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Original Article

Histopathological Evaluation of Skin Neoplasms

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ABSTRACT

Introduction: Skin tumor incidence has increased over the last several decades. A wide range of tumors are encountered in clinical practice. Accurate identification of skin lesions is vital in ensuring malignancies are not missed and that they are treated early to avoid morbidity and mortality.

Materials and Methods: A retrospective cross sectional hospital based study on a series of cases was performed in the Department of Pathology, Patan Academy of Health Sciences, Patan Hospital, Lalitpur, Nepal from April 2011 to March 2016. Data from the histopathology database were analyzed using SPSS version 16.0.

Results: During the study period, 410 skin biopsies were received, of which 214 (52.2%) were skin neoplasms. Among them, 175 (81.8%) were benign and 39 (18.2%) were malignant neoplasms. Incidence of keratinocytic tumors was highest followed by soft tissue tumors and melanocytic tumors. Intradermal nevus was the most common benign neoplasm. Among the malignant neoplasms, squamous cell carcinoma was most prevalent (46.1%) followed by basal cell carcinoma (15.3%). Skin neoplasms were present in all age groups with maximum number of benign neoplasms prevalent in 21-30 years and malignant in 51-60 years age group. Mean age was 38 years and 58 years for benign and malignant neoplasms respectively.

Conclusions: Histopathological evaluation of skin biopsy is an important tool in diagnosis of skin neoplasms. Intradermal nevus and squamous cell carcinoma was the most common benign and malignant neoplasm respectively. Malignant neoplasms were more common in older patients.

Keywords: Glomus tumor; Melanoma; Nevus; Pilomatricoma; Sebaceoma; Squamous cell carcinoma

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INTRODUCTION

Skin is the largest organ of our body. It acts as a protective covering to internal viscera and provides a passive protective barrier to fluid loss and mechanical injury, is a sophisticated sensory organ and has important endocrine roles, particularly the synthesis of vitamin D. Imbalances in factors affecting the delicate homeostasis that exists among skin cells may result in conditions as diverse as wrinkles and hair loss, blisters and rashes, and life-threatening cancers and disorders of immune regulation.[1] Skin conditions are very common and the incidence of skin neoplasms has increased over the last several decades.[1,2] Many cutaneous disorders are intrinsic to the skin, but some are manifestations of systemic disease. Majority of skin lesions are diagnosed on the basis of clinical examination findings and history.[3] Skin neoplasms however pose diagnostic difficulty because of similarity in gross appearances. In such instances, skin biopsy facilitates clinical diagnosis and guides treatment.[2,3]

The current study aims to evaluate the prevalence of skin neoplasms and its distribution according to WHO classification. It also evaluates the age, gender and anatomical site wise distribution of benign and malignant neoplasms of patients diagnosed with skin neoplasms at Patan Academy of Health Sciences over a 5 year study period.

Table 1: Distribution of skin neoplasms according to WHO classification

Group of neoplasm	Benign n (%)	Malignant n (%)	Total n (%)
Keratinocytic tumors	61 (28.5%)	25 (11.7%)	86 (40.2%)
Appendageal tumors	12 (5.6%)	3 (1.4%)	15 (7%)
Melanocytic tumors	47 (22%)	3 (1.4%)	50 (23.4%)
Soft tissue tumors	49 (22.9%)	5 (2.3%)	54 (25.2%)
Neural tumors	6 (2.8%)	-	6 (2.8%)
Metastatic tumors	-	3 (1.4%)	3 (1.4%)
Total	**175 (81.8%)**	**39 (18.2%)**	**214 (100%)**

Table 2: Histomorphological patterns of benign skin neoplasms

Keratinocytic tumors	
Squamous papilloma	25(14.3%)
Fibroepithelial polyp	7 (4%)
Seborrhoeic keratosis	15(8.6%)
Verruca vulgaris	13 (7.4%)
Melanoacanthoma	1 (0.6%)
Total	**61 (34.9%)**

Appendageal tumors	
Pilomatricoma (Fig.1)	6 (3.4%)
Trichoepithelioma	2 (1.1%)
Eccrine poroma	2 (1.1%)
Nodular hidradenoma	1 (0.6%)
Sebaceoma (Fig. 2)	1 (0.6%)
Total	**12 (6.8%)**

Neural tumors	
Neurofibroma	6 (3.4%)
Total	6 (3.4%)

Melanocytic tumors	
Intradermal nevus	6 (20.6%)
Compound nevus	8 (4.6%)
Junctional nevus	2 (1.1%)
Becker's nevus	1 (0.6%)
Total	**47(26.9%)**

Soft tissue tumors	
Cavernous hemangioma	6 (3.4%)
Capillary hemangioma	7 (4%)
Lobular capillary hemangioma	19 (10.9%)
Lymphangioma	1 (0.6%)
Glomus tumor (Fig. 3)	2 (1.1%)
Benign fibrous histiocytoma	12 (6.9%)
Fibroma	2 (1.1%)
Total	**39 (28%)**

MATERIAL AND METHODS

This is a retrospective cross sectional hospital based study performed in the Department of Pathology at Patan Academy of Health Sciences, Patan Hospital, Lalitpur, Nepal. This study included data collected over a period of 5 years, from April 2011 to March 2016. The study included all the histopathologically diagnosed cases of skin neoplasms, both benign as well as malignant. The material comprised of both incisional and excisional biopsy specimens.

The specimens were fixed in 10% formalin. Gross examination was done and sections were taken from representative areas. The tissue was processed and stained with Hematoxylin and Eosin stain as per standard protocol. The slides were examined by pathologists under light microscopy. Histologic classification of tumors was done according to World Health Organization (WHO) guidelines. The relevant clinical details of the patients were noted from the histopathology requisition forms. The variables were entered in a database and data was analyzed in SPSS version 16.0.

RESULTS

During the study period, 410 skin biopsies were submitted at our institution. This represented 2.5% of all the surgical specimens received at the histopathology laboratory over the study period. Among them, 214 (52.2%) were skin neoplasms and 196 (47.8%) were non-neoplastic lesions. Out of the neoplasms, 175 (81.8%) were benign and 39 (18.2%) were malignant lesions. Thus, benign neoplasms were more common than malignant ones with a benign to malignant ratio of 4.5:1. Incidence of keratinocytic tumors was highest with 86 cases, followed by soft tissue tumors, melanocytic tumors and appendageal tumors. Overall maximum number of benign as well as malignant neoplasms belonged to the keratinocytic category (Table 1). Intradermal nevus (20.6%) was the most common benign neoplasm followed by squamous papilloma (14.3%). Among the malignant neoplasms, squamous cell carcinoma was most prevalent (46.1%) followed by basal cell carcinoma (15.3%). The histomorphological patterns of benign and malignant skin neoplasms are tabulated in table 2 and 3.

Skin neoplasms were present in all age groups. Age range was 5-78 years for benign and 17-93 years for malignant neoplasms. Benign neoplasms were commonly observed in 21-30 years age group. Maximum number of malignant neoplasms were found in 51-60 years age group. Mean age was 38 years and 58 years for benign and malignant neoplasms respectively. Malignant neoplasms were more common in older patients. The distribution of benign and malignant skin neoplasms in various age groups

Table 3: Histomorphological patterns of malignant skin neoplasms

Keratinocytic tumors	
Squamous cell carcinoma	18 (50%)
Basal cell carcinoma (Fig. 4)	6 (16.6%)
Verrucous carcinoma	1 (2.8%)
Total	**25 (69.4%)**

Appendageal tumors	
Sebaceous carcinoma	1 (2.8%)
Malignant adnexal tumor	1 (2.8%)
Adenoid cystic carcinoma of eccrine gland	1 (2.8%)
Total	**3 (8.4%)**

Melanocytic tumors	
Malignant melanoma	3 (8.4%)
Total	**3 (8.4%)**

Soft tissue tumors	
Dermatofibrosarcoma Protuberans	5 (13.8%)
Total	**5 (13.8%)**

Table 4: Distribution of benign skin neoplasms in various age groups

Group of neoplasm	0-10 yrs (%)	11-20 yrs (%)	21-30 yrs (%)	31-40 yrs(%)	41-50 yrs (%)	51-60 yrs(%)	61-70 yrs(%)	71-80 Yrs(%)	81-90 yrs(%)	91-100 yrs(%)	Total (%)
Keratinocytic tumors	1(0.6)	4(2.3)	10(5.7)	16(9.1)	6(3.4)	14(8)	6(3.4)	4(2.3)	-	-	61(34.9)
Appendageal tumors	1(0.6)	4(2.3)	2(1.1)	1(0.6)	1(0.6)	-	1(0.6)	2(1.1)	-	-	12(6.8)
Melanocytic tumors	1(0.6)	9(5.1)	14(8)	12(6.9)	6(3.4)	2(1.1)	3(1.7)	-	-	-	47(26.9)
Soft tissue tumors	2(1.1)	5(2.9)	14(8)	7(4)	10(5.7)	7(4)	3(1.7)	1(0.6)	-	-	49(28)
Neural tumors	-	1(0.6)	1(0.6)	3(1.7)	1(0.6)	-	-	-	-	-	6(3.4)
Total	**5(2.9)**	**23(13.2)**	**41(23.4)**	**39(22.3)**	**24(13.7)**	**23(13.1)**	**13(7.4)**	**7(4)**	**-**	**-**	**175(100)**

Table 5: Distribution of malignant skin neoplasms in various age groups

Group of neoplasm	0-10 yrs (%)	11-20 yrs (%)	21-30 yrs (%)	31-40 yrs(%)	41-50 yrs (%)	51-60 yrs(%)	61-70 yrs(%)	71-80 Yrs(%)	81-90 yrs(%)	91-100 yrs(%)	Total (%)
Keratinocytic tumors	-	-	-	2(5.1)	2(5.1)	7(17.9)	6(15.3)	1(2.6)	6(15.3)	1(2.6)	25(63.8)
Appendageal tumors	-	-	1(2.6)	1(2.6)	-	1(2.6)	-	-	-	-	3(7.8)
Melanocytic tumors	-	-	-	-	1(2.6)	1(2.6)	-	1(2.6)	-	-	3(7.8)
Soft tissue tumors	-	1(2.6)	-	2(5.1)	1(2.6)	1(2.6)	-	-	-	-	5(12.9)
Neural tumors	-	-	-	-	-	1(2.6)	2(5.1)	-	-	-	3(7.7)
Total	-	1(2.6)	1(2.6)	5(12.8)	4(10.3)	11(22.8)	8(20.4)	2(5.2)	6(15.3)	1(2.6)	39(100)

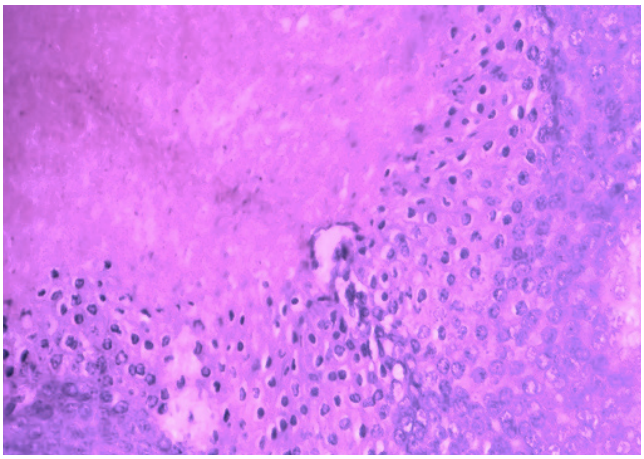

Figure 1: Pilomatricoma featuring transformation of basaloid cells into shadow cells (HE stain; X40).

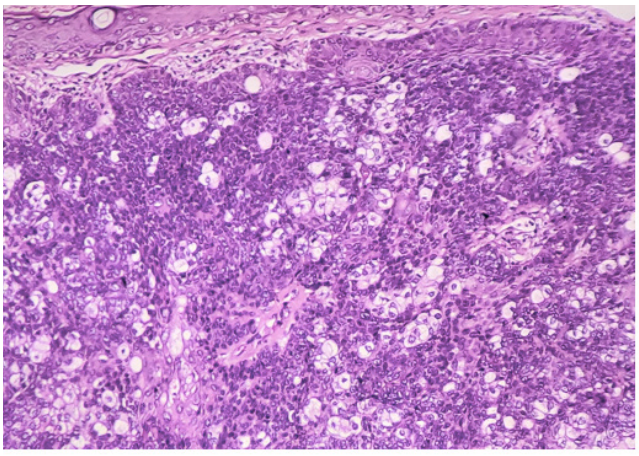

Figure 2: Sebaceoma. The tumor is composed of basaloid cells admixed with clearer (sebaceous) cells with predominance of basaloid cells (HE stain; X40).

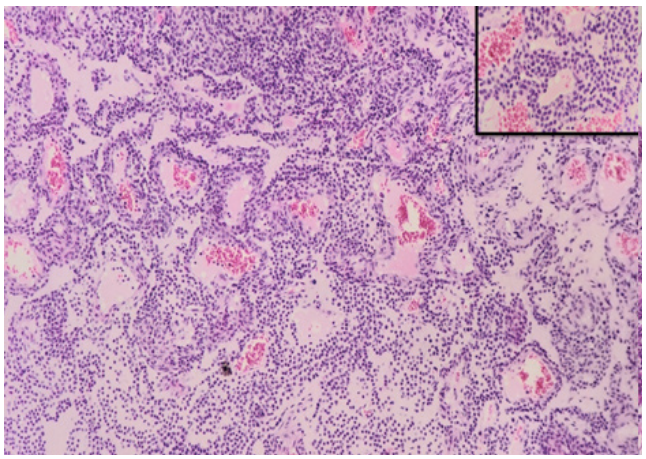

Figure 3: Glomus tumor (Glomangioma). Vascular spaces are surrounded by layers of glomus cells. (HE stain; X40). Inset showing higher power view of the same.

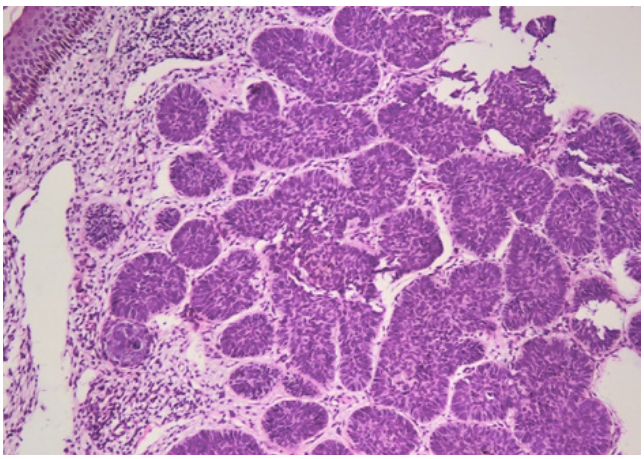

Figure 4: Basal cell carcinoma. The islands of tumor cells show peripheral palisading and retraction artefact (HE stain; X40).

is shown in table 4 and 5. Benign skin neoplasms showed a slight female predominance with a ratio of 1.2:1. There was no particular gender predilection for malignant neoplasms. In our study, maximum number of skin neoplasms, both benign and malignant were seen in the head and neck region. In 27.6% of the cases, the anatomical location of the lesion was not mentioned (fig. 5).

DISCUSSION

A wide range of tumors, benign as well as malignant are encountered in clinical practice. The prevalence of skin malignancy is on rise in the Nepalese society.[4] With increased UV irradiation resulting from thinning of the ozone layer, skin malignancy incidence rates have been predicted to increase in the future unless, as is hoped, human behaviour to reduce sun exposure can offset these predicted rises.[5] Accurate identification of skin lesions is vital in ensuring malignancies are not missed and that they are treated early to avoid morbidity and mortality.[6] Skin biopsy is the method to assist the dermatologists to reach a definitive diagnosis and guide patient management.

Out of the 410 skin biopsies received during the study period, 214 (52.2%) were skin neoplasms and 196 (47.8%) were non-neoplastic lesions which were excluded from the study. Out of the neoplasms, 175 (81.8%) were benign and 39 (18.2%) were malignant. The ratio of benign to malignant neoplasms was 4.5:1. This data is comparable to study performed by Rajinder et al who also found that benign neoplasms were twice more common than malignant tumors.[7] In contrast, a predominance of malignant neoplasms over benign ones were noted in various studies performed by Shivanand et al and Nandyal et al.[8,9] This disparity in prevalence of benign and malignant neoplasms could be attributed to geographical variation.

In this study, incidence of keratinocytic tumors was highest with 86 cases, followed by soft tissue tumors, melanocytic tumors and appendageal tumors. Overall maximum number of benign as well as malignant neoplasms in our study belonged to the keratinocytic category. Similar findings were observed in various studies.[7,10] Some studies found that in the benign category adnexal tumors were more prevalent.[8,9] Among the malignant neoplasms, incidence of squamous cell carcinoma was highest followed by basal cell carcinoma corroborating data from various studies.[7-10] In the present study, among the benign neoplasms, intradermal

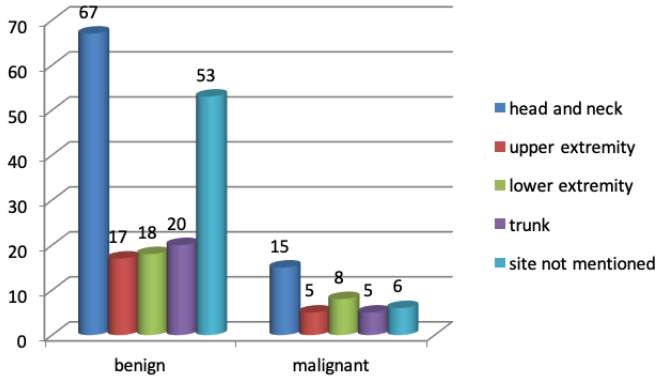

Figure 5: Anatomical site-wise distribution of skin neoplasms

nevus was the most common followed by squamous papilloma. Verrucas were reported as the commonest benign neoplasm in some studies.[7,10]

Various studies have shown that benign neoplasms are common in younger age group and malignant ones exhibit an ascending trend in age.[7,9] A similar pattern was noted in our study with maximum number of benign neoplasms in 21-30 years and malignant tumors in 51-60 years age group. This could be because older people have longer exposure to the sun's ultraviolet rays which has strong association with skin malignancy.

Our study showed a slight female predominance in benign tumors and no particular gender predilection for malignant neoplasms. Studies performed by Rajinder et al and Vaibhav et al concluded that both benign and malignant neoplasms were common in males than females.[7,10] In our study, maximum number of skin neoplasms, both benign and malignant were seen in the head and neck region. Equal number of neoplasms were seen in head and neck region and extremities with face being the commonest site in a study performed by Vaibhaav et al.[10] This finding supports the fact that skin neoplasms are most common in areas of the body with maximum sun exposure.

CONCLUSIONS

Histopathological study of skin biopsy is an important tool in diagnosis of skin neoplasms. Intradermal nevus and squamous cell carcinoma was the most common benign and malignant neoplasm respectively. Malignant neoplasms were more common in older patients.

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