

A clinicopathologico-epidemiological study of non-Melanoma malignant skin tumors of the scalp

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ABSTRACT

Background: The scalp is a specialized anatomic region, in which the tumors can be neglected by the patient, leading to a potential risk of delayed detection and late management.

Objective: To assess the morphological criteria and histologic distribution of non-melanoma malignant scalp tumors in Farwaniya region, Kuwait.

Patients and Methods: A total of 23 patients presented with scalp nodules or plaques and diagnosed pathologically as a malignant tumor were collected from Al-Farwaniya dermatology clinics -Kuwait through a period of 3 years duration (2004-2007).

Results: The clinical analysis revealed that male patients (14) constituted (60.86 %), while female patients (9) constituted (39.14%). The average age of patients was 54.6 ± 9.7 years for men and 57.1 ± 7.8 years for women. Kuwaiti patients constituted the vast majority of female patients (77.8%), while non-Kuwaiti patient constituted the majority of male patients (64.2%).

The majority of the scalp lesions (78.3%) were located on the vertex (43.5%) and frontal regions (34.8%). Nodular skin lesions were the classic presentation in 17 patients (73.9%), while ulcerative lesions were presented in 4 patients, and pigmented plaques in 2 patients.

The histological analysis revealed that 15 cases were basal cell carcinoma (56.5%), 4 cases of malignant adnexal tumors, 2 cases of squamous cell carcinoma, one case of malignant lymphoma, and one case of metastatic tumor.

Conclusion: Basal cell carcinoma is the most common non-melanoma malignant scalp tumor. Further multi center studies are recommended to clarify the exact demographic distribution of non- melanoma scalp tumors in Gulf region.

INTRODUCTION

The scalp is a specialized anatomic region, in which the highest density of pilosebaceous follicles is present and terminal hairs are concentrated.¹⁻² Malignant scalp tumors, when asymptomatic or small in size, may be covered by hairs and neglected by the patient, leading to a potential risk of delay in detection and resulting in a grave outcome.³⁻⁴ Malignant tumors occurring in the scalp are not common.⁵ Approximately 2% of all skin tumors occur on the scalp.⁶ Overall, squamous cell carcinomas (SCCs) are more common than basal cell

carcinomas (BCCs) in this anatomic region.⁷ Furthermore, only few English-language articles regarding the epidemiology and histology of scalp malignancies could be found in the literature.⁸⁻⁹

PATIENTS AND METHODS

A retrospective study was conducted using our computer database. The majority of patients were seen in the out patient dermatology clinics in Farwaniya region, Kuwait, while few patients were referred from the other departments in Farwaniya hospital.

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The case definition for this study was any primary or metastatic malignant tumor involving the skin and subcutaneous tissues of the scalp, with confirmed histopathological diagnosis, through the Year 2004-2007. Tumors diagnosed as reappearance of previously treated ones (recurrence or residuals) were excluded. We counted the number of patients rather than the number of cancers to assess the number of cases.

A detailed and systematic list of histologic types was designed according to the classification of Lever's Histopathology of the Skin.¹⁰

For each tumor, the following data were extracted using our computer database: age of the patient at the time of cancer diagnosis, sex, nationality, location of each lesion on the scalp, and the histopathologic diagnosis of the tumor.

Locations were designated as being located on the frontal, temporal, parietal, occipital, vertex, or hairline regions of the scalp. The histologic categories was designed according to the classification of Lever's Histopathology of the Skin, and consisted of a panel of malignant tumors from different tissue origins, including tumors of the epidermis, skin appendages (follicular, sebaceous, eccrine, and apocrine differentiation), fibrous tissue, fatty tissue, neural tissue, muscular tissue, osseous tissue, blood vessels, lymphomas and leukemia's, and metastatic tumors.

RESULTS

A total of 23 cases were collected during the period of Year 2004 to the Year 2007. Male patients (n=14) constituted the majority (60.9%), while female patients (n= 9) constituted (39.1%). The total

number of Kuwaiti patients was 16(8 males, and 8 females), while 7 patients were non-Kuwaiti (6 males and 1 females).

The average age of patients was 54.6 ± 9.7 for men and 57.1 ± 7.8 for women. There was no statistically significant difference between both the age groups. However, the peak age of male scalp tumors (46-48 y) was lower than the peak of female scalp tumors (51-53y)

The anatomic distribution of scalp tumors is depicted in table 1. The majority of the scalp lesions were located on the vertex (39.1%) and frontal regions (30.4%). Together these accounted for 69.5% of all tumors.

The histologic analysis of the tumors revealed that 15 cases (65.2%) were basal cell carcinomas, 4 cases (17.5%) were malignant appendage tumors, 2 cases (8.7%) were squamous cell carcinoma, one case (4.3%) was malignant lymphoma, and one case (4.3%) was metastatic tumor.

Regarding the sex distribution of the tumors affecting male patients, there were 10 BCC (43.5%), 2 SCC (8.7%), one malignant lymphoma (4.3%) and one appendage tumor (4.3%). Whereas in females, there were 5 BCC (21.7%), 3 appendageal tumors (13%), and one case of cutaneous metastasis (4.3%).

Overall, 73.9 % of cases (n=17) presented with nodular skin lesion, while 17.4% of cases (n=4) presented with ulcerative skin lesions, and only 2 cases (8.7%) presented with pigmented plaque.

Examining the sex ratio of each histologic type,

Table 1 Showing clinical characteristics of 23 patients diagnosed histologically with malignant scalp tumors

No.	Age	Sex	Nat.	Location	Clinical Presentation	Histologic diagnosis
1	62	M	K	Vertex	Nodular	BCC
2	48	M	K	Vertex	Nodular	M. Adnexal T.
3	59	M	NK	Frontal	Ulcer	SCC
4	53	F	K	Temporal	Nodular	BCC
5	48	M	K	Vertex	Nodular	BCC
6	59	F	K	Temporal	Ulcer	BCC
7	43	F	K	Vertex	Nodular	M. Adnexal T.
8	46	M	NK	Frontal	Ulcer	SCC
9	50	M	K	Parietal	Pigmented plaque	BCC
10	51	F	K	Vertex	Nodular	BCC
11	42	F	NK	Occipital	Nodular	Metastasis
12	60	M	K	Frontal	Nodular	M. Lymphoma
13	62	M	K	Vertex	Nodular	BCC
14	71	F	K	Frontal	Nodular	BCC
15	50	F	K	Vertex	Nodular	M. Adnexal T.
16	57	M	NK	Vertex	Nodular	BCC
17	46	M	NK	Parietal	Pigmented plaque	BCC
18	66	M	K	Frontal	Nodular	BCC
19	49	M	NK	Frontal	Nodular	BCC
20	52	M	K	Frontal	Ulcer	BCC
21	67	F	K	Parietal	Nodular	BCC
22	60	M	NK	Vertex	Nodular	BCC
23	39	F	K	Hair line	Nodular	M. Adnexal T.

there was an excess of male patients with basal cell carcinoma (males: females=2:1). On the other hand, malignant skin appendage tumors had female predominance (male: female=1:3). While squamous cell carcinoma and malignant lymphoma only presented in males, and skin metastasis only presented in females.

In the analysis of age at diagnosis, basal cell carcinoma (mean:56.9 years) and squamous cell carcinoma (mean:52.5 years) occurred in patients between the fifth and six decades, while malignant skin appendage tumors tended to occur in a younger age group (mean:45 years).

BCC was the most common non-melanoma ma-

lignant scalp tumor in our study. Out of the fifteen patients, there were 11 Kuwaiti patients (6 males and 5 females) and 4 non-Kuwaiti male patients. The mean age of BCC at the time of diagnosis was higher in female patients (60.2 years) than in male patients (55.2 years).

Regarding the location, 6 cases (40%) were located on the vertex, 4 cases (26.6%) on the frontal region, 3 cases (20%) on the parietal region, and 2 cases (13.4%) on the temporal region. The clinical presentation was commonly (n=11) nodular (73.4%), while there were 2(13.3%) cases who presented with ulcerative lesions, and other 2 cases (13.3%) presented with pigmented plaques.

The histologic analysis of BCCs revealed 5 cases with nodular type, 3 cases with adenoid type, 2 cases with micro-nodular type, 2 cases with superficial type, 2 cases with pigmented type and one case on top of nevus sebaceous.

DISCUSSION

Overall, 5.7% of all tumors we treated were located on the scalp. This value is higher than reported in other studies, presumably because of the referral nature of our practice. There was a 3:1 male to female ratio among scalp tumors. In women, the vast majority of scalp tumors were BCCs, whereas in men SCCs outnumbered BCCs. In fact, our data probably provides an underestimate of the number of SCCs in the scalp of men, as elderly alopecic men with numerous SCCs on the scalp are often managed using non-surgical techniques. As women retain their hairline, the numerous actinic keratoses and squamous cell carcinomas seen in the scalp of some men is not encountered in women.¹¹

The areas of highest incidence of skin cancer of the scalp in women were the vertex (34%) and the frontal regions (33%). These are the regions of the scalp most liable to sun exposure in everyday situations. Young women also often part their hair in the frontal region exposing this portion of their scalps to ultraviolet radiation. Moreover, the vertex of the scalp has natural whorled-patterns of hair, creating potential gaps that allow ultraviolet exposure of the scalp. However, although we did not address any potential history of sunburns of the scalp, we presume that this would be a rare occurrence in the female scalp. We assume that the low incidence of tumors at the hairline is caused by classification of most of these tumors as be-

ing located on either the forehead or temple in our database.¹²

There is an exponential growth in the number of skin cancers in men and women as a function of age up to the eighth decade of life seen in our practice. Thereafter, the numbers drop sharply because of decreased numbers of patients above age 80 in the general population as well as possibly less aggressive management of skin cancers in these patients because of medical comorbidities. The bimodal distribution of female scalp tumors as a function of age and the fact that 28% of these tumors occurred in patients under the age of 50 years, raises the possibility that some of these tumors may not be entirely solar-induced.

In a series of BCCs in children, 23% of tumors were located on the scalp. This indicates a disproportionately high incidence of scalp tumors in children with skin cancer, a population whose tumors are likely not caused by chronic sun exposure.¹³

Other factors such as possible underlying clinically occult sebaceous nevi or previous exposure to ionizing radiation may contribute to these tumors.¹⁴

In summary, women appear less likely than men to develop cutaneous malignancies on the scalp. The vast majority of tumors on the scalp of women are basal cell carcinomas. The bimodal age distribution suggests that for basal cell carcinomas of the scalp, particularly those in younger patients, chronic ultraviolet exposure may play a lesser carcinogenic role.¹¹

Significantly, undetermined primary tumor accounted for about one third of all metastatic scalp tumors in our study, indicating the underlying primary tumor might be poorly differentiated and highly malignant, and that there was no known internal primary tumor when scalp biopsy was performed. Therefore, a diagnosis of carcinoma arising from the internal organs may have been first established by recognition of the cutaneous metastasis of the scalp. Scalp metastases as the initial manifestation of internal malignancies have been reported in lung adenocarcinoma, colorectal cancer, follicular carcinoma of the thyroid gland, renal carcinoma, pancreatic cancer, carcinoma of the gallbladder, carcinoid tumor of the larynx, and malignant fibrous histiocytoma of the retroperitoneum.¹⁵⁻¹⁸

Basal and squamous cell carcinomas, angiosarcoma, and dermatofibrosarcoma protuberans can have aggressive and destructive behaviors; invade beyond the periosteum, skull bone, dura, and even brain; and result in profound morbidity and mortality.¹⁹⁻²¹

CONCLUSION

Basal cell carcinoma is the most common non-melanoma malignant scalp tumor. Further multi center studies are recommended to clarify the exact demographic distribution of non-melanoma scalp tumors in Gulf region. As patient's themselves cannot examine their scalp well. All physicians, irrespective of specialty should perform the complete scalp inspection and palpation in general physical examination for either skin or internal cancers. Although malignant scalp tumors are not common, when facing a patient with scalp lesions or lumps, physicians should be alert in detecting

any suggestive new growth hidden in this hairy area to make an early diagnosis and perhaps to detect an internal malignancy at an earlier stage. In doing so, carcinoma staging and management may be limited to the initial stages in patients.

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