



Imperceptible yet Important: An Account of Skin Adnexal Tumor at Tertiary Care Center

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Abstract

Background and Objectives:

Skin adnexal tumors are large and diverse group of skin neoplasms which are derived from multipotent undifferentiated cells and differentiates either into pilosebaceous unit or eccrine sweat glands or apocrine sweat glands. Due to its varied clinical presentation and diversity, histopathology plays an important role to confirm diagnosis in suspected cases. To study demographic, clinical and histopathological characteristics of skin adnexal tumors (SATs) in patients attending Out patients Department of LG hospital, Ahmedabad.

Materials and Methods:

Total 66 clinically suspected patients were included in this cross-sectional study conducted over 6 years (September 2014 to September 2020) and subjected to biopsy and histopathological examination. Out of which only 47 patients were finally analyzed with respect to demographical, clinical and histopathological parameters, as they are confirmed microscopically.

Results:

The confirmed cases of appendageal tumors were benign except Sebaceous cyst carcinoma and most common site being head and neck region (43/47). Male to female ratio was 1:1.13 and younger age group was more commonly affected (21-30 years). Most of the tumors (60%) had chronic course (>2 years). 44.68% cases showed sebaceous gland differentiation, 40.42% hair follicle differentiation and 14.9% sweat gland differentiation. Most common type of adnexal tumour was syringoma (23.44%) and nevus sebaceous (23.44%), followed by sebaceous adenoma (20%), trichoepithelioma (8.8%). Concordance in clinico-histopathological diagnosis was found in 44.68% cases.

Conclusion:

Malignant SATs are very rare entity. Occurrence of these tumors over discernible sites of head and neck area and preponderance in younger females, they are important cosmetically. They are often over-diagnosed clinically because of its imitation with other tumors and huge variety, that's why accurate diagnosis is done by histopathological examination.

Keywords: Appendageal tumors, Clinico-pathological correlation, Histopathology, Morphology, Skin adnexal tumors

Introduction

Skin adnexal tumors (SATs) are neoplasms that differentiate toward or arise from pilosebaceous unit, eccrine sweat glands or apocrine sweat glands. These tumors are derived from multipotent undifferentiated cells present within the epidermis or its appendageal structures.^[1] Influenced of genes, local vascularity, and the microenvironment of the epidermis and dermis lead to conversion of multipotent cells into adnexal tumors.^[2] Activation of molecular pathways responsible for forming the mature adnexal structure determine the histological feature of tumor.^[3]

Most of the benign SATs present as asymptomatic papules or nodules which are difficult to diagnose clinically, although distribution of lesions over specific anatomic location and number will provide important clue.^[4] Since all cutaneous adnexa share same origin, tumor arising from them may have many common features. They are confirmed by histopathology and immunohistochemistry has corroborative value.^[5]

Most of these tumors are benign. Risk of malignant degeneration varies with individual lesions.^[4] Some are of clinical importance due to the association with internal malignancy like breast carcinoma and Cowden syndrome (trichilemmoma), Gardner, Birt–Hogg–Dubé and Muir–Torre syndrome (sebaceous tumors), basal cell nevus and Brooke–Spiegler syndrome (trichoepithelioma).^[1]

Most of the time SATs are diagnosed incidentally on excision biopsy done for cosmetic reasons or due to suspicion of malignancy. In view of difficulty encountered in diagnosis and its association with other syndromes, we aim to study demographic, morphological, histopathological features of SATs, which will help us for better understanding and early diagnosis.

Materials And Methods:

It was a cross sectional descriptive study done over a period of 6 years (September 2014 to September 2020) in Department of Dermatology, LG hospital, Ahmedabad. All the patients with clinical suspicion of SATs were evaluated (with detailed history and examination). Patients who gave consent for histopathological examination were included in the study. Formalin fixed, paraffin embedded tissue specimens were subjected to haematoxylin and eosin

staining, detailed microscopic examination and reporting by Department of pathology. Special stains like periodic acid Schiff (PAS), alcian blue, mucicarmine and Masson's trichrome were also used when required. Cases that are clinically diagnosed as SATs but histopathological findings were not suggestive, were excluded from the study. Out of 66 suspected cases, total 47 cases were finally considered and analyzed in the study. Statistical analysis was done using SPSS 27 software.

The study was reviewed and approved by institutional review board of the medical college. Confidentiality of all the data obtained from this study was maintained.

Results:

In the present study, 72.3% (47/66) of clinically suspected cases were found to be appendageal origin. Out of 47 cases of SATs, only one case was malignant while rest all were benign. In the present study, tumors involving sweat gland constituted highest no. of cases i.e., 44.68% (21/47), followed by sebaceous gland tumors 40.42% (19/47) and hair follicle tumors 14.9% (7/47). Among sweat gland tumors, 13(27.65%) cases were of syringoma (figure-2) and which was also overall the commonest SAT in this study. Syringocystadenoma papiliferum (figure-5), Eccrine spiradenoma (figure-6), chondroid syringoma, Apocrine hydrocystoma, nodular hidradenoma and eccrine poroma are other types of sweat gland SATs. Nevus sebaceous (figure-1) (7/19,36.84%) was most common tumor in sebaceous gland group. Sebaceous adenoma was second on the list accounted for 31.57% (6/19) cases. Trichoepithelioma (figure-3,4) (4/47,8.5%) was the most common among hair follicle tumors, followed by trichoadenoma, trichofolliculoma and dilated pore of winer. [Table-1]

Affected age group was ranging from 13-76 years with mean age of presentation was 29.32±16.7 year. Highest no. of cases is observed in 21-30 years of age group (29.8%, 14/47), followed by 11-20 years (21.27%, 10/47) and 41-50 years (14.9%, 7/47). [Table-2] Youngest case was of nevus sebaceous and the eldest case was of trichoepithelioma.

Female to male ratio was 1.35:1. while in nevus sebaceous male: female ratio was 2.5:1. [Table-3]

46.8% cases had history of lesion for >2 years while 36.2% cases had 6 month-2 years history and 17.2% cases had <6-month history. Mean duration of complaints was 2.16 ± 1.15 year. [Table-4] Most common site involved was face (70.1%, 33/47), followed by scalp (21.27%, 10/47). [Table-5]

49% (23/47) cases were presented as a single lesion while 51% (27/47) cases were having multiple lesions. [Table-6]

21 (44.68%) patients had concordant clinic-histopathological findings while 26 (55.32%) patients had different clinico-histopathological diagnosis. [Table-7]

Discussion:

Histologically SATs are classified in to 4 categories depending upon differentiation: sebaceous gland, hair follicle, eccrine sweat gland and apocrine sweat gland.^[6] In most of the cases differentiation occurs uniformly involving only single appendage but some tumors may show features of more than one appendage with varying degree of maturation.^[7] Genetic factors like mendelian inheritance and p53 gene mutation are also important in its occurrence.^[8]

Tumors with sweat gland differentiation were most common, comprising of 44.68% cases which is consistent with other studies like Das et al.,^[9] Radhika et al.,^[10] Nair et al.,^[11] Jindal et al.,^[12] Pentola et al.^[13] and Sharma et al.^[14]

Among all the tumors, syringoma was most common SAT. Other studies like Das et al.,^[9] Nair et al.^[11] also found syringoma as a most common tumor. As mentioned earlier, sweat gland tumors were commonest in most of the studies but some of the them did not find syringoma as most common tumor so we can not imply that sweat gland tumors commonest because syringoma is the most common tumor in this category.

All the SATs were benign except sebaceous cyst carcinoma. This benign nature of tumors was concordant with other studies like Das et al.,^[9] Nair et al.^[11] and Jindal et al.^[12]

Most common age group affected was 21-30 years in present study. This younger age group was commonly involved in studies done by Das et al.,^[9] Radhika et al.,^[10] Pantola et al.,^[13] and Sahu et al.,^[15] While Sharma et al.,^[14] reported older age group

was commonly affected. Further study is required to established possible causal association between age and occurrence of SATs.

Female predominance was seen in our study and is comparable to Das et al.,^[9] Nair et al.,^[10] and Jindal et al.,^[12] and but they have observed female predominance with wider margin than present study. Female predominance is justified as highest no. of patients in our study are of syringoma, occurring commonly in females.^[10]

Most common site of predilection in present study was face and scalp as appendages are concentrated more in these regions. These were also the most common site in all other studies- Das et al.,^[9] Radhika et al.,^[10] Nair et al.,^[11] Jindal et al.,^[12] Pentola et al.,^[13] Sharma et al.^[14] and Sahu et al.^[15]

Most of our patients had duration of lesion for more than 2 years. Long duration of lesion was also established in studies done by Das et al.^[9] and Pentola et al.^[13] Long duration of history before presentation may be attributed to asymptomatic and benign nature of lesion.

We report a single case of syringocystadenoma papiliferum evolved from nevus sebaceous. Primary syringocystadenoma papiliferum is a rare occurrence.

Out of 47 cases, 21 case had clinical and histopathological correlation which describes importance of histopathological examination in every case of suspected skin adnexal tumors.

Conclusion:

Owing to the fact that these tumors appear on the discernible sites of head and neck area and preponderance in younger females, majority of our presenting patients are concerned for cosmetic reasons. Though rare but benign appendageal tumors may convert into malignancy which is commonly seen in elderly age group, so early diagnosis is important. Diagnosis of these tumors may help in early identification of underlying syndromes and prevents its associated complications. They are often misdiagnosed clinically because of its imitation with other tumors and huge variety, that's why accurate diagnosis is done by histopathological examination.

References

1. T. S. S. Ahmed, J. D. Priore, and J. T. Seykora, "Tumors of epidermal appendages," in *Lever's Histopathology of the Skin*, D. E. Elder, R. Elenitsas, B. L. Johnson, and G. F. Murphy, Eds., pp. 867–868, Lippincott Williams & Wilkins, Philadelphia, Pa, USA, 9th edition, 2005.
2. Wong TY, Suster S, and Cheek RF, Mihm MC Jr. Benign cutaneous adnexal tumours with combined folliculosebaceous apocrine and eccrine differentiation: clinicopathological and immunohistochemical study of eight cases. *Am J Dermatopathol* 1996; 18:124-8.
3. Klein W, Chan E, Seykora JT. Tumors of the epidermal appendages. In: Elder DE, Elenitsas R, Johnson BL Jr, Murphy GF, editors. *Lever's Histopathology of the Skin*. 9th ed. Philadelphia: Lippincott Williams and Wilkins; 2005. pp. 867–926.
4. R. Stantaylor, J. B. Perone, S. Kaddu, and H. Kerl, "Appendage tumors and hamartomas of the skin," in *Fitzpatrick's Dermatology in General Medicine*, K.
5. Wolff, L. Goldsmith, S. Katz, B. A. Gilchrest, A. S. Paller, and D. J. Leffell, Eds., pp. 1068–1087, McGraw Hill, New York, NY, USA, 7th edition, 2008.
6. Khandpur S, Ramam M. Skin Tumors. In: Valia RG, Valia AR, editors. *IADVL Text book of Dermatology*. 3rd ed. Mumbai: Bhalani Publishing House; 2008. pp. 1475– 38.
7. Moore To, Orman HL, Orman SK, et al. Poromas of Head and Neck. *J Am Acad Dermatol*. 2001; 44:48-52.
8. Perez MI, Robins P, Biria S, Roco J, Siegel E, Pellicer A. P53 oncoprotein expression and gene mutations in some keratoacanthomas. *Arch Dermatol* 1997;133:189-93.
9. 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 Jan;56(1):33-6. doi: 10.4103/0019-5154.77548. PMID: 21572788; PMCID: PMC3088931.
10. Kottu, Radhika & BV, Phaneendra & Rukmangadha, Nandyala & MK, Reddy. (2013). A study of biopsy Confirmed skin adnexal tumours: experience at a tertiary care teaching hospital. *Journal of Clinical and Scientific Research*. 2. 132-138. 10.15380/2277-5706.JCSR.12.069.
11. Nair PS. A clinico-histopathological study of skin appendageal tumors. *Indian J Dermatol Venereol Leprol* 2008;74:550.
12. U Jindal, R Patel. *Study Of Adnexal Tumors Of The Skin: A Three Year Study Of 25 Cases*. The Internet Journal of Pathology. 2012 Volume 13 Number 3.
13. Pantola, Chayanika, S. Kala, A. Agarwal, S. Amit and Saurabh Pantola. "Cutaneous Adnexal Tumours: A Clinicopathological descriptive study of 70 cases." (2013).
14. Sharma A, Paricharak DG, Nigam JS, Rewri S, Soni PB, Omhare A, Sekar P. Histopathological study of skin adnexal tumours-institutional study in South India. *J Skin Cancer*. 2014;2014:543756. doi: 10.1155/2014/543756. Epub 2014 Feb 5. PMID: 24649367; PMCID: PMC3932724
15. Sahu, Alaka & Sa, Dilip Kumar & Naik, Salil & Agrawal, Kailash. (2018). Skin Adnexal Tumors: A histopathological study of 60 cases at a tertiary care centre.. *Annals of Pathology and Laboratory Medicine*. 5. A215-220. 10.21276/APALM.1787.

Tables and Figures:

Table 1: Distribution of types of SATs according to direction of differentiation

Category	Direction of differentiation	Types of skin adnexal tumors		No. of cases
1	Sebaceous gland	Benign	Sebaceous adenoma	6(31.57%)
			Nevus sebaceous	7(36.84%)
			Sebaceous hyperplasia	5(26.31%)
		Malignant	Sebaceous	1(2.1%)
			Basaloid squamous carcinoma	1(2.1%)
			Total	19 (40.42%)
2	Sweat gland	Benign	Syringoma	13(27.65%)
			Eccrine poroma	1(2.1%)
			Chondroid syringoma	1(2.1%)
			Apocrine hydrocystoma	1(2.1%)
			Nodular hidradenoma	1(2.1%)
			Eccrine spiroadenoma	2(4.2%)
			Syringo cystadenoma	2(4.2%)
		Malignant	-	-
			Total	21 (44.68%)
			3	Hair follicle
Dilated pore of winer	1(2.1%)			
Trichoadenoma	1(2.1%)			
Trichofolliculoma	1(2.1%)			
Malignant	-	-		
	Total	7(14.9%)		

		< 10	11-20	21-30	31-40	41-50	51-60	61-70
Sebaceous gland tumors	Sebaceous adenoma (n=6)	-	4	1	-	1	-	-
	Nevus sebaceous (n=7)	4	2	1	-	-	-	-
	Sebaceous Hyperplasia (n=5)	-	-	3	-	-	2	-
	Sebaceous cyst carcinoma (n=1)	-	-	-	-	-	-	1
Sweat gland tumors	Syringoma (n=13)	-	2	5	1	3	2	-
	Eccrine poroma (n=1)	-	-	-	1	-	-	-
	Chondroid syringoma (n=1)	-	-	1	-	-	-	-
	Apocrine hydrocystoma (n=1)	-	-	-	-	1	-	-
	Nodular hidradenoma (n=1)	-	-	-	1	-	-	-
	Eccrine spiroadenoma (n=2)	-	-	1	1	-	-	-
	Syringo cystadenoma (n=2)	-	2	-	-	-	-	-
	Trichoepithelioma (n=4)	-	-	2	-	1	-	1
Hair follicle tumors	Dilated pore of winer (n=1)	-	-	-	1	-	-	-
	Trichoadenoma (n=1)	-	-	-	1	-	-	-
	Trichofolliculoma (n=1)	-	-	-	-	1	-	-
	n=47	4	10	14	6	7	4	2

Table 2: Age group wise distribution of SATs

Table 3: Gender wise distribution of SATs

		Male	Female	M: F
Sebaceous gland tumors	Sebaceous adenoma	4	2	2:1
	Nevus sebaceous	5	2	2.5:1
	Sebaceous Hyperplasia	2	3	0.6:1
	Sebaceous cyst carcinoma	-	1	-
Sweat gland tumors	Syringoma	3	10	0.3:1
	Eccrine poroma	-	1	-
	Chondroid syringoma	-	1	-
	Apocrine hydrocystoma	1	-	-
	Nodular hidradenoma	1	-	-
	Eccrine spiroadenoma	1	1	1:1
	Syringo cystadenoma	1	1	1:1
Hair follicle tumors	Trichoepithelioma	-	4	-
	Dilated pore of winer	1	-	-
	Trichoadenoma	-	1	-
	Trichofolliculoma	1	-	-
Total		20	27	

Table 4: Duration of presentation of lesion

		< 6 months	6 month- 1 year	1-2 year	> 2 years
Sebaceous gland tumors	Sebaceous adenoma	-	-	1	5
	Nevus sebaceous	2	-	-	5
	Sebaceous Hyperplasia		3	2	
	Sebaceous cyst carcinoma	-	1	-	-
Sweat gland tumors	Syringoma	3	3	-	7
	Eccrine poroma	-	-	-	1
	Chondroid syringoma	-	1	-	-
	Apocrine hydrocystoma	1	-	-	-
	Nodular hidradenoma	1	-	-	-
	Eccrine spiroadenoma	-	2	-	-

	Syringo cystadenoma	-	-	1	1
Hair follicle tumors	Trichoepithelioma	-	-	1	3
	Dilated pore of winer	1	-	-	-
	Trichoadenoma	-	-	1	-
	Trichofolliculoma	-	1	-	-
	Total	8	11	6	22

Table 5: Site distribution of SATs

		Scalp	Face	Neck	Upper extremity	Trunk
Sebaceous gland tumors	Sebaceous adenoma	-	6	-	-	-
	Nevus sebaceous	7	-	-	-	-
	Sebaceous Hyperplasia	-	5	-	-	-
	Sebaceous cyst carcinoma	-	1	-	-	-
Sweat gland tumors	Syringoma	-	13	-	-	-
	Eccrine poroma	-	-	-	1	-
	Chondroid syringoma	-	1	-	-	-
	Apocrine hydrocystoma	-	1	-	-	-
	Nodular hidradenoma	-	1	-	-	-
	Eccrine spiroadenoma	1	-	-	1	-
	Syringo cystadenoma	1	-	-	-	1
Hair follicle tumors	Trichoepithelioma	-	3	1	-	-
	Dilated pore of winer	1	-	-	-	-
	Trichoadenoma	-	1	-	-	-
	Trichofolliculoma	-	1	-	-	-
	Total	10	33	1	2	1

Table 6: Distribution according to no. of lesions

		Single	Multiple
Sebaceous gland tumors	Sebaceous adenoma	6	-
	Nevus sebaceous	6	1
	Sebaceous Hyperplasia	-	5
	Sebaceous cyst carcinoma	1	-
Sweat gland tumors	Syringoma	1	12
	Eccrine poroma	1	-
	Chondroid syringoma	-	1
	Apocrine hydrocystoma	1	-
	Nodular hidradenoma	1	-
	Eccrine spiroadenoma	1	1
	Syringo cystadenoma	2	-
Hair follicle tumors	Trichoepithelioma	2	2
	Dilated pore of winer	-	1
	Trichoadenoma	-	1
	Trichofolliculoma	1	-
Total		23	24

Table 7: Clinico-histopathological correlation

	Concordant	Discordant
Clinico-pathological	21	26
Percentage (n=47)	44.68%	55.32%

Table 8: Comparison of various parameters with various studies

	Pantola et al [13]	Sahu et al [15]	Sharma et al [14]	Present study
Study duration	6 years	5 years	6 years	6 years
Total no. of patients	70	60	56	47
Most common age group affected	20-39 years	21-30	51-60	21-30
Male: female	1.8:1	1.7:1	1.07:1	1:1.13
Most common site	Head and neck	Head and neck	Head and neck	Head and neck
Sebaceous SATS	4(5.7%)	19(31.66%)	12(21.43%)	19(40.42%)
Sweat glad SATs	42(60%)	27(45%)	24(42.86%)	21(44.68%)
Hair follicle SATS	24(33.33%)	14(23.33%)	20(35.71%)	7(14.9%)

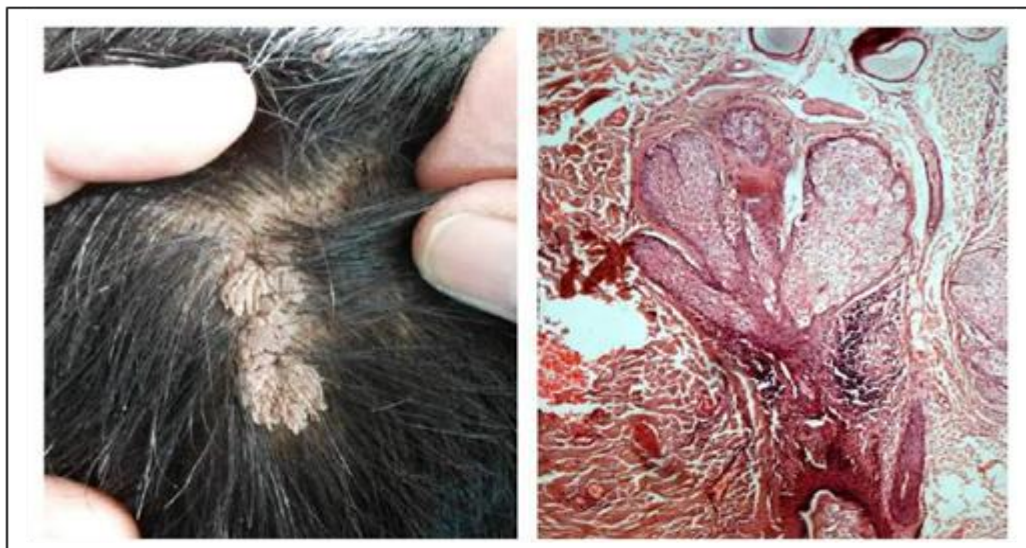


Figure 1: Nevus Sebaceous: Papillomatosis, lobules of mature sebaceous glands and apocrine glands within the dermis

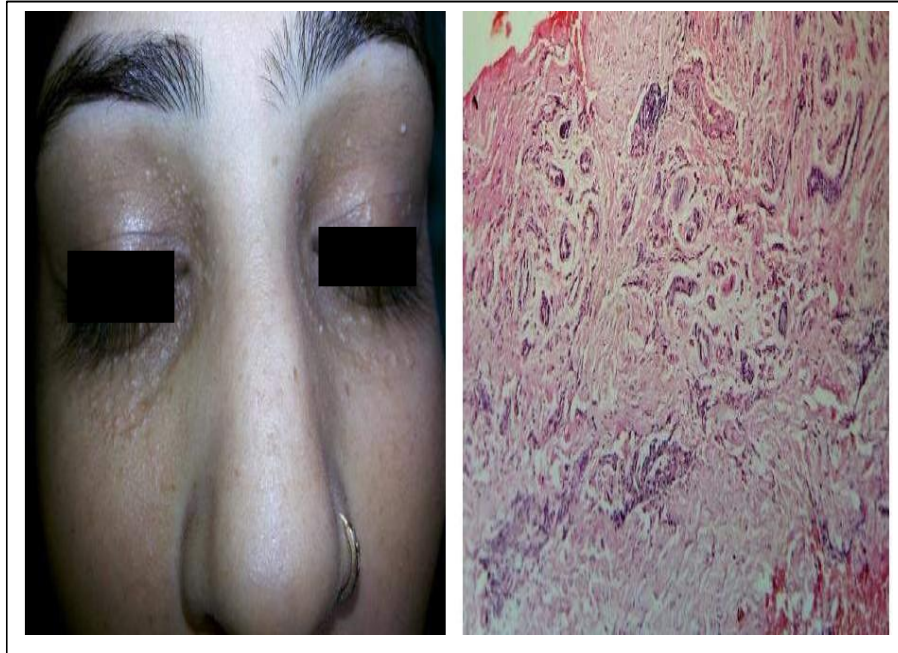


Figure 2: Syringoma: Well-circumscribed symmetric collections of small tadpole-shaped tubular structures are seen in the superficial dermis

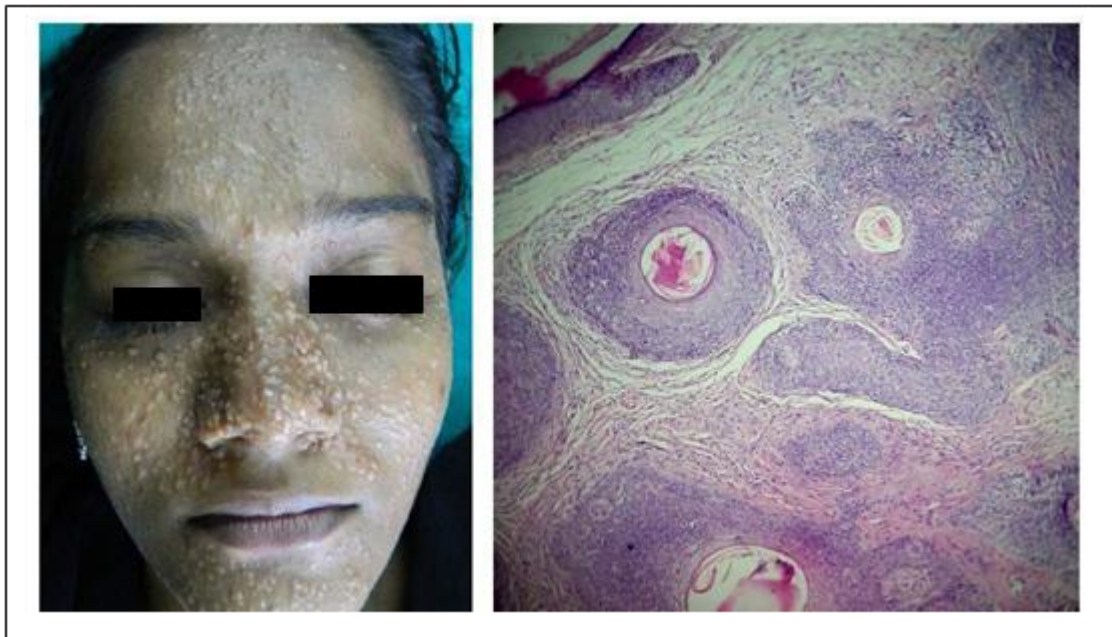


Figure 3: Trichoepithelioma: Aggregates of monomorphic basaloid cells in the upper dermis surrounded by abundant fibrous stroma with stromal-stroma relation

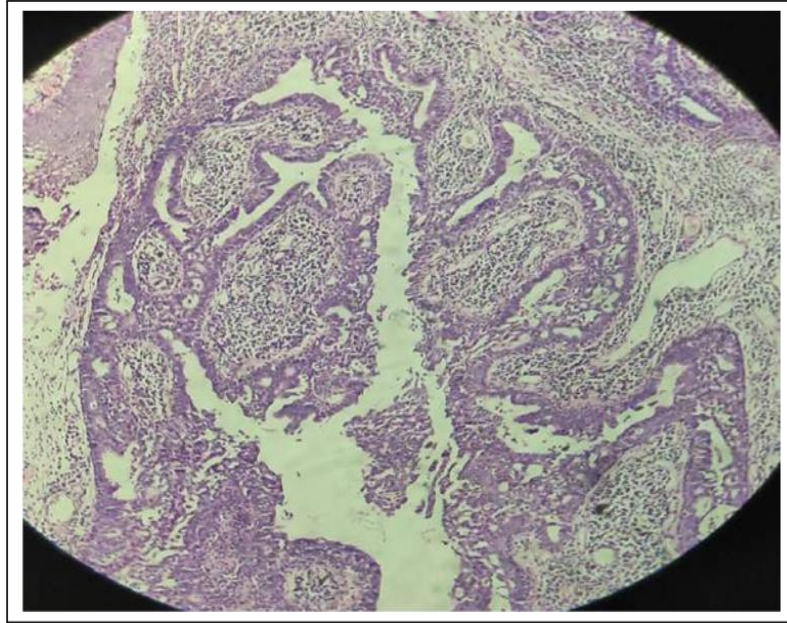


Figure 4: Syringocystadenoma pappiliferum: Invagination of papillary projection extending downwards in dermis lined by double layer of glandular epithelium with laminar columnar cells and outer small cuboidal cells

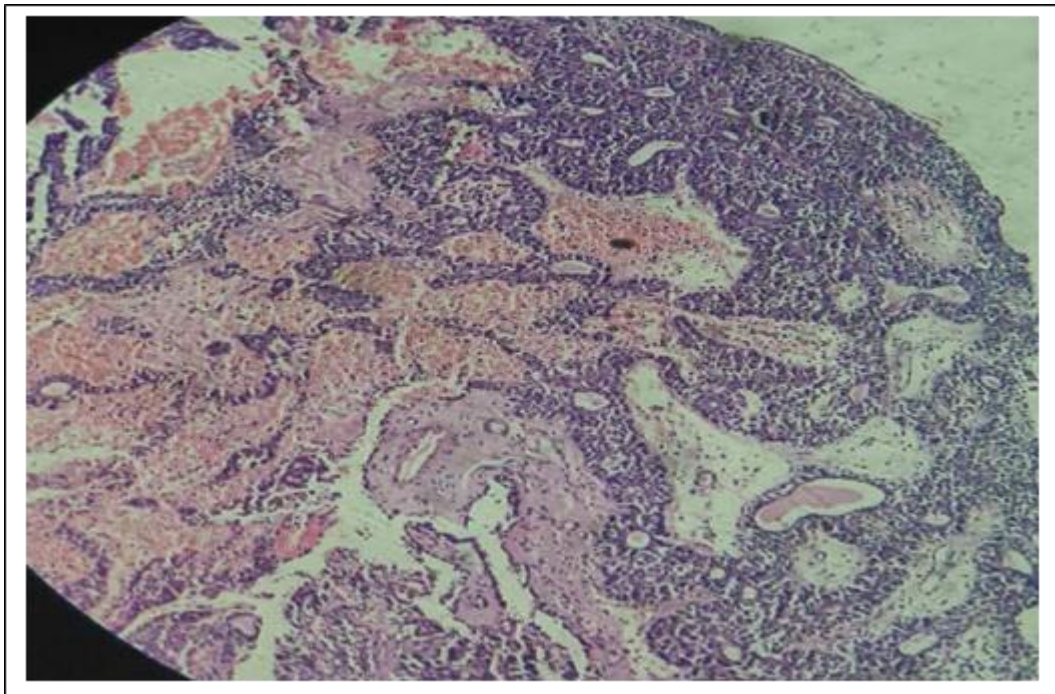


Figure-5: Eccrine Spiradenoma: Numerous nodules and strands of basaloid cells. Two cell populations are seen with light (clear) and dark cells. Ductal structures are seen with pink secretory material