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Correlating Clinical, Histopathological, and Dermoscopic features of Basal Cell Carcinoma: A Case Study Analysis

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Abstract: ***Basal cell carcinoma (BCC) stands as the most prevalent form of skin cancer accounting for approximately 80% of non-melanoma skin cancers worldwide. Despite it's generally indolent nature and low metastatic potential, prompt identification is essential to mitigate local tissue destruction. BCC manifests in diverse clinical subtypes often posing diagnostic challenges when differentiating from other cutaneous lesions. At the microscopic level, BCC is characterized by nests of basaloid cells exhibiting peripheral palisading. Dermoscopy serves as a valuable diagnostic tool revealing distinctive features like arborizing vessels and blue-gray ovoid nests which frequently correspond to specific histological patterns. The integration of clinical observations, dermoscopic findings and histopathological analysis yields a more comprehensive diagnosis guiding appropriate therapeutic approaches.***

Keywords: Basal cell carcinoma, Dermocscopy, Clinico-histopathology

1. Introduction

Basal cell carcinoma is a slow-growing, locally invasive epidermal neoplasm with minimal metastatic potential, arising from the basal cell layer. It primarily affects sun-exposed areas in fair-skinned individuals over 50 years of age.[1] While ultraviolet radiation remains the primary risk factor, other contributing factors include ionizing radiation, chronic arsenic exposure, and genetic predisposition.

Clinically, BCC presents with remarkable heterogeneity manifesting as nodular, superficial, morpheaform and pigmented variants. The diagnosis traditionally relies on clinical examination and histopathological confirmation but dermoscopy has emerged as a valuable non-invasive diagnostic tool. It serves as a bridge between clinical observation and histopathology, revealing characteristic features such as arborizing vessels, blue-grey ovoid nests and maple leaf-like areas that often correspond to specific histological patterns.[2] This paper presents a series of six cases that exemplify the correlation between clinical features, dermoscopic patterns and histopathological findings in BCC.

2. Case Report

A 55-year-old female farmer presented to the out patient department with a two-year history of a black-coloured ulcer over her upper lip which was gradually increasing in size,bleeds occasionally on touch and is associated with pain. (Figure 1a) No H/O trauma. No history of similar lesions in family. Dermatological examination revealed a solitary,well defined rodent ulcer measuring 2x1.5 cm with rolled out hyperpigmented edges and fleshy ulcerated center. Hair, nails, and mucosa appeared normal. Cervical lymphadenopathy was present.

Biopsy showed an epithelial neoplasm made up of tumor islands that vary greatly in size and shape and show connection with surface epidermis at places. The tumor islands are made up of small round cells that show peripheral palisading. The nuclei of these cells were uniformly stained and dark and showed no nucleoli. Occasional pyknotic cells were scattered between these cells. The surrounding stroma showed mucin and a moderately dense perivascular lymphoplasmocytic infiltrate. The tumor islands were separated from this stroma by a cleft at a few places. (Figure 1b)

Dermoscopy showed arborizing vessels, superficial fine telengectasias, bluegray ovoid nests, multiple blue grey globules, maple leaf like areas, spoke wheel areas, ulceration, erosions, white red structureless areas & white streaks.(Figure 1c)
A total of 6 cases including the above mentioned are summerized in Table 1.

3. Discussion

Basal cell carcinoma represents the most prevalent form of cutaneous malignancy, comprising approximately 80% of non-melanoma skin cancers globally. BCC typically presents as a shiny,pink or flesh colored papule or nodule with surface telengectasia. The tumor may enlarge and ulcerate,giving the borders a rolled or rodent ulcer appearance. The most common sites for nodular basal cells are face,especially nose, cheeks,forehead,nasolabial folds and eyelids.[3] This neoplasm, originating from the basal layer of the epidermis and its appendages, primarily results from cumulative ultraviolet radiation exposure with additional etiological factors including ionizing radiation, chronic arsenic exposure, and specific genetic predispositions. While BCC exhibits a low metastatic potential, its local invasiveness can lead to significant morbidity, particularly in functionally and cosmetically sensitive anatomical regions.[4]

Our findings demonstrate a robust correlation between clinical presentations and specific dermoscopic features, corroborating the observations of Lallas et al. who reported high correspondence between certain dermoscopic patterns like arborizing vessels, blue-gray ovoid nests and particular BCC subtypes.[5] Furthermore,our results align with those of

Wozniak-Rito et al. who demonstrated dermoscopy's capacity to accurately predict BCC subtypes in 87% of cases, underscoring its role as an intermediary between clinical observation and histopathology.[6]

The strong correlation observed between dermoscopic features and histopathological findings in our study, particularly in identifying specific growth patterns, is consistent with the work of Pyne et al.[7] Their research elucidated the correspondence between dermoscopic features such as arborizing telangiectasia and blue-gray ovoid nests with specific histological patterns in BCC. Our findings further substantiate the utility of dermoscopy as a non-invasive modality for predicting histological subtypes, potentially informing biopsy techniques and treatment strategies.

In comparison to previous investigations, our study offers a comprehensive analysis of six diverse cases, providing insights into various BCC presentations. (Table 1) While Reiter et al. primarily focused on dermoscopic accuracy in diagnosing BCC subtypes, our investigation extends this by correlating dermoscopic features with both clinical and histopathological findings, offering a more holistic perspective on BCC diagnosis and management.[8]

The strong correlations observed between clinical, dermoscopic, and histopathological findings in our study have significant implications for clinical practice. Utilizing dermoscopy as an intermediate step between clinical examination and biopsy may enhance the accuracy of BCC subtype prediction and facilitate more informed management strategies. This approach could potentially reduce the necessity for multiple biopsies and improve treatment outcomes, as suggested by Trigoni et al.[9]

The correlation between clinical, dermoscopic, and histopathological findings not only enhances diagnostic accuracy but also informs treatment strategies. As demonstrated by these cases and supported by existing literature, this multifaceted methodology is crucial in navigating the complexities of BCC in dermatological practice.

4. Conclusion

This series of six basal cell carcinoma (BCC) cases emphasizes the importance of clinicohistopathologic and dermoscopic correlation in the accurate diagnosis and classification of BCC. Key dermoscopic features including arborizing vessels, superficial fine telengectasias, blue grey ovoid nests, multiple blue grey globules, maple leaf like areas, spoke wheel areas, ulceration, erosions, white red structureless areas, white streaks were instrumental in distinguishing BCC subtypes. While histopathological examination remains the gold standard for definitive diagnosis and treatment planning, dermoscopy enhances early detection and reduces diagnostic uncertainty. The findings of this series highlight the complementary roles of dermoscopy and histopathology in improving diagnostic precision, potentially facilitating more tailored therapeutic interventions for BCC patients.

Declaration of patient consent: Informed written consent for the publication of case details and photographs has been obtained from the patients or caregivers of all patients included in this manuscript.

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Conflicts of interest: There are no conflicts of interest.

Patient	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Age	53	57	52	59	64
Gender	F	M	F	M	F
Occupation	Farmer	Construction worker	Farmer	Private sector	Labourer
Fitzpatrick Skin Type	III	IV	IV	IV	III
Site and Size	Upper lip,2 x 1 cm (Figure 1)	Retroauricular area,3x4 cm(Figure 2)	Left malar region, 5x4 cm (Figure 3)	Upper lip, 2 x 1.5 cm	Left malar region 3x1.5 cm (Figure 5)
Clinical Features	Solitary, well defined, rodent ulcer measuring 2x1 cm with rolled out hyperpigmented edges with fleshy ulcerated center	Solitary, well defined, rodent ulcer with rolled out edges measuring 4x3cm with floor consisting of granulation tissue and serous discharge present	Solitary, well defined, hypeprpigmented plaque with central ulceration and haemorrhagic crusting present over left malar region	Solitary, well defined rodent ulcer with rolled out hyperpigmented edges with fleshy ulcerated center	Solitary, well defined, hyperpigmented to black coloured plaque measuring 2x1.5 cm present below right ear
Dermoscopy	Arborizing vessels, superficial fine telengectasias, blue-gray ovoid nests, multiple blue grey globules, maple leaf like areas, ulceration, erosions.	Superficial fine telengectasias, blue-gray ovoid nests, multiple blue grey globules, areas, ulceration, erosions, maple leaf like areas.	Superficial fine telengectasias, blue-gray ovoid nests, multiple blue grey globules, maple leaf like areas, spoke wheel areas, ulceration, erosions, white red structureless areas.	Arborizing vessels, blue-gray ovoid nests, multiple blue grey globules, maple leaf like areas, spoke wheel areas.	Arborizing vessels, superficial fine telengectasias, bluegray ovoid nests, multiple blue grey globules, maple leaf like areas.
Histopathology	Epithelial neoplasm made up of tumor islands,consisting of small round cells that show peripheral	Epithelial neoplasm made up of tumor islands,consisting of small round cells that show peripheral palisading.	Mild epidermal acanthosis with focal ulceration and characteristic basaloid tumor islands in the	An epithelial neoplasm characterized by tumor islands composed of small, round cells with peripheral palisading.	Mild epidermal acanthosis with focal ulceration, along with distinctive basaloid tumor islands in the

	palisading. Surrounding stroma showed mucin and a moderately dense perivascular lymphoplasmocytic infiltrate. Occasional pyknotic cells are present.	Surrounding stroma showed mucin and a moderately dense perivascular lymphoplasmocytic infiltrate.	dermis showing peripheral palisading and clefting. The mucinous stroma contains moderate lymphocytic infiltrate with prominent retraction spaces between tumor islands and stroma .	The surrounding stroma contains mucin along with a moderately dense perivascular lymphoplasmacytic infiltrate. Occasional pyknotic cells are also present.	dermis exhibiting peripheral palisading and clefting. The mucinous stroma shows a moderate lymphocytic infiltrate, with prominent retraction spaces between the tumor islands and the surrounding stroma.

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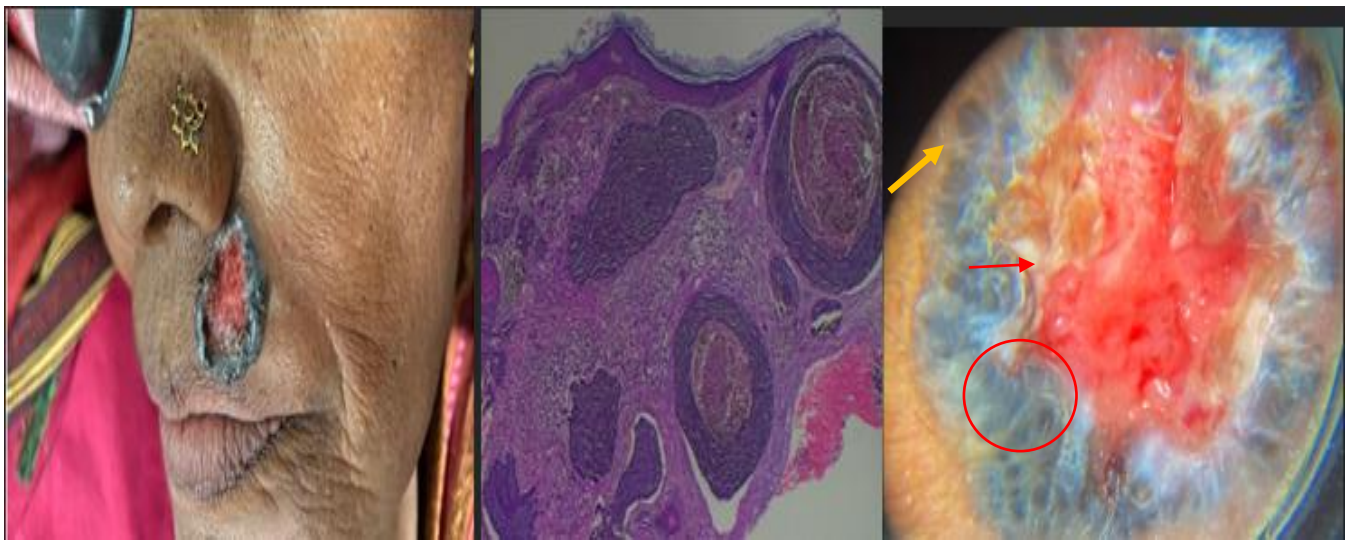
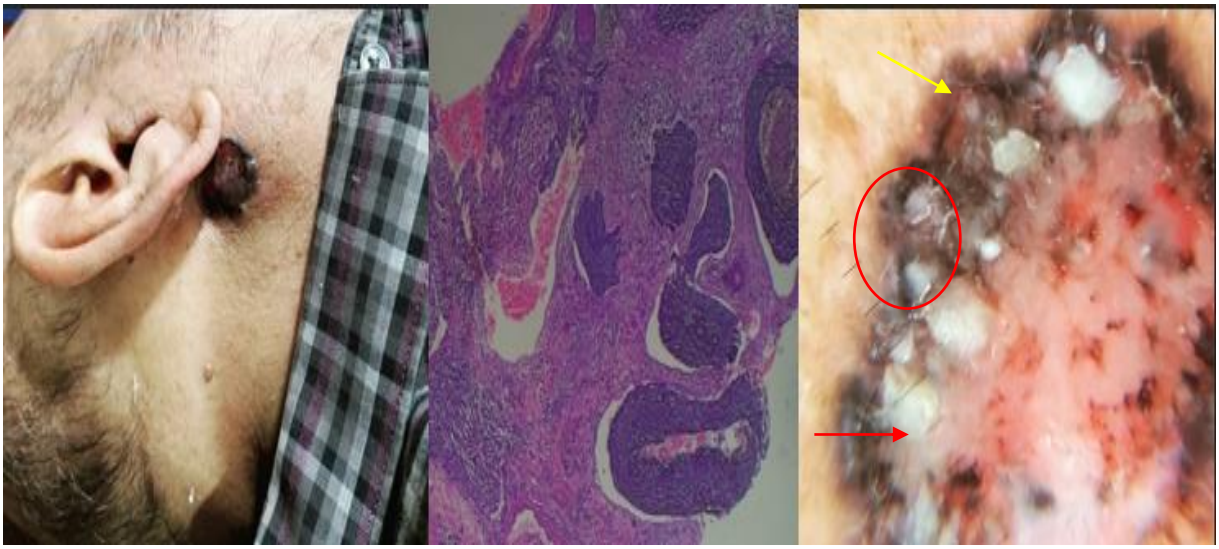
Figures



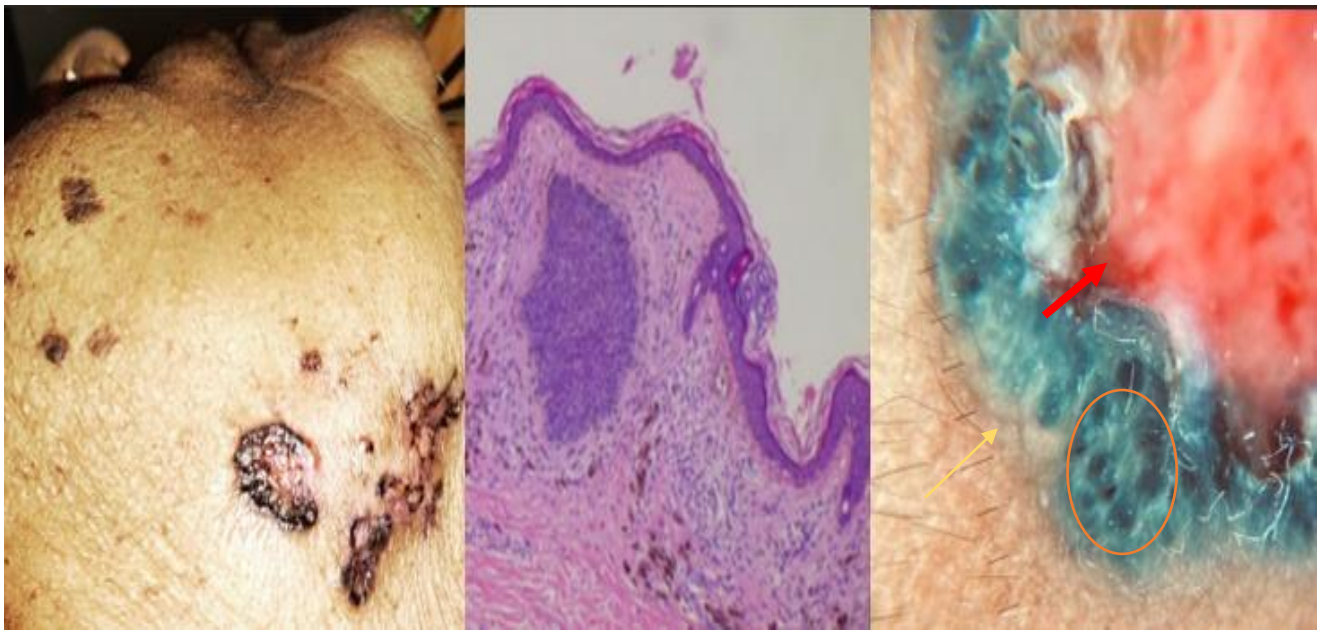
1a **1b** **1c**

Figure 1



2a **2b** **2c**

Figure 2



3a **3b** **3c**

Figure 3

Figure 1

a) Clinical image showing solitary, well defined, rodent ulcer measuring 2x1 cm with rolled out hyperpigmented edges with fleshy ulcerated center
b) Histopathology image showing epithelial neoplasm made up of tumor islands, consisting of small round cells that show peripheral palisading.
c) Dermoscopy image showing arborizing vessels, superficial fine telengectasias (red arrow), blue-gray ovoid nests, multiple blue grey globules (red circle), maple leaf like areas (yellow arrow), ulceration, erosions.

Figure 2

a) Clinical image showing solitary, well defined, rodent ulcer with rolled out edges measuring 4x3cm with floor consisting of granulation tissue and serous discharge present
b) Epithelial neoplasm made up of tumor islands, consisting of small round cells that show peripheral palisading. Surrounding stroma showed mucin and a moderately dense perivascular lymphoplasmocytic infiltrate.
c) Dermoscopy showing superficial fine telengectasias (red arrow), blue-gray ovoid nests, multiple blue grey globules (red circle), areas, ulceration, erosions, maple leaf like areas (yellow arrow).

Figure 3

a) Clinical image showing solitary, well defined, hypeprpigmented plaque with central ulceration and haemorrhagic crusting present over left malar region

b) Histopathology image showing mild epidermal acanthosis with focal ulceration and characteristic basaloid tumor islands in the dermis showing peripheral palisading and clefting.
c) Dermoscopy showing superficial fine telengectasias (red arrow), blue-gray ovoid nests, multiple blue grey globules (red circle), maple leaf like areas (yellow arrow), spoke wheel areas, ulceration, erosions, white red structureless areas.