Section: Pathology

Original Research Article

A STUDY ON CYTOHISTOPATHOLOGICAL CORRELATION OF SKIN ADNEXAL LESIONS IN A TERTIARY CARE CENTRE

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ABSTRACT

Background: Skin adnexal tumours are relatively an uncommon entity in day to day pathology practice. The present study was conducted with an aim to diagnose skin adnexal neoplasm on Fine Needle Aspiration Cytology (FNAC) to differentiate them from superficial subcutaneous swelling, and their correlation on Histopathology for confirmation. **Materials and Methods:** This is a retrospective study of FNAC of 28 cases of subcutaneous and dermal swellings for 2 years from February 2023 to February 2025 at Government General Hospital Sangareddy, Telangana. FNAC of the swelling was performed and slides were stained with Giemsa and H &E stain. Following FNAC, the swelling was excised and subjected to histopathological examination for correlation. **Result:** Total of 22 cases were studied. Majority of the cases were between 2nd to 4th decade with female predominance. Among which Benign adnexal lesion were 19(91.7%),3(8.3%)were Malignant. FNAC helped in typing the adnexal lesion. Most of the cases were in correlation with cyto and histopathological diagnosis. Few of them were difficult to diagnose on cytology due to pauci cellularity. However they turned to be benign on histopathology. **Conclusion:** FNAC is a rapid, safe, cost effective investigation to differentiate Benign and Malignant lesions of skin adnexal tumours, which guide the surgeon regarding extent of excision.

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 catagories.[1] 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.[2] 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 Skin adnexal tumours on FNAC and Histopathology done at our institute.

MATERIALS AND METHODS

This is a retrospective study done for 2 years from February 2023 –February 2025. Fine needle aspiration (FNA) was done for all the swellings presented as intradermal and subcutaneous nodules. A total of 22 cases of Adnexal Tumors were studied. FNAC was performed with a 22-gauge needle attached to a 5 ml syringe. The material obtained was smeared on glass slides and stained 2 slides with geimsa & haematoxylin–eosin stain. Thorough history was taken, and detailed clinical examination was performed at the time of the procedure. The reports were then correlated with histopathology if the patient had proceeded with excision of swelling following FNAC. The excised specimens which were not received on histopathology were excluded from the study.

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RESULTS

Total of 22 cases were included in this study. With female predominanace (64%), male (36%), forming a ratio of 1.8:1.

Age range of cases were between 8y-60y, with a mean age of 38y.

Table 1: Age wise distribution of benign and malignant adnexal lesions.

Age (years)	Benign lesions	Malignant lesions	Total
0-10	1	0	1
11–20	3	0	3
21–30	5	0	5
31–40	6	0	6
41–50	2	0	2
51–60	2	3	5
Total	19	3	22

The youngest was 8years and oldest patient was 60 years, respectively [Table 1].

Head and neck were found to be the most common site (70%) followed by the arm (10%), axillary(10%), and thigh region(10%) [Table 2].

Table 2. Site wise distribution of benign and malignant adnexal lesions.

Site	Benign lesions	Malignant lesions	Total
Head and neck	13	3	16
Trunk	2	0	2
Upper extremities	2	0	2
Lower extremities	2	0	2
Total	19	3	22

All 22 FNAC smears were adequate for opinion. Out of the 22 cases reported, 19 cases (91.7%) were reported to be benign while only 3 cases (8.3%) were reported as malignant.

There were six cases of Pilomatricoma located as cystic swelling in the scalp region. Aspiration smears showed nests of basaloid cells and sheets of ghost cells with foreign body giant cell reaction admixed with inflammatory cells.

There were two cases of chondroid syringoma which presented as dermal nodules in the head and neck, trunk, and lower extremities. FNAC smears showed nests and sheets of benign epithelial cells with moderate cytoplasm and bland chromatin embedded in a chondromyxoid stroma.

Seven cases were reported as benign skin adnexal tumors with basaloid cells with bland chromatin in basement membrane matrix which could not be characterized further on cytology [Table 3].

One case of Trichilemmoma confirmed on histopathology yielded large and small clusters of squamoid and basaloid cells, a few of which showed an abrupt association with anucleate, keratinized globules.

Three Cases of Trichilemmal cyst presented as scalp swelling. Fnac smears showed anucleate and few nucleated squames in a dirty background. Histopathology confirmed the diagnosis with absence of granular layer.

Three cases were reported as malignant adnexal tumors based on moderate to severe degree of pleomorphism, high nucleocytoplasmic ratio, and increased mitotic activity. However, diagnosis of a specific malignant tumor could not be made on cytology.

Out of 28 cases Histopathological diagnosis was available in 22 cases. The FNAC findings were confirmed and correlated on histopathology [Tables 4 and 5].

Table 3: Cytomorphological pattern/diagnosis of the adnexal lesions.

Type of skin adnexal lesion	Cytodiagnosis
Trichilemmoma	1
Benign skin adnexal tumor with basaloid cells and cystic change.	7
Pilomatrixoma	6
Trichilemmal cyst	3
Chondroid syringoma	2
Malignant skin adnexal lesion	3

Out of 22 cases cytology diagnosis in 15 cases was concordant with histopathology. Seven cases were not in correlation with histopathological sections.

Two cases turned out to be pilomatricoma and two to be proliferating trichilemmal tumour respectively.

One each of the benign skin adnexal tumors turned out to be Eccrine hidrocystoma, Granular cell tumour, poroma respectively. Three cases that were diagnosed as malignant skin adnexal tumors on cytology [Figure 6]; histopathology was available for

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all the cases, which were reported as Basal cell carcinoma.

Table 4: Benign skin adnexal lesions.

S. No.	Diagnosis on cytology	Diagnosis on histopathology	No. of cases
1.	Trichilemmoma	Trichilemmoma	1
2.	Pilomatricoma	Pilomatricoma	6
3.	Chondroid syringoma	Chondroid syringoma	2
4.	Benign skin adnexal tumor.	Pilomatrixoma	2
5.	Benign skin adnexal tumor with basaloid cells and cystic change	Eccrine hydrocystoma	1
6.	Keratinous cyst	Trichilemmal cyst	3
7.	Benign skin adnexal tumor.	Proliferating trichilemmal tumour	2
8.	Benign skin adnexal tumor.	Granular cell tumour	1
9.	Benign skin adnexal tumor.	Poroma	1
Total cases		19	

Table 5: Malignant skin adnexal lesions.

S. No.	Diagnosis on Cytology	Diagnosis on histopathology	No. of cases
1.	Malignant skin adnexal tumor	Basal cell carcinoma	1
2.	Malignant skin adnexal tumor	Basal cell carcinoma	1
3.	Malignant skin adnexal tumor	Basal cell carcinoma	1
Total cases		3	

DISCUSSION

Appendageal tumours have traditionally been divided into four principal categories according to whether the histologic structures appear like apocrine glands, sebaceous glands, hair follicles, or eccrine glands. In general, this type of diagnostic nosology depends on Appendageal structures.' Microscopic characteristics are helpful for the grouping of appendageal lesions. These comprise tumours with predominant follicular, sebaceous, apocrine, eccrine and multilineage distinction. Although many lesions display considerable diversity in histopathological appearance, there is considerable morphological overlap between entities that exhibit the notable flexibility of adnexal cutaneous tumours.[3-15]

"This study examined 22 skin adnexal tumors, comparing cytologic diagnoses and detailed cell morphology from fine-needle aspiration (FNAC) with subsequent histopathological findings. FNAC accurately identified the tumor type in most cases. A key diagnostic feature was the presence of pinkish basement membrane material.

In our study the most affected age group was 20-40 years, which is consistent with prior research.[1,2] With a female predominance (1.8:1 female-to-male ratio), in concordinance with studies by Arora et al. and Chand et al., which reported female predominance.[1,2] Rajalakshmi et al. reported a near-equal ratio (1.1:1).[3] Follicular tumors, particularly pilomatricoma, were the most common in our study, aligning with Kumar et al,[4] findings (48.93%). This contrasts with Chand et al. and Nair, who observed sweat gland tumors as the most frequent.[2,6]

"Our study found a 86% incidence of benign tumors, with an 7:1 benign-to-malignant ratio, which aligns with the results of Chand et al., Rajalakshmi et al., and Kumar et al.[2,5] However, Radhika et al. reported a lower incidence of 77%."

"Eccrine tumors can mimic basal cell carcinoma, cutaneous leiomyoma, neurofibroma, and metastatic malignancies.[7] Therefore, recognizing their specific cytological features is crucial for accurate patient management and to avoid misdiagnosis as cancer. Chondroid syringoma, a rare benign skin adnexal tumor analogous to pleomorphic adenoma, typically occurs in the head and neck.[8] Cytologically, it presents a biphasic pattern with benign epithelial cells within a chondromyxoid stroma."[2,9,10]

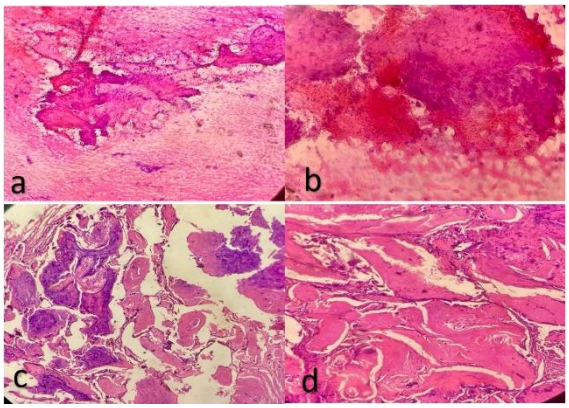

Figure 1: Pilomatricoma – (a–b) Giemsa-stained smears show clusters of basaloid cells and sheets of ghost cells (10X & 40X respectively). (c-d) Hematoxylin and Eosin stained section exhibiting transition of basaloid cells to ghost cells (10X & 40X respectively).

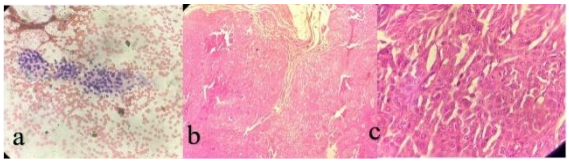

Figure 2: Trichilemmoma - (a) Giemsa stain smear (40X) showing sheets of basaloid cells. (b-c) H&E stained sections showing rounded lobular arrangement of the tumour with cuboidal cells squamous morules seen (10X & 40X respectively).

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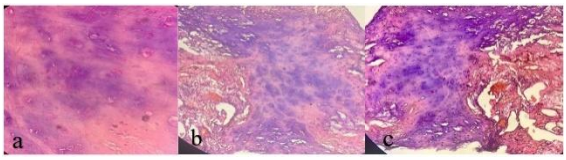

Figure 3: Chondroid syringioma - (a) Giemsa stained smear shows occasional clusters of basaloid cells in an chondroid mix pink eosinophilic background. (b-c) H&E stained sections show a biphasic tumor containing cords and islands of bland epithelial cells embedded in a fibrous and chondromyxoid stroma (10X & 40X respectively).

"The classic diagnostic features of pilomatricoma include a triad of ghost cells, basaloid cells, and foreign body giant cell reaction, accompanied by nucleated squames, calcification, and inflammatory cells.[11] The proportion of these components is influenced by the lesion's age. When FNAC is performed on an early-stage lesion or peripheral pilomatricoma lesions often yields a high concentration of basaloid cells, potentially leading to a false diagnosis of malignancy due to their high nuclear-to-cytoplasmic ratio and limited cytoplasm. Conversely, aspirating mature or central lesions may reveal a predominance of ghost cells, which can be mistaken for an epidermal inclusion cyst.[12,13] While adnexal tumors are typically benign and curable by local excision, their rare malignant counterparts are locally aggressive and have poor outcomes. Accurate diagnosis of malignancy in skin adnexal tumors is therefore crucial.

"Cytologic diagnosis is valuable in managing adnexal lesions. Skin appendageal tumors should be considered in the differential diagnosis of cutaneous nodules, especially with clinicopathological correlation. While most adnexal tumors are benign and curable with local excision, malignant forms are rare but aggressive, with potential for nodal and distant metastasis and poor outcomes. Accurate diagnosis of malignancy is crucial for therapy and prognosis. FNAC can detect malignant changes often missed clinically, confirmed by histopathology and aided by immunohistochemistry.

Malignant features include asymmetry, infiltrative margins, cytonuclear atypia, increased mitotic activity, and irregular cell arrangement. Early recognition of adnexal tumors is vital as they can indicate syndromes linked to internal malignancies, such as trichilemmomas in Cowden syndrome and sebaceous tumors in Muir-Torre, Birt-Hogg-Dubé, and Brooke-Spiegler syndromes; however, no syndromes were observed in this study. In Contrary with previous studies, Basal cell carcinoma was the most common malignant tumor in our study."

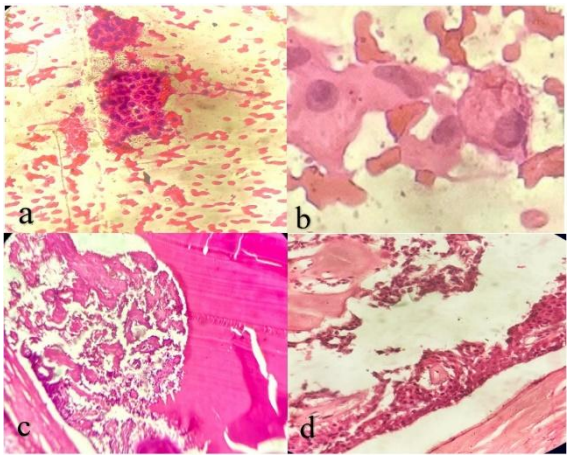

Figure 4: Eccrine Hidrocystoma - (a) Giemsa stained smear shows cyst macrophages and occasional basaloid cells in a pink eosinophilic background. (b-c) H&E stained sections show cyst wall lined by bilayered epithelium outer myoepithelium and inner tall columnar cells with basally located round to vesicular nuclei (10X & 40X respectively).

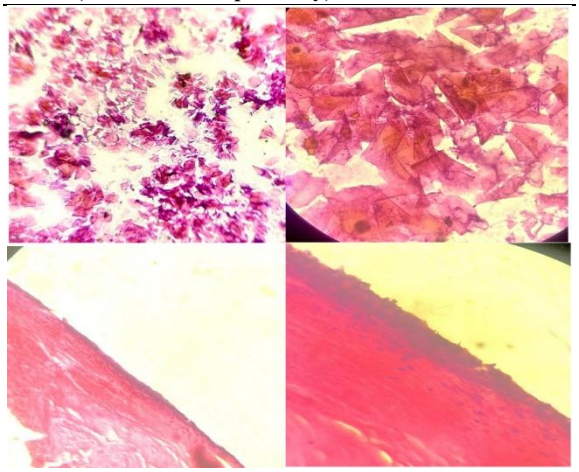

Figure 5: Trichilemmal cyst- (a-b)Giemsa stained smears shows anucleated and few nucleated squames (10x,40x respectively). (c-d) H&E stained sections show cyst wall lined by stratified squames epithelium with absence of granular layer with subepithelium showing abrupt keratinisation

Figure 6: Basal Cell Carcinoma - (a) Giemsa stained smear shows cluster of basaloid cells with palisading. (b-c) H&E stained sections show nests of basaloid cells with central cysts and peripheral palisading along with peritumoural clefting.

CONCLUSION

"Skin adnexal tumors are a diverse group, primarily benign. While histopathology remains the gold standard, fine-needle aspiration cytology (FNAC) is a valuable and promising tool for diagnosing and classifying these tumors as benign or malignant. FNAC facilitates early diagnosis and guides surgical decisions regarding excision."

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