ISSN: 2320-9267

Indian Journal of Pharmaceutical and Biological Research (IJPBR)

Journal homepage: www.ijpbr.in

RESEARCH ARTICLE

Histopathological spectrum of Pigmented Melanocytic Lesions

Richa Sharma[1*], Shubhangi Khamankar[2], Dharitri Bhat[3]

ABSTRACT

Background: Pigmented lesions are of a major concern with great psychological impact on quality of life. According to WHO, the number of melanoma cases worldwide is increasing faster than any other cancer. Pigmented melanocytic lesions encompass a wide spectrum of benign and malignant entities with overlapping clinical and histopathological features. Accurate histopathological evaluation remains the gold standard for diagnosis and plays a crucial role in prognostication and therapeutic decision-making.

Methods: This study was carried out in the Department of Pathology of a tertiary care centre in Maharashtra. All the melanocytic lesions were included in the study.Formalin-fixed, paraffin-embedded tissue sections were processed and stained with hematoxylin and eosin.

Results: A total of 61 cases of pigmented melanocytic lesions were analyzed. Benign melanocytic nevi constituted the majority of cases, followed by malignant melanoma. The lesions were distributed in the age ranging from 14 - 80 yrs. Male predominance in seen in cases of melanoma. The most frequently involved anatomical sites were extremities. Malignant melanoma cases demonstrated characteristic features such as asymmetry, increased mitotic activity, and cytological atypia.

Conclusion: Benign melanocytic nevi are the most common pigmented melanocytic lesions encountered in routine histopathology practice. Histopathological examination remains indispensable for accurate diagnosis and differentiation between benign and malignant lesions, thereby guiding appropriate clinical management.

Keywords: Pigmented melanocytic lesions, melanocytic nevi, malignant melanoma, histopathology, skin tumors

Indian J. Pharm. Biol. Res. (2026): https://doi.org/10.30750/ijpbr.14.3.62

INTRODUCTION

Pigmented skin lesions are one of the most frequently encountered symptoms in dermatology[1]. Apart from being a frequent cause of dermatologic consultation, these pigmented lesions are of a major concern with great psychological impact on quality of life[2]. According to WHO, the number of melanoma cases worldwide is increasing faster than any other cancer[3]. With increase in the awareness about skin cancer, patients are presenting to their dermatologists with earlier forms of pigmented lesions. Identifying the lesions with malignant or potentially malignant nature amongst these lesions is most important and difficult task in dermatology. Early diagnosis of these lesions allows excellent prognosis and also prevents further progression[4,5].Despite various available advanced modalities like Dermoscopy and Epiluminescense for the diagnosis of pigmented skin lesions, histopathological examination is always essential for confirmation of diagnosis, staging and categorization of these lesions[6,7]. One of the most challenging and litigious areas of pathology is early and accurate diagnosis of malignant melanoma and its precursor lesions specially nevi with malignant potential[4]. There is significant overlap in histopathological picture of different pigmented disorders, hence morphology alone is not specific[8,9]. Pathologists are increasingly facing the challenge to make definitive diagnoses of benign nevi or malignant melanoma[10].In addition to cosmetic significance, nevi and other benign

[1]Assistant Professor, Department of Pathology, Santosh Medical College, Ghaziabad, Uttar Pradesh, India

[2]Associate Professor, Department of Pathology, Government Medical College, Gondia, Maharashtra, India

[3]Associate Professor, Department of Pathology, Government Medical College, Nagpur, India

Corresponding Author: Richa Sharma, Assistant Professor, Department of Pathology, Santosh Medical College, Ghaziabad, Uttar Pradesh, India Email: richasharmamrt44@gmail.com

How to cite this article: Sharma R, Khamankar S, Bhat D. Histopathological spectrum of Pigmented Melanocytic Lesions. Indian J. Pharm. Biol. Res. 2026;14(3):390-394.

Source of support: Nil

Conflict of interest: None.

Received: 03/06/2026 **Revised:** 12/06/2026 **Accepted:** 05/07/2026

pigmented lesions are important as simulants of melanoma or potential precursors of melanoma[11]. Pigmented skin lesions are most often melanocytic. Many times, non-melanocytic lesions can also be pigmented, especially in dark-skinned individuals[12,13].

MATERIALS AND METHODS

Present study is a cross sectional study carried out in pathology department of a tertiary care hospital settings in Maharashtra. The study involved collection of cases over a period of one year.Samples included punch biopsy, excisional biopsy and wide local excision. Sections were processed and stained with Hematoxylin and Eosin stain. Slides were viewed and diagnosis were made taking into consideration the clinical and histological features. All the melanocytic lesions were included in the study. Inadequate biopsies were excluded from the study.

RESULTS

Total 61 cases were included in the study including nevi which constituted the maximum percentage of the melanocytic lesions (n=41, 67%). Malignant melanoma cases were 12 in number (19%). Rest of the cases (n=8, 14%) were of Dowling Degos disease, Melasma etc. (Table 1 and Figure 1)

These cases were distributed in the age ranging from 14 to 80 years. Malignant melanoma was observed in older age group. Nevi were distributed in younger to older age group.

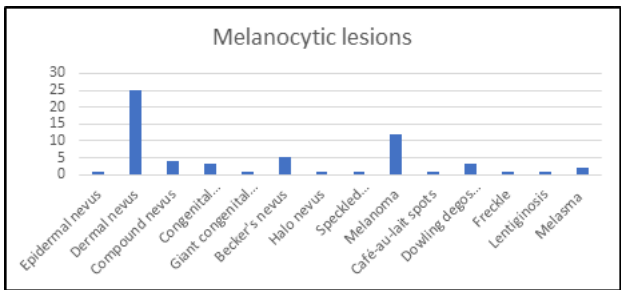

Figure 1: Distribution of cases

There was a male preponderance in malignant melanoma (M:F ratio= 5:1). This is in contrast to benign nevi where female preponderance was seen (M:F= 1:7).

These cases are most commonly distributed over extremities followed by face and trunk. (Table 2). Malignant melanoma cases were observed on feet and legs. Nevi were distributed over face, trunk and limbs. A case of Café au lait spots was included in the study which showed lesions over trunk.

The most common melanocytic lesion observed in the study is nevi (n= 41 cases,67%). Nevi can be clinically classified as acquired and congenital. Histopathologically, it can be classified as junctional or intraepidermal,

Table 1: Distribution of cases (n=61)

	Broad categories	*Histopathological diagnosis*	*No. of cases*	*Percentage (%)*
1.	Nevi (n=41, 67%)	Epidermal Nevus	1	1.6
		Dermal Nevus	25	41
		Compound Nevus	4	6.5
		Congenital Melanocytic Nevus	3	5
		Giant Congenital Melanocytic Nevus	1	1.6
		Becker's Nevus	5	8.2
		Halo Nevus	1	1.6
		Speckled Lentiginous Nevus	1	1.6
2.	Malignant melanoma (n=12, 19%)		12	19.6
3.	Others (n=8, 14%)	Cafe-au-Lait Spots	1	1.6
		Dowling Degos Disease	3	5
		Freckle	1	1.6
		Lentigenoses	1	1.6
		Melasma	2	3.3
	Total		61	100

Table 2: Site distribution of cases

Site	Number of cases	Percentage
Extremities	27	45
Face	18	29
Trunk	16	26
Total	61	100

compound and dermal nevi. In our study, most common type is dermal nevus (n=25). Other types being compound nevus, epidermal nevus, Becker's nevus, Halo nevus and congenital nevus etc. Histologically, nests of nevi are present at tips of rete ridges in intraepidermal component. In dermal nevus, the cells show epithelioid to oval to spindled appearance (Fig. 2)

The second most common melanocytic lesion observed is malignant melanoma (n= 12 cases,19%). These cases are seen in 50 – 80 years of age. These tumors were located over toe and foot (extremities). Histological types noted are of Acral lentiginous melanoma (n=6), superficial spreading melanoma (n=3) and nodular melanoma (n=3). (Fig. 3)

Rest of the 8 cases includes Melasma (n=2) which is seen over face of females. Café- au- lait spots (n=1) is seen over abdomen and trunk of a male. Dowling Degos disease (n=3) is observed in the study followed by 1 case each of lentiginoses and freckle.(Fig. 4, 5)

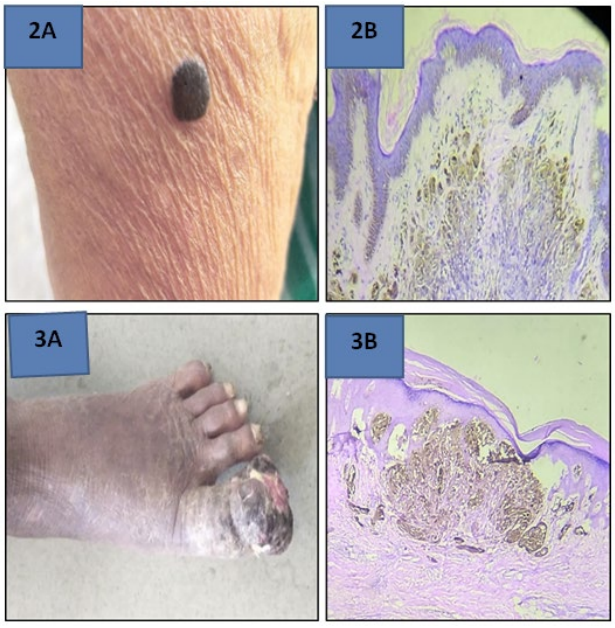

Figure 2: A- clinical photograph of nevi. B-Microscopy showing nests of nevi

Figure 3: A- Clinical photograph of left toe melanoma. B-Photomicrograph showing large pleomorphic tumor cells in melanoma

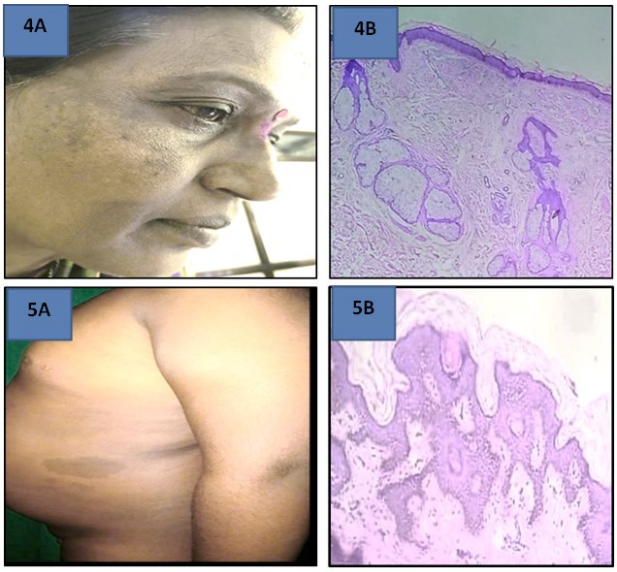

Fig. 4: 4A- Clinical photograph showing melasma. 4B-Photomicrograph showing increased epidermal melanin

Fig. 5: 5A- Clinical photograph showing café-au-lait spots. 5B-Microscopy of Café-au-lait spots

DISCUSSION

The present study included 61 cases of pigmented melanocytic lesions highlighting the predominance of benign nevi (67%) followed by 19.6% cases of melanoma. While the rest (14%) is constituted by other pigmented dermatoses. This distribution reflects broader clinical trends—nevi are far more frequently encountered in dermatopathology than melanoma, particularly in nonwhite populations[14].

The finding that dermal neviwere most common (41%) aligns with established histopathological patterns where intradermal nevi often persist or even increase with age, especially in sunexposed individuals[15].

Compound nevi (6.5%) and congenital melanocytic nevi (5%) were also observed in expected frequencies consistent with literature from Indian and global cohorts. 15Notably, congenital melanocytic nevi of medium to large size carry non-negligible lifetime melanoma risk—meta-analytic data indicate about 1.15% incidence in congenital melanocytic nevi overall, with significantly higher risk in large/giant lesions (RR ~22) [16]. Approximately 19 % of cases were diagnosed as malignant melanoma. While

this percentage may appear elevated relative to general population incidence, it likely reflectsbiopsy selection bias—clinically suspicious lesions being more likely excised and examined. Importantly, all melanoma cases occurred in older age groups, consistent with global epidemiologic data showing melanoma risk rises sharply in the 50s and 60s, often with cumulative UV damage and genetic mutations.

A striking finding in this cohort is the **gender dichotomy** malignant melanoma showed male preponderance (M:F = 5:1), whereas benign nevi were far more frequent in females (M:F = 1:7). Internationally, men are often diagnosed with melanoma at more advanced stages, potentially due to lower use of sun protection and delayed health seeking, while women may present more frequently with benign nevi, influenced by hormonal or cosmetic concerns. These gender patterns echo epidemiologic insights on behavioral and biological risk modifiers[15].

Anatomically, lesions most commonly occurred on the extremities, followed by face and trunk. Malignant melanoma cases were predominantly on feet and legs—consistent with acral lentiginous melanoma, a subtype more prevalent in darker-skinned individuals and typically arising on lower extremities. Benign nevi were broadly distributed over face, trunk, and limbs [17].

The small subset of other pigmented dermatologic conditions—Dowling-Degos disease (DDD), café-au-lait spots, melasma—accounted for 14%. The presence of rare entities like Dowling-Degos disease (5%) highlights the importance of considering such differential diagnoses. Histologically, DDD is characterized by epidermal elongation, rete ridges forming antler-like branching, suprapapillary thinning, horn cysts, and hyperpigmentation—features clearly differentiating it from melanocytic lesions[18].

Several insights emerge when integrating our findings with the literature1)Nevi as risk markers: Epidemiologic studies have shown that individuals with higher nevus counts, particularly on trunk (men) or legs (women), carry significantly elevated melanoma risk (up to 24–27fold[19]. Thus, benign nevi observed in this cohort—notably on legs or trunk—might reflect not only benign disease but potentially future melanoma risk. 2)Diagnostic usefulness: A clinical study in an Indian population reported female preponderance of nevi and varied dermoscopic patterns—globular, reticular, homogeneous — confirming typical features and age distributions similar to our cohort[15].

CONCLUSION

This study highlights the spectrum of melanocytic lesions encountered in clinical practice, with nevi being the most prevalent, comprising 67% of all cases. Malignant melanoma, though less common (19%), remains a critical diagnosis due to its aggressive nature and need for early intervention. The remaining 14% of lesions, including conditions such as Dowling-Degos disease and melasma, underscore the importance of accurate histopathological evaluation in differentiating melanocytic from non-melanocytic pigmented lesions. Timely diagnosis and classification of these lesions are essential for appropriate patient management and prognosis.

REFERENCES

1. Balch CM, Gershenwald JE, Soong SJ, Thompson JF, Atkins MB, Byrd DR. Final version of 2009 AJCC melanoma staging and classification. J Clin Oncol. 2009; 27:6199-206.
2. Mruthyunjayappa S, Mahanthappa H, Gopal MG, Venugopal SB. A study of spectrum of histopathological features in patients presenting with hyperpigmented skin lesions. Arch Med Health Sci. 2016;4(2):189-95
3. Lens MB, Dawes M. Global perspective of contemporary epidemiological trends of cutaneous malignant melanoma. Br J Dermatol 2004;150(2):179- 85
4. Marsden JR, Newton-Bishop JA, Burrows L, Cook M, Corrie PG, Cox NH et al. Revised UK guidelines for the management of cutaneous melanoma 2010. Br J Dermatol 2010;163(2):238-56.
5. Cancer Council Australia and Australian Cancer Network. Clinical Practice Guidelines for the Management of Melanoma in Australia and New Zealand. New Zealand guidelines group, Wellington, New Zealand, 2008.
6. Troxel DB. Medicolegal Aspects of Error in Pathology. Arch Pathol Lab Med. 2006;130(5):617–19.
7. Tsai MR, Cheng YH, Chen JS, Sheen YS, Liao YH, Sun CK. Differential diagnosis of nonmelanoma pigmented skin lesions based on harmonic generation microscopy. J Biomed Opt. 2014 Mar;19(3):36001.
8. Goyal K, Chahal KS, Malhotra SK. To study the clinicopathological correlation of common pigmentary disorders of skin. IJSR 2016; 7(4):1448-52.
9. Gupta P, Karuna V, Grover K, Rathi M, Verma N. The histopathological spectrum of skin diseases with emphasis on clinicopathological correlation: A prospective study. IP journal of Diagnostic pathology and oncology 2018;3(2):91-95
10. Anand I, Ilanthodi S, Girish P N, Pai MR. A histo-pathological study with an emphasis on stratification of pigmented lesions of the skin. Indian J Pathol Oncol 2020;7(4):643-649.
11. Suvernakar SV, Harwani SR, Deshpande SA. Clinicopathological Study of Pigmented Skin Lesions. IOSR journal of Dental and Medical sciences. 2014; 13(5):70-73
12. Parvathi M, Chowdari B, Lekha GD, Kumar SS, Bhagya

Lakshmi A. A clinico-pathological study of pigmented cutaneous lesions: a one-year prospective study in a tertiary care hospital. Int J Res Med Sci. 2017 Dec;5(12):5316-5321.

13. Laishram RS, Myrthong BG, Laishram S, Shimray R, Kumar A, Sharma DC. Pigmented skin lesions: are they all of melanocytic origin? A histopathological perspective. J Pak Associa Dermatol. 2013;23(3):284-88.
14. Liu P, Su J, Zheng X, Chen M, Chen X, Li J, Peng C, Kuang Y and Zhu W (2021) A Clinicopathological Analysis of Melanocytic Nevi: A Retrospective Series. *Front. Med.* 8:681668.
15. Malladi NSN, Chikhalkar SB, Khopkar U, Kharkar V. A descriptive observational study on clinical and dermoscopic features of benign melanocytic neoplasms. Indian J Dermatol VenereolLeprol. 2020 May-Jun;86(3):251-261.
16. Scard C, Aubert H, Wargny M, Martin L, Barbarot S. Risk of melanoma in congenital melanocytic nevi of all sizes: A systematic review. J EurAcad Dermatol Venereol. 2023 Jan;37(1):32-39.
17. Patel AB, Kubba R, Kubba A. Clinicopathological correlation of acquired hyperpigmentary disorders. Ind J Dermatol Ven Leprol. 2013;79(3): 367-75.
18. Rice AS, Cook C. Dowling-Degos Disease. [Updated 2023 Aug 16]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK531470/
19. Krüger S, Garbe C, Büttner P, Stadler R, Guggenmoos-Holzmann I, Orfanos CE. Epidemiologic evidence for the role of melanocytic nevi as risk markers and direct precursors of cutaneous malignant melanoma. Results of a case control study in melanoma patients and nonmelanoma control subjects. J Am Acad Dermatol. 1992 Jun;26(6):920-6. doi: 10.1016/0190-9622(92)70133-z. PMID: 1607409.