



## Original Research Article

## Clinico-pathological study of skin adnexal tumours in a tertiary care hospital

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## ABSTRACT

**Background:** Skin adnexal tumours are heterogenous group of uncommon tumours having distinct histological features. They have varied clinical presentation and morphological differentiation towards one or more types of adnexal structures found in normal skin. The aim of this study was to study the different histomorphological patterns of appendageal tumours and correlate them with clinical presentations.

**Materials and Methods:** This was a retrospective study of three year duration of all cases clinically diagnosed to be appendageal tumours and confirmed by histopathology in our department. The tumours were classified according to their differentiation after a detailed histopathological examination in haematoxylin and eosin sections.

**Results:** The total number of cases in the study were 43, in which 28 were males and 15 females. Most of the tumours (97.7 %) were benign and there was only one case sebaceous carcinoma. The majority of the tumours had an eccrine differentiation (30.9%), nodular hidradenoma among them being the most common lesion (20.9%). Trichilemmal cyst (30.2%) constituted the maximum cases of pilar origin.

**Conclusion:** Skin adnexal tumours are relatively rare with benign ones being more common than the malignant tumours. Proper clinical correlation and histopathological study helps in reaching a correct diagnosis.

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## 1. Introduction

The skin adnexal tumours are heterogenous group of tumours having varied clinical features with distinct histology. They are classified into eccrine, apocrine, pilar or sebaceous categories.<sup>1</sup> These tumours arise from undifferentiated pluripotent stem cells and differentiate into specific tumour types influenced by genetics, local vascularity and the microenvironment of epidermis or dermis. Most of them are benign with fewer malignant counterparts.<sup>2</sup>

Often presenting as an asymptomatic papule or nodule, they can be missed clinically in many cases. Due to the diverse but specific histopathological patterns, we conducted this study to determine the pattern of

appendageal tumours in our institution.

## 2. Aim

To study the histomorphology of appendageal tumors

## 3. Objectives

1. Categorization of appendageal tumors based on histological features.
2. Correlation with clinical parameters.

## 4. Materials and Methods

This was a retrospective study done over a period of three years in our institution. Data was collected after a thorough study of the outpatient, inpatient histopathological records. Inclusion criteria was only the biopsy confirmed

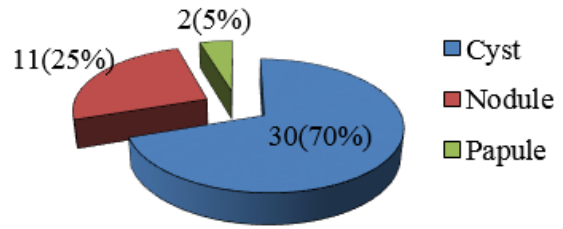
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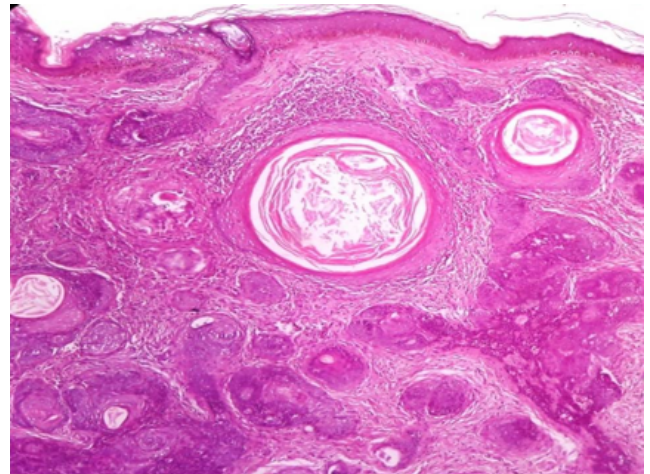
cases of all skin appendageal tumors presenting as nodules, cystic lesions or papules. All age group were included and no gender discretion was applied in selecting the cases. Cases clinically diagnosed as skin appendageal tumour, but not proven in histology, were excluded from the study. Haematoxylin and Eosin (H&E) was the stain used in histopathological slides. The cases were selected and classified into different categories like apocrine, eccrine, sebaceous and pilar (follicular) based upon their morphology.

**5. Results**

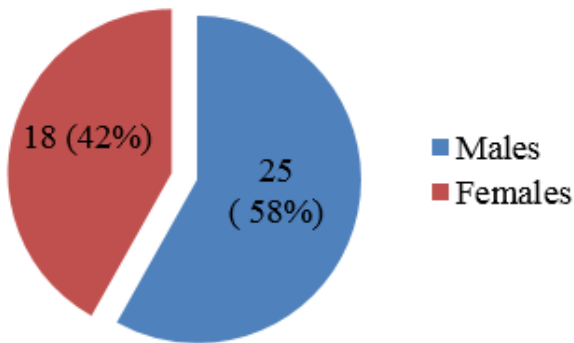
The total number of cases analysed in our study was 43. Out of which 25 were males (58.1%) and 18(41.9%) were females. The male: female ratio was 1.38:1.[Figure 1] The duration of illness varied from 2 months to 6 years. The clinical presentation of swellings varied as cysts(70%), nodules (25%) and papules (5%).[Figure 2] Majority of the lesions were single with few presenting as multiple lesions. Maximum number of cases belonged to age-group of 31-40years (23.8%) closely followed by 11-20 & 21-30 years age group (21.4% each) (Table 1). Majority of tumours showed pilar differentiation (52.4%) (Table 2) with Trichilemmal cyst being the most common benign pilar tumor (30.23%) (Table 3). Commonest site of involvement was scalp (51.2%) followed by face (27.9%).[Table 4]



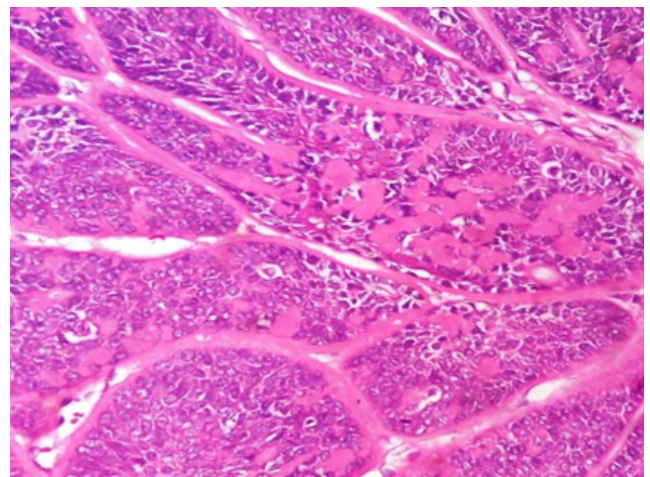
**Fig. 2:** Clinical presentation of lesions, n (%)



**Fig. 3:** Horn cysts in Trichoepithelioma, H&E stain, 100x



**Fig. 1:** Gender distribution of cases, n (%)



**Fig. 4:** Lobules of basaloid cells separated by eosinophilic material in Cylindroma, H&E stain, 100x

**Table 1:** Age distribution of cases

| Age group (years) | No of cases(n) | Percentage(%) |
|-------------------|----------------|---------------|
| 1-10              | 5              | 11.9          |
| 11-20             | 9              | 21.4          |
| 21-30             | 9              | 21.4          |
| 31-40             | 10             | 23.8          |
| 41-50             | 7              | 16.3          |
| 51-60             | 3              | 7.14          |
| Total             | 43             | 100           |

**Table 2:** Differentiation of appendageal tumours

| Tumour categories | No. of cases(n) | Percentage(%) |
|-------------------|-----------------|---------------|
| Eccrine           | 13              | 30.9          |
| Pilar             | 22              | 52.4          |
| Sebaceous         | 05              | 11.6          |
| Apocrine          | 03              | 7.1           |



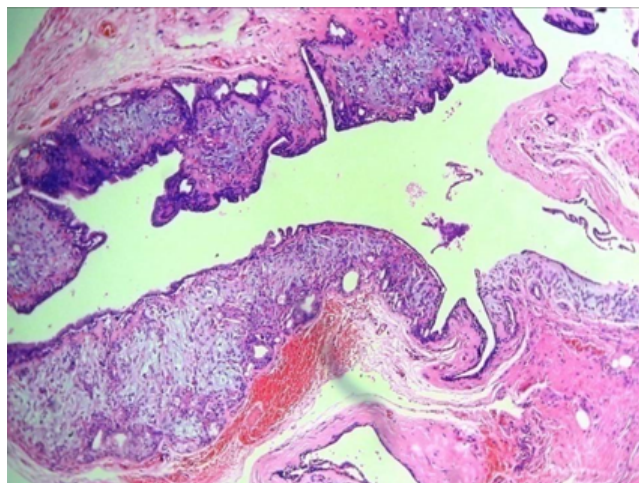


Fig. 5: Chondroid syringoma, H&E stain, 100x

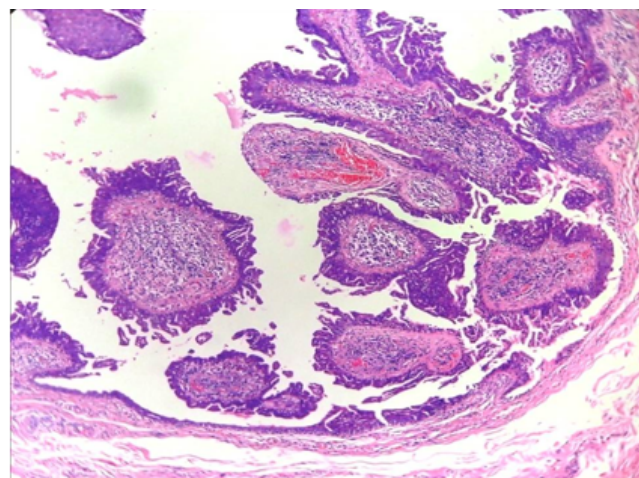


Fig. 6: Syringocystadenoma papilliferum, H&E stain, 100x

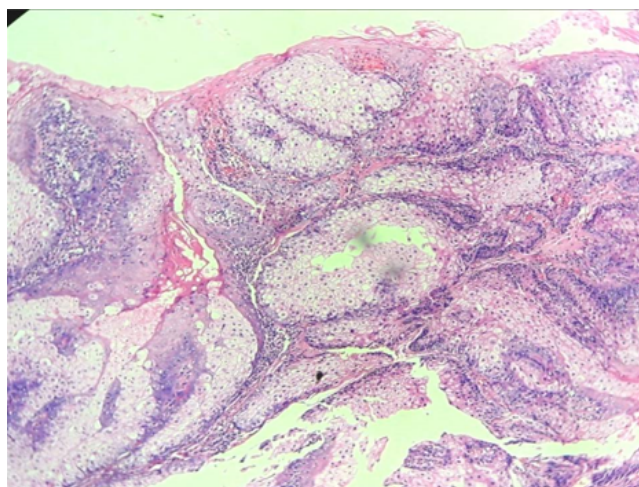


Fig. 7: Lobules of mostly mature sebaceous cells in Sebaceous adenoma, H&E stain, 100x

Table 3: Gender distribution of tumor categories

| Appendageal Tumours             | Male(%)           | Female(%)         | Total( %)       |
|---------------------------------|-------------------|-------------------|-----------------|
| <b>Eccrine</b>                  |                   |                   |                 |
| Nodular hidradenoma             | 5(11.63%)         | 4(9.30%)          | 9(20.93%)       |
| Cylindroma                      | 2(4.65%)          | 1(2.32%)          | 3(6.97%)        |
| Chondroid syringoma             | 0                 | 1(2.32%)          | 1(2.32%)        |
| <b>Pilar/Follicular</b>         |                   |                   |                 |
| Trichilemmal cyst               | 8(18.60%)         | 5(11.63%)         | 13(30.23%)      |
| Pilomatricoma                   | 5(11.63%)         | 3(6.97%)          | 8(18.60%)       |
| Trichoepithelioma               | 1(2.32%)          | 0                 | 1(2.32%)        |
| <b>Sebaceous</b>                |                   |                   |                 |
| Nevus sebaceous                 | 2(4.65%)          | 1(2.32%)          | 3(7.0%)         |
| Sebaceous adenoma               | 0                 | 1(2.32%)          | 1(2.32)         |
| Sebaceous carcinoma             | 1(2.32%)          | 0                 | 1(2.32%)        |
| <b>Apocrine</b>                 |                   |                   |                 |
| Apocrine hidrocystoma           | 1(2.32%)          | 1(2.32%)          | 2(4.65%)        |
| Syringocystadenoma papilliferum | 0                 | 1(2.32%)          | 1(2.32%)        |
| <b>Total</b>                    | <b>25(58.14%)</b> | <b>18(41.86%)</b> | <b>43(100%)</b> |

Table 4: Distribution of tumours according to location

| Site       | Number of cases (n) | Percentage (%) |
|------------|---------------------|----------------|
| SCALP      | 22                  | 51.2           |
| FACE       | 12                  | 27.9           |
| BACK       | 03                  | 7.0            |
| UPPER LIMB | 05                  | 11.6           |
| BREAST     | 01                  | 2.3            |

6. Discussion

Skin appendageal tumours often cause a diagnostic dilemma for pathologists due to uncertain origin, varied clinical presentation and overlapping morphology. But it is crucial to diagnose them as some of them have malignant potential. Appendageal tumours may be associated with certain syndromes such as Muir-Torre syndrome, Brooke-Spiegler syndrome etc.<sup>3</sup>

In our study out of 43 cases, 35 were males and 18 were females with male:female ratio 1.38:1. Though majority of the cases (23.8%) belonged to age group of 31-40 years, 11-20 and 21-30 yr age group also had high number of cases each (21.4%). Majority of cases belonged to the third decade in a study by Kala et al and Radhika et al.<sup>4,5</sup> However, Nair et al reported 11-20 years to be the most commonly affected whereas, Sharma et al found it to be 51-60 years.<sup>6,7</sup>

Head and neck were the most common areas of involvement which was concordant with studies by

Garima et al and Pathakamuri P et al.<sup>8,9</sup> Single lesions were frequently encountered and majority were cystic lesions(70%) which was consistent with study by Gandhi et al.<sup>10</sup> All the tumours were benign(97.7%), the only malignant case encountered in our study was sebaceous carcinoma.

The most common differentiation observed among tumours in our study was pilar comprising of 22 cases (52.4%) which was similar to study by Kaur et al.<sup>11</sup> This was in concordance with studies by Garima et al, with Pilomatricoma being the most common tumour.<sup>8</sup> However, as per Agrawal et al and Pachori et al maximum tumours belong to eccrine group, with nodular hidradenoma leading in eccrine category of differentiation.<sup>12,13</sup> In contrast Pathakamuri P et al found chondroid syringoma to be the most common among eccrine group.<sup>9</sup>

In our study, the most common lesion was Trichilemmal cyst comprising of 30.2% (13cases) of total cases. There was a case of proliferating trichilemmal cyst which had squamous proliferation arising from the cyst wall. Many tumours may arise from trichilemmal cyst like malignant trichilemmal tumour.

Pilomatricoma comprised of 18.6% (8 cases) and Trichoepithelioma comprised of 2.3%(1 case) of total cases. Pilomatricoma was characterized by a well-circumscribed tumour island comprising of two types of cells- basophilic cells with elongated nuclei and 'shadow cells' having eosinophilic cytoplasm and central unstained nuclei. Some studies show beta-catenin gene mutation in Pilomatricoma which affects cell-cell-adhesion.<sup>14</sup>

Trichoepithelioma was characterized by multiple horn cysts and basophilic tumour islands with peripheral nuclear palisading. Its challenging to distinguish trichoepithelioma from basal cell carcinoma. However, papillary mesenchymal bodies which are repetitive abortive attempts to form papillary mesenchyme in trichoepithelioma are typically absent in basal cell carcinoma (Figure 3).<sup>6</sup>

Among eccrine tumours, nodular hidradenoma was the most common tumour in our study which presented as solitary nodules. Out of 9 total cases, 5 patients presented as scalp nodule, 2 cases presented as cystic lesions over back and rest 2 presented as nodules in upper limb. Histopathologically, the tumour was well-circumscribed lobulated tumor in dermis with solid and cystic spaces. Solid areas revealed polyhedral cells with basophilic cytoplasm and round cells with clear cytoplasm. One of the cases had predominance of clear cells, hence was reported as clear cell hidradenoma. Duct-like structures were present and intervening stroma varied from delicate vascularised cords to hyalinised collagen. The clear cells were due to glycogen and alternate term is clear cell hidradenoma.

There were three cases of cylindroma (2.3%), 2 on scalp and one pre-auricular swelling The tumour consisted of a

well-circumscribed lesion having islands of tumour cells with a typical 'jigsaw' puzzle architecture on low power examination. The lobules were composed of peripheral layer of dark staining basaloid cells and pale staining area at the centre. The acellular basement-like material was PAS positive Cylindromas are associated with Brooke-Spiegler syndrome and familial cylindromatosis which results in a mutation in tumour suppressor gene CYLD. (Figure 4).<sup>15</sup>

There was a single case of chondroid syringoma among eccrine tumours which presented as a cyst of forehead of a 61 years old female patient. Histopathology revealed multiple well-circumscribed cystic spaces lined by tissue having biphasic growth pattern with epithelial elements in the form of non-branching bilayered tubules as well as solid nests embedded in a predominantly fibrous and focally chondromyxoid areas. (Figure 5).

There were three apocrine tumours, out of which two were diagnosed as apocrine hidrocystoma. One of these cases presented as a left sub-brow cyst, another was a subcutaneous axillary nodule. Histopathology revealed multiloculated cystic space lined by bilayered epithelium, an outer flattened myoepithelial cell layer and an inner layer of tall columnar cells with eosinophilic cytoplasm and basally located round to oval vesicular nuclei. Decapitation secretion was present.

One case of syringocystadenoma papilliferum was diagnosed from discharging breast sinus of left breast tissue of a 52 years female patient. Histopathology showed cystic areas with papillary projections lined by squamous to columnar cells with some apocrine change. Stroma comprised of sheets of plasma cells (Figure 6).

Sebaceous differentiation was seen with 3 cases of nevus sebaceous, 2 were on face and one on forehead. Histological features were hyperkeratosis, irregular acanthosis, papillomatosis of epidermis and dermis having many mature and partially mature sebaceous glands. Many appendageal tumours may develop in nevus sebaceous like trichoblastoma, syringocystadenoma papilliferum and malignant epithelial tumours like squamous cell carcinoma and basal cell carcinoma. But this was not observed in our study.

There was a case of sebaceous adenoma diagnosed from a nodular swelling over face of a 27 years female patient. Histopathology revealed a well-circumscribed tumour with tumour cells arranged in lobules. The lobules consist of mature sebaceous cells at the centre and the dark staining undifferentiated basaloid cells at the periphery.(Figure 7) Sebaceous adenoma are often seen as cutaneous component of Muir-Torre syndrome.<sup>16</sup>

Our study comprised of only one malignant tumour-sebaceous carcinoma which was diagnosed from an eyelid mass of a 68 year male patient. On biopsy, the tumour showed a nesting pattern with cells having finely vacuolated cytoplasm and distinct cell borders.

Sebaceous carcinoma is often misdiagnosed as chalazion or chronic blepharokeratoconjunctivitis, hence it poses a challenge to clinicians as well as pathologists.

## 7. Conclusion

Skin appendageal tumours are very common in head and neck region. They have diverse but specific histomorphological features which makes biopsy an imperative tool for their diagnosis. They can give rise to other tumours and also carry malignant potential. Further, they can hint at an underlying internal malignancy like Cowden syndrome. Hence, a systematic and detailed history, proper clinical examination and histopathological approach can help in arriving at the correct diagnosis.

## 8. Source of Funding

None.

## 9. Conflict of Interest

None.

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