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**Original Research Article**

# Histopathological Study of Adnexal Lesions in Tertiary Care Hospital

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## Abstract

**Background:** Adnexal tumors (ATs) are the tumors arising from the appendages of the skin such as sweat glands, sebaceous glands, and hair follicles. These tumors are usually misdiagnosed clinically, and histopathology confirms the diagnosis.

**Aim and Objectives:** To study the incidence, histopathological pattern, age and sex wise distribution of various skin adnexal lesions and also compare the results of the study with those of other studies.

**Method:** In this study, a total of 149 cases of skin adnexal lesions were studied during the period of 2 years from November 2016 to October 2018. All slides were stained with standard haematoxylin and eosin stain (H & E) and studied under a light microscope. A special stain like PAS was performed whenever required.

**Results:** Out of 149 cases, 133 (89.26%) were diagnosed as neoplastic and 16 (10.74%) as non-neoplastic lesions. In neoplastic cases benign tumors (93; 69.9%) were common than malignant (40; 30.1%) with male preponderance. Skin adnexal lesions show wide age presentation, but malignant tumors presented with older age (60-80 years). Among all adnexal tumors, predominantly most of them showed the solid pattern and basaloid cell population. Calcification is common in both benign and malignant skin adnexal tumors, but necrosis is a prominent feature of malignant tumors. Peripheral palisading classically described in some malignant tumor-like BCC but it can be seen in benign skin adnexal tumor.

**Conclusion:** Hematoxylin and Eosin staining remain the best for the primary histopathological diagnosis. Immunohistochemistry is very helpful in the accurate categorization of the lesion when there is a dilemma in histopathological diagnosis.

**Keywords:** Adnexal tumors, Histopathology, Haematoxylin, Eosin, Benign, Malignant, Calcification, Immunohistochemistry.

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## 1. Introduction

Adnexal tumors (ATs) are a heterogeneous group of skin tumors usually found as solitary, sporadic lesions; however, certain specific types of multiple tumors may be an indication of some complex genetic syndromes, for example, Cowden's syndrome and Muir Torre syndrome [1]. Although most of the adnexal tumors are benign, it is important to diagnose them accurately since; 1) Many of such tumors are predetermined genetically and may arise in the form of multiple potentially harmful lesions or, 2) May represent sites of predilection for later development of more aggressive tumors or, 3) May themselves be locally aggressive or capable of metastasis and may be misdiagnosed as metastatic tumors to the skin [2], 4) Awareness of the morphology of the skin adnexal tumors will contribute to a right diagnosis and can help to avoid potential pitfall, 5) Apart from their rarity, challenges in

diagnosis also result due to their variations, their frequent differentiation along two or more adnexal lines.

Skin adnexal tumors (SATs) are rare in the Indian subcontinent and hence pose difficulty in diagnosis as they may histopathologically look like more common skin malignancies in this region. Several studies on SATs have been carried out in Western countries but very few in this region [3]. Hence the present study was carried out with an objective to study the incidence, histopathological pattern, age and sex wise distribution of various skin adnexal lesions and also analyzes the data regarding the relative proportion of non-neoplastic and neoplastic lesions of skin and adnexa and compare with other studies.

## 2. Materials and Methods

All biopsy of skin adnexal swelling referred to Department of Pathology during the period of 2 years from November 2016 to October 2018 were included in the study while those patients treated conservatively or patients referred to other hospitals were excluded from the study. Total of 149 cases of skin adnexal lesions was studied during the 2 years period.

Biopsy specimens and paraffin blocks of all identified lesions of skin received in the Pathology Department, Medical College and research Centre were collected. All clinical data were noted as per proforma. The biopsy material in 10% formalin was subjected to routine processing and paraffin embedding. Serial sections were taken for each biopsy and were stained by standard Haematoxylin and Eosin stain (H & E) and special stain like PAS was performed whenever required. For all the retrospective case blocks were retrieved and serial sections were taken for each biopsy and were stained by standard Haematoxylin and Eosin stain (H & E). The H&E stained sections were then studied under a light microscope.

## 3. Observations and Results

Out of total 9860 (100%) specimen received in the histopathology section during the study period of 2 year skin and adnexal specimens were 149 (1.51%). Out of 149 cases, 133 (89.26%) were diagnosed as neoplastic and 16 (10.74%) as non-neoplastic lesions. Among the 133 neoplastic cases, 93(69.92%) were benign and 40(30.08%) cases were malignant, (Table 1).

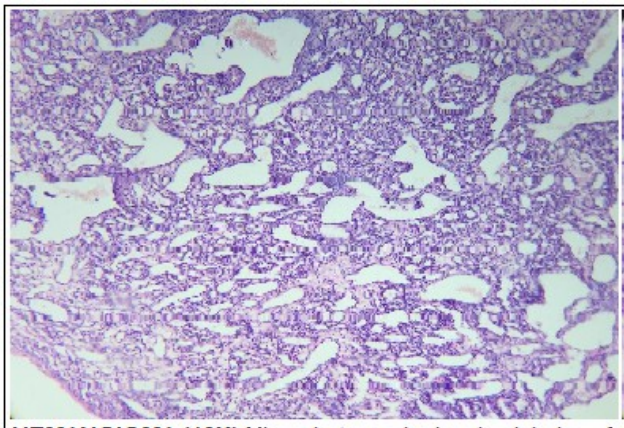
**Table 1: Neoplastic cases were categorized into five groups according to the origin of the tumor**

| Group of neoplasm | Benign | Malignant |
|---|---|---|
| Epidermal tumors | 18 (13.54%) | 24 (18.05%) |
| Melanocytic tumors | 10 (7.50%) | 6 (4.51%)) |
| Soft tissue tumors of dermis | 28 (21.06%) | 0 (00.0%) |
| Neural tumors | 13 (9.77%) | 0 (00.0%) |
| Adnexal tumors | 24 (18.05%) | 10 (7.52%) |
| Total | 93 (69.92%) | 40 (30.08%) |

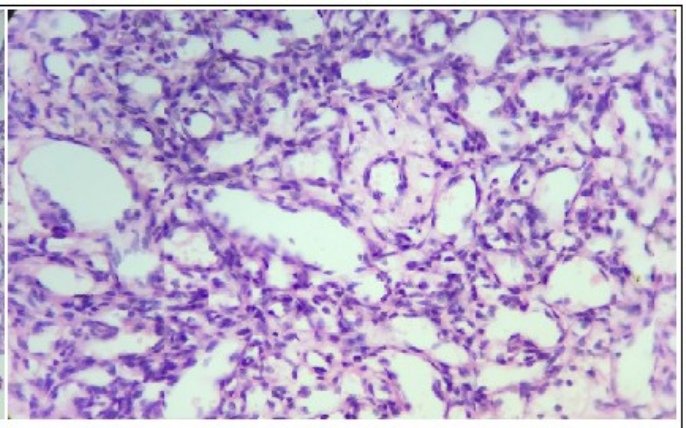
Among benign neoplastic category, soft tissue tumors were the maximum with 28 cases (21.05%) followed by adnexal tumors (24; 18.04%), epidermal or keratinocytic tumor (18; 13.53%), Neural tumor (13; 9.77%) and Melanocytic tumor (10; 7.50%), (Table 2). A most common benign tumor was hemangioma constituting 10 cases (10.75%) followed by dermatofibromas with 8 cases (8.60%).

**Table 2: Frequency of benign tumors of skin and adnexa**

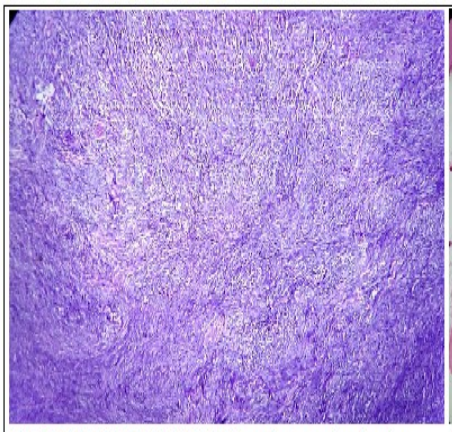
| Benign Tumors | | No. of Cases (%) | Total |
|---|---|---|---|
| Epidermal tumors | Seborrheic keratosis | 6 (6.45%) | 18 (13.53%) |
| | Cutaneous papilloma | 7 (7.53%) | |
| | Keratoacanthoma | 5 (5.38%) | |
| Melanocytic tumors | Intradermal nevus | 3 (3.22%) | 10 (7.50%) |
| | Compound nevus | 4 (4.30%) | |
| | Junctional nevus | 3 (3.22%) | |
| Soft tissue tumors of the dermis | Fibroma | 6 (6.45%) | 28 (21.05%) |
| | Dermatofibromas | 8 (8.60%) | |
| | Dermatofibrosarcoma | 3 (3.22%) | |
| | protuberance | 1 (1.07%) | |
| | Lipoma | - | |
| | Hemangioma | 10 (10.76%) | |
| Neural tumors | Schwannoma | 7 (7.52%) | 13 (9.77%) |
| | Neurofibroma | 6 (6.45%) | |
| Adnexal tumors | Pilomatricoma | 7 (7.53%) | 24 (18.04%) |
| | Trichoepithelioma | 1 (1.07%) | |
| | Trichilemmal cyst | 4 (4.30%) | |
| | Eccrineparoma | 3 (3.22%) | |
| | Nodular hidradenoma | 4 (4.30%) | |
| | Apocrine hidrocystoma | 1 (1.07%) | |
| | Nevus sebaceous | 1 (1.07%) | |
| | Sebaceous adenoma | 3 (3.22%) | |
| Total | 93 (100%) | | |



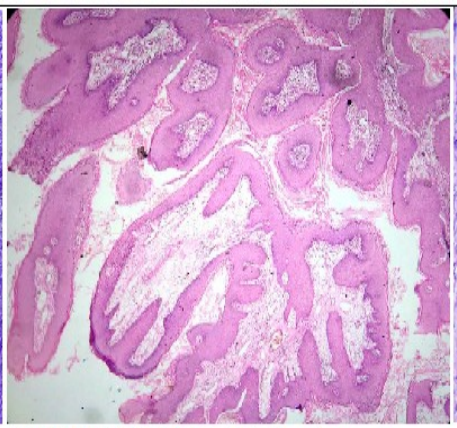
**HEMANGIOMA (10X)** Microphotograph showing lobules of dilated capillaries in oedematous stroma



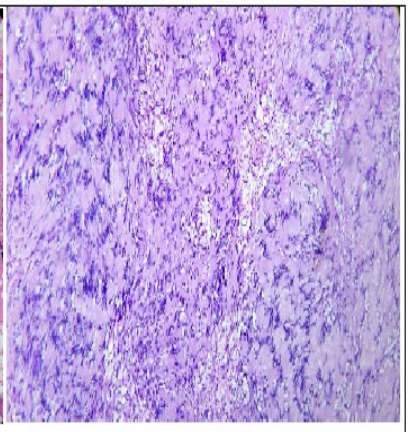
**HEMANGIOMA (40X)** Microphotograph showing benign proliferation of capillary sized blood vessels lined by endothelial cells.



**DERMATOFIBROMA (10X)** Microphotograph showing – densely cellular spindle cells arranged in fascicles and storiform pattern.



**CUTANEOUS PAPILLOMA (10X)** -Microphotograph showing fibrovascular core covered by sqamous epithelium

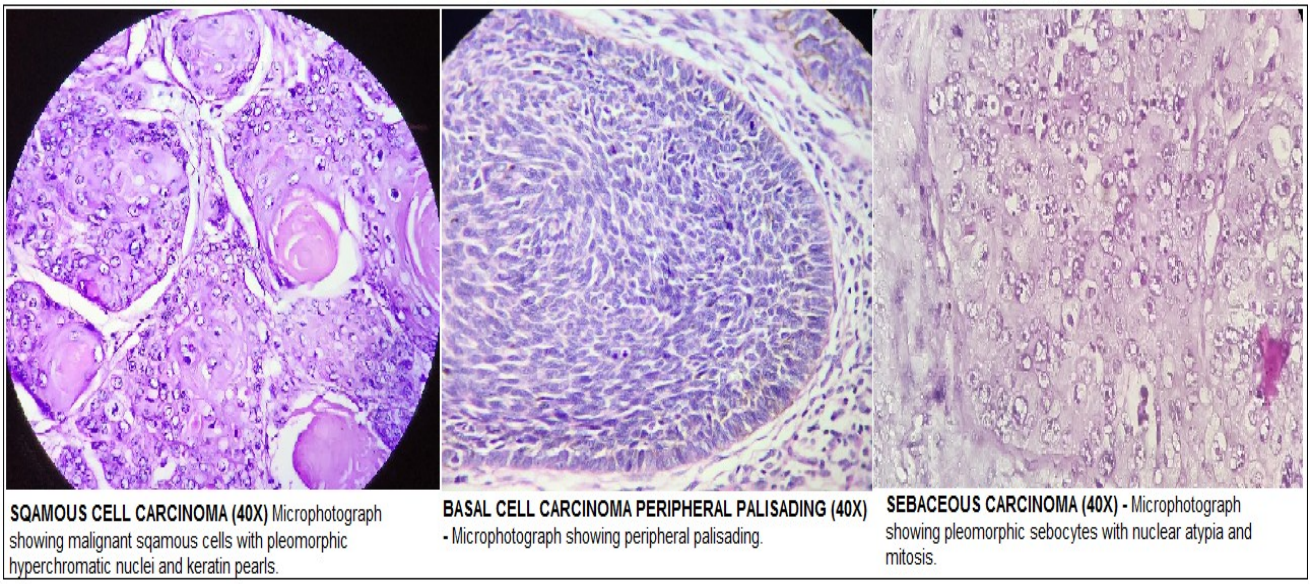


**SCHWANNOMA (10X)** Microphotograph showing hypercellular area (Antony A) and hypocellular area (Antony B).

Among malignant neoplastic category, epidermal or keratinocytic tumor were maximum with 24 cases (18.04%) followed by adnexal tumors with 10 cases (7.51%) and Melanocytic tumor with 6 (4.50%). The commonest malignant tumor was squamous cell carcinoma comprising 17 (42.5%) cases, followed by basal cell carcinoma 7 (17.5%) cases, (Table 3).

**Table 3: Frequency of malignant tumors of skin and adnexa**

| Malignant Tumors | | No. of Cases (%) |
|---|---|---|
| Epidermal tumors | Squamous cell carcinoma | 17 (42.5%) |
| | Basal cell carcinoma | 7 (17.5%) |
| Melanocytic tumors | Malignant melanoma | 6 (15%) |
| Soft tissue tumors of dermis | - | 0 (00.0%) |
| Neural tumors | - | 0 (00.0%) |
| Adnexal tumors | Sebaceous carcinoma | 6 (15%) |
| | Malignant eccrineporoma | 2 (5.0%) |
| | Malignant proliferating | - |
| | Trichilemmal tumors | 2 (5.0%) |
| Total | 40 (100%) | |



**SQAMOUS CELL CARCINOMA (40X)** Microphotograph showing malignant sqamous cells with pleomorphic hyperchromatic nuclei and keratin pearls.

**BASAL CELL CARCINOMA PERIPHERAL PALISADING (40X)** - Microphotograph showing peripheral palisading.

**SEBACEOUS CARCINOMA (40X)** - Microphotograph showing pleomorphic sebocytes with nuclear atypia and mitosis.

The most common nonneoplastic lesion was granulomatous inflammation comprising 3 (18.75%) cases followed by calcinosis cutis and calcified cyst comprising 2 (12.5%) cases each, (Table 4).

**Table 4: Frequency of non-neoplastic lesions of skin and adnexa**

| Nonneoplastic lesion | | No. of Cases (%) |
|---|---|---|
| Inflammatory | Granulomatous inflammation | 3 (18.75%) |
| | Folliculitis | 1 (6.25%) |
| | Chronic abscess | 1 (6.25%) |
| | Hidraadinitissuppuritiva | 1 (6.25%) |
| Infectious | Actinomycosis | 1 (6.25%) |
| | Mycetoma | 1 (6.25%) |
| | Molluscumcontagiosum | 1 (6.25%) |
| | Fungal infection | 1 (6.25%) |
| Other | Calcified cyst | 2 (12.5%) |
| | Calcinosis cutis | 2 (12.5%) |
| | Corn | 1 (6.25%) |
| | Idiopathic calcinosis of the scrotum | 1 (6.25%) |
| Total | 16 (100%) | |

Among neoplastic cases, the most common age of presentation for benign neoplasm was 41-60 years and for malignant neoplasm was 60-80 years, most common age of presentation for non-neoplastic lesion was 21-40 years. The male-female ratio in the present study was 1.6:1. Basal cell carcinoma accounted for 17.5% among malignant tumor. Age incidence observed was 40 -79 years and male to female ratio was 1.3: 1. All cases of basal cell carcinoma were present in head, neck and face area. Immunohistochemistry (IHC) was done in one case, immunopositive markers were CK5&6/HMWCK (34betaE12) and immunonegative were vimentin/s100 protein/Melan A so case was reported as pigmented basal cell carcinoma. There were 6 cases of malignant melanoma and sebaceous carcinoma each constituting 17.5% among total malignant tumor. The most common age of presentation was 50-70 years.

## 4. Discussion

In the present study, skin adnexal lesions comprised 1.51% of all types of histopathology specimens received over a period of two years in the department of pathology, comparable with the study done by Bari *et al* (1.3 %) [4]. The benign tumors were 69.9% and malignant tumors were 30.1% which is comparable with the other studies [5, 6]. Commonest benign tumor group was soft tissue tumors (21.05%) followed by adnexal tumors (18.4%), this finding is similar to the study of Narhire *et al* [7]. Whereas commonest malignant tumor was squamous cell carcinoma (42.5%) followed by basal cell carcinoma

(17.5%), the similar finding is reported by Bari *et al* [4] and Singh *et al* [8]. However, the commonest non-neoplastic lesion was granulomatous inflammation (18.75%) followed by calcinosis cutis and calcified cyst whereas in a study conducted by Gaikwad *et al* [9] commonest non-neoplastic lesion was calcinosis cutis this difference can be explained by inherent referral bias and sample size.

There were 6 (6.45%) cases of seborrhiec keratosis, 4 were present on trunk and 2 were present over the scalp with male to female ratio of 1:1. 7 (7.53%) cases of cutaneous papilloma, were found, all were on the upper extremity with most common age between 40-50.5 (5.37%) cases of keratoacanthoma, one on trunk and 2 on the dorsum of the foot and 2 on the upper extremity with the common age of 30-50 years. Intradermal Nevus was found in 3.22% cases among benign skin and adnexal neoplasm with the common age of 10-30 years. There were 6 cases of the fibroma (6.45%) among benign skin and adnexal neoplasm. Most common age was 30-50 years. Clinical features, gross and histopathological findings of seborrhiec keratosis, cutaneous papilloma, keratoacanthoma, Intradermal Nevus and fibroma were similar to the findings stated by Young *et al* [10], Knox *et al* [11], Maize *et al* [12], Mackie *et al* [13] and Lund *et al* [14] respectively.

Percentage of dermatofibroma cases was 8.60% among benign skin and adnexal neoplasm with the most common age of 30-50 years and male to female ratio of 3:1. There was 1 (1.07%) case of Lipoma in 60 years female which was present on the forearm. Dev at el [15] reported an incidence of 38.35% of all benign soft tissue tumors, the average age was 28 years. The vast discrepancy in both studies is due to only dermal lipomas are included in the present study and subcutaneous lipomas are not considered. Hemangioma showed the highest percentage (10.75%) among benign skin and adnexal neoplasm. Age incidence was mostly less than 20 years and also scattered in all ages and male to female ratio was 1.5;1. Percentage of schwannoma cases was 7.52%. Age incidence was 30 -49 years and male to female ratio was 1.5:1. The findings of the present study are similar to the findings stated by previous studies [14, 15].

7 (7.52) cases of Pilomatricoma were seen in this study, among total benign neoplasm and 29.1% among benign adnexal neoplasm with mean age being of 26 years. The occurrence of Pilomatricoma was highest among all the adnexal tumors showing follicular differentiation. Most of the patients present with lesions over arm; other sites included the neck, forearm, and thigh. Similar observations have been made in Sharma *et al* [5]. 4 (4.30) cases of nodular hidradenoma were found among total benign neoplasm and 16.6% among benign adnexal neoplasm.3 (3.22%) cases of eccrineporoma were among total benign neoplasm and 12.5% among adnexal neoplasm with age group of 18-55 years. Three cases (3.22%) of sebaceous adenoma were seen among all adnexal tumors and 12.5% among adnexal neoplasm. All these findings are correlated with the other studies [5, 6, 16-18].

There were 17 (42.5%) cases of squamous cell carcinoma among total malignant tumors (40; 30%) with common age incidence of 50-70 years. Male to the female ratio observed was 4.6: 1. Squamous cell carcinoma was present in the lower extremity in 14 cases followed by head, neck and faces area in 2 cases and forearm in 1 case. There were 7 cases of basal cell carcinoma which accounted for 17.5% among malignant tumor. Age incidence observed was 40 -79 years and male to female ratio was 1.3: 1.

Immunohistochemistry (IHC) was done in one case, immunopositive markers were CK5 & 6/HMWCK (34betaE12) and immunonegative were vimentin/s100 protein/Melan A so the case was reported as pigmented basal cell carcinoma. Percentage of basal cell carcinoma was 17.5 % among all malignant tumors which are comparable with prior studies [19-21]. There were 6 cases of malignant melanoma accounted for 17.5% among total malignant tumor. Most common age group was 50-70 years. Percentage malignant melanoma was 17.5 % among all malignant tumors which are comparable with the study conducted by Singh *et al* [19]. The current study included 6 cases of sebaceous carcinoma which accounted for 15% of all malignant tumors. Five patients out of six were male and one patient was female, within the age group ranging from 55 to 70 years. Eyelid was the most common site (3 cases) followed by scalp (3 cases). Similar observations were made by Kaur *et al* [16].

This study included two cases of Malignant proliferating trichilemmal tumor which accounted for 5% of all malignant tumors. Age incidence was observed 50-70 years presented with an irregular lesion on parietal region of the scalp, presented with pale tan or reddish papule, indurated nodule. Similar observations have been made in Radhika *et al* [22].

## 5. Conclusion

Among all the skin and adnexal lesions, the frequency of neoplastic lesions was more as compared to non-neoplastic lesions. In neoplastic cases, benign tumors were common than malignant with male preponderance. Skin adnexal lesions show a wide age presentation, but malignant tumors presented with older age.

Hematoxylin and Eosin staining remain the best for the primary histopathological diagnosis. Immunohistochemistry is very helpful in the accurate categorization of the lesion when there is a dilemma in histopathological diagnosis among all the skin and adnexal

tumors, predominantly most of them showed the solid pattern and basaloid cell population. Calcification is common in both benign and malignant skin adnexal tumors, but necrosis is a prominent feature of malignant tumors. Peripheral palisading classically described in some malignant tumors-like BCC but it can be seen in benign skin adnexal tumor. This predominant pattern may help in the diagnosis of skin and adnexal tumors whenever there is an overlapping of cellular morphology. Due to the scarcity of few tumors pattern, the analysis was not clearly established hence multi-analysis of the individual tumor may be required along with the other ancillary techniques.

The drawback of this study was that the present data being hospital generated cannot be regarded as representative of the incidence of skin and adnexal lesions in the general population.

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