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# An Observational Study on Cutaneous Appendageal Tumours with Pilar Differentiation

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**Abstract**

**Background**: Cutaneous appendageal tumours belong to a diverse group of tumours with specific histo pathology.The aim of this study is to determine the pattern, age,gender and site distribution of Pilar differentiation tumours. **Material & Methods:** The study was conducted in the department of Pathology,Government Medical College Srinagar for a period of 18 months. It was an observational cross sectional study.Formalin fixed,paraffin embedded tissue sections were stained with hematoxylin and eosin stain for histopathological analysis. **Results:** A total of 112 cases of Pilar tumours were studied.108 were benign and 4 were malignant with male to female ratio of 1.07:1. The maximum number of benign cases were observed in 11 -20 years of age group and the malignant tumours age ranges from 35-45 years and the tumour usually presented in the eighth decade.Head and Neck was the most common site. **Conclusion:** Histopathological examination of Pilar Tumours is the gold standard to differentiate between benign and malignant tumours. It is also useful for exact categorization of cutaneous appendageal tumours.

**Keywords**:- Cutaneous appendageal tumours, Pilar differentiation tumours, Pilomatricoma.

## INTRODUCTION

The skin is the largest organ in the body, both in weight and surface area.[1] Skin is a double-layered membrane covering the exterior of the body and consists of a stratified cellular epidermis and an underlying dermis of connective tissue. In adults, the skin weighs over 5 kg and covers a surface area approaching 2m2.[2] Neoplasms of cutaneous appendages are rare lesions and since they are so infrequently encountered in practice, they may cause difficulty in diagnosis. These tumors can differentiate in the direction of any of the four types of cutaneous appendages i.e., eccrine sweat glands, apocrine sweat glands, sebaceous glands and hair follicles.[3] They are often difficult to diagnose clinically and histopathology usually provides diagnostic confirmation.[4]

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Hair Follicle: Hair follicles begin to develop early during the fetal period, mainly around the 9thand 12thweek of gestation. They originate because of the proliferation of the germinative layer of the epidermis and extend to the underlying dermis.[5] Cutaneous appendageal tumors are a large diverse group of tumors that are commonly classified according to their state of appendageal differentiation- eccrine, apocrine, follicular and sebaceous.[6]

Adnexal tumors arising from the skin are usually missed clinically as most of the Skin adnexal tumors (SATs) present as asympto¬matic papules or nodules. Anatomic location, number and distribution of lesions provide important clue. Di¬agnosis of skin adnexal tumors is possible by performing an elliptical skin biopsy, submitting for haematoxylin and eosin (HandE) staining and histochemistry. Most Skin adnexal tumors (SATs) are benign, but a malignant counterpart of every Skin adnexal tumors (SATs) has been described.[7] Cutaneous metastasis occurs in 10% of patients with internal carcinomas.[8,9] Head and neck region is unique because of its rich distribution of pilosebaceous apparatus, apocrine as well as eccrine sweat glands. It has also been previously documented that appendageal tumours (ATs) predominate over head and neck area.[10]

## MATERIAL AND METHODS

The present study was an observational cross-sectional study over a period of 18 months from Jan 2020 to June 2021 in the department of Pathology, Govt. Medical College and Associated Hospital Srinagar. The clinical details were retrieved from the requisition forms of our department. All skin specimens and skin biopsy received by Department of Pathology were properly labeled, numbered and kept for overnight fixation in 10 percent formalin. The maximum number of required tissue sections were taken, tissue was processed as per standard procedure. 3 to 4 micron sections were taken from paraffin embedded tissue blocks and stained with hematoxylin and eosin stain.

PHOTOGRAPHY:The digital pictures of the selected processed tissue preparations were photographed using Nikon DS-Ri2 digital camera attached to microscope, Nikon ECLIPSE Ci-L.

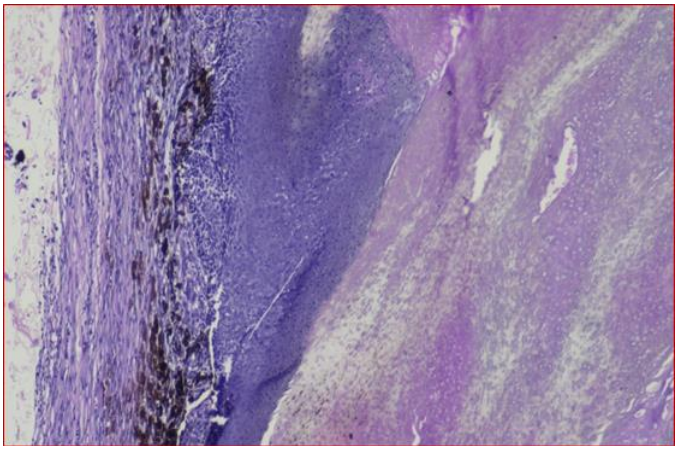

**Figure 1 A:** Pilomatricoma 10 x low power showing maturation, the cells become larger, acquire abundant eosinophilic cytoplasm along with melanin pigmentation within basaloid cells (H&E)

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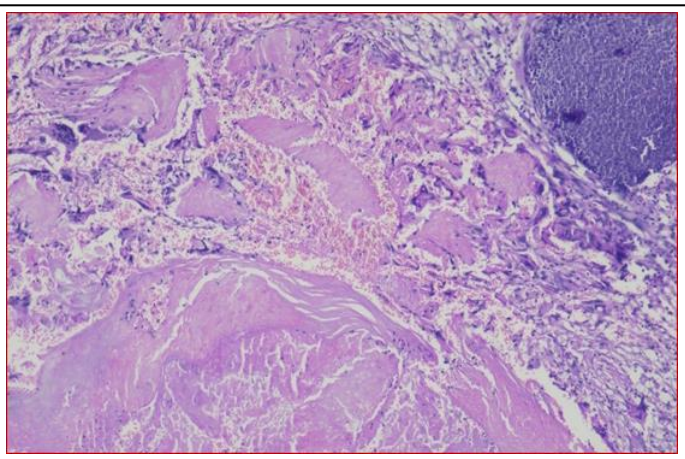

**Figure 1B:** Pilomatricoma 10x low power showing typical biphasic population (H&E)

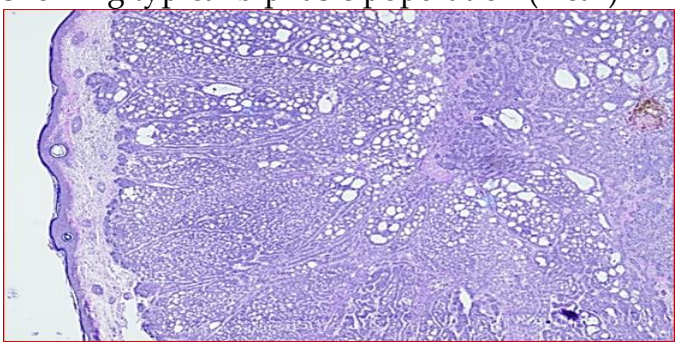

**Figure 2 A:** Trichoblastoma 10x low power showing pseudoencapsulated nodular basaloid cell population, and stromal mucin deposition resulting in adenoid foci (H&E)

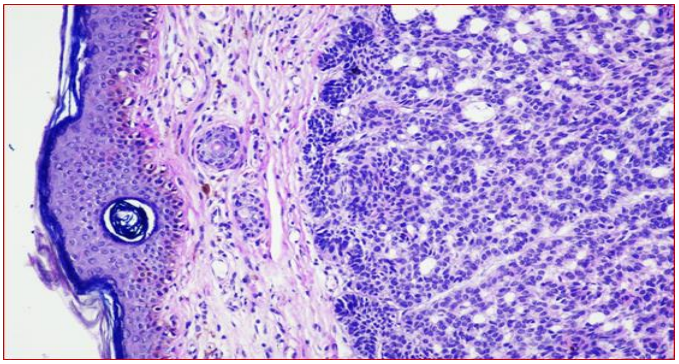

**Figure 2 B:** Trichoblastoma 40x High power showing epithelial cells with peripheral palisading and absence of retraction artifact (H&E)

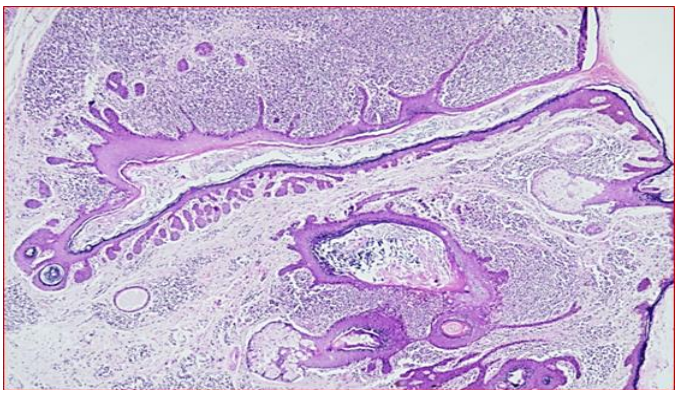

**Figure 3:** Trichofolliculoma 10x low power showing dilated follicles filled with keratin and communicating with the epidermis (H&E)

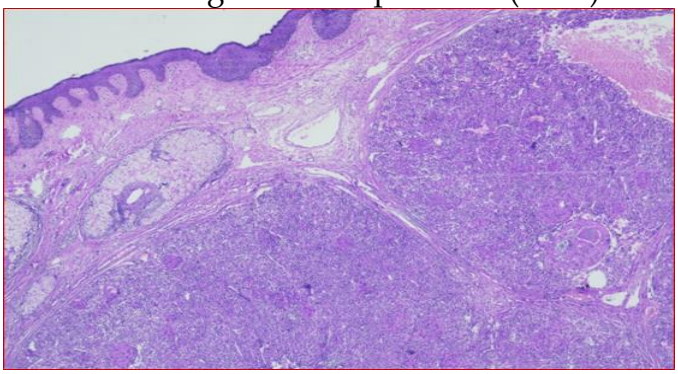

**Figure 4 A:** Trichelemmoma 4x Scanner view (H&E)

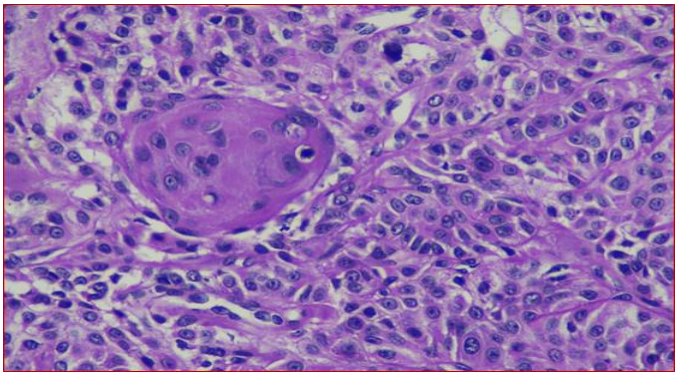

**Figure 4 B:** Trichelemmoma 40x showing area of tumour composed of clear cells with squamous morules in the centre(H&E)

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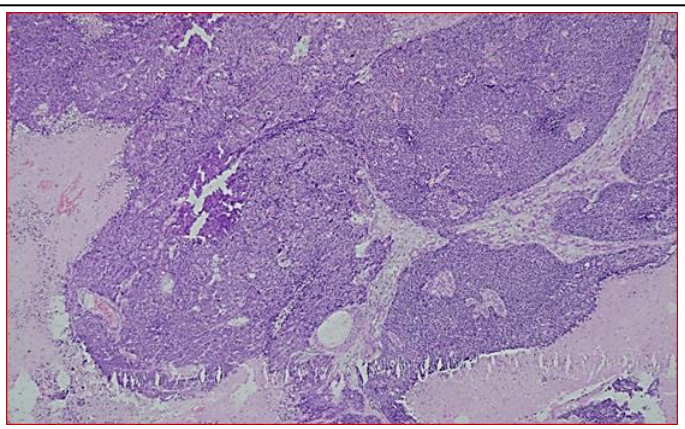

**Figure 5 A:** Trichelemmal Carcinoma 4x Scanner view showing a well-defined tumour composed of lobules of epithelium with sharply defined lower border (H&E)

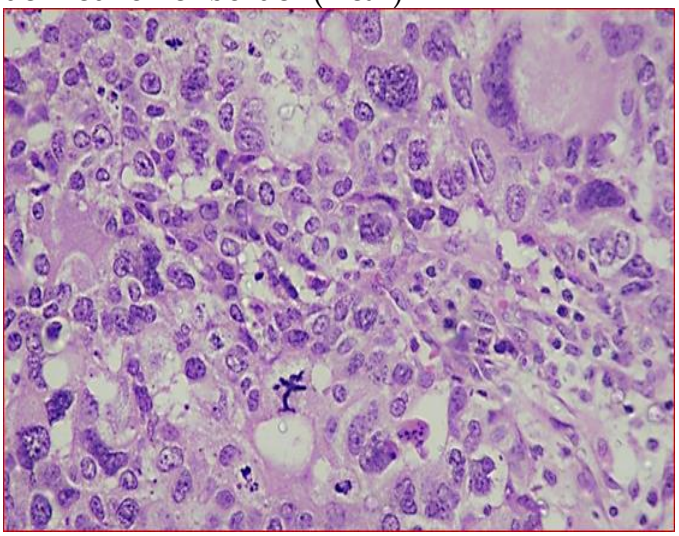

**Figure 5 B:** Trichelemmal Carcinoma 40x high power view showing marked nuclear pleomorphism and abnormal mitotic figure(H&E)

## RESULTS

This study was an observational cross-sectional study conducted in the Department of Pathology, Government Medical College Srinagar [Table 1]. Over the study period of 18 months, 112 cases of Pilar neoplasms were diagnosed. The most common neoplasm identified in this study was Pilomatricoma (83.9%) and least common were Trichoadenoma (0.89%), Proliferating Trichelemmal cyst (0.89%), Trichelemmoma (0.89%). Benign adnexal tumours constituted 96.42% (108/112) cases and 3.57% (4/112) malignant adnexal tumours were noted. In the present study, cutaneous pilar tumour were observed in all age groups ranging from 2 to 85 years.However the highest incidence was observed in the age group of 11-20 years followed by 21 to 30 years as shown in [Table 2]. The Male Female ratio was 1.07 :1 as shown in [Figure 6] Head and Neck was the most common site comprising of 62.5% (70 case), followed by upper limb and lower limb [Table 3].

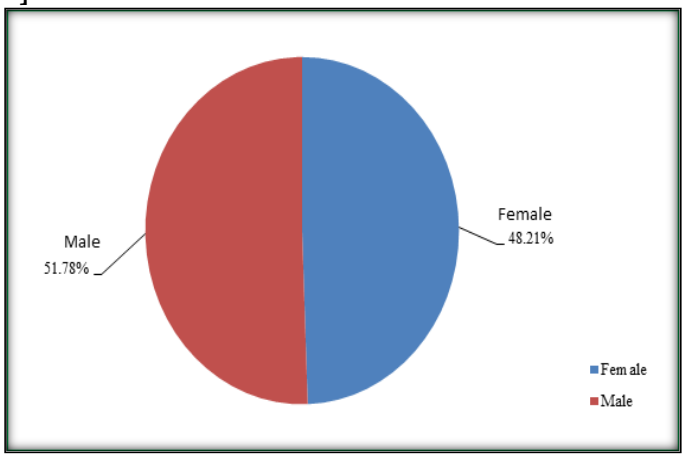


**Figure 6:** Distribution of Pilar Neoplasms According to Gender

**Table 1:** Histological Pattern of Pilar Neoplasms.

| | S.No | Diagnosis | Frequency | Percentage % |
|---|---|---|---|---|
| Hair follicle | 1 | Pilomatricoma | 94 | 83.92% |

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| | | | | |
|---|---|---|---|---|
| Tumors | 2 | Trichoadenoma | 1 | 0.89% |
| | 3 | Trichoblastoma | 3 | 2.67% |
| | 4 | Trichoepithelioma | 4 | 3.57% |
| | 5 | Trichofolliculoma | 4 | 3.57% |
| | 6 | Proliferating Trichelemmal cyst | 1 | 0.89% |
| | 7 | Trichelemmoma | 1 | 0.89% |
| | 8 | Trichelemmal carcinoma | 4 | 3.57% |

**Table 2:** Distribution of Pilar Neoplasms according to Age Group

| **Record of Age** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Histological Dx** | **<=10 yrs** | **11-20yrs** | **21-30yrs** | **31-40yrs** | **41-50yrs** | **51-60yrs** | **61-70yrs** | **71-85yrs** | **Total** |
| Pilomatricoma | 15 | 33 | 23 | 12 | 5 | 2 | 2 | 2 | 94 |
| Trichoadenoma | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Trichoblastoma | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 3 |
| Trichoepithelioma | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 4 |
| Trichofolliculoma | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 4 |
| Proliferating trichelemmal cyst | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Trichelemmoma | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Trichelemmal Carcinoma | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 4 |

**Table 3:** Site wise Frequency of Pilar Neoplasm

| **S.No** | **Site** | **Frequency** | **Percentage %** |
|---|---|---|---|
| 1 | Head and Neck | 70 | 62.5% |
| 2 | Upper limb | 25 | 22.3% |
| 3 | Lower limb | 7 | 6.25% |
| 4 | Trunk | 10 | 9.82% |
| | Total | 112 | 100% |

**Table 4:** Comparison of sites in different studies

| **Table 4** | | | | |
|---|---|---|---|---|
| **Study** | **Total No.of cases** | **Head and Neck** | **Extremities** | **Trunk** |
| Vaidik et al,[18] | 130 | 63 | 49 | 18 |
| Arvind G et al,[12] | 90 | 74 | 9 | 7 |
| Present study | 112 | 70 | 32 | 10 |

## DISCUSSION

The diagnosis of adnexal tumour poses great difficulties owing to a variety of reasons namely, the enormous types of tumors with their variants, the occurrence of multiple lines of differentiation in a single tumor as well as the complicated nomenclature. Adnexal tumors originate from multipotent undifferentiated stem cells which have the capability to

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differentiate along particular pathways, may be multiple.[4,11]

112 cases of pilar tumors were studied over a period of 18 months in our institution. The present study was compared with studies carried out over different time periods and different durations . In the present study, the most common benign neoplasm encountered was pilomatricoma 94 cases( 83.92%) followed by trichoepithelioma 4 cases (3.57%) and the malignant neoplasm was trichelemmal carcinoma 4 cases (3.57%) . This coincides with the findings of Arvind et al,[12] and Muktanjalee et al.[13]

In our study, among 112 cases of pilar neoplasms 108 were benign and 4 were malignant as shown in table .This is in agreement with the findings of other studies Arvind et al,[12] Muktanjalee et al,[13] Ankit Sharma et al.[14]

Pilar neoplasms show a wide range of age distribution. The present study observed wide age range of 2-85 years. The most common age group involved in this study was 11-20 years which is similar to findings of Pradeep S Nair et al.[8] However Vani D et al,[15] found 41-50 year as the most common age group. Rathoriya SG et al,[16] and Alka Sahu et al,[17] found 31-40 year and 21-30 year as the most common age group.

In the present study, Pilar neoplasms showed slight male predominance with male :female ratio of 1.05:1 which is comparable with the studies of Alka Sahu et al,[17] Vaidik et al,[18] Arvind G Valand et al (1.7:1 ,1.24:1 ,1.72:1).[12]

In our study, head and neck was the commonest site involved, 70 cases (62.5%) followed by extremities 32 cases (28.55%) and trunk 10 cases (9.82%) which is consistent with the studies of Arvind G Valand et al,[12] Vaidik et al,[18] as shown in [Table 4].

**Common Skin Adnexal Lesions with Pilar Differentiation**

In the present study tumors of hair matrix including Pilomatricoma were the most frequently encountered follicular lesion and accounted for 83% of the cases with pilar differentiation.

**Pilomatricoma**

Pilomatricoma is a benign neoplasm with differentiation towards the matrix of the hair follicle.It was first described in 1880 by Malherbe and Chenantais as a tumor of hair follicle.[19] In 1949 Lever and Griesmer highlighted the matricial differentiation. Pilomatricoma is most frequently seen in the first and second decade.[19]

**Microscopy:** In general, the tumour is often well circumscribed and composed of epithelial islands embedded in a cellular stroma. Two types of cells comprise the islands: basophilic cells and shadow cells. The basophilic cells resemble hair matrix cells and shadow cell without nucleus. In few cases, small round, eosinophilic centres of keratinization are seen within the areas of basophilic cells or within the aggregates of shadow cells and multiple foci of calcification and foreign body reaction containing many giant cells adjacent to the shadow cells are seen in the stroma of the tumours.

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## CONCLUSIONS

It is evident from the present study, that histopathological examination of Pilar Adnexal Tumours is the gold standard to differentiate between benign and malignant tumours. It is also useful for exact categorization of Cutaneous Appendageal Neoplasms.

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