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Study of Frequency and Patterns of Malignant Skin Adnexal Tumors: A Hospital-Based Study

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ABSTRACT

When benign and malignant neoplasms exist in the skin, it becomes difficult to distinguish between them from a clinical perspective. Frequently, a histological examination is required to achieve a definitive diagnosis. Histopathological testing is a crucial diagnostic tool in the field of dermatology. The purpose of this study was to investigate the occurrence, distribution and features of cancerous skin tumors originating from the adnexal structures in the Jammu region. The study was carried out on a sample of 50 cases over a four-year period (2009 to 2013) at the Department of Pathology, ASCCOMS, Jammu. Out of all the different forms of skin appendageal tumors detected, 47 (94%) were found to be benign and 3 (6%) were determined to be malignant. Among all study participants, 66.7% had malignant eccrine tumors and 33.3% had malignant sebaceous tumors, according to the histological types of the malignant skin appendageal tumors. There was one instance of a malignant eccrine tumor in males, while no instances of malignant sebaceous tumors were seen. There is one instance of each malignant eccrine tumor and malignant sebaceous tumor in females. The number of benign cutaneous and adnexal neoplasms exceeds the number of malignant neoplasms. Haematoxylin and Eosin stained sections are the most effective approach for establishing the primary diagnosis due to their unique histomorphological characteristics.

INTRODUCTION

The skin is a multifaceted and expansive organ, constituting the biggest organ in the body. The adnexal structures of the skin, including the sebaceous and other glands, are located in the dermis and the nearby subcutaneous tissue. There are numerous neoplasms that can develop from cutaneous appendages, and they have been recognized for a long time[1,2]. Most skin appendageal tumors primarily differentiate along a single appendageal line, leading to the development of various kinds[3].

The majority of these tumors are benign[4]. The malignant ones are rare and typically exhibit irregular shapes, solitary and grow rapidly as plaques or nodules that have a tendency to ulcerate, whereas benign tumors are regular in shape and smooth. The risk of malignant degeneration varies depending on the characteristics of each specific lesion[5]. Local recurrence is a well documented phenomenon, however metastasis is infrequent, particularly in cases of malignant tumors generated from the eccrine and apocrine glands, as well as sebaceous carcinoma[6] but variations can be seen. The classification of these tumors has been established using standard histological examination, histochemistry and electron microscopy. The classification of appendageal tumors is typically determined by their differentiation towards a specific appendage and the extent to which this differentiation decreases. This classification system divides appendageal tumors into three main subgroups.

These appendageal tumors can be broadly categorized into three categories: hamartomas, cysts, and tumor-like diseases, benign tumors and malignant tumors. From a clinical standpoint, differentiating between benign and malignant neoplasms becomes challenging when they occur in the skin[7]. Often, a histological study is necessary to obtain a clear diagnosis. Histopathological examination is a highly important method of diagnosis in the field of dermatology. This study was conducted to examine the frequency, patterns and characteristics of malignant cutaneous adnexal tumors in the Jammu region.

MATERIALS AND METHODS

The present study comprised all skin appendageal tumors that were submitted for histological investigation at the Department of Pathology, Acharya Shri Chander College of Medical Sciences and Hospital, Jammu. The study spanned four years, from 2009-2013. One study conducted from 2012-2013 was prospective, while the remaining studies were retrospective. Prior to initiating the investigation, the study protocol received approval from an institutional ethical committee. A retrospective analysis was conducted to analyze all the histological reports of cutaneous appendageal tumors.

In this study, Haematoxylin and Eosin (H and E) stained slides of each case were carefully investigated. Additional portions were excised from paraffin blocks as required. The clinical information supplied in the requisition form was duly considered and documented. In this prospective investigation, the clinical information of the patients was collected via histopathological requisition forms. Any missing information was then sought from the clinical case sheets and the relevant clinician. Every pertinent piece of information was documented and examined.

The specimens obtained during the prospective investigation were immersed in a solution of 10% buffered formalin for a whole night to preserve them. Following fixation, the specimens were visually inspected and three-dimensional measurements of the specimen were recorded. An analysis was conducted on the outer surface to determine the type of lesion, color, texture, and whether there was any ulceration. The characteristics of cystic lesions, including the type of cyst and its contents, were documented. Tissue samples were obtained from the tumor, the skin above it, and the margins of the resected area. The chosen representative sections of the tissue were subjected to processing.

To conduct histological examination, selected tissue sections were stained using Hematoxylin and Eosin. When it was required, the appropriate sections were stained with PAS and the diagnosis was ultimately confirmed. A comprehensive microscopic analysis was conducted and documented, and tumors were classified according to the internationally recognized Lever's Classification of Skin Appendageal malignancies. A statistical analysis was conducted and the findings were presented in the form of percentages.

RESULTS AND DISCUSSIONS

Out of all the different forms of skin appendageal tumors detected, 47 (94%) were found to be benign and 3 (6%) were determined to be malignant. Among all study participants, 66.7% had malignant eccrine tumors and 33.3% had malignant sebaceous tumors, according to the histological types of the malignant skin appendageal tumors. There was one instance of a malignant eccrine tumor in males, while no instances of malignant sebaceous tumors were seen. There is one instance of each malignant eccrine tumor and malignant sebaceous tumor in females. (Table 1) Based on the distribution of histological categories of detected malignant eccrine tumors, two cases of eccrine porocarcinoma were observed with a frequency of 100%. Based on the distribution of histological kinds of detected malignant sebaceous tumors, one case of sebaceous carcinoma was seen with a frequency of 100%. (Table 2) (Table 3) depicts the gross features of malignant skin adnexal tumors

Table 1: Distribution of histological kinds of identified malignant skin appendageal tumors based on the site of origin and age group categories

Type of malignant tumour	Site of malignant tumour		Age group(years)	Total
			51-75	
Malignant eccrine tumour	Site of tumour	Thigh	1	1
		Sole of foot	1	1
	Total		2	2
Malignant sebaceous tumour	Site of tumour	Eye lid	1	1
	Total		1	1

Table 2: Analysis of histopathological types of diagnosed malignant tumors distribution

Malignant tumours		
Malignant eccrine tumour		
Eccrine porocarcinoma	2	100.0
Total	2	100.0
Malignant sebaceous tumour		
Sebaceous carcinoma	1	100.0
Total	1	100.0

Table 3: Pattern of gross features of malignant skin adnexal tumors among study subjects

Gross features of malignant skin adnexal tumours	NO. of lesions	Percentage
Solitary	3	100
Multiple	NIL	NA
Size>2cm	1	33.3
Size 2cm-5cm	2	66.6
Size<5 cm	NIL	NA
Erythema	3	100
Ulceration	3	100
Cyst	NIL	NA

Table 4: Pattern of histopathological features of malignant skin adnexal tumours among study subjects

Histopathological features of malignant skin adnexal tumours	NO. of lesions	Percentage
Atvpia	3	100
Nuclear pleomorphism	3	100
Necrosis	2	66.6
Mitosis	3	100
Vascular invasion	NIL	
Lymphatic invasion	NIL	
Perineural invasion	NIL	

among study subjects. All the tumors showed solitary, erythema and ulceration as gross features. (Table 3) (Table 4) depicts the histopathological features of malignant skin adnexal tumors among study subjects. All the tumors showed atvpia and nuclear pleomorphism as histopathological features. Two thirds showed necrosis. (Table 4)

We observed that out of all the different forms of skin appendageal tumors detected, 47 (94%) were found to be benign and 3 (6%) were determined to be malignant. Among all study participants, 66.7% had malignant eccrine tumors and 33.3% had malignant sebaceous tumors, according to the histological types of the malignant skin appendageal tumors (SAT). There was one instance of a malignant eccrine tumor in males, while no instances of malignant sebaceous tumors were seen. There is one instance of each malignant eccrine tumor and malignant sebaceous tumor in females.

Gundalli (2015) *et al*[8] found most of benign neoplasms in 3rd-5 th decade and malignant in 6th-8 th decade. Bari (2014) *et al*[9] found most of benign neoplasms in 3rd decade and malignant in 7 th decade. In the present study, skin and adnexal neoplasms showed male predominance with M: F ratio of 1.4: 1 which is comparable with the study of Sharma A *et al* (2014)[10] with M: F ratio of 1.07: 1 and Bari (2014) *et al*[9]. Benign skin and adnexal neoplasms showed female predominance with M: F ratio of 1: 1.2. Males outnumbered females with M: F ratio of 10: 1 among malignant skin and adnexal neoplasms. Results are comparable with the study of Kamyab-Hesari K (2013) *et al*[7] (83.5%), Vani (2015) *et al*[9] (64.7%) and Sharma (2014) *et al*[10] (64.3%).

Gayathri *et al.,* in their study have described trichoepithelioma of hair follicular origin to be the predominant tumour[11]. Follicular differentiation is identified by Proliferation of basaloid bulbar follicular germinative cells, peripheral nuclear palisading, adjacent papillary mesenchymal bodies and matricial ghost cells. Apocrine differentiation is by the presence of decapitation secretion. Eccrine differentiation by the presence of tubules. Sebaceous differentiation is seen by the presence of the mulberry cells with clear vacuolated cytoplasm[12].

There are certain general charactrestic differentiating features between benign and malignant SATs. Benign tumours show symmetry, vertical orientation with V-shape, uniform collection of epithelial cells with dense fibrotic stromal reactions around tumour cells and absence of necrosis, atypia and mitosis[13]. Malignant SATs show asymmetry, horizontal orientation of tumour, Irregular arrangement of cells with infiltration with necrosis, atypia and mitosis with diminished tumour associated sclerotic stroma. Tirumalee *et al.,* have stressed the importance of examining under scanner view magnification to assess the silhouettes of SATs to

differentiate benign and malignant tumours[14]. In our study both the malignant tumours displayed asymmetry, horizontal orientation of tumour with lack of lobulation. Irregular arrangement of cells with infiltration with necrosis, atypia and frequent mitosis, with diminished tumor associated sclerotic stroma.

CONCLUSION

Skin and adnexal neoplasms represent a minimal proportion of all histopathological lesions recorded. The number of benign cutaneous and adnexal neoplasms exceeds the number of malignant neoplasms. Malignant eccrine tumors and malignant sebaceous tumors are frequently observed as malignant skin appendageal tumors, categorized based on histological categories. Haematoxylin and Eosin stained sections are the most effective approach for establishing the primary diagnosis due to their unique histomorphological characteristics.

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