Original Article:

A study of biopsy confirmed skin adnexal tumours: experience at a tertiary care teaching hospital

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ABSTRACT

Background and objectives: Skin adnexal tumours are a heterogeneous group of tumours with considerable clinical and histopathological overlap.

Methods: Retrospective study of skin adnexal turmours (n=35) diagnosed on histopathological examination over a period of 11 years (January 1993 to December 2003)

Results: Majority of the patients were in the third decade; females outnumbered males. Twenty seven tumours were benign and 8 were malignant. The most common benign and malignant tumours were nodular hidradenoma (n=5) and sweat gland carcinoma (n=4). Only 4 out of 35 cases showed clinical correlation with histopathologic diagnosis.

Conclusions: Skin adnexal tumours are relatively rare. Benign adnexal tumours are more common than malignant lesions. Histopathology is essential to confirm the diagnosis.

Key words: *Skin adnexal tumour, Nodular hidradenoma, Sweat gland carcinoma*

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INTRODUCTION

Skin appendages are sweat gland, sebaceous gland and hair follicle. Adnexal tumours arising from the skin are usually missed clinically and often confirmed by histopathology.[1] Immunohistochemistry may further help in confirmation of the diagnosis.[2,3] These tumours may be confused with certain types of cutaneous cancer. Diagnosis of skin adnexal tumours is possible by performing an elliptical skin biopsy, submitting for haematoxylin and eosin (H&E) staining and histochemistry. Adnexal tumours of the skin though rare, have been recognized from the later part of the 19th century.[4]

Tumours of cutaneous appendages are uncommon. The classification of these tumours is complex. They carry a wide histopathological spectrum, and different terms are often used to describe the same tumour.[5] Few clinicopathologic studies are available on adnexal tumours from India and the world as well. The clinical details are essential for diagnosing skin adnexal tumours on biopsy. Many a time, the clinical details are not provided to the pathologist in the request form and even when available, discrepancy between clinical and histopathological diagnosis is often encountered. Given the importance of clinical correlation for an accurate histopathologic diagnosis in dermatopathology, the present study was conducted.

MATERIAL AND METHODS

Adnexal tumours of the skin diagnosed in the Department of Pathology, during the period, January 1993 to December 2003, at our tertiary care teaching hospital in Tirupati, South India, formed the material for this retrospective study. The tumours were subjected to meticulous gross and microscopic examination. Apart from routine haematoxylin and eosin (H&E) staining, special staining procedures such as mucicarmine, periodic acid-schiff (PAS), Alcian blue, Toludine blue, Masson's trichrome and Vangieson stains wherever necessary were done for arriving at correct diagnosis.

Age and gender prevalence, comparison of clinical diagnosis, site of involvement with biopsy diagnosis were done.

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RESULTS

During the study period, 35 adnexal tumours of skin were diagnosed on histopathological examination (Table 1). There were 17 (48.5%), sweat gland tumours. Of these 13 were benign and 4 were malignant. Benign tumours included nodular hidradenoma (n=5, 14.2%) (Figure 1); hidradenoma papilliferum (n=3, 8.5%) (Figure 2); syringoma (n=1, 2.8%) (Figure 3); cylindroma (n=1, 2.9%); and eccrine spiradenoma (n=3, 8.5%). All 4 malignant tumours (11.4%) were sweat gland carcinomas (Figures 4).

There were 7 (20%) sebaceous gland tumours. Among them 5 (71.4%) were benign and the remaining 2 (28.6%) were malignant. Five patients (14.2%) were diagnosed to have sebaceous naevus. Sebaceous carcinoma was seen in 2 (5.7%) patients (Figure 5). Tumours arising from the hair follicle accounted for 11 (31.4%) cases. Among them, 9 (81%) were benign and 2 (19%) were malignant tumours. Benign hair follicle tumours included trichofolliculoma (n=1, 2.8%), trichoepithelioma (n=2, 5.7%), pilomatrixoma (n=2, 5.7%) (Figure 6), piloleiomyoma (n=3, 8.5%) (Figure 7), tricholemmal carcinoma (n=2, 5.7%) (Figure 8), Fordyce's spot 1 (2.8%). Comparison of observations from the present study and other published studies is shown in Table 2.[4,6,7]

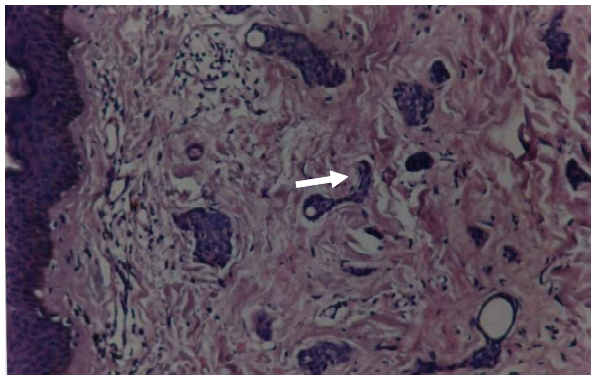

Figure 3: Syringoma. Photomicrograph showing - complex tubules with epithelial extensions (*comma tails*) suggestive of "tadpole" appearance (arrow) (Haematoxylin and eosin, × 100)

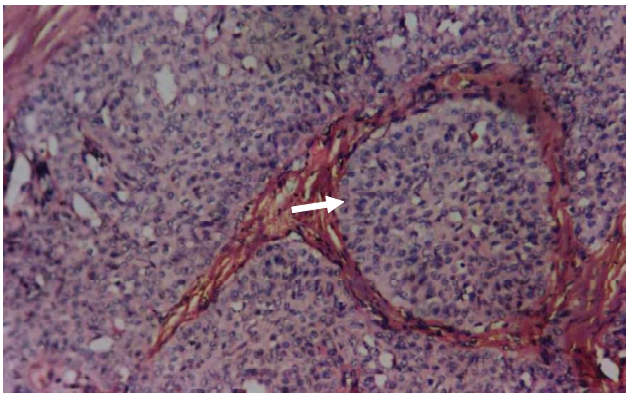

Figure 1: Nodular hidradenoma. Photomicrograph showing basaloid tumour cells (arrow) with clear cytoplasm arranged in nodules by hyalinized stroma (Haematoxylin and eosin, × 100)

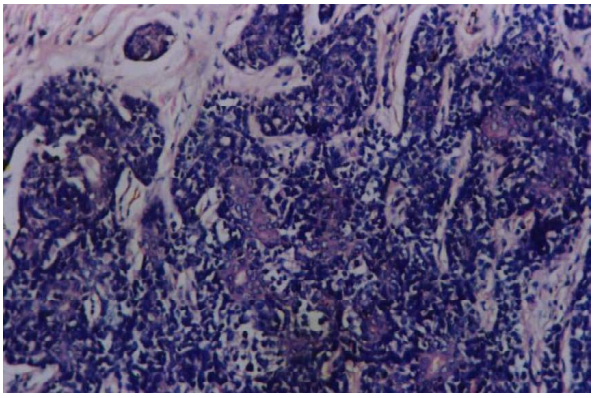

Figure 4: Sweat gland carcinoma. Photomicrograph showing tumour cells arranged in tubules and solid sheets with variable mitotic index (Haematoxylin and eosin, × 100)

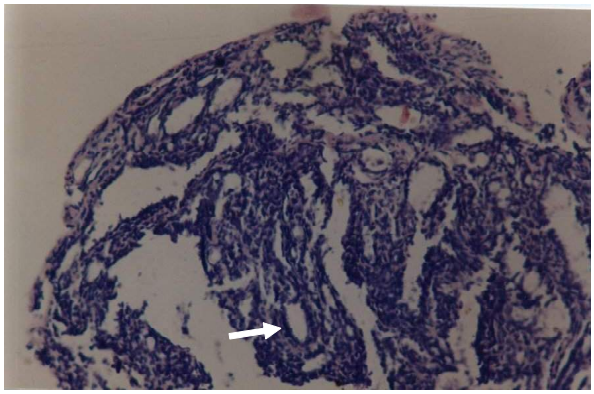

Figure 2: Hidradenoma papilliferum. Photomicrograph showing tumour cells arranged in tubules (arrow) papillary glands lined by apical cuboidal cells and basal myoepithelial cells (Haematoxylin and eosin, × 100)

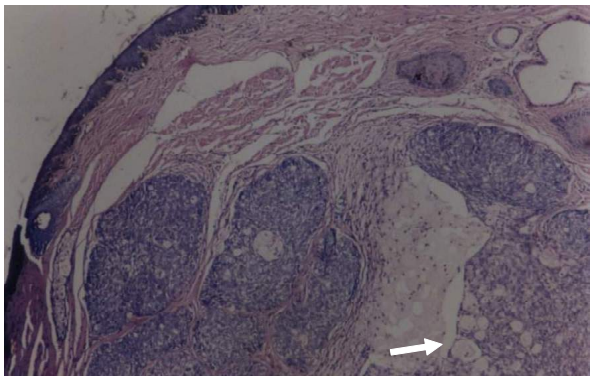

Figure 5: Sebaceous carcinoma. Photomicrograph showing tumour cells with foamy vacuolated cytoplasm (arrow) (Haematoxylin and eosin, × 100)

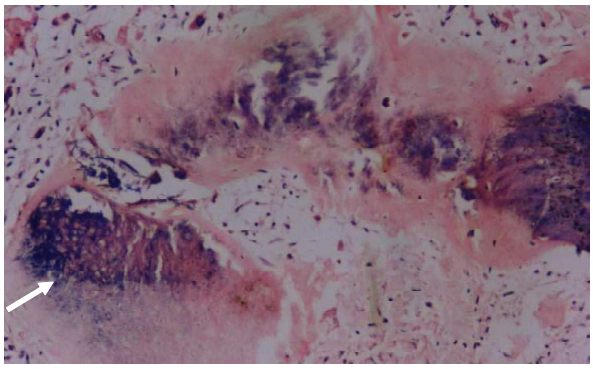

Figure 6: Pilomatrixoma. Photomicrograph showing shadow cells and dystrophic calcification (arrow) (Haematoxylin and eosin, × 400)

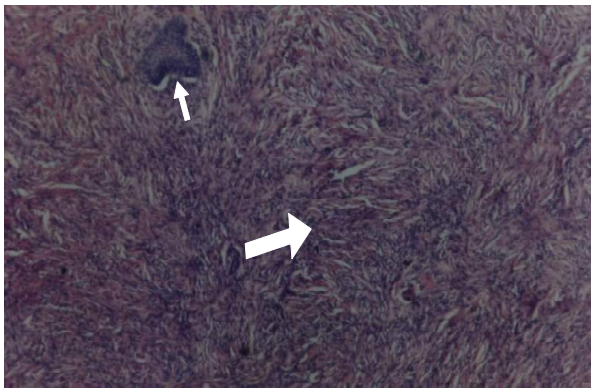

Figure 7: Piloleiomyoma. Photomicrograph showing smooth muscle tumour (thick arrow) and hair follicle (thin arrow) (Haematoxylin and eosin, × 100)

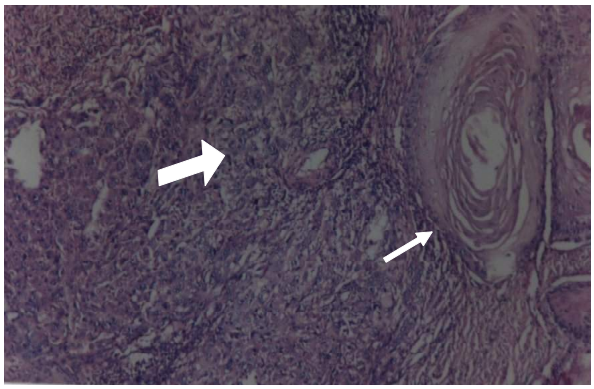

Figure 8: Tricholemmal carcinoma. Photomicrograph showing tumour cells (thick arrow) along with hair follicle (thin arrow) (Haematoxylin and eosin,×100)

DISCUSSION

Adnexal tumours are thought to have a genetic basis. Mendelian inheritance and P53 mutations are important contributing factors.[8] In some instances, there are markers for internal malignancy. Cell of origin is supposed to be from either primary epithelial germ cells or pluripotential cells or cells of pre-existing structure. Primary epithelial germ cells may give rise to either hyperplasias or neoplasias.

Clinically eccrine poroma is seen in palms and soles, cylindroma in forehead and scalp, syringoma as multiple, small, tan papules in the vicinity of lower lids. Trichoepitheliomas usually occur as multiple, semitransparent dome shaped papules on the face, scalp, neck and upper trunk. Sebaceous carcinomas occur in the meibomian glands of eyelid. Eccrine and apocrine carcinomas are seen in the axilla originating from the apocrine glands. Grossly adnexal tumours are non descript, seen as papules, solitary or multiple, as flesh coloured nodules and disfiguring lesions such as ulcers.

Adnexal tumours of the skin, though rare have been recognized from the later part of the 19th century.[9] We also observed that adnexal tumours of skin appear to be relatively uncommon tumours. Of the 35 cases studied, benign adnexal tumours (n=27) were more commonly seen than malignant tumours (n=8).

There are only a few studies from India and abroad describing in detail about the appendageal tumours of the skin.[6,7,10–13] Present study shows nodular hidradenoma (14.2%) as the predominant sweat gland tumour. Similar observations were reported by others[4,8,9] (Table 2). Nodular hidradenoma is characterized by medium sized round cells with

Table 1: Clinical features of patients with adnexal tumours

Adnexal tumour	No., gender distribution	Age range (years)	Clinical diagnosis	Site
Sweat gland (n = 17)				
Nodular hidradenoma	5, M:F=1:4	21-70	Papilloma (1)	ND (2)
			Parasitic cyst (1)	Calf (1)
			Granuloma (1)	Scalp (2)
			Sebaceous cyst (1)	
			Scalp swelling (1)	
Hidradenoma papilliferum	3 (all females)	27-68	Swelling right perineum (1)	Perineum (1)
			Diagnosis ND (2)	ND (2)
Syringoma	1 (male)	22	ND	
Cylindroma	1 (female)	50	Tumour leg	Leg (1)
Eccrine spiradenoma	3 (all males)	32-50	Neurofibroma (1)	Left palm (1)
			Swelling in the neck (1)	Neck (1)
			Diagnosis ND (1)	Site ND (1)
Sweat gland carcinoma	4, M:F =3:1	35-70	Mass at angle of the mouth (1)	Mouth (1)
			Cocks peculiar tumour (1)	Scalp (2)
			Lump breast (1)	Breast (1)
			Scalp tumour (1)	
Sebaceous gland (n = 7)				
Sebaceous nevus	5, M:F=1:4	27-50	Compound melanocytic nevus (1)	ND (2)
			Raised mole (1)	Foot (1)
			Papilloma (1)	Scalp (2)
			Nevus (1)	
			Dermatofibrosarcoma (1)	Eyelid (2)
Sebaceous carcinoma (n = 2)	M:F=1:1	60-67	Meibomian carcinoma	Right upper eyelid (1)
				Carcinoma eyelid (1)
Hair follicle (n = 10)				
Trichofolliculoma	1 (male)	17-40	Trichoepithelioma (1)	ND (1)
Trichoepithelioma	2 (male)		Trichoepithelioma (2)	Scalp (2)
Pilomatrixoma	2, M:F = 1:1	15-58	Generalized lymphadenopathy (1)	ND (1)
			Scalp tumour (1)	Scalp (1)
Piloleiomyoma	2, M:F =1:2	25-36	Piloleiomyoma (1)	Site ND (1)
			Neurofibroma (2)	Thigh (1)
				Abdomen (1)
Tricholemmal carcinoma	2 (all females)	50-52	Calcifying epithelioma	Scalp (1)
			Swelling over right eyebrow	
Miscellaneous (n=1)				
Fordyce's spot	(male)	39	Papilloma	ND

M=male; F=female; ND=not described

Table 2: Comparison of prevalence of skin adnexal tumours in various published studies and present study

Tumour	Reddy et al[4] (n =85) No (%)	Vaishnav et al[6] (n = 48) No. (%)	Kartha et al[7] (n = 82) No. (%)	Present Study (n = 35) No. (%)
Sweat Gland				
Nodular Hidradenoma	29 (34.1)	20 (41.7)	14 (17.1)	5 (14.2)
Hidradenoma Papilli Ferum	-	1 (2.1)	-	3 (8.5)
Hidrocystoma	-	-	3 (3.7)	-
Syringoma	3 (3.5)	-	7 (8.5)	1 (2.8)
Syringocystdenoma papilliferum	3 (3.5)	8 (16.7)	8 (8.5)	-
Chondroid syringoma	2 (2.4)	3 (6.3)	7 (8.5)	-
Cylindroma	1 (2.2)	1 (2.1)	-	1 (2.8)
Eccrine Spiradenoma	2 (3.5)	-	-1.2	3 (8.5)
Unclassified	3 (3.5)	-	5 (6.6)	-
Sweat gland carcinoma	11 (2.9)	5 (10.4)	ND	4 (11.4)
Sebaceous gland				
Sebaceous gland adenoma	3 (3.5)	2 (4.2)	3 (3.7)	-
Sebaceous nevus	-	1 (2.1)	-	5 (14.2)
Sebaceous carcinoma	15 (7.7)	-	ND	2 (5.7)
Hair follicle				
Hair nevus	-	1 (2.1)	-	-
Trichofolliculoma	-	-	2 (2.4)	1 (2.8)
Trichoepithelioma	4 (4.7)	2 (4.2)	13 (15.9)	2 (5.7)
Pilomatrixoma	9 (10.6)	3 (6.3)	20 (24.4)	2 (5.7)
Piloleiomyoma	ND	ND	ND	3 (8.5)
Tricholemmal carcinoma	ND	ND	ND	2 (5.7)
Miscellaneous				
Fordyce's spot	ND	ND	ND	1 (2.8)

ND = not described

hydropic change arranged in the form of nodules on light microscopy (Figure 1). We observed a single case of papillary hidradenoma. Histopathologically most of these tumours are circumscribed and solid whereas others are cystic. The growth pattern consists of a mixture of tubules and papillary tufts that are covered by a two cell layer, i.e., an apical cuboidal cell and a deep myoepithelial cell (Figure 2). In a study[3] 7 cases of benign hidradenomas were reported out of 15 cases of atypical and 15 cases of malignant lesions on immunohistochemical studies. Clear cell hidradenoma arising in the axilla has been described.[14] Syringoma (2.8%) and cylindroma (2.8%) were the least common tumours in the present study. Syringomas are characterized histologically by interweaving nests, cords and small cysts that are located in the upper half of the dermis. They are enmeshed in a dense collagenous stroma without any epidermal contact. The ducts of syringoma are composed of 1-2 layers of cuboidal cells rarely showing clear cell change. *Tadpole appearance* is quite common in syringoma (Figure 3). The prevalence of syringoma in other published studies ranged from 0%

to 30%.[6,13,15] Cylindroma is a benign basaloid tumour that has a mosaic architecture. They are solitary or multiple. Histologically these are circumscribed non-encapsulated dermal nodules composed of islands and cords of basaloid cells surrounded by a thick hyalinized, Periodic acid-Schiff (PAS) positive basement membrane. Syringocystadenoma papilliferum and chondroid syringoma were not documented in the present study. Sweat gland carcinoma was the second most common tumour. Histologically, sweat gland carcinomas are composed of tubules that contain epithelium with decapitation secretion. The growth patterns take the form of papillary, solid or mixed. The mitotic index may vary widely and in some cases will not help to establish the diagnosis. Syringocystadenoma papilliferum and sweat gland carcinoma were the other common sweat gland tumours.[6]

Though sebaceous carcinoma was common in an earlier report,[4] only 2 cases were observed in the present study (Table 1). Histologically, the sebaceous carcinomas have infiltrated zones and often harbour pleomorphic cell populations of clear and solid cells (Figure 8). Sebaceous nevus was the common sebaceous gland tumour observed by us (Table 1). However this tumour was not documented in other published studies.[4] Sebaceous naevus histologically consists of zones of epidermal hyperplasia with small foci of sebaceous glands, miniature hairs and minimal numbers of ducts or glands. Basaloid proliferations are more commonly observed as apocrine lobules. Piloleiomyoma is a smooth muscle tumour arising from the hair follicle. Though considered to be rare, three such cases were documented in the present study. Piloleiomyoma is characterized by a benign smooth muscle cell tumour arising from the arrector pilorum muscle with entrapped hair follicle on histopathology. This tumour was not encountered in other published studies.[4,6,7] Trichoepithelioma, pilomatrixoma and trichilemmal carcinoma were reported in 2.9% patients in the present study. Trichoepithelioma histologically is a symmetric lesion that contains a mixture of epithelial elements ranging from hair germs associated with capillary mesenchymal bodies to small horn cysts, to lace like reticular basaloid structures to mature hairs. In pilomatrixoma, the histopathological hallmark is that of basaloid lobules which are contiguous with eosinophilic effete cells admixed with keratin i.e., *shadow cells* (Figure 4). Dystrophic calcifications are usually present. Pilomatrixoma is a relatively rare skin neoplasm. It is rarely diagnosed preoperatively. Its incidence peaks in the first and sixth decades of life.[16] Tricholemmal carcinoma, documented in this study, has not been described in other studies.[4,6] Tricholemmal carcinomas are multilobulated neoplasms with abundant clear cell differentiation. They have the cystic lobular growth pattern with pronounced cytologic pleomorphism, architectural disorganization and infiltrative growth (Figure 8). It is striking that only 4 out of 35 cases showed clinical correlation with histological diagnosis. This indicates skin adnexal tumours cannot be diagnosed on clinical grounds only and histopathologic diagnosis plays a major role in diagnosing these tumours. In dermatopathology, one of the most intriguing yet unresolved questions is the lineage of adnexal neoplasms with an expanding arsenal of stem cell markers.[17]

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