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Clinico - Pathological Spectrum of Skin Tumors - A Three - Year Retrospective Study

[1]Dr. Sreelakshmi S., [2]Dr. Savithri Ravindra

[1]Postgraduate, Department of Pathology, Kempegowda Institute of Medical Science, Bangalore, Karnataka, India

[2]Professor, Department of Pathology, Kempegowda Institute of Medical Science, Bangalore, Karnataka, India

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Corresponding Author: Dr. Sreelakshmi S., Postgraduate, Department of Pathology, Kempegowda Institute of Medical Science, Bangalore, India

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ABSTRACT

Globally, the prevalence of skin tumors is not so uncommon. These are categorised broadly as Keratinocytic (Epidermal), melanocytic, appendageal, soft tissue and tumors of hematopoietic and lymphoid origin. Histopathological examination will help in establishing a definitive diagnosis.

Aims

To study the histopathological spectrum of skin tumors

To correlate with the clinical presentation and demographic data.

Settings and Design: Retrospective study, observational study

Methods and Material

This is a retrospective analysis of histopathologically diagnosed skin tumors conducted in the Department of Pathology in a tertiary care centre from January 2018 to December 2020. All the slides stained with haematoxylin and eosin were reviewed and analysed. Demographic and clinical data were collected from hospital records.

Statistical Analysis Used

Differences in the distribution of continuous variables between categories were analyzed by Mann Whitney and categorical variables by Chi-squared test.

Results

This study consists of 131 cases. 91 cases were benign (69.5%) and 40 cases were malignant (30.5%). Male to female ratio was (1.34:1). The mean age of patients with benign tumor was 42.32 ± 18.07 years and malignant tumors was 64.80 ± 10.55 years. Keratinocytic tumors were the commonest (n = 60; 45.8%) followed by soft tissue tumors (n = 39; 29.7%), appendageal tumors (n = 22;16.7%), melanocytic tumors (n=8; 6.1%) and haematolymphoid tumors (n=2;1.52). Most common

site involved was extremities (n=55; 42.0%) followed by Head and neck(n=40;30.6%).

Conclusion

Most of the skin tumors present as nodules, a good clinical and histological correlation is helpful in diagnosing them.

Key-words

Skin tumors, histopathology, Keratinocytic tumors.

INTRODUCTION

Skin is the complex organ in the body[1] and is composed of epidermis, dermis and subcutis. It consists of mainly three anatomic components; epidermis and skin adnexa, melanocytic system and dermis and subcutis[2]. Tumors arise from these components. Based on the origin, skin tumors are classified as Keratinocytic (Epidermal), melanocytic, appendageal, soft tissue and tumors of hematopoietic and lymphoid origin[3].

In a tropical and developing country like India inflammatory dermatoses are more prevalent than tumors [4]. Over the last few decades incidence of skin tumors has markedly increased may be due to increasing sun exposure. [5]

There are several factors which contributes to skin tumors, they are genetic, chemical, hormonal, nutritional, viral, and environmental factors.[6] Variations in the incidence and spectrum of skin cancer in different regions may be due to differences in skin types, geographical latitudes, occupational exposure, sun exposure and differences in disease awareness.[5]

Many of the cutaneous neoplasms may be a sign of other internal malignancy like multiple seborrheic keratosis (Leser-Trelat syndrome)[7] and multiple adnexal tumors can also be associated with internal visceral malignancy[8]. Sometimes it is difficult to distinguish benign and malignant tumors clinically. Hence it is hard to diagnose skin lesions on clinical grounds alone.[6] Role of histopathology is invaluable in arrive at a diagnosis; hence a good clinico-pathological correlation is needed to make a definitive diagnosis[9].

This study is done to analyze the histopathological spectrum of skin tumors and to correlate with the clinical presentation and demographic data in a tertiary care centre in south India.

MATERIALS AND METHODS

It was a retrospective study conducted in department of pathology in a tertiary care centre. All histopathologically-diagnosed skin tumors during the period of January 2018 to December 2020 (3 years) were included in this study. The study was cleared by the ethics committee at our institute.

Detailed clinical history, examination findings and demographic data for each case were collected from hospital records. The cases without proper clinical information and the tumors arising from mucocutaneous junction were excluded. All the slides stained with haematoxylin and eosin were reviewed.

Histological findings were recorded and analysed. All cases were classified as epidermal (Keratinocytic), melanocytic, appendageal tumors, soft tissue tumors and hematolymphoid malignancy. These findings were correlated with clinical details.

Relative frequency of various lesions, demographic distribution, clinical presentation as well as the distribution of sites were recorded. Differences in the distribution of continuous variables between categories were analysed by Mann Whitney and categorical variables by Chi-squared test. The data collected was tabulated, analysed and compared to other similar studies.

RESULTS

A total of 131 cases were included in this study. In that majority were benign (n=91;69.5%) than malignant tumors (n=40;30.5%) (Fig 1).

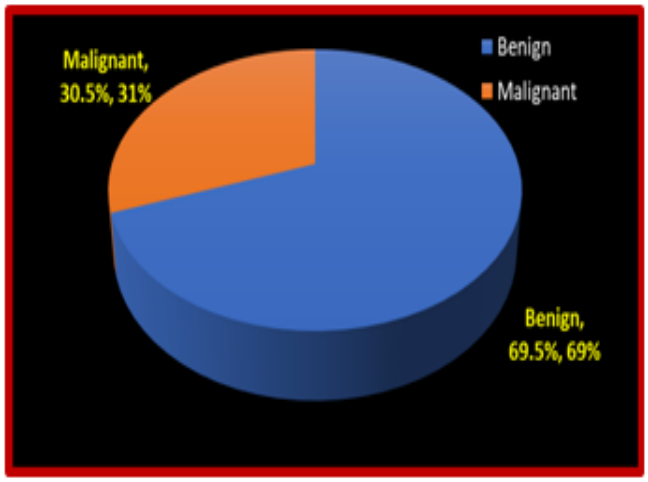

Fig 1: Distribution of benign and malignant tumours among study patients

There were 75(57.25%) males and 56 (42.74%) females, with Male to female ratio was (1.34:1). Occurrence of both benign (52.7%) and malignant tumors are slightly higher in males (67.5%) (Table 1).

The incidence of skin tumors was observed in all age group ranging from 06-90. The occurrence malignant tumors were higher in older age group with the range of 40-90 (mean 64.80 ± 10.55 years). Whereas the prevalence of benign tumors shows a wide range of age distribution 06-75(mean 42.32 ± 18.07), but the occurrence is comparatively less in older patients. P value for age distribution was 0.001, which is statistically significant (Table 1).

Keratinocytic tumors were the predominant group constituting 60 cases (45.8%). Soft tissue tumors were the second largest group (n=39 ;29.7%) followed by appendageal tumors (n = 22;16.7%), melanocytic tumors (n=8; 6.1%) and haematolymphoid tumors(n=2;1.52) respectively. Keratinocytic tumors formed the bulk of malignant tumors comprising 35 cases out of 40. (Table 2).

Table 1: Age and gender distribution of skin tumors

Variable	Category	Benign		Malignant		P-Value
		Mean	SD	Mean	SD	
Age	Mean	42.32	18.07	64.80	10.55	<0.001*[a]
	Range	06 – 75		42 – 90		
		N	%	N	%	
Sex	Males	48	52.7%	27	67.5%	0.12[b]
	Females	43	47.3%	13	32.5%	

Table 1 : Distribution of Skin Tumors According to Tumor Differentiation

Type	Benign	Malignant	Total	
			N	%
Keratinocytic tumor	25	35	60	45.8
Melanocytic tumor	06	02	08	6.1
Appendageal tumor	21	01	22	16.7
Soft tissue tumor	39	-	39	29.7
Hematolymphoid tumor	-	02	02	1.52

Among the malignant neoplasms predominantly seen tumor was basal cell carcinoma (BCC) (n=18) followed by squamous cell carcinoma (SCC) (n=15) in this study (Table 3).

Table 3: Distribution of different malignant Tumors among study patients

Variable	Category	n	%
Malignant Tumors	Basal Cell Carcinoma	18	13.7%
	Squamous Cell Carcinoma	15	11.5%
	Keratoacanthoma	3	2.3%
	Mycosis Fungoides	2	1.5%
	Melanoma	1	0.8%
	Sebaceous Carcinoma	1	0.8%

In basal cell carcinoma most common sub type was nodular variant (n=10) (Fig-2). 3 cases of infiltrating variant, 2 cases of superficial and pigmented variants were reported. One case was basosquamous carcinoma which had mixed features of both basal cell carcinoma and squamous cell carcinoma.

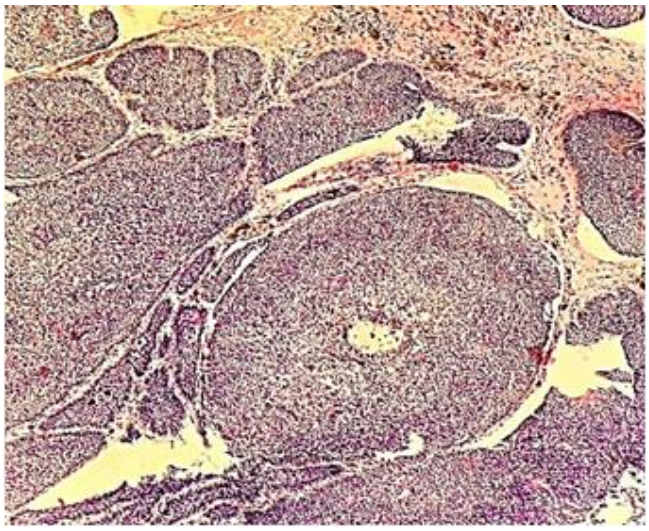

Fig-2: Basal cell carcinoma showing large islands of pleomorphic basaloid cells with peripheral palisading of nuclei (H & E stain 100X)

There were 15 cases of squamous cell carcinoma, in that 8 cases were well differentiated (Fig-3), 6 cases were moderately differentiated and 1 case was poorly differentiated. 1 case was verrucous squamous cell carcinoma which is a well differentiated variant of SCC. Well differentiated SCC showed mild pleomorphism with all cases had individual cell keratinisation and many had keratin pearl formation. Many of the moderately differentiated cases also had individual cell keratinisation and some had keratin pearl formation.

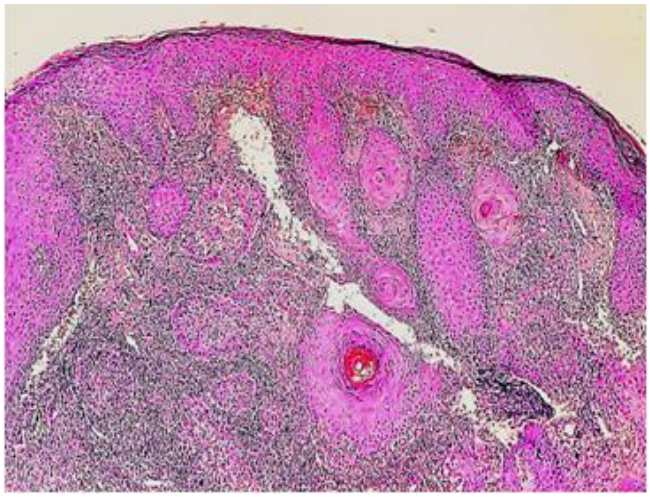

Fig-3: Squamous cell carcinoma microphotograph showing malignant squamous cells arranged in solid nest and sheets with keratin pearl formation (H & E stain 100X).

Three cases of Keratoacanthoma (Fig-4) were diagnosed, in that one case was in mature stage with typical crateriform architecture and other two were in early proliferative stage showing symmetrical lesion with invagination of interconnecting squamous epithelium. All cases showed mild atypia with proliferation of squamous epithelium.

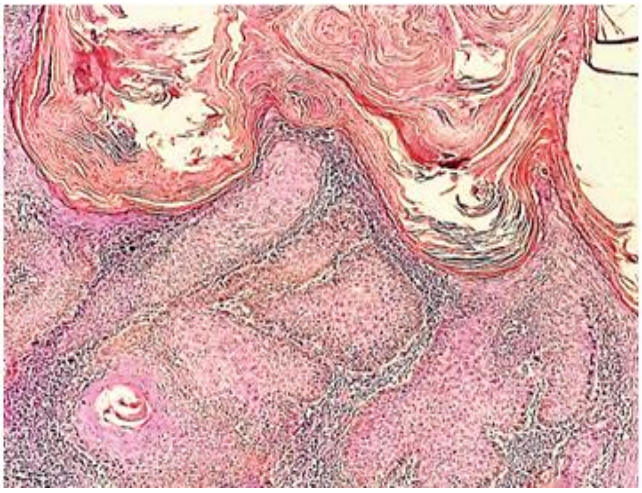

Fig-4: Keratoacanthoma microphotograph showing squamous cells proliferation with mild atypia and central keratin filled crater (H&E, x100)

Seborrheic keratosis (Fig-5) was the commonest benign tumors followed by Pilomatricoma (Fig-6) (Table-4).

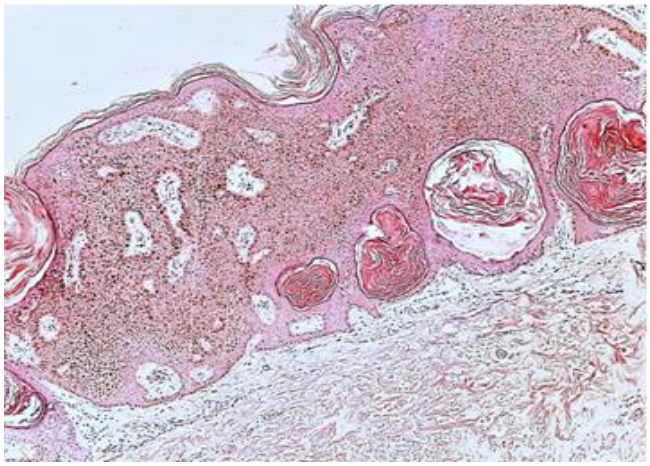

Fig 5: Seborrheic keratosis microphotograph showing acanthotic epithelium and horn cyst with proliferation of basaloid keratinocytes (H & E stain 100X)

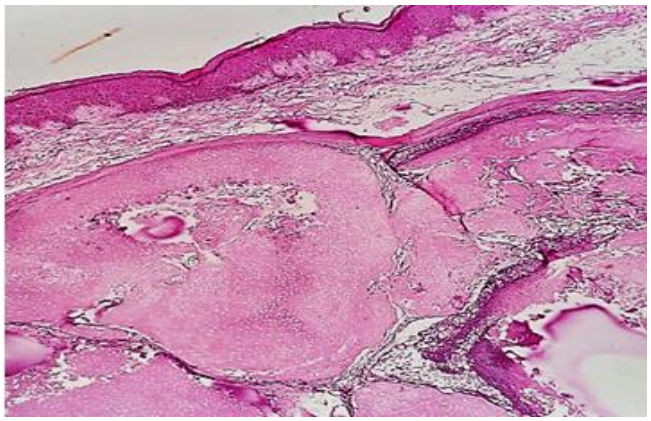

Fig 6: Pilomatricoma, microphotograph showing sheets of ghost cells with basaloid cells (H & E stain 100X)

Table 4 :Distribution of different benign Tumors among study patients

Variable	Category	n	%
Benign Tumors	Seborrheic keratoses	17	13.0%
	Pilomatricoma	10	7.6%
	Dermatofibroma	9	6.9%
	Pyogenic granuloma	9	6.9%
	Neurofibroma	9	6.9%
	Verruca Vulgaris	7	5.3%
	Hidradenoma	6	4.6%
	Lipoma	5	3.8%
	Schwannoma	5	3.8%
	Intradermal Nevus	3	2.3%
	Junctional Nevus	2	1.5%
	Eccrine Spiradenoma	2	1.5%
	Verruca Plana	1	0.8%
	Compound Nevus	1	0.8%
	Syringioma	1	0.8%
	Eccrine Poroma	1	0.8%
	Cylindroma	1	0.8%
	Glomangioma	1	0.8%
	Granular Cell Tumor	1	0.8%

Out of 22 adnexal tumors 21 lesions were benign with commonest being Pilomatricoma. One case was sebaceous carcinoma (Fig-7), which had nest and sheets of atypical cells with sebaceous differentiation showing moderate nuclear pleomorphism and many mitotic figures, it was categorised as grade 2.

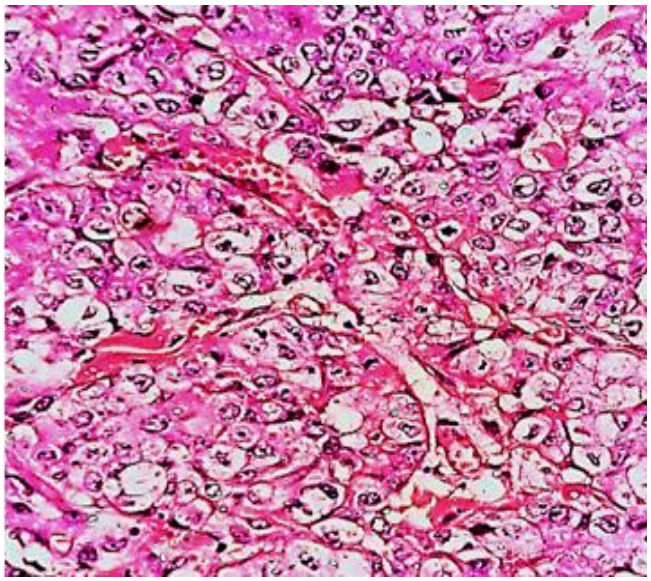

Fig 7: Sebaceous carcinoma microphotograph showing nest of multivacuolated cells with moderate pleomorphism, nuclear atypia with few mitosis (H &E stain 400X).

In soft tissue tumors all cases were benign with commonest being neurofibroma (Fig-8), pyogenic granuloma and dermatofibroma (n=9).

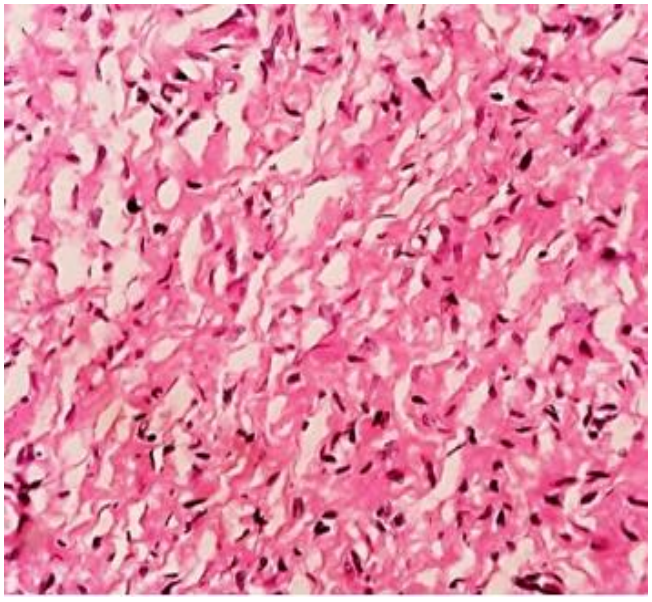

Fig 8: Neurofibroma showing spindle cells with wavy nuclei with interspersed collagen (H&E, x400).

Of the 131 cases, 8 were melanocytic origin, in that 6 were benign which included 3 intradermal nevus (Fig-9) junctional nevus and 1compound nevus. Two cases of malignant melanomas (Fig-10) were reported, both the cases showed marked pleomorphism with nuclear atypia, prominent nucleoli, and melanin pigmentation. One case was graded as Clark's level IV and the other as Clark's level V.

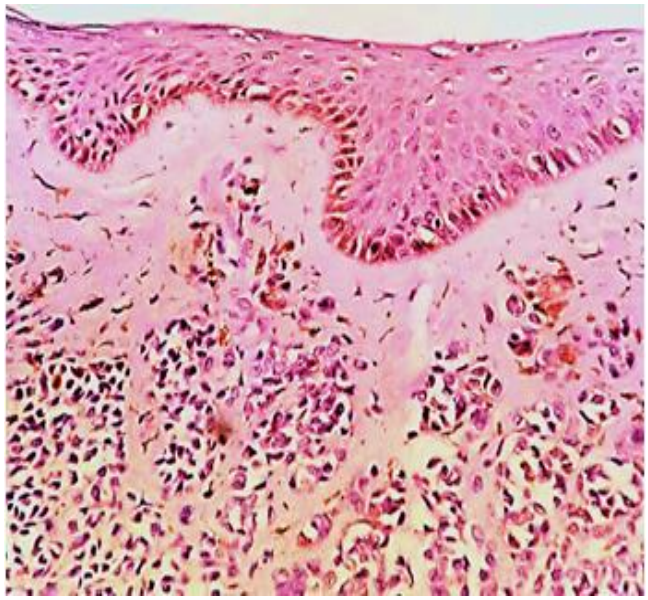

Fig 9: Intradermal nevus microphotograph showing showing nest of nevus cells in dermis (H&E, x400)

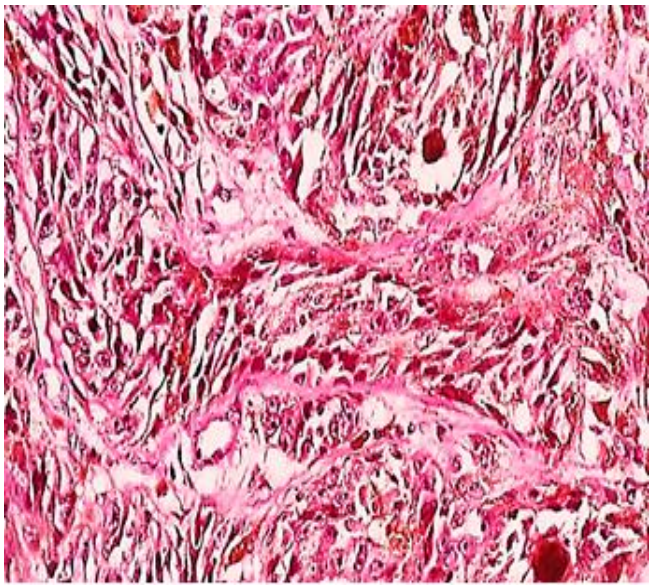

Fig 1: Malignant melanoma microphotograph showing polygonal neoplastic cells arranged in nest and islands with intracytoplasmic pigment (H & E stain 400X)

Two cases of mycosis fungoides were diagnosed. Both the cases had features of early patch stage.

Majority of the lesions were located on extremities (n=56;4.21%) followed by Head and neck(n=37;2.82%). Most of the malignant lesions were seen on the face (42.5%) followed by lower limb (20%). Benign lesions were seen predominantly on upper limb (30.8) followed by back (18.7%) and lower limb (17.6%) (Fig-11).

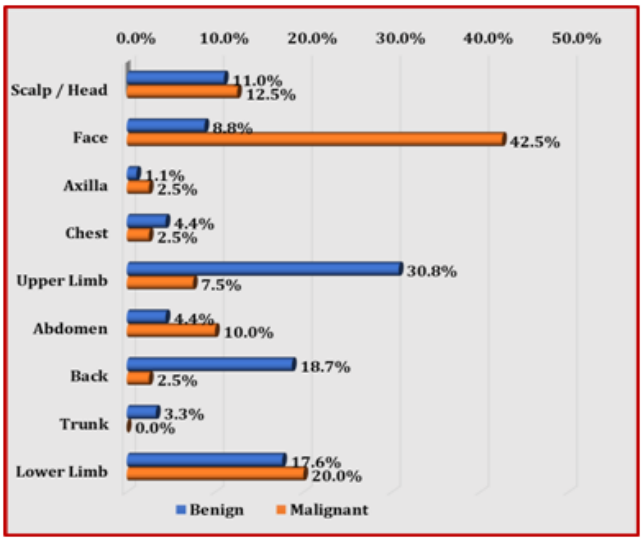

Fig 11: Site of occurrence of Tumors between Benign & malignant tumors (P-Value=<0.001)

Most of the benign lesions were nodules (67%) whereas in malignant tumors, majority of the lesions were non-healing ulcer (40%) (Fig-12). In melanocytic tumors, both the cases of melanomas presented as irregular pigmented patches whereas junctional nevus had brown coloured macule. Clinically all cases of intradermal and compound nevus presented as nodules or papules. Both the cases of mycosis fungoides had multiple erythematous patches. Clinical presentations of adnexal neoplasm and soft tissue tumors were papules, nodules and masses.

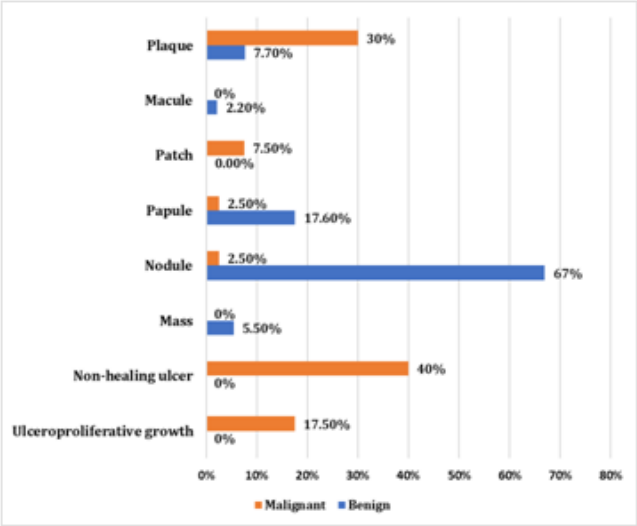

Fig 12: Comparison of clinical presentation of benign & malignant tumors

DISCUSSION

Skin tumors can be benign or malignant. Occurrence of benign neoplasms are common than the malignant neoplasm. In this study 131 cases were examined, in that 69.5% were benign and 30.5 % were malignant.

Which is in accordance with the results by Shrivastava V et al, Goel P et al, Har Shai et al and Bari V et al. [5,6,10,11]But Samanta M et al reported higher incidence of malignant tumors in their study.[12]

Skin tumors can affect both males and females and show wide range of age distribution. We found slight male preponderance. Which is comparable with many other studies. [5,6] Pappala P et al found slight female preponderance in their study.[9] Though all age groups are affected, many studies have reported the incidence of malignant tumors increases with the age. We observed the same with mean age group for malignant tumors was 64.8. [5,6]

Keratinocytic tumors comprises a broad range of benign and malignant lesions and are arising from keratinocytes of epidermis and adnexa. Malignancies in this category are the most commonly encountered cancers in routine practices.[13] Similar to many other studies we also observed keratinocytic tumors as the commonest (45.8%). [5,6,10]

BCC is the most prevalent cancer in humans world-wide. (14,15) We also found the higher incidence of BCC in the malignant neoplasms, which is in concordance with other studies. [6,16] Few authors reported higher incidence of Squamous cell carcinoma in their study,[5,10] which forms the second commonest cancer in our study. Most of the malignant tumors were presented as non-healing ulcer which is in accordance Shrivastava V et al.[5]

There are many histological subtypes in BCC, and nodular variant is the commonest type. (14,7) We also reported the same which is in concordance with Goel P et al.[6] Two cases of superficial BCC were reported; these are frequently observed on the trunk, we also found the same. One case of basosquamous carcinoma was reported, this is an aggressive subtype of BCC.

Most of the SCC were well differentiated (53.3%) in our study whereas Goel P et al found higher incidence of moderately differentiated SCC.[6] We reported 3 cases of keratoacanthoma now these are considered as a variant of well differentiated SCC. [17]

In benign neoplasm also we observed keratinocytic tumors as the predominant type in that Seborrheic keratosis was the commonest which is similar to the result by Chatra N et al.[18] Some studies have reported Verrucae as the commonest benign tumor. [5,6,10]

Second largest group in our study was soft tissue tumors. Benign soft tissue tumors are frequently seen with incidence of 3000 cases per 1 million person-years. [19] However, there were limited studies on the prevalence of skin soft tissue tumors. We found higher incidence of neurofibroma, dermatofibroma and pyogenic granuloma in this category. Chatra N et al observed higher incidence of neurofibroma[18] and Bari V et al reported pyogenic granuloma as the common soft tissue tumors.[10] No sarcomas were encountered in our study. Most of these lesions were presented as nodules.

As some other studies we also noticed higher incidence of Pilomatricoma in adnexal neoplasms.[5,6] However Saha et al. reported syringiomas as the commonest adnexal tumors.[20] Except one case of sebaceous carcinoma all other cases were benign. Clinically all the lesions in this group were nodules.

We found extremities as the commonest site (42.0%) followed by Head and neck (30.6%), however Shrivastava V et al and Goel P et al reported the most common site as head and neck followed by extremities[5,6] and Bari V et al reported equal prevalence in both extremities and head and neck.[10] We noticed benign tumors were commonly seen on

extremities whereas the commonest site for malignant tumors were face.

Skin tumors can affect both genders and people of all ages. The malignant tumors are mostly seen in the older age group. Extremities and head and neck are the most common sites. Predominance of Keratinocytic tumors noted in both benign and malignant categories. Majority of benign lesions were presented as nodules whereas in malignant neoplasm the common presentation was non healing ulcer.

Slight discordance among various studies may be attributable to environmental, genetic and other factors.

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