

## Clinicopathological study of cutaneous adnexal tumors in a tertiary hospital of South India

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### Abstract

**Introduction:** Tumors of the cutaneous appendages are uncommon. They are categorized into sweat gland tumors, hair follicle tumors and sebaceous gland tumors. Benign adnexal neoplasm's are more common than the malignant tumors.

**Aim:** To study the spectrum of adnexal tumors of skin with respect to age, sex, site and histopathological pattern

**Methodology:** We conducted a retrospective analysis of 40 histopathologically confirmed cases of cutaneous adnexal tumors in a tertiary hospital of South India during three years. All the specimens of cutaneous adnexal tumors received during this period were analysed and lesions were categorized according to WHO classification system for Skin Adnexal Tumors.

**Result:** 40 cases of Skin adnexal tumors were diagnosed during the study period. 21 cases (55%) were benign, while 19 cases (45%) were malignant. Skin adnexal tumors were most common in the age group of 31-50 years (35%), with equal sex distribution. The head and neck region was the most common site affected (37.5%) with 45% located on the face. The sweat gland tumors formed the largest group involving 55% cases followed by the hair follicle tumors (25%), followed by 10% each of apocrine gland and sebaceous gland tumors. Pilomatricoma was the most common benign tumor and malignant nodular hidradenoma was the most frequent malignant adnexal tumor in our study.

**Conclusion:** Histopathological examination is the gold standard in the diagnosis of cutaneous adnexal tumors due to their wide spectrum and frequency of differentiation along two different lines within the same lesion.

**Keywords:** Adnexal tumors, Histopathology, Skin, Pilomatricoma, syringocystadenoma

### Introduction

Cutaneous adnexal tumors (CAT) are uncommon neoplasms, infrequently encountered in day to day practice<sup>1</sup>. These tumors can differentiate in the direction of any of the four types of cutaneous appendages namely eccrine and apocrine sweat glands, sebaceous glands and hair follicles<sup>2</sup>. They arise from multipotential undifferentiated cells present within the epidermis or its appendages, which on activation of molecular pathways, forms a mature adnexal structure.<sup>1</sup> Head and neck regions are the most common location. Majority of these tumors are benign and present as asymptomatic papule or nodule challenging the clinical diagnosis. However anatomic location, number and distribution of lesions provide important clue to the diagnosis.<sup>1,3,4</sup> Malignant counterpart of every CAT has been described. Malignant CAT is rare, locally aggressive and has the potential for nodal involvement and distant metastasis with a poor clinical outcome<sup>5</sup>. Difficulty in diagnosis can result due to their morphological diversity and frequent differentiation along two or more adnexal lines simultaneously. The aim of our study was to determine the spectrum of adnexal tumors with respect to age, sex, location and histopathological pattern.

### Materials and Method

This is a retrospective study conducted by the Department of Pathology in a tertiary hospital of South India. The case records of 40 histopathologically

confirmed cases of cutaneous adnexal tumors during the three years period between January 2013 and December 2015 was reviewed. Details about the age, sex, site of the lesion, and histopathological type was noted. All Hematoxylin and Eosin stained slides were reviewed. Sites were categorized into Head and Neck, Trunk, upper limb and lower limb. The tumors were categorized according to World Health Organization classification system for Skin Adnexal Tumors 2006. Tumors were classified as Eccrine Tumors, Pilar Tumors, Apocrine Tumors and Sebaceous Tumors. Eccrine tumors encountered were Eccrine Spiradenoma, Chondroid Syringoma, Syringoma, Cylindroma, Nodular Hidradenoma, Eccrine Poroma, Eccrine porocarcinoma and malignant nodular hidradenoma. Pilar tumors encountered were Pilomatricoma, malignant Trichoblastoma and Proliferating Trichilemmal Tumor. Apocrine Tumors encountered were Syringocystadenoma Papilliferum and Mucinous carcinoma. Sebaceous Tumors encountered were sebaceous carcinoma.

### Results

We studied 40 cases of cutaneous adnexal tumors. There were 21(52.5%) males and 19(47.5%) females in the study. Majority of patients were in the age group of 31-40 years (17.5%) and 41-50 years (17.5%) followed by 51-60 years (15%). Youngest patient was a 6 year old female and oldest was 85 year old male. Male to female ratio (M:F) was 1.10:1. Head and neck region

was the commonest site affected (72.5%) followed by upper limb (12.5%), trunk (10%) and lower limb (5%). One patient had multiple adnexal tumors involving scalp, face, trunk and lower limb. In the head and neck region, majority were located on face (62%), followed by scalp (31%) and neck (7%). Benign adnexal tumors constituted 55% of cases and malignant adnexal tumors constituted 45% of cases. Eccrine tumors constituted the largest group accounting for 55% of cases, followed by hair follicle tumors (25%) and 10% each of apocrine and sebaceous gland tumors. Eccrine tumors were sub classified into Eccrine Spiradenoma (5%), Chondroid Syringoma (7.5%), Syringoma (5%), Cylindroma (2.5%), Nodular Hidradenoma (5%), Eccrine Poroma (2.5%), Eccrine Porocarcinoma (5%) and malignant nodular hidradenoma (22.5%). Pilar tumors were sub classified into Pilomatricoma (20%), Proliferating Trichilemmal tumor (2.5%) and Malignant Trichoblastoma (2.5%). Apocrine Tumors were further classified into Syringocystadenoma Papilliferum (10%), Mucinous carcinoma (2.5%). There were 4 cases of sebaceous carcinoma (10%). There was one case each of dual lesions in the scalp, case of eccrine porocarcinoma with syringocystadenoma papilliferum and another case of syringocystadenoma papilliferum with squamous cell carcinoma. Pilomatricoma was the most common (36.3%) benign tumor in our study. Amongst the malignant tumors, malignant nodular hidradenoma was commonest (50%). Maximum number of benign tumors occurred between 21-40 years of age, while most of the malignant tumors occurred above 40 years of age.

**Table 1: Distribution of adnexal tumors according to location**

Site involved	Number of cases	Percentage
Head and neck	29	72.5%
Trunk	4	10%
Upper limb	5	12.5%
Lower limb	2	5%

**Table 2: Distribution of adnexal tumors according to their origin**

Type of neoplasm	Number of cases	Percentage
Eccrine differentiation	22	55%
Hair follicle differentiation	10	25%
Apocrine differentiation	4	10%
Sebaceous differentiation	4	10%

## Discussion

Adnexal tumors of skin though rare have been recognized from the later part of the 19<sup>th</sup> century. They are derived from pluripotent cells that have ability to

differentiate toward any of the appendage structure<sup>6</sup>. Mendelian inheritance and p53 mutations are important contributing factors. In some instances CAT are marker of internal malignancy<sup>7</sup>.

Our study showed CAT in 52.5% males and 47.5% females, male to female ratio being 1.10:1. In a study done by Ankit et al<sup>1</sup>, 51.7% were males and 48.2% were females with a male to female ratio of 1.07:1. Pantola C et al<sup>6</sup> also reported high incidence of adnexal tumors in males with a M: F ratio of 1.8:1. Marla NJ et al<sup>2</sup> found that adnexal tumors were more in females with a male to female ratio of 1.5:2. Female preponderance was also seen by Saha A et al<sup>3</sup> Jindal U et al<sup>4</sup>, Vani D et al.<sup>5</sup>

Maximum patients in our study were between 31-50 years of age (35%), followed by 51-60 years (15%). Youngest patient was a 6 year old female. Maximum number of benign tumors occurred between 21-40 years of age, while most of the malignant tumors occurred above 40 years of age. Vani D et al,<sup>5</sup> in their study, found that skin adnexal tumors were common between 40-49years (21.56%), and less common above 80 years and below 10 years. According to Pantola C et al<sup>6</sup> majority of cutaneous adnexal tumors occurred between 20-39 years (57%) followed by 40-59 years and 0-19 years. Radhika K et al<sup>7</sup> found that majority of CAT occurred at 3<sup>rd</sup> decade of life.

From the above data, it is clear that CAT is common at 3<sup>rd</sup> to 4<sup>th</sup> decade of life. Incidence is very low at extremes of life; most of the tumors occurring above 80 years are malignant.

Clinical presentation wise, eccrine poroma is seen in palms and soles, cylindroma in forehead and scalp, syringoma as multiple, small, tan papules in the vicinity of lower eyelid. Sebaceous carcinomas occur in the meibomian glands of eyelid. Eccrine and apocrine carcinomas are seen in the axilla. Grossly, adnexal tumors are non-descript, seen as papules, solitary or multiple flesh coloured nodules and disfiguring lesions such as ulcers<sup>7</sup>. In our study, Head and neck region was the commonest site affected (37.5%) followed by upper limb (12.5%) and trunk (7.5%). In the head and neck region, majority were located on face (45%), followed by scalp (22.5%) and neck (5%). Similar findings were noted by Ankit et al, Marla NJ et al, Pantola C et al and Devanand B et al.<sup>1,2,6,8</sup>

The possible explanation for the majority of cutaneous adnexal tumors to occur at head and neck region can be abundance of cutaneous adnexal appendages at this site.

In our study, benign adnexal tumors constituted 55% of cases and malignant adnexal tumors constituted 45% of cases, which is in accordance with studies done by Ankit et al, Marla NJ et al, Jindal U et al and Pantola C et al<sup>1,2,4,6</sup> who reported 80.36%, 90%, 96% and 95.7% benign and 19.64%, 10%, 4% and 4.3% malignant tumors respectively.

Eccrine tumors (Fig. 1) constituted the largest group accounting for 55% of cases, followed by hair follicle tumors (25%) and 10% each of apocrine and sebaceous gland tumors in our study. Jindal U et al<sup>4</sup> in their study, also found majority of tumors (52%) with eccrine differentiation, followed by 44% of hair follicle tumors and 4% of sebaceous gland tumors. In a study done by Vani D et al,<sup>5</sup> 43.13% were sweat gland tumors, 37.25% pilar tumors and 19.6% sebaceous gland tumors.

Pilomatricoma (Fig. 2) was the most common (36.3%) benign tumor in our study. Amongst the malignant tumors, malignant nodular hidradenoma was commonest (50%). Ankit et al,<sup>1</sup> and Marla NJ et al,<sup>2</sup> in their study, also found Pilomatricoma to be the most common benign tumor accounting for 21.43% and 67% of cases respectively. Nodular hidradenoma was the commonest benign tumor in a study done by Vani D et al<sup>5</sup> and Radhika K et al<sup>8</sup> accounting for 15.78% and 14.2% respectively.

Classically Pilomatricoma appears as a dome-shaped nodule in the head and neck of children and infants. It is also referred to as the calcifying epithelioma of Malherbe. It produces towards hair cortex comprising of keratinized shadow cells or ghost cells having central unstained areas representing lost nuclei surrounded by basaloid cells.<sup>4,9</sup> In our study, most of the cases of Pilomatricoma occurred on face followed by scalp and upper limb with a M:F ratio of 1:7. Majority of patients were below 30 years, only one patient was above 40 years of age.

Syringocystadenoma papilliferum (Fig. 3) is a rare adnexal neoplasm. On microscopic examination, papillary projections with squamous epithelial lining and ductal invaginations were observed. These ductal structures were lined by inner columnar and outer cuboidal cells.<sup>5</sup>

M:F ratio was 3:1, only one case occurred in the trunk at lower back, rest occurred on the scalp.

We also observed one case with malignant transformation into squamous cell carcinoma.

Mucinous carcinoma presents as a pale or violaceous nodule up to 3 cm in diameter involving the eyelids, face or head and neck of elderly patients. The histopathology of mucinous carcinoma of the skin is analogous to that of its counterpart in the breast, comprising nests of variably cohesive atypical epithelial cells lying free in pools of mucin. The individual tumor cells manifest hyperchromatic nuclei with nucleoli and a degree of cytologic atypia which varies from low grade to frankly anaplastic.<sup>9</sup> We had one case of Mucinous carcinoma occurring in a 54 year old male who had an ulceronodular growth on cheek.

Eccrine spiradenoma (Fig. 4) is characterized by multiple basophilic lobules showing intervening cords of two types of epithelial cells, with dark dense nuclei and cells with large pale nuclei. The pale cells often

arranged around small lumina filled with amorphous eosinophilic material.<sup>6</sup>

We had two cases, one occurred in a 65 year old male at upper lip and another in a 35 year old female on forearm.

With all the bewildering arrays of cutaneous adnexal tumors, what matters most to the clinician is whether it is benign or malignant. Traditionally, cytologic/ nuclear atypia has been used as the single most important feature to distinguish benign from malignant tumors. Dr Bernard Ackerman challenged this concept and proposed that contrasting silhouettes/ architectural attributes accurately distinguish benign from malignant tumors. Features favoring benign tumors are Symmetry, V-shape, stroma-stroma clefting, absence of necrosis, well circumscription, smooth borders, vertical orientation to skin surface and shelling out completely on excision. Tirumalae R et al<sup>10</sup>, successfully evaluated the histologic features on silhouettes of benign and malignant skin adnexal tumors.

Immunohistochemistry has limited role in the typing of adnexal tumors. However it may be helpful in cases of poorly differentiated carcinomas of adnexa mimicking Non-Hodgkin's lymphoma.

## Conclusion

Skin adnexal tumors are daunting diagnostic problems to both surgeons and pathologists. Histopathological examination is the gold standard in the diagnosis of cutaneous adnexal tumors due to their wide spectrum and frequency of differentiation along two different lines within the same lesion.

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