

Clinicopathological Study of Pigmented Skin Lesions

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Abstract: Pigmented lesions refer to melanocytic proliferations. Benign proliferations are often called moles or nevi. Malignant proliferations are melanomas. One of the most challenging and litigious areas of pathology is the accurate diagnosis of these pigmented lesions and differentiate them from pigmented variants of nonmelanocytic lesions. These include seborrheic keratosis, pigmented actinic keratosis, dermatofibroma, pigmented basal cell carcinoma and dermatofibrosarcoma. Histopathological study of 44 pigmented skin lesions was carried out in the department of Pathology, Dr. S.C.GMC, Nanded (India) for a period of one year (Jan 2012 to Dec 2012). The lesions examined included 19 melanocytic lesions i.e 12 benign nevi, 2 dysplastic nevi, 5 cases of cutaneous malignant melanoma and 25 nonmelanocytic lesions- 12 pigmented basal cell carcinoma, 10 seborrheic keratosis and 3 cases of actinic keratosis. The most common age group affected was 61-80 years with a male to female ratio of 1:1.1. Majority of lesions were located on head and neck region. Analysis of clinical diagnosis with histopathological diagnosis revealed a positive correlation of 84% and negative correlation of 16%. Seborrheic keratosis and basal cell carcinoma were the common nonmelanocytic lesions to be misdiagnosed as malignant melanoma clinically. There was lack of clinicopathological correlation in dysplastic naevus.

Keywords: Nevi, Melanoma, Nonmelanocytic lesion, Histopathological study.

I. Introduction

Pigmented lesions refer to melanocytic proliferations. They are composed of one or more of three related cell types: melanocytes, nevus cells or melanoma cells, each of which may be located in the epidermis or the dermis.

Benign tumors of nevus cells are called melanocytic nevi, while malignant tumors are called malignant melanomas.[1] Melanocytic lesions are important as malignant melanoma which accounts for only 1% of skin cancers, is responsible for over 60% of cancer related deaths. According to World Health Organisation, the number of melanoma cases worldwide is increasing faster than any other cancer.[2] Nevi and other benign pigmented lesions, except for their cosmetic significance, are important as simulants of melanoma and as potential precursors of melanoma.

1.1. Melanocytic nevi: Melanocytic nevi are only rarely present at birth, most appear in adolescence and early adulthood. There are transitional stages in the life cycle of nevi, which are believed to start out as junctional nevi, then compound nevi and having become intradermal nevi, undergo involution.[1]

1.2. Malignant melanoma: The term "black cancer" was first used to describe cutaneous malignant melanoma by Hippocrates in the fifth century BC. In 1806, Rene Laennec provided the first description of melanoma as a disease entity and also marks the first published use of the word melanoma.[3] The peak incidence is around the sixth decade of life. The large majority are associated with sunlight exposure. Therefore most are found in the head and neck area and lower extremity, the latter being particularly common in females.

WHO histological classification of melanoma includes superficial spreading, nodular, lentigo maligna, acral lentiginous, desmoplastic, melanoma arising from blue nevus and those arising in giant congenital naevi, childhood, naevoid and persistent melanoma, all originate almost invariably from melanocytes at epidermal-dermal junction. [4] Clark and colleagues introduced the concept of radial and vertical growth phase in the evolution of malignant melanoma.

Clark's level of invasion: Has a prognostic and descriptive value.[1]

Level 1- confined to dermis

Level 2- Invasion into papillary dermis

Level 3- Invasion into papillary and reticular dermis interface

Level 4- Invasion into reticular dermis

Level 5- Invasion into subcutaneous fat

1.3. Dysplastic Nevus: In between the benign melanocytic nevi and malignant melanoma, lies dysplastic nevi. Munro, in 1974, first described the macroscopic and microscopic picture of Melanocytic

Dysplastic Nevus (MDN). In 1978, Clark et al. published the first report to advance MDN as a separate pathological entity associated with an increased risk of melanoma.[3] Dysplastic nevi present atypical features both clinically and histologically, and thus are important as stimulants of melanoma. Histologically they show three characteristic features: lentiginous hyperplasia, random cytologic atypia and a stromal response. A fourth feature, architectural atypia, is generally regarded as a diagnostic requirement.

1.4. A variety of nonmelanocytic lesions have pigmented variants, which defy clinical recognition and can mimic melanocytic lesions including melanoma. Such mimickers include seborrheic keratosis, basal cell carcinoma, actinic keratosis, dermatofibrosarcoma protuberans and rarely lesions like follicular cyst.[5,6] Crasta et al. (2002) carried out a study to assess the prevalence of lesions with pigmented variants where histopathological examination helped to confirm/refute the clinical diagnosis. In their study, the most common lesion presenting with such diagnostic difficulty clinically was seborrheic keratosis, others being basal cell carcinoma, actinic keratosis and dermatofibrosarcoma protuberans.[5]

II. Aim And Objectives

- a. To study the spectrum of pigmented skin lesions, both melanocytic and nonmelanocytic.
- b. To study the role of histopathology in the diagnosis of these lesions.
- c. To correlate the clinical diagnosis with histopathological diagnosis.

III. Material And Methods

In this prospective study conducted at the department of Pathology, Dr. S.C.GMC, Nanded, a total of 44 patients with pigmented skin lesions were evaluated. Only neoplastic pigmented lesions were included in the study. Inflammatory and other nonneoplastic lesions were excluded. A detailed clinical history was obtained and dermatological examination was carried out to evaluate the type, distribution, configuration and topography of lesions. The lesion was biopsied after taking written consent of the patient. Punch biopsy was preferred for smaller lesions whereas excision biopsy was done for the larger ones. Sections were processed for histopathological study. They were stained by routine hematoxylin and eosin stain for basic study of lesion based on its histomorphology.

The results and observations were organized and interpreted in light of demographic, clinical and histopathology findings.

IV. Results And Observations

Histopathological study of 44 pigmented skin lesions was done.

4.1. Distribution of lesions: Out of 44 cases studied, 19 were melanocytic while 25 were nonmelanocytic lesions.

Table No.1: Distribution of Neoplastic pigmented skin lesions based on its histopathology

Lesions		No. of cases	Percentage (%)
Melanocytic	Benign melanocytic naevi	12	27.27
	Dysplastic naevi	2	4.55
	Malignant melanoma	5	11.36
Non melanocytic	Seborrheic keratosis	10	22.72
	Spreading pigmented actinic keratosis	3	6.82
	Pigmented BCC	12	27.27
Total		44	100

4.2. Age and sex distribution: The most common age group affected was 61-80 years with 21 (47.73%) cases. All lesions were more common in this age group except for benign melanocytic nevi which were common in the age group of 21-40 years (8 cases; 66.67%). The male to female ratio was 1:1.1.

4.3. Site distribution of lesions: Majority of lesions were located on the head and neck region (28 cases; 63.64%), followed by lower extremity (10 cases; 22.73%) and trunk (6 cases; 13.64%). No lesion was found on upper extremity. Melanoma was found more commonly on lower extremity (3 cases; 60%).

4.4. Histopathological typing of lesions: Out of 12 cases of benign melanocytic naevi, 7 (58.33%) were intradermal, 4 (33.33%) were compound and 1 (8.33%) was junctional naevus.

Clark's grading of malignant melanoma revealed 2 (40%) cases each in grade 3 and grade 5 and 1(20%) case in grade 4. There was no lesion in clark's grade 1 and 2.

The most frequent histological subtype of pigmented basal cell carcinoma was nodular type seen in 7 (58.33%) cases, followed by 3 (25%) cases of adenoid and 1 (8.33%) case of micronodular and basosquamous type each.

4.5. Clinical and histological correlation: An analysis of clinical diagnosis with the histopathological diagnosis revealed a positive correlation of 84% and negative correlation of 16%.

Table No. 2: Clinical and histopathological correlation of pigmented skin lesions

Clinical diagnosis	No. of cases	Histopathological diagnosis			
		Consistent	Inconsistent		
Benign melanocytic naevi	13	12	Dysplastic nevus (1)	--	--
Malignant melanoma	9	4	BCC (2)	Seborrheic keratosis (2)	Dysplastic nevus (1)
Seborrheic keratosis	8	8	--	--	--
Spreading pigmented actinic keratosis	3	3	--	--	--
Pigmented basal cell carcinoma	11	10	Malignant melanoma (1)	--	--
Total (%)	44 (100%)	37 (84.10%)	7 (15.90%)		

V. Discussion

In this prospective study, we tried to study the melanocytic lesions and their nonmelanocytic mimickers. The melanocytic group comprised of benign melanocytic naevi, dysplastic naevi and malignant melanoma while seborrheic keratosis, pigmented actinic keratosis and pigmented basal cell carcinoma comprised the nonmelanocytic lesions. Crasta J et al. (2002)[5] reported basal cell carcinoma, seborrheic keratosis, actinic keratosis and dermatofibrosarcoma protuberans to be the common nonmelanocytic tumors that resemble melanocytic tumors.

5.1. Age and sex distribution: Out of 44 cases in our study, majority (47.73%) were in the age group of 61-80 years, followed by 22.73% in the age group of 21-40 years. The male to female ratio was 1:1.1. Crasta J et al. (2002)[5] reported 53.84% cases in the age group of 61-80 years with a M:F ratio of 1.2:1. Youl PH et al (2011)[7] reported 52.41% of the total cases in >50 years age group and M:F ratio of 1.4:1.

5.2. Site distribution of lesions: Our study revealed head and neck involvement in 63.64% cases, lower extremity in 22.73% and trunk in 13.64% cases. Crasta J et al. (2002)[5] reported head and neck involvement in 70% cases, trunk in 20% and lower extremity in 10% cases. Youl PH et al. (2011)[7] reported a higher percentage of lesions on the trunk (46.14%). This may be due to larger sample size of their study.

5.3. Malignant melanoma: The present study included 5 cases of malignant melanoma. Histologically, all lesions showed junctional activity at dermaepidermal junction. Both epitheloid and spindle cells were seen. Clark's grading of malignant melanoma in our study revealed grade 3 and 5 in 40% cases each while grade 4 was seen in 20% cases.

Table No.3: Comparison of clark's grading of malignant melanoma

Grade \ Study	Hussein MR et al (2006)[8] n=21	Mukhopadhyay S et al (2008)[2] n=21	Konrad P et al (2011)[7] n=72	Present study (2012) n=5
1	--	18.2%	29.2	--
2	9%	18.2%	12.3	--
3	14%	36.2%	32.3	40
4	28.57%	18.2%	26	20
5	47.61%	19%	--	40

Clark's grading of malignant melanoma in the present study are comparable with the studies by Hussien MR et al (2006)[8] and Mukhopadhyay S et al (2008)[2].

5.4. Clinical and histopathological correlation: In the present study an analysis of the clinical diagnosis with the histopathological diagnosis revealed a positive correlation in 84% cases and negative correlation in 16% cases thus emphasizing the importance and utility of histopathology in arriving at a conclusive diagnosis. Curley RK et al (1989)[10] reported an overall sensitivity (diagnostic accuracy) of 50% in clinically evaluating pigmented lesions.

Out of 9 cases of malignant melanoma diagnosed clinically, only 4 cases on histopathology were found to be consistent with melanoma. Remaining 5 cases proved to basal cell carcinoma (2 cases), seborrheic keratosis (2 cases) and dysplastic nevus (1 case). Crasta J et al (2002)[5] in their study on pigmented lesions of non melanocytic origin, found seborrheic keratosis and basal cell carcinoma to be the common nonmelanocytic lesions that mimic melanocytic lesions including melanoma.

The present study included 2 cases of dysplastic naevi, none of which was diagnosed clinically. Grob JJ et al (1988)[11] showed that the diagnosis of dysplastic naevi on the basis of clinical criteria alone is difficult and unreliable. Kwok YK et al (2001)[12], in their study on melanocytic naevi, reported a lack of clinicopathological concordance in dysplastic naevi.

Out of 11 cases of pigmented basal cell carcinoma diagnosed clinically, 1 proved to be malignant melanoma on histopathology. Anderson WK et al (1991)[13], in their study on 178 cases of malignant melanoma, had described 2 subsets of melanoma which defy clinical diagnosis, one of which is mistaken for basal cell carcinoma and the other with verrucous appearance is mistaken for seborrheic keratosis.

VI. Conclusion

Pigmented lesions include both melanocytic as well as nonmelanocytic lesions. A good clinical correlation and biopsy with histopathological diagnosis is necessary for the accurate diagnosis and definite treatment of patients with pigmented skin lesions. It differentiates melanocytic from nonmelanocytic tumors and also helps in the subtyping and grading of tumors.

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