

## Histopathological evaluation of Skin Tumours

Rajinder Kaur<sup>1,\*</sup>, Vanita Kumar<sup>2</sup>, Kuldeep Mehra<sup>3</sup>, Neelu Gupta<sup>4</sup>, Amritpal Singh<sup>5</sup>

<sup>1,3,5</sup>Resident, <sup>2</sup>Professor, <sup>4</sup>Professor & Head, Dept. of Pathology, Sardar Patel Medical College & Associate Group of Hospital, Bikaner, Rajasthan

**\*Corresponding Author:**

Email: drrajamrit@gmail.com

### Abstract

**Introduction:** The skin is the largest organ of the body. Skin tumours encompass a wide spectrum and belong to a diverse group of neoplasm rendering the classification difficult.

**Aim:** The aim of our study was to analyse prospectively the distribution of skin tumours with reference to age and sex.

**Materials and methods:** The present study was a prospective study of skin tumours from 1st January 2013 –31st August 2015 at Department of Pathology in Sardar Patel Medical College and associated group of hospitals, Bikaner. The study included all histopathologically confirmed cases of skin tumours.

**Results:** Out of 110 skin tumours, 74 were benign tumours and 36 were malignant. Thus benign tumours were more common than malignant tumours with benign to malignant ratio of 2.05:1. Incidence of epidermal tumours was highest 83 cases (75.45%) followed by adnexal tumours 20 cases (18.18%). The maximum number of benign tumours was found in second and third decade and malignant tumours in seventh decade.

**Conclusion:** Benign tumours were common in younger age group whereas malignant tumors showed an ascending trend in age. Both benign and malignant tumours of skin were common in males than females. Verrucas (31.08%) were the commonest benign tumours followed by squamous papilloma (14.86%). Among the malignant tumours Squamous Cell Carcinoma (SCC) was the commonest (55.55%) followed by Basal Cell Carcinoma (30.55%).

**Keywords:** Age distribution, Sex distribution, Skin tumours.

### Introduction

Skin is the largest organ of the body. It represents a window to the internal well-being or disease. Many internal diseases may manifest themselves in the skin.<sup>1</sup> Skin tumours at time pose a great challenge to surgeons as some of benign tumours can be confused with malignant tumours and it is vitally important to intervene as some can become metastatic resulting in morbidity and mortality. Most of the time clinical diagnosis may not be accurate because of similarity in gross appearance.<sup>2</sup> The knowledge of histopathological patterns can help in prognosis and planning an effective management.<sup>3</sup>

We have divided the skin tumours into benign and malignant epidermal, adnexal and melanocytic categories. The aim of our study is to find out the age and sex wise distribution of different tumours of skin.

### Material & Methods

The study was carried out in the department of Pathology, Sardar Patel, medical college and associated group of hospitals, Bikaner from 1st January 2013 – 31st August 2015. This study was hospital registry based prospective study, consisted of analysis of tumours of skin received in the histopathology section of department of pathology. We received a total of 15,958 specimens for histopathology examination during the study period. Cases presented as neoplastic skin lesions was 278 and 122 were non neoplastic lesions. Non neoplastic skin lesions, cysts, mesenchymal tumours, haematological tumours, and

skin secondaries were excluded from the study. The study included 110 histopathologically confirmed cases of tumours of epidermis along with melanocytic tumours and appendageal tumours. All the biopsies and resected specimens received in the histopathology section were immediately fixed in 10% formalin for 24 hours. The specimens were examined grossly and sections were taken. Then they were processed and embedded in paraffin wax. Three-five microns thick sections were taken and then stained with Haematoxylin & Eosin stain and evaluated under light microscopy. The tumours were classified according to World Health Organization classification of skin – 2006.<sup>4</sup>

### Results

Out of 110 tumours of skin, 74 were benign tumours and 36 tumours were malignant. Thus benign tumours were more common than malignant tumours with benign to malignant ratio of 2.05:1. Incidence of epidermal tumours was highest 83 cases (75.45%) followed by adnexal tumours 20 cases (18.18%). Maximum numbers of cases among benign tumours were that of wart 23 cases (31.08%) followed by squamous papilloma 11 cases (14.86%). Among malignant tumours incidence of squamous cell carcinoma was highest 20 cases (55.55%) followed by basal cell carcinoma 11 cases (30.55%). In our study tumours of skin were present in all the age groups, though maximum numbers of benign tumours were

found in second and third decade and malignant tumours in seventh decade of life (Table 1).

**Table 1: Age wise distribution of different tumours of skin**

Name of tumour	Age group (years)							
	≤10	11-20	21-30	31-40	41-50	51-60	61-70	>70
Basal cell carcinoma	-	-	-	-	2	2	3	4
Cylindroma	-	1	-	-	-	-	-	-
Eccrine acrospiroma	-	1	-	-	1	2	-	1
Eccrine spiradenoma	-	1	3	1	-	-	-	-
Hidrocystoma	-	-	-	-	1	-	-	-
Intradermal nevus	-	3	1	-	-	-	-	1
Keratoacanthoma	-	-	-	-	-	1	1	-
Malignant melanoma	-	1	-	-	1	-	-	-
Malignant transformation of eccrine spiradenoma	-	-	-	-	-	1	-	-
Pseudoepitheliomatous hyperplasia	-	-	2	2	-	1	4	1
Pilomatricoma	-	-	-	-	-	1	-	-
Proliferating trichelemmal tumor	-	-	-	1	-	-	-	-
Squamous cell carcinoma	-	-	-	3	4	4	6	3
Sebaceous carcinoma	-	-	-	1	-	-	1	-
Seborrhic Keratosis	-	-	-	-	1	2	2	1
Squamous Papilloma	-	1	4	2	2	1	-	1
Syringocystadenoma papilliferum	-	1	-	-	1	-	-	-
Trichoepithelioma	-	1	-	-	-	-	-	-
Wart/Verruca	2	7	5	2	3	3	1	-
Total	2	17	15	12	16	18	18	12

The malignant tumours showed ascending trend in age while benign tumours showed wide age range.

### Benign Tumours

Among the 52 benign epidermal tumours, 23 were warts and present in all the age groups, the peak age incidence was found in 2nd to 3rd decade (12 cases) and male to female ratio of 3.83:1. In our study squamous papilloma was found exclusively in females. Seborrhic keratosis was found predominantly in females with female to male ratio of 2:1.

Among the 17 cases of benign adnexal tumours, 12 cases were females and 5 were males with female to male ratio of 2.4:1. Maximum numbers of cases were found that of sweat gland tumours (14 cases). In present study 5 cases were that of intradermal nevus. Peak incidence was seen between 11-30 years of age (80%). There was male predominance with male to female ratio of 1.5:1 (Table 2).

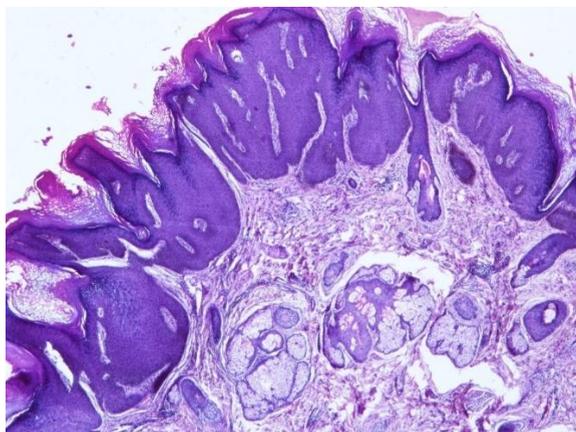
**Table 2: Sex wise distribution of benign tumours of skin**

Tumours type	Incidence	Male	Female
<b>Epidermal or keratinocytic tumours</b>			
Wart	23 (31.08%)	17	6
Squamous papilloma	11 (14.86%)	0	11
Pseudoepitheliomatous	10	6	4

hyperplasia	(13.51%)		
Seborrhic keratosis	6(8.10%)	2	4
Keratoacanthoma	2(2.70%)	2	0
<b>Adnexal or appendageal tumours</b>			
Proliferating trichelemmal tumor	1(1.35%)	1	0
Pilomatricoma	1(1.35%)	0	1
Trichoepithelioma	1(1.35%)	0	1
Syringocystadenoma papilliferum	2(2.70%)	1	1
Cylindroma	1(1.35%)	0	1
Hidrocystoma	1(1.35%)	0	1
Eccrine acrospiroma	5(6.76%)	3	2
Eccrine spiradenoma	5(6.76%)	0	5
<b>Melanocytic tumours</b>			
Intradermal nevus	5(6.76%)	3	2

The benign epidermal tumours and melanocytic tumours showed male predominance

**Verruca:** It showed hyperkeratosis, acanthosis, and papillomatosis. Vertical tiers of parakeratotic cells, foci of clumped keratohyaline granules and koilocytic changes were seen (Fig. 1). One case of verruca plana showed hyperkeratosis and acanthosis but no papillomatosis.



**Fig. 1: Verruca vulgaris showing hyperkeratosis, acanthosis, and papillomatosis, vertical tiers of parakeratotic cells (H&E, 4X)**

**Seborrheic keratosis:** All the 6 cases showed acanthotic type of seborrheic keratosis. Acanthosis, hyperkeratosis, papillomatosis and horn cysts were seen. In 5 cases basaloid cells showed melanin pigment within the cytoplasm.

**Pseudoepitheliomatous hyperplasia:** All cases showed irregular invasion of the dermis by uneven, sharply demarcated epidermal cell masses with horn-pearl formation without atypia. In 7 cases strands of epithelium were heavily infiltrated by inflammatory cells.

**Squamous papilloma:** It showed hyperkeratosis, acanthosis with elongation of rete ridges and papillomatosis. There were no koilocytic changes. One case showed sebaceous gland hyperplasia. It included in verrucas in many studies.

**Keratoacanthoma:** It showed central keratin-filled crater giving symmetrical appearance, blunt down growths of squamous epithelium into the dermis with an irregular lower border to the tumour. The squamous cells are well differentiated and showing minimal atypia.

**Proliferating tricholemmal tumour:** Irregularly shaped lobules of squamous epithelium undergoing an abrupt keratinisation without a granular layer.

**Pilomatricoma:** The tumour composed of two types of cells, basophilic cells and shadow cells. The basophilic cells are arranged on one side and along the periphery of the tumour islands. The shadow cells have a distinct border and possess a central unstained area as a shadow of the lost nucleus.

**Hidrocystoma:** It showed islands of basaloid cells in the dermis with peripheral palisading of cells. There was no connection of these islands with the epidermis. Horn cysts and fibrous stroma was seen.

**Cylindroma:** The tumour showed dual population of cells with jigsaw puzzle pattern and the hyaline basement membrane showed PAS positivity.

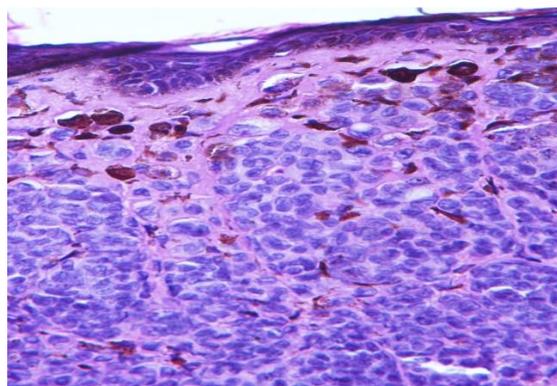
**Syringocystadenoma papilliferum:** Within the dermis, broad villous projections protrude into cystic spaces. These papillae showed columnar epithelium toward the lumen of the spaces, and simple cuboidal epithelium at the periphery. Many cystic spaces filled with secretion.

**Eccrine acrospiroma:** It showed epithelial lobules in the dermis. It comprised of clear cell and polyhedral cells. The tumour contains small collections of eosinophilic hyalinized stroma.

**Eccrine spiradenoma:** It showed nodules of basaloid cells in dermis, the intervening oedematous stroma with ectatic vessels. Two types of neoplastic epithelial cells, dark and pale were seen. Dark cells were small, basaloid with hyperchromatic nuclei located at the periphery, whereas pale cells, which were larger with vesicular nuclei and ample pale cytoplasm near the centre of the clusters.

**Trichoepithelioma:** It showed islands of basaloid cells in the dermis with peripheral palisading of cells. Horn cysts and presence of fibrous stroma was seen.

**Intradermal nevus:** The dermis contains nests, cord and sheets of nevus cells. The cells showed varied amount of intracytoplasmic melanin pigment. Also seen were few melanophages in the dermis.(Fig. 2)



**Fig. 2: Intradermal nevus showing nests, cord and sheets of nevus cells. The cells showing varied amount of intracytoplasmic melanin pigment**

### Malignant tumours

In present study among malignant tumours maximum numbers of cases were that of squamous cell carcinoma with male preponderance and ratio of male to female was 1.22:1. The maximum numbers of cases of squamous cell carcinoma were found in 5<sup>th</sup> to 7<sup>th</sup> decade.

Eleven cases of Basal cell carcinoma were encountered in our study with male predominance and male to female ratio was 1.75: 1. Majority of cases were between 7<sup>th</sup> to 8<sup>th</sup> decades.

There were 3 cases of adnexal carcinomas that showed female predominance. The youngest case was 35 years old and oldest was 70 years old. Two cases of

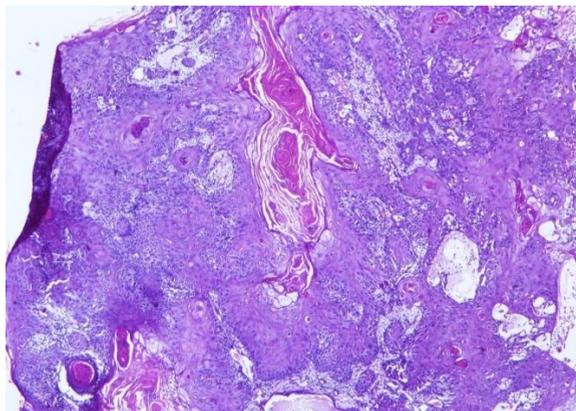
malignant melanoma were encountered with equal sex incidence (Table 3).

**Table 3: Sex wise distribution of malignant tumours of skin**

Name of tumours	Incidence	Male	Female
<b>Epidermal or keratinocytic tumours</b>			
Squamous cell carcinoma	(55.55%)	11	9
Basal cell carcinoma	(30.55%)	7	4
<b>Adnexal or appendageal tumours</b>			
Sebaceous carcinoma	(5.55%)	0	2
Malignant eccrine spiradenoma	(2.77%)	0	1
<b>Melanocytic tumours</b>			
Malignant melanoma	(5.55%)	1	1

The malignant epidermal and melanocytic tumours showed female predominance.

**SCC:** Majority (65%) of the squamous cell carcinomas was well differentiated. The invading tumour masses are composed in varying proportions of normal squamous cells and of anaplastic squamous cells. In well differentiated SCC keratinization were seen in the form of horn pearls. Individual cell keratinisations, and nuclear hyperchromasia, were seen (Fig. 3).

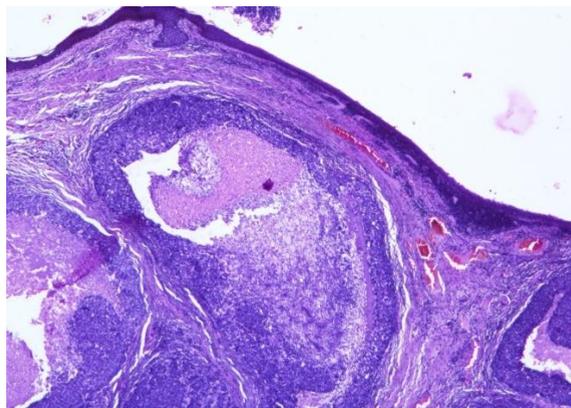


**Fig. 3: Squamous cell carcinoma showing invasive clusters of tumour cells and keratin pearl. (H&E, 4X)**

**Basal cell carcinoma:** It showed peripheral palisading of lesional cell nuclei, a specialized stroma, and clefting artifact between the epithelium and the stroma. In 2 cases melanin pigment was seen

**Sebaceous carcinoma:** It showed the irregular lobules formations with variations in the size of the lobules. Although many cells were undifferentiated, distinct sebaceous cells showing a foamy cytoplasm are present in the centre of most lobules. Many undifferentiated cells and sebaceous cells appear atypical, showing

considerable nuclear and nucleolar pleomorphism. Focal necrosis gives rise to comedo-like pattern (Fig. 4).



**Fig. 4: Sebaceous carcinoma showing lobule formation, distinct sebaceous cells showing a foamy cytoplasm are present in the centre of most lobules. Comedo like necrosis seen. (H&E 10X)**

**Malignant eccrine spiradenoma:** It showed glandular formation, squamous differentiation, high mitotic rate, loss of two cell populations, increased nuclear to cytoplasmic ratio, and hyperchromasia.

**Malignant melanoma:** The cells were arranged in nests and sheets with pleomorphic nuclei and prominent eosinophilic nucleoli. Varying amount of intracytoplasmic pigment was seen in the tumour cells and macrophages.

## Discussion

In present study the epidermal tumours, both benign and malignant were the common tumours of skin (75.45%). The incidence of verrucas was highest among benign tumours 23 cases (31.08%). This finding was concordant to the study of Bari V et al<sup>5</sup>. Age range was 6-61 years. The study showed male predominance with male to female ratio of 2.83:1. Study by Nandyal et al<sup>6</sup> also showed similar age range and male predominance. Squamous papilloma showed wide age range and female predominance. Pseudoepitheliomatous hyperplasia found predominantly in male and age ranges from 25-70 years similar to study by Zarovnyaya E et al<sup>7</sup>. In our study seborrheic keratosis showed female predominance and found in fourth to seventh decades. Rajesh G et al<sup>8</sup> observed a male to female ratio of 1:1.04 and the most common age group affected was 60 years and above (40%). In the present study intradermal nevus was 6.67% (5 cases), which was similar to study by Bari V et al<sup>5</sup>. Peak incidence was seen in second to third decade (60%), which was similar to study by Nandyal et al<sup>6</sup>. Saimila MOA et al<sup>9</sup> and Solanki RL et al<sup>10,11</sup> observed a wide age range and equal sex distribution in benign adnexal tumours. In our study benign adnexal

tumours had a wide age range with female predominance.

In our study, the incidences of benign and malignant tumours were 67.27% and 32.72% respectively. Thus, our findings were comparable to that of Har – Shai et al<sup>12</sup>. In the present study squamous cell carcinoma accounted for maximum number of cases (55.55%) which is similar to the observations made by Chakravarthy RC et al<sup>13</sup>, Deo SV et al<sup>14</sup>, Budharaja SNet al<sup>15</sup> and Bari V et al<sup>5</sup>. The squamous cell carcinoma and basal cell carcinoma were found predominantly in males similar to study by Budharaja SN et al<sup>15</sup>. The maximum numbers of tumours were found in 5<sup>th</sup> to 7<sup>th</sup> decade which was similar to study by Bari V et al<sup>5</sup>. Two cases of malignant melanoma were found in present study one was 11 year old and other was 45 year old. In the study by Nandyal et al<sup>6</sup> age range of malignant melanoma was 28-70 years. The adnexal carcinoma in present study was found in females only. In contrast to study by Reddy KM et al<sup>16</sup> showed male to female ratio 2:1.

### Conclusions

Among the 110 cases of skin tumours incidence of epidermal tumours were highest 75.45% followed by Adnexal tumours 18.18%. Most common benign tumour was wart and most common malignant tumour was squamous cell carcinoma. Benign tumours were common in younger age group whereas skin cancers exhibit an ascending trend in age. Maximum numbers of tumours were found predominantly in male. The adnexal carcinomas were found in females and malignant melanoma showed equal sex incidence. Most of our findings roughly correlate with the Indian published literature. In our study differences in distribution of tumours from some other studies due to some factors like number of cases included in study, time period of study and geographical variations. This study provides a data base of age and sex distribution of skin tumours which will be useful for the surveillance.

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### References

- Alexander JF Lazar, Murphy GF. The skin. In: Robbins and Cotran Pathologic Basis of Disease, Kumar V, Abbas AK, Fausto N, Aster JC, eds. 8th edition. India: Saunders; 2010. p. 1165-1204.
- Elder DE, Elenitsas R. Benign pigmented lesions and malignant melanoma. In Lever's histopathology of skin. 9th ed. Philadelphia: Lippincott Raven; 2005. p. 715-804.
- Reddy MK., Veliath AJ, Nagarajan S and Aurora AL. A clinicopathological study of adnexal tumours of skin. Indian journal of medical research, June 1982:p. 882-889.
- LeBoit PE, Burg G, Weedon D and Sarasin A. Pathology and genetics of skin tumours. In World health organisation classification of skin tumours. IARC press.Lyon, 2006. P.9-164.
- Vaibhav Bari, Prashant Murarkar, Alka Gosavi, Kalpana Sulhyan, Skin Tumours – Histopathological Review of 125 Cases. Indian Medical Gazette, November 2014. P. 417-428.
- Nandyal SS, Puranic RB. Study of demographic profile of skin tumors in a tertiary care hospital. IJCRR. 2014;6(16:24-28.)
- Zarovnaya E, black C. Distinguishing Pseudoepitheliomatous hyperplasia from squamous cell carcinoma in mucosal biopsy specimen from the head and neck. Archives of pathology & laboratory medicine. Vol. 129:2005;8:P. 1032-1036.
- Rajesh G, Thappa DM, Jaisankar TJ and Chandrashekar L. Spectrum of seborrheic keratosis in South Indians: a clinical and dermoscopic study. Indian J Dermatol Venereol Leprol Jul-Aug 2011;77(4):483-8.
- Saimila MOA. Adnexal skin tumors in Zaria, Nigeria. Annals of African Medicine 2008; Vol. 7, No.1: 6-10.
- Solanki RL, Anand VK, Gaur SK, Arora HL and Gupta R. Neoplasms of hair follicle. Indian journal of Dermatology Venereol Leprology 1989;55:33-7.
- Solanki RL, Anand VK. Neoplasms of sweat gland. Indian J of Dermatol Venereol Leprol1989;55:108-12.
- Har-Shai Y., Hai N., Taran A., Mayblum S., Barak A., Tzur E. et al. — Sensitivity and positive predictive values of presurgical clinical diagnosis of excised benign and malignant skin tumours: a prospective study of 835 lesions in 778 patients. Plast Reconstr Surg. 108(7):1982-1989, 2001.
- Charkravorthy RC and Choudhuri DR. Malignant neoplasms of the skin in Eastern India. The Indian Journal of Cancer, vol 5, 1968:133-144.
- Deo SV. Surgical management of skin cancers: Experience from a regional cancer centre in North India. Indian Journal of Cancer 2005;42:145-50.
- Budharaja SN, Pillai VCV, Periyannagam WJ, Kaushik SP and Bedi BMS. Malignant neoplasms of skin in Pondicherry- a study of 102 cases. The Indian Journal of Cancer, 1972:284-295.
- Reddy KM, Veliath AJ, Nagarajan S and Arora AL. A clinicopathological study of adnexal tumours of skin. Indian J Med Res 75, June 1982:882-889.