1%)	6(3.9%)	–	3(1.9%)	86(55.8%)
Anal/perineum	4(2.6%)	1(0.6%)	2(1.3%)	1(0.6%)	–	8(5.2%)
Inguinal	11(7.1%)	–	–	–	–	11(7.1%)
Genitalia	3(1.9%)	–	1(0.6%)	–	–	4(2.6%)
<b>Total</b>	<b>104(67.5%)</b>	<b>16(10.4%)</b>	<b>13(8.4%)</b>	<b>12(7.8%)</b>	<b>9(5.8%)</b>	<b>154(100%)</b>

**Key:** MM= malignant melanoma; KS= Kaposi's sarcoma; SCC= squamous cell carcinoma; BCC= basal cell carcinoma

Wide local excision and lymph nodal dissection were the most common surgical procedures performed in 79.2% and 18.2% respectively. Limb amputation was carried out in 13(8.4%) of cases. Other patients were treated with non-surgical treatment including anti-retroviral therapy in HIV positive patients and others were referred to Oncology department for possible cytotoxic chemotherapy and radiotherapy (Table 3).

### Type 3: Type of surgical procedures performed

Type of surgical procedure	Frequency	Percentage
<b>Wide local excision</b>	<b>122</b>	<b>79.3</b>
Simple	87	71.3
With skin grafting	20	16.4
With flaps	15	12.3
<b>Limb amputations</b>	<b>13</b>	<b>8.4</b>
Minor	6	46.2
Major	7	53.8
<b>Lymph node dissection</b>	<b>28</b>	<b>18.2</b>

A total of 48 post-operative complications were recorded in 33 (21.4%) patients. Of these, wound infection was the most common post-operative complication accounting for 58.3% of cases. Table 4 shows post-operative complications.

The majority of patients (79.2%; N=122) required hospitalization for their treatment and the remaining 32(20.8%) were treated as outpatients. The length of hospital stay for in-patients ranged from 5 to 18 days (mean 8.14 days). Six patients died in hospital giving a mortality rate of 3.8%. The commonest causes of deaths were advanced malignancy, complications of HIV/AIDS and sepsis. The immediate causes of death were not established.

**Table 4: Post-operative complications**

Complications	Frequency	Percentage
Wound infection	28	58.3
Loss of skin grafting	7	14.6
Flap necrosis	4	8.3
Recurrence	4	8.3
Stump dehiscence	2	4.2
Re-amputation	1	2.1
Total	48	100

## Discussion

Dermatological malignancies accounted for 12.8% of all histopathologically diagnosed malignancies seen during the studied period in our setting. This figure is comparable with other African studies (Yakubu & Mabogunje, 1995; Rafidandi, 1998; Ochicha *et al.*, 2004). The relative frequency of dermatological malignancies is much lower than in the Caucasians in Europe, North America, and Australia where skin cancer accounts for over half (>50%) of all malignancies especially among those living in sunny tropical/subtropical climates and the incidence continues to rise alarmingly (Diepgen & Mahler, 2002). Lower levels of protective cutaneous melanin in Caucasians render them more vulnerable to carcinogenesis from solar radiation (Marks, 1995).

Malignant melanoma was the most common histopathological type accounting for 67.5% of all dermatological malignancies. This finding is in contrast with other African studies

which report Squamous Cell Carcinoma as the commonest cutaneous malignancy (Amir *et al.*, 1992; Yakubu & Mabogunje, 1995; Adayi & Banjo, 1996; Mandong *et al.*, 2000; Diepgen & Mahler, 2002). While solar radiation has been suggested as a major cause of malignant melanoma among Caucasians, many of malignant melanoma among black Africans has been reported to be unrelated to solar exposure since they occur on the unexposed plantar of the foot (Oettle, 1966).

This plantar predilection of African melanomas has prompted speculation of trauma as an aetiological factor (Oettle, 1966; Lewis, 1967; Edington, 1979; Koh, 1991; Ochicha *et al.*, 2004). Higher incidence of malignant melanoma in our study may be attributed to repeated trauma and constant pressure on the weight bearing areas of the foot as shoe-wearing is less frequent among people especially those from rural areas. Oettle (1966) suggested that shoe wearing was accompanied by decrease in melanoma incidence. It is also possible the lesions may arise from melanotic naevus and hyperpigmented macules, common on the plantar surfaces in blacks. Pigmentation on the plantar surfaces has been studied in Ugandan Africans and found that grade III pigmentation (discrete small areas of pigmentation with clear cut margins which occur at about 18 to 20 years of age) was incriminated (Lewis, 1967). We could not establish the reason for the high incidence of high grade MM (Clark's III-V) in this study.

Kaposi Sarcoma (KS) was the second most prevalent skin malignancy in our locality comprising 10.4% of skin cancer. Similar finding was also reported in a previous study done in Dar es Salaam in which, it also ranked second after Squamous Cell Carcinoma (Amir *et al.*, 1992). Since the emergence of HIV infection, there has been a steady increase in the prevalence of KS worldwide (Mandong *et al.*, 2004). In Zimbabwe, there has been a significant rise in skin cancer due to increased number of HIV related Kaposi sarcoma (Watt *et al.*, 1997). The number of HIV related Kaposi sarcoma in our study was 68.8% and the disease has become a major cause of morbidity and mortality. Thus it is obvious that successful HIV control will go a long way to reduce the incidence of this vascular malignancy.

Squamous Cell Carcinoma (SCC) ranked third at 8.4% which is in contrast to a previous study in Tanzania and other African countries which reported SCC as the most common dermatological malignancy (Amir *et al.*, 1992; Yakubu & Mabogunje, 1995; Adayi & Banjo, 1996; Mandong *et al.*, 2000; Diepgen & Mahler, 2002). Numerous African studies reported SCC secondary to chronic ulcers as the major risk factor (Amir *et al.*, 1992, Mandong *et al.*, 2000). This contrasts with light-skinned people in whom sun exposure is the major etiological factor (Diepgen & Mahler, 2002). Its prevalence in the lower limbs is related to chronic lower limb ulcers in our population. Our findings are in agreement with reports from Nigeria and Tanzania (Amir *et al.*, 1992; Nggada *et al.*, 2003; Ochicha *et al.*, 2004; Samaila & Adewuyi, 2005). Chronic ulcers, if poorly managed as in our case, may undergo malignant transformation, hence the need for prompt and proper medical and surgical management of chronic ulcers.

Basal Cell Carcinoma (BCC) accounted for 7.8% of all dermatological malignancies which is in marked contrast to 70-80% in White population (Marks, 1995; Diepgen & Mahler, 2002; Ochicha *et al.*, 2004). BCC is uncommon in Africans because of the protective skin pigmentation from UV radiation (Feldman *et al.*, 2001; Maurice & Godwin, 2009). In this study, the majority of patients were albinos accounting for 58.3% of cases and the head was the most

frequent anatomical site affected. Similar anatomical site distribution was also reported in other studies (Feldman *et al.*, 2001; Samaila & Adewuyi, 2005; Asuquo *et al.*, 2007). The occurrence of these tumours in sun-exposed parts of the body suggests the role of solar radiation as a risk factor in skin cancer in albinos.

Surgery has been reported to be the mainstay of treatment of the majority of skin cancers (Deo *et al.*, 2005). Adequate surgical resection is most important to prevent local recurrence. Good results can be obtained with radical surgery and optimal surgical margins along with reconstructive procedure when needed. Regional lymph node dissection is also indicated in the presence of positive regional lymph node (Deo *et al.*, 2005). In this study, wide local excision and lymph nodal dissection were the most common surgical procedures performed in 79.2% and 18.2% respectively. Limb amputation was required in 8.4% of patients. The remaining patients were treated with non-surgical treatment including anti-retroviral therapy in HIV positive patients and others were referred to Cancer centre for possible cytotoxic chemotherapy and radiotherapy.

Radiotherapy can be used as primary mode of treatment for SCC and BCC located in areas such as the nose, lip, eyelid and canthus, where surgery is either technically difficult or likely to yield poor cosmesis palliation (Vora & Garner, 2004). Radiotherapy has a very limited role in malignant melanoma (Vora & Garner, 2004; Deo *et al.*, 2005). Adjuvant radiotherapy in skin cancers is indicated in patients with advanced lesions, positive margins, lymph node metastasis, metastases in melanoma and for palliation (Vora & Garner, 2004). In our study, patients who required adjuvant therapy were referred to Oncology department for either radiotherapy or cytotoxic chemotherapy.

This study has limitations that the true prevalence of this disease in our centre may be underestimated by the retrospective nature of the study

In conclusion, dermatological malignancies particularly malignant melanomas are more prevalent in our setting. Since chronic ulcers, burn scar, albinism, HIV infection and solar radiation have been reported in literature to be etiological factors for dermatological malignancies, surgeons should have a high index of suspicion in the management of chronic ulcers to avoid labelling "malignancies" as "chronic ulcers" and should remember to biopsy all suspected lesions.

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