

A Rare Case of Intradermal Nevus of the Breast: A Nevus of Special Site

Dr Harminder Kour¹, Dr Rashmi Gautam^{2*}, Dr Praveen Prakash¹, Dr Parul Singhal², Dr Shilpa Tomar²

¹Assistant Professor, Department of Pathology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

²Professor, Department of Pathology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

***Corresponding Author:** Dr Rashmi Gautam

Professor, Department of Pathology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India

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Abstract: Intradermal nevi are common benign melanocytic lesions; however, their occurrence in anatomically distinct locations such as the breast may present diagnostic challenges due to site-specific histological variations. Pigmented lesions in the breast region, particularly in the nipple–areola complex, often raise clinical suspicion for malignancy, necessitating careful evaluation and histopathological assessment. Such lesions may occasionally be detected incidentally during evaluation or surgical management of unrelated breast conditions. We report a rare case of an intradermal nevus identified incidentally in the skin overlying a benign breast lump in a middle-aged female, representing a nevus of special site. Histopathological examination revealed classic features of an intradermal nevus, including dermal confinement of nevus cells, progressive maturation, and absence of cytologic atypia or mitotic activity. Immunohistochemistry showed diffuse positivity for S100 protein, confirming melanocytic origin. Awareness of nevi of special sites and their characteristic histological features is essential to avoid misdiagnosis as melanoma and prevent unnecessary aggressive management.

Keywords: Intradermal Nevus, Breast, Nevus of Special Site, Melanocytic Lesion, Nipple–Areola Complex.

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INTRODUCTION

Melanocytic nevi are common benign proliferations of melanocytes that typically follow a predictable pattern of evolution from junctional to compound, and ultimately to intradermal forms [1, 2]. However, nevi occurring at certain anatomical locations—such as the breast, genitalia, acral regions, flexural areas, scalp, and conjunctiva—are categorized as nevi of special sites due to their propensity to exhibit atypical architectural and cytological features that may simulate dysplastic nevi or melanoma [1-4]. These site-related variations are well recognized in dermatopathology and are important sources of potential diagnostic pitfalls.

Intradermal nevus represents the terminal stage of nevus maturation and is characterized by complete dermal localization of nevus cells, absence of junctional activity, and progressive maturation with descent into the deeper dermis [1, 2]. These lesions are generally benign and frequently encountered in routine practice; however,

their presentation in uncommon anatomical locations may raise clinical and histopathological concern.

The breast, particularly the nipple–areola complex, is an unusual site for melanocytic nevi and may pose diagnostic challenges due to the clinical suspicion of malignant melanoma or other pigmented lesions [4-6]. Pigmented lesions in this region often warrant careful evaluation because melanoma, although rare at this site, carries significant prognostic implications. Furthermore, hormonal influences and unique anatomical features of the breast skin may contribute to variations in melanocytic lesion morphology.

In this context, awareness of site-specific histological patterns and their distinction from malignant entities becomes crucial. We report a rare case of an intradermal nevus identified incidentally in the skin overlying a benign breast lesion, emphasizing its histopathological features, differential diagnosis, and clinical significance.

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CASE PRESENTATION

A middle-aged female presented to the surgical outpatient department with a complaint of a painless lump in the breast of several months' duration. The lump was insidious in onset and had not shown any significant increase in size. There was no associated history of pain, ulceration, bleeding, nipple discharge, or skin changes. The patient denied any history of trauma, prior breast lesions, or hormonal therapy. There was no significant personal or family history of breast carcinoma or cutaneous malignancy.

On clinical examination, a well-defined, mobile, non-tender lump was palpated in the breast parenchyma. The overlying skin appeared unremarkable on initial inspection, and no nipple retraction or discharge was noted. Regional lymph nodes were not palpable. Based on the clinical findings, a provisional diagnosis of a benign breast lesion was made.

Routine laboratory investigations were within normal limits. Radiological evaluation was suggestive of a fibroadenoma, and the patient was planned for surgical excision. A lumpectomy specimen was received in the pathology department for histopathological examination.

Gross examination revealed a well-circumscribed breast tissue mass with attached skin. The skin surface showed a small, pigmented, slightly elevated lesion measuring approximately 0.6 cm in greatest dimension, which had not been clinically

emphasized prior to excision [Figure 1]. On cut section, the breast mass was firm and gray-white, without areas of necrosis or hemorrhage. Representative sections were taken from both the breast lesion and the pigmented skin lesion.

Microscopic examination of the breast mass demonstrated features consistent with a benign fibroepithelial lesion. Sections from the pigmented skin lesion showed an intact epidermis without evidence of junctional melanocytic proliferation. The dermis contained nests and cords of nevus cells confined entirely to the dermal compartment [Figures 2]. These cells were uniform, round to oval, with moderate cytoplasm and inconspicuous nucleoli [Figure 3]. Progressive maturation of nevus cells with descent into the deeper dermis was evident, with smaller and less pigmented cells in the deeper layers. No cytologic atypia, mitotic figures, or necrosis was identified.

Immunohistochemical analysis demonstrated diffuse nuclear and cytoplasmic positivity for S100 protein in the nevus cells, confirming their melanocytic origin [Figure 4]. Based on the morphological and immunohistochemical findings, a diagnosis of intradermal nevus of a special site (breast skin) coexisting with a benign fibroepithelial breast lesion was made.

The postoperative course was uneventful, and the patient was advised routine follow-up.



Figure 1: Gross specimen of breast tissue showing a small, pigmented, slightly elevated lesion (marked with black arrow) on the skin surface measuring approximately 0.6 cm in maximum dimension

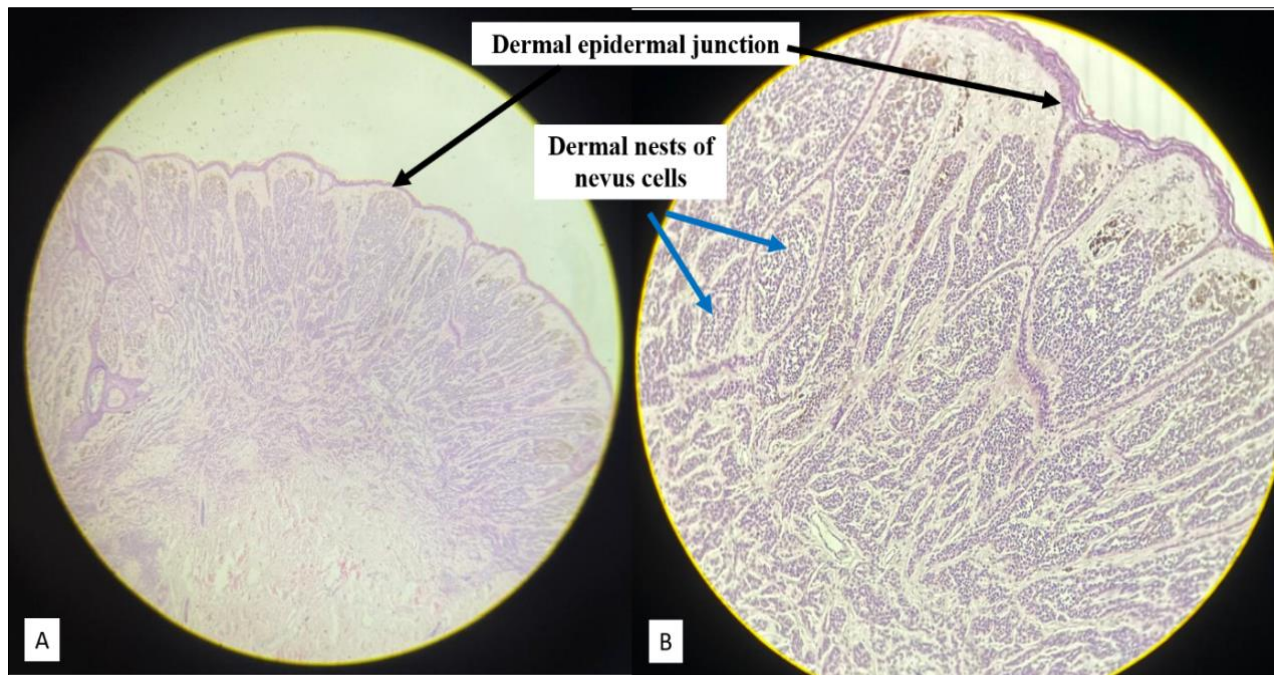


Figure 2: Photomicrograph showing nests and cords of nevus cells (marked with blue arrows) confined to the dermis (dermal epidermal junction marked with black arrow) A: H&E stain, 100x; B: H&E stain, 400x

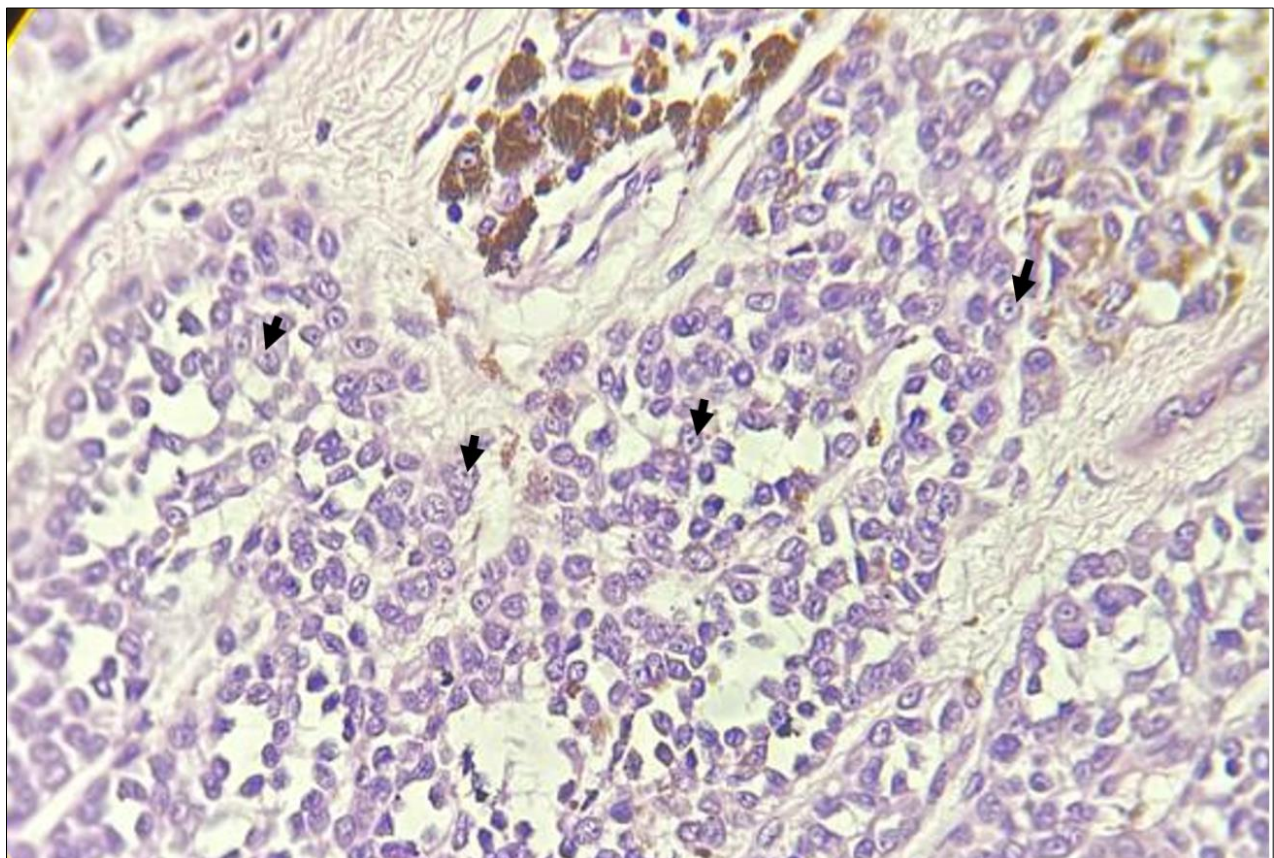


Figure 3: Photomicrograph showing nests and cords of uniform, round to oval cells with moderate cytoplasm and inconspicuous nucleoli (marked with black arrows) (H&E, 400x)

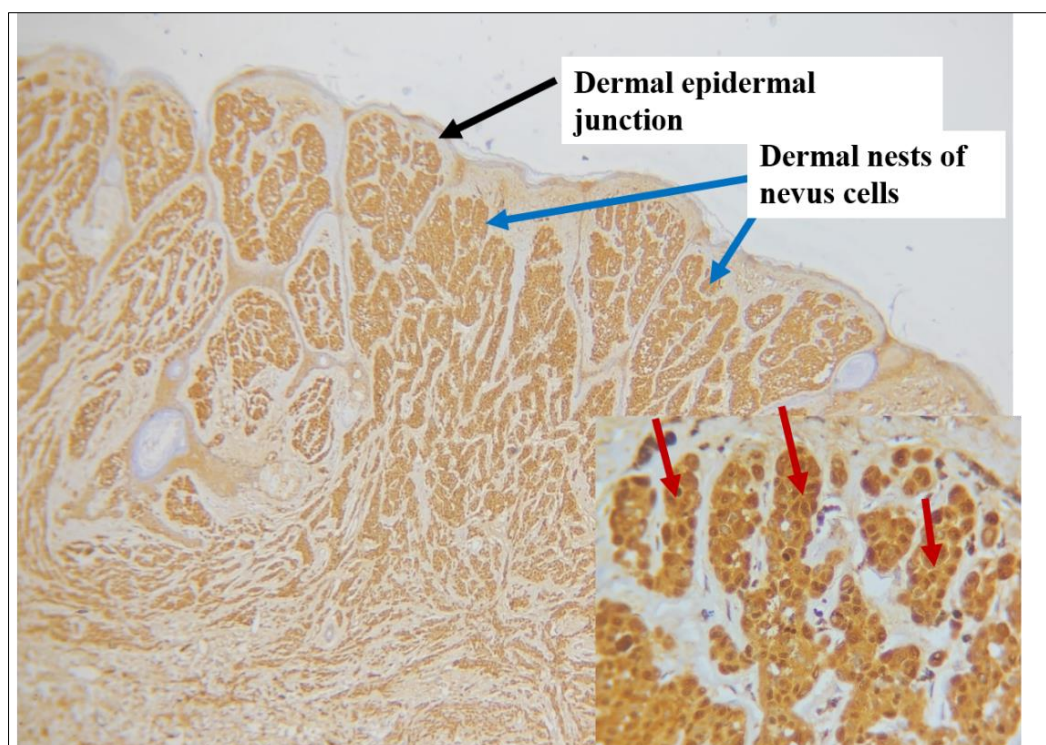


Figure 4: Photomicrograph showing S100 positivity in nests and cords of nevus cells, IHC, S100; 100x. Inset shows diffuse nuclear and cytoplasmic positivity for S100 protein in the nevus cells (red arrows) (400X)

DISCUSSION

Nevi of special sites were initially described in acral and genital regions; however, subsequent studies have expanded this category to include multiple anatomical locations such as the ear, conjunctiva, scalp, breast, flexural areas, and trunk, all of which may

demonstrate site-related atypia [3-7]. These melanocytic nevi arising in special anatomical sites demonstrate site-specific histopathological variations that may mimic atypical or malignant lesions [3-7]. A summary of common sites and their characteristic atypical features is provided in Table 1 [3, 4].

Table 1: Melanocytic Nevi of Special Sites and Their Characteristic Histopathological Features

Anatomical Site	Site-specific Histopathologic Features
Breast / Nipple–areola complex	Irregular nesting, mild cytologic atypia, occasional pagetoid spread
Genitalia (vulva, penis)	Lentiginous growth, cytologic atypia, dermal fibrosis
Acral sites (palms, soles)	Prominent lentiginous pattern, irregular junctional proliferation
Flexural areas (axilla, groin)	Architectural disorder, bridging of rete ridges
Scalp	Deep extension along adnexal structures, increased cellularity
Conjunctiva	Epithelial inclusion cysts, variable pigmentation
Ear	Asymmetry, irregular nests, mild atypia
Back/shoulder (special site subset)	Cytologic atypia, irregular architecture

Reported atypical features include asymmetry, irregular nesting, cytologic atypia, focal pagetoid spread, and occasional mitotic activity, which, in the absence of appropriate clinicopathological correlation, may lead to overdiagnosis and unnecessary aggressive management [3-7]. Intradermal nevus represents the final stage in the natural evolution of melanocytic nevi and is typified by the absence of junctional activity and confinement of nevus cells to the dermis [1, 2]. A key diagnostic feature is the demonstration of progressive maturation, wherein superficial nevus cells appear larger and more pigmented, while deeper cells become smaller, less pigmented, and may exhibit neurotization [7-9]. This orderly maturation is a hallmark of benignity and helps

distinguish intradermal nevi from melanoma, where such maturation is typically absent [7-11].

The occurrence of melanocytic nevi in the breast region is relatively uncommon and may be clinically significant due to the heightened suspicion for melanoma, particularly in the nipple–areola complex [5-9]. Pigmented lesions in this area often prompt excision due to concerns regarding malignancy [6-10]. In addition, clinical evaluation alone may be insufficient to reliably differentiate benign from malignant lesions, thereby necessitating histopathological examination [7-11].

The differential diagnosis of pigmented lesions in the breast includes dysplastic nevus, melanoma, pigmented basal cell carcinoma, and seborrheic keratosis [7-10]. Among these, melanoma remains the most critical entity to exclude due to its aggressive clinical course [9-11]. Histopathological features favoring melanoma include asymmetry, poor circumscription, lack of maturation, cytologic atypia, increased mitotic activity, and epidermal involvement such as pagetoid spread [7-11]. In contrast, the present case demonstrated classical benign features, including symmetry, well-circumscription, dermal confinement of nevus cells, and progressive maturation without atypia or mitoses [1, 2].

Immunohistochemistry can serve as a useful adjunct in confirming melanocytic origin, particularly in diagnostically challenging cases [7-10]. S100 protein is a sensitive marker for melanocytic lesions and typically shows diffuse nuclear and cytoplasmic positivity, as observed in the present case [9, 10]. However, it is important to note that S100 lacks specificity, and correlation with morphology remains essential [7-11].

Previous reports have highlighted that nevi of special sites may exhibit unusual histological features that overlap with atypical melanocytic proliferations, underscoring the importance of integrating clinical findings with histopathological assessment [3-7]. The limited number of reported cases of intradermal nevi involving the breast further emphasizes the rarity of this entity and the need for increased awareness among clinicians and pathologists [5, 6].

From a clinical standpoint, such lesions are frequently incidental findings, as demonstrated in this case, where the nevus was identified in the skin overlying a benign breast lump. Recognition of this entity is crucial to prevent overdiagnosis as melanoma and to avoid unnecessary surgical interventions or overtreatment. Careful evaluation of histological features, along with consideration of anatomical site-specific variations, plays a pivotal role in ensuring accurate diagnosis.

CONCLUSION

Intradermal nevus of the breast is an uncommon benign melanocytic lesion that may be encountered incidentally and can pose diagnostic challenges due to site-specific histological variations. Given the potential for these lesions to mimic atypical melanocytic proliferations or melanoma, careful histopathological

evaluation with attention to features such as dermal confinement, cellular maturation, and absence of significant atypia is essential. Awareness of nevi of special sites and appropriate clinicopathological correlation are crucial to ensure accurate diagnosis and to prevent overdiagnosis and unnecessary aggressive treatment.

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