



## Original Research Article

## A clinico-histopathological study of cutaneous appendageal tumours

Gowda Monika M<sup>1</sup>, S Sathish K<sup>1</sup>, M Basavarajaiah D<sup>2,\*</sup><sup>1</sup>Kempegowda Institute of Medical Sciences, Bengaluru, Karnataka, India<sup>2</sup>Dept. of Dermatology, KVAFSU B Hebbal, Bidar, Karnataka, India

## ARTICLE INFO

## Article history:

Received 01-08-2019

Accepted 13-08-2019

Available online 14-09-2019

## Keywords:

cutaneous appendageal tumors  
malignant  
histopathologically  
clinically

## ABSTRACT

The cutaneous appendageal tumors are an ideal subject for study from clinical and morphological point of view and so ubiquitous that they can affect people of all age group. A histopathological study of 100 cases of cutaneous appendageal tumors was carried out at tertiary care hospital over 18 months. A Total 95 cases were benign and 5 cases were malignant tumors, constituting 95.0 % p<0.01 and 5.0 % p>0.01 respectively. Sweat gland tumors were the most common manifestation (79.0% ) p<0.01, followed by hair follicle tumors (20%) and eccrine duct tumors 1(1%). Male and female ratio was 27:73. The commonest affected body site was head and neck region. The mean age was 36.58 ±1.22 years. Out of 95 cases of benign tumors, syringoma accounted for 48% (48), trichoepithelioma 12 p<0.01, eccrine hydrocystoma (11) p<0.01, trichofolliculoma, Apocrine hydrocystoma and nodular hidradenoma each (4) p>0.01. Total (39) p<0.01 are correlating both clinically and histopathologically and (61) p<0.01 are not correlating clinically and histopathologically.

Summing of the results concludes that, the diagnosis of skin tumors presenting with unique difficulties in correlation with wide variety of tumors. Histopathological study is one of the most valuable means of diagnosis in dermatopathology and the diagnosis of skin tumors can be done by correlating clinical features, gross and histological appearances.

© 2019 Published by Innovative Publication.

## 1. Introduction

More than ten decade ago, the noted pathologist Rudolph Virchow understood skin as a protective covering for more delicate and functionally sophisticated internal viscera<sup>1</sup>. The skin is a complex and largest organ in the human body, Cutaneous appendageal tumors are basically classified into following groups viz., arising from hair follicles, sebaceous glands, & ducts (eccrine glands and apocrine glands)<sup>2</sup>. These tumors mainly arise from the undifferentiated pluripotent stem cells and differentiate to specific tumors influenced by genetics, local vascularity and microenvironment of the epidermis and dermis<sup>3</sup>. These tumors commonly present with papule and nodules. Mainly present on head-neck region, but also can present elsewhere in the body<sup>2</sup>. Usually appendageal tumors are benign rarely malignant, cutaneous appendageal tumors were presented clinically

with papules or nodules, sometimes with ulcers. This produce confusion in the nomenclature and difficulty in diagnosis and treatment<sup>2</sup>. Therefore, histopathological confirmation will play a very important role in the accurate diagnosis of the disease<sup>3</sup>. The Risk of malignant degeneration has been varies with individual lesions<sup>1</sup>. The local recurrence is well recorded but events metastases are rare with the exception of the malignant eccrine and apocrine gland derived tumors and sebaceous carcinoma<sup>4</sup>. Sometimes due to morphological overlap of the lesions, malignancies are missed out. Thus, this study can attempt to correlate early diagnosis of malignancy with respect to treatment aspects and also to know the relation between clinical features and histopathological features of cutaneous appendageal tumors and to describe the diagnosis of malignancy at early stage, the incidence of various benign and malignant appendageal tumors were significantly correlate with the clinical features in relation

\* Corresponding author.

E-mail address: [sayadri@gmail.com](mailto:sayadri@gmail.com) (M. Basavarajaiah D).

to age and sex matched frequency with various histological types of tumors etc..

## 2. Materials and Methods

A prospective observational study was conducted at Department of Dermatology, Kempegowda Institute of Medical Science and Research, Bengaluru during the year 2014-2016. A total 100 clinically suspected patients were recruited with written consent. All patients were met inclusion and exclusion criteria. Inclusion; Benign and malignant tumors of the cutaneous appendages. Age group of patients between 18 -70 years. Exclusion; Benign and malignant tumors of the epidermis and subcutaneous fat, Tumors of melanogenic system were excluded from the study, The hematolymphoid tumors, soft tissue tumors and metastatic tumors, pregnant, lactating mothers and children and Patients those who does not give the consent population excluded. The Skin appendageal tumors were evaluated by taking consent of the patient's, the detailed history was extracted from the patient record, clinical examination biopsy was done for all patients's. Patient were examined thoroughly and asked to stop blood thinning drugs four days prior to the procedure, also data sets of Type -II diabetes mellitus (uncontrolled leads to secondary infection of biopsy site and delays wound healing of the biopsy site) and other comorbidities were collected from the pretested questionnaires. Local anaesthesia was administered by using lignocain 1/80000 dilution with normal saline using insulin syringe, 2.5 mm or 3 mm biopsy test was used to extrapolate the lesions, even excision biopsy was done for the bigger lesions and suture was done with ethylon 4'0 suture material if necessary. Biopsy tissue was sent for histopathological examination to pathology department. Patient was administered on short course of oral and topical antibiotics. The collected data was analyzed by using SPSS-16.50 version. Chisquare test, ANOVA, paired and unpaired t test statistical methods was employed to test the hypothetical results.

## 3. Results

A Total 100 cases were cutaneous appendage tumors were seen in study period. Of these 100 cases, 95 cases were benign and 5 cases were malignant tumors. Benign tumors constituted 95.0% and malignant tumors constituted 5.0%. The study showed female predominance, male to female ratio was 75:25 . Study shows that, the most of the cases presented with multiple papules, followed by single papule and nodules. Face (periorbital, malar cheek) is a common site of involvement in cutaneous appendageal tumors. An apocrine gland tumors were seen in 65 cases (65.0%), eccrine gland tumors were seen in 73(73% ). only one cases expressed eccrine duct tumors (1.0%). The Hair follicle tumors were comprises 20.0% of the cases, 1 case of

spiroadenoma were seen in male patient at the median age of 56 (IQR 52-58) years of age, presented as multiple papules on the extensor aspect of the right forearm. Histopathology findings showed that, the thinned outepidermis with focal area of necrosis and ulceration. The papillary dermis shows an adnexal tumor demarcated from overlying epidermis by a clear grezzone. Tumor had composed of nest and lobules of tumor cell with little pleomorphism and moderate amount of pale eosinophilic cytoplasm. Large nuclei with prominent nucleoli, moderate anisonucleosis and atypical mitosis. sebaceous carcinoma has noticed in one female (1.0%) at onset of 65 years, presented with nodule scalp ( $p < 0.001$ ) it was found to be statistically significant. The tumor arranged in lobule and syncytial pattern with scant stroma was seen in study period. Tumor cells are large polygonal with moderate amount of foamy cytoplasm, vesicular nucleus and prominent nucleoli. Syringocystadenoma papilliformis was seen in one male patient at the onset of 40 years of age presented with plaque on the scalp since 15 years with no symptoms ( $p < 0.01$ ). A Similar study findings were noticed during the study intervention, an extramammary paget's disease was expressed with prevalence of 1.0 %, exhibits at the onset of 66 year of old female ( $p < 0.01$ ) presented with plaque in left axilla with ulceration since two years ( $p < 0.01$ ). Nearly three (3.0%) cases of pilomatricoma were encountered and found to be statistically significant ( $p < 0.01$ ) (1 male and 2 females 1:1) IQR age (38 -40 years). In the present study maximum of the cases of tumors were of eccrine gland accounting for 73.0% (odds 5.30-7.55 MLE's 21.56)  $p < 0.01$ , followed by hair follicle 20% (odds 1.25-3.55, MLE's 8.11)  $p < 0.01$ , followed by apocrine gland 6% (odds 0.52-1.44, MLE's 0.62)  $p > 0.01$ , followed by eccrine duct origin was seen in one patient 1.0% (odds 0.21-0.55)  $p < 0.01$ . The study shows that, out of 100 cases of appendageal tumors, only 39 cases were seen during study period (39%) (odds 10.15-16.22, MLE's 16.11)  $p < 0.01$  cases were significantly correlating with clinically and histopathologically findings as compared with rest of the population. (63/100)

In the present study benign tumors formed the majority (95%). In the study by Sharma A et al and Ackerman BA et al benign tumors formed the majority Apocrine/Eccrine tumors (79%) was commonest which is consistent with finding of Deprez M<sup>3</sup> .

The sensitivity of clinical diagnosis versus histopathological diagnosis for non syringoma was 52/100 and Syringoma 48/100 is significantly associated with clinical diagnosis as accrued with good specificity (88.46 % ) PPV (80.65%) and NPV (66.67%)  $p < 0.0001$ . However, the accuracy of the test diagnosing of both true positive and true negative predictive values by obtaining clinical and histopathological for syringoma (71%). The results were found to be significant ly associated between

**Table 1:** Correlation of Clinical and Histopathology diagnosis

Clinical diagnosis	Histopathology diagnosis		Total
	Syringoma	Non-syringoma	
Syringoma	25	6	31
Non-syringoma	23	46	69
Total	48	52	100

Sensitivity (%)=52.08, Specificity (%)=88.46, PPV =80.65, NPV =66.67, accuracy 71.0, Chisquare 19.13 p<0.0001

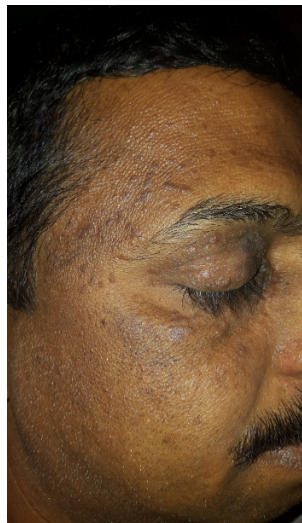
**Table 2:** Comparative distribution of different malignant skin tumors in India

Type of tumors	Nair PS et al. <sup>1</sup>	Deprez M et al. <sup>3</sup>	LeBoit PE et al. <sup>5</sup>	Present study
Squamous cell Carinoma	26.4%	43.63%	55.80%	62.50%
Basal cell carcinoma	49.40%	32.6%	18.10%	22.50%
Malignant melanoma	4.60%	14.20%	26.10%	7.50%
Sebaceus carcinoma	0.52%	3.20%	1.22%	2.50%
Microcystic adnexal carcinoma	1.0%	1.80%	0.63%	2.50%
Angiosarcoma	0.98%	0.11%	0.18%	2.50%

**Table 3:**

Studies	Singh I et al <sup>6</sup>	LeBoit PE et al <sup>7</sup>	Present study
Hair follicle	19(34.54%)	12(41.37%)	4(26.60%)
Apocrine /eccrine tumor	24(43.63%)	14(48.27%)	8(53.33%)
Sabaceous gland tumors	12(21.81%)	3(10.34%)	3(20.0%)
Total number of cases	55(100.0%)	29(100%)	15(100%)

Apocrine/Eccrine tumors (79%) was commonest which is consistent with finding of Singh I et al<sup>6</sup> and LeBoit PE et al<sup>7</sup>



**Fig. 1:** Syringoma over neck



**Fig. 2:** Syringoma on face

clinical and histopathological diagnosis. Chi-square 19.183, (P<0.001). Similar homogeneous findings were noticed in Trichoepithelioma (50.0%) (p<0.01), non-trichoepithelioma was 88.63% (p<0.01) with moderate specificity of the test (37.50%) of the 12 cases of trichoepithelioma was the positive predictive value PPV (92.86%) of non-trichoepithelioma was the negative predictive value.

However, the accuracy of the test diagnosing of both true positive and true negative values obtaining from the resulted findings as significantly associated with histopathologically findings trichoe pithelioma (84.00%). It was found to be highly significant association between clinical and histopathological diagnosis, (P<0.003) coefficient of



**Fig. 3:** Trichoepithelioma



**Fig. 4:** Eccrine hydrocystoma



**Fig. 5:** Apocrine hydrocystoma with syringoma

determination was ( $R^2=0.98$ ). The same extension of the resulted findings were noticed in the cylindroma, the sensitivity of clinical diagnosis versus histopathological diagnosis of cylindroma was 33.33% ie 33.33% of cases were diagnosed clinically and histopathologically, where as true negative - non-cylindroma was 100.00%, which is the specificity of the test was 100.00% of 3 cases of cylindroma was the positive predictive value (PPV).

The sensitivity of clinical diagnosis versus histopathological diagnosis for eccrine hydrocystoma was 28.57% ( $P<0.01$ ). ie a total 28.57% of cases were diagnosed clinically and histopathologically, true negative i.e non-eccrine hydrocystoma was 97.83% which is the specificity of the test. 50.00% of the 7 cases of eccrine hydrocystoma was the positive predictive value, 94.74% of non-eccrine hydrocystoma was the negative predictive value. However, the accuracy of the test diagnosis of both true positive

and true negative by clinical and histopathologically for eccrine hydrocystoma was (92.00%). It was found to be highly significant association between clinical and histopathological diagnosis ( $P<0.024$ ). The nodular hidradenoma, paget's disease of nipple, sebaceous carcinoma and syringocystadenoma were highly statistically significant differences were observed with respect to good specificity and sensitivity ( $>95%$ ) ( $p<0.01$ ).

#### 4. Discussion

Appendageal tumors are thought to have a genetic basis. Mendelian inheritance and P-53 mutations are important contributing factors. Cell of origin is supposed to be from either primary epithelial germ cell or pluripotent cells or cells of pre-existing structure. Primary epithelial germ cells may give rise to either hyperplasia or neoplasia<sup>1</sup>. Clinically cylindroma occurs in forehead and scalp, syringoma as multiple, small, tiny papules in the vicinity of lower lids<sup>4</sup>. Trichoepithelioma usually occur as multiple, semi transparent dome shaped papules on the face, scalp, neck and upper trunk. Sebaceous carcinoma occurs in the meibomiam glands of eyelids Grossly adnexal tumors are non descriptive, seen as papules, solitary or multiple, as flesh coloured nodules and disfiguring lesions such as ulcers.

Adnexal tumors of the skin, though rare have been recognized from the later part of the 19<sup>th</sup> century. We also observed that, the adnexal tumors of skin appear to be relatively uncommon tumors. Of the 100 cases studied, benign adnexal tumors were more commonly seen



in malignant tumors.<sup>8,6</sup>

There are only a few studies from India and abroad describing in detailed about the appendageal tumors of the skin. In the present study, syringoma was the most common appendageal tumor of sweat gland origin accounting for 48%, spiradenocarcinoma, microcystic adnexal tumors, sebaceous carcinoma, syringe cystadenoma papilliferum, extramammary pagets and paget's disease of the nipple are the least common tumors observed in the present study. Syringomas are characterized histologically by interweaving nests, cords and small cysts that are located in the upper half of the dermis. They are enmeshed in a dense collagenous stroma without any epidermal contact. The ducts of syringoma are composed of 1-2 layers of cuboidal cells rarely showing clear cell change. Tadpole appearance is quite common in syringoma<sup>6,9-12</sup>.

Though sebaceous carcinoma was common in an earlier report, only single case observed in the study. Histologically, sebaceous carcinomas have infiltrated zones and often harbour pleomorphic cell populations of clear and solid cells. Trichoepithelioma were reported in 12% of the cases in the present study. Histologically it is a symmetric lesion that contains a mixture of epithelial elements ranging from hair germs associated with capillary mesenchymal bodies to small horn cysts, to lace like reticular basaloid structures to mature hairs<sup>10</sup>. It is striking that only 39 out of 100 cases showed clinical and histological correlation<sup>11</sup>. This indicates cutaneous appendageal tumors cannot be diagnosed on clinical grounds only and histopathologic diagnosis plays a major role in diagnosing these tumors. In dermatopathology, one of the most intriguing yet unresolved question is the lineage of appendageal neoplasms with an expanding arsenal of stem cell markers<sup>13-16</sup>. Similar study literature has correlated with the present study intervention

## 5. Conclusion

Skin is a complex organ. Because of its complexity a wide range of diseases can develop from the skin including tumors from surface epidermis, epidermal appendages and dermal tissue. The diagnosis of skin tumors presents unique difficulties, in part, related to the wide variety of tumors and the complicated nomenclature. The study of histogenesis of the adnexal tumors is interesting, fascinating and challenging because of wide range of differentiation. Histopathological study is one of the most valuable means of diagnosis in dermatopathology and the diagnosis of skin tumors can be done by correlating clinical features, gross and histological appearances. The present study emphasizes the various patterns of cutaneous appendageal tumors in this varied geographic location in Indian context. Histopathological confirmation is mandatory for any cutaneous appendageal tumors for accurate diagnosis

and early treatment in case of malignancy.

## 6. Funding

None.

## 7. Conflict of Interest

None.

## References

1. Nair PS. A clinico-histopathological study of skin appendageal tumors. *Indian J Dermatol Venereol Leprol.* 2008;74(3):550–550.
2. Wick MR, Goellner JR, Wolfe JT, Su WP ; 1985,.
3. Deprez M, Uffer S. Clinicopathological features of eyelid skin tumors. A retrospective study of 5504 cases and review of literature. *Am J Dermatopathol.* 2009;31(3):256–62.
4. Sirikanjanapong S, Seymour AW, Amin B. Cytologic features of microcystic adnexal carcinoma. *Cyto Journal.* 2011;8(1):5–10.
5. Leboit PE, Burg G, Weedon D, Sarasin A. Melanocytic tumors. In: Pathology and genetics of skin tumors. World Health Organisation classification of tumors. Lyon: IARC Press ; 2006,.
6. Singh I. The skin and its appendages. In: The Human embryology ; 2003, .p. 103–112. 7th ed.
7. Leboit PE, Burg G, Weedon D, Sarasin A. Appendageal tumors. In: Pathology and genetics of skin tumors. World Health Organisation classification of tumors. Lyon: IARC Press ; 2006,.
8. Delfino S, Toto V, Brunetti B, Marino D, Baldi MP, et al. Poroid hidradenoma: a case report. V, editor ; 2007,.
9. Ackerman BA, Embryologic. Philadelphia: Williams and Wilkins. *Histologic diagnosis of inflammatory skin diseases.* 1997;p. 3–56. histologic and anatomical aspects.
10. Murphy GF, Elder DE, Elenitsas R, BI J, M ; 2005, . Levers histopathology of the skin.
11. Young B, Lowe JS, Stevens A, Heath JW, Skin. Wheaters functional histology ; 2006, .p. 167–85. 5th ed.
12. Singh I. New Delhi: Jaypee Brothers. *Textbook of Human Histology.* 2002;p. 193–206. Skin and its appendages.
13. Allaoui M, Hubert E, Michels JJ. Malignant Pilomatricoma: Two New Observations and Review of the Relevant Literature. *Turkish Journal.* 2014;30(1):66–74.
14. Rao S, Ramakrishnan R. Malignant Proliferating Trichilemmal Tumor Presenting Early in Life: An Uncommon Feature. *J Cutan Aesthet Surg.* 2011;4(1):51–56.
15. Karmarkar PJ, Mahore SD, Wilkinson AR. Solitary trichoblastoma. *Indian J Pathol Microbiol.* 2009;52(2):277–285.
16. Saha A, Das NK, Gharami RC, Chowdhury SN, Datta PK. A clinico-histopathological study of appendageal skin tumors, affecting head and neck region in patients attending the dermatology opd of a tertiary care centre in eastern India. *Indian J Dermatol.* 2011;56:33–39.

## Author biography

**S Sathish K** Associate Professor

**M Basavarajaiah D** Associate Professor

**Cite this article:** Monika M G, Sathish K S, Basavarajaiah D M. A clinico-histopathological study of cutaneous appendageal tumours. *Indian J Clin Exp Dermatol* 2019;5(3):206-210.