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Giant pigmented basal cell carcinoma in the inguinal region: A diagnostic challenge at an uncommon site

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Abstract

Background: Basal cell carcinoma is the most common skin cancer. It accounts for 80% of all non-melanoma skin cancers. It most commonly occurs in sun-exposed areas. 0.094% of the cases occur in the inguinal region.

Case presentation: A 70-year-old male presented with swelling in the left inguinal region for 6 months, diagnosed as malignant melanoma based on clinical and cytological features and finally as pigmented basal cell carcinoma by histopathology and immunohistochemistry.

Conclusion: All pigmented lesions are not melanoma. Pigmented basal cell carcinoma is an important differential diagnosis for malignant melanoma irrespective of the site, size, and clinical picture. We take this opportunity to reiterate the chances and reasons for the misdiagnosis of basal cell carcinoma in cytology smears.

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Introduction

Basal cell carcinoma (BCC) is the most common skin cancer worldwide, accounting for approximately 80% of non-melanoma skin cancers, particularly in individuals over 50 years of age (1). BCC was first described in the early 19th century and was officially recognized as a distinct entity by WHO in 1974 (2).

BCC pathogenesis is multifactorial, involving genetic mutations - particularly in the Hedgehog signaling pathway - along with UV radiation and immune status (3). BCC most commonly occurs in sun-exposed areas such as the head and neck region, particularly the nose, followed by the cheek (4). Its occurrence in the inguinal and perianal region is extremely rare and accounts for only 0.094% (5). BCC clinically presents as pearly pink papules or macules with ulceration, sometimes with pigmentation and telangiectatic vessels (6). Diagnosis is primarily based on clinical features and confirmed by histopathology. Cytopathological methods such as scrape cytology and fine needle aspiration cytology (FNAC) of BCC lesions can also be utilized as preliminary investigative tools; however, an important drawback is the difficulty in differentiating BCC from malignant skin adnexal tumours and in subtyping BCC (7).

We report a rare case of giant pigmented BCC in the inguinal region that posed a significant diagnostic challenge and was initially misdiagnosed as malignant melanoma. This case is presented for two key reasons: Firstly, due to the rarity of its site and size; and secondly, to reiterate the diagnostic challenges associated with FNAC of BCC at an uncommon location.

Case Presentation

A 70-year-old male presented to the Department of Surgery with a six-month history of a painful lesion on his left inner thigh. His past medical, family, and medication histories were non-contributory. General examination revealed a moderately built and nourished patient with no systemic abnormalities. Local examination identified a 7 × 5 cm ulcerated, proliferative, and irregularly pigmented growth in the left inguinal region, with no palpable regional lymphadenopathy (Figure 1). Given the clinical presentation, the primary differential diagnoses were malignant melanoma and squamous cell carcinoma. FNAC and imprint cytology were performed. Cytology revealed clusters and singly scattered tumor cells with moderate pleomorphism, high N:C ratios, coarse chromatin, prominent nucleoli, and intracytoplasmic brown-to-black pigment deposits (Figure 2A and B). Based on the clinical site and cytomorphology, a provisional cytological diagnosis of malignant melanoma was rendered. Pre-operative screening detected Hepatitis B positivity; all other biochemical and hematological parameters were within normal limits. The patient underwent wide local excision of the lesion with left inguinal lymph node dissection.

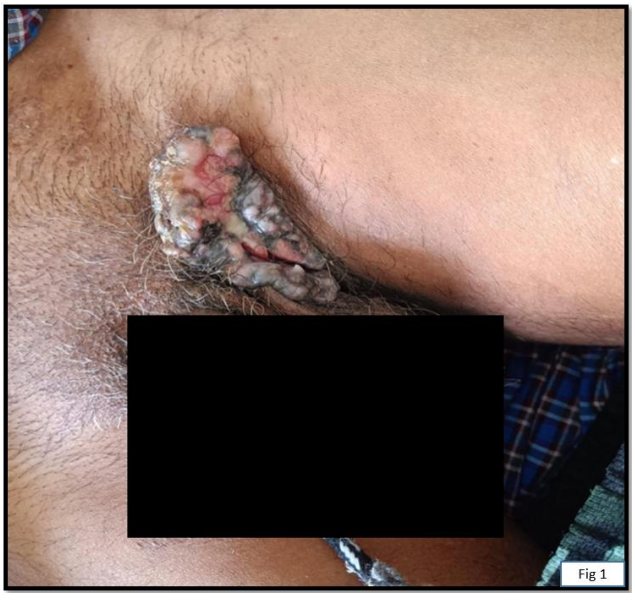

Figure 1. Ulceroproliferative growth in the left inguinal region

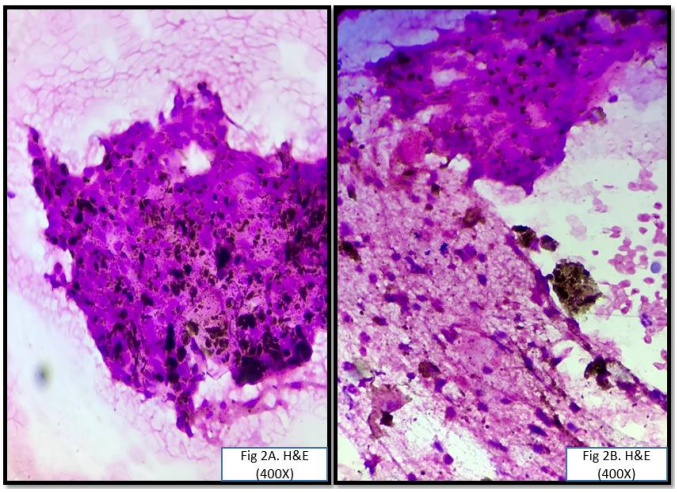

Figure 2. A: Clusters of tumor cells with moderate amounts of cytoplasm exhibiting mild to moderate pleomorphism in the form of a high nuclear cytoplasmic ratio, coarse chromatin, and a few cells with prominent nucleoli; B: Tumor cells showing intracytoplasmic brown-to-black pigment deposits.

The definitive histopathological and immunohistochemical findings are as follows: Gross examination revealed a 7 × 5 × 3 cm pigmented, irregular, and ulcerated skin lesion, with the cut surface showing grey-white areas and focal blackish discoloration (Figure 3A). Light microscopy (H and E) demonstrated an infiltrating tumor arising from the basal layer, with cells arranged in nests, cords, and sheets showing peripheral palisading and retraction clefts. The tumor cells were small, round to oval, with hyperchromatic nuclei, regular nuclear borders, and scant cytoplasm (Figure 3B and C), suggestive of pigmented BCC. To exclude melanoma, Melan A immunohistochemistry was performed and was negative (Figure 3D). Furthermore, all seven isolated lymph nodes were free of tumor. The final diagnosis was pigmented BCC of the left inguinal region, with no evidence of regional lymph node metastasis.

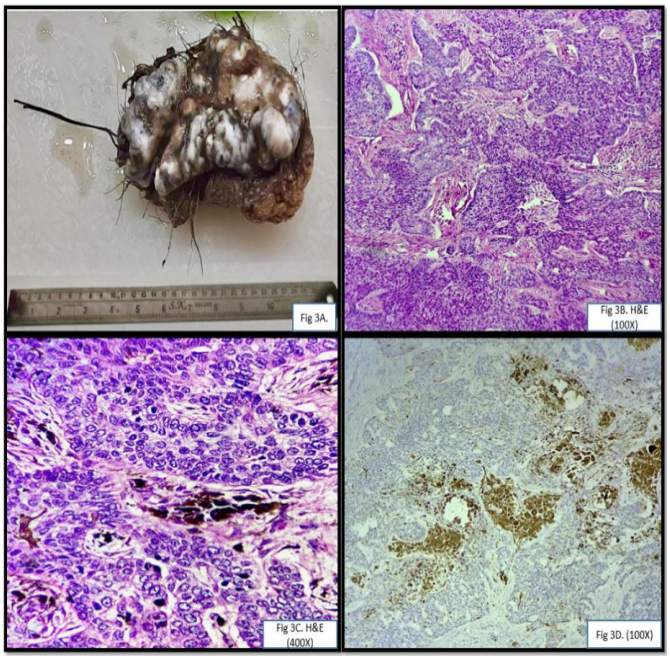

Figure 3. A: Wide local excision specimen of the ulceroproliferative growth with pigmentation; B: Nests, cords, and trabeculae of tumor cells with retraction clefts; C: Tumor cells showing peripheral palisading and having round-to-oval, hyperchromatic to vesicular nuclei with scant cytoplasm and intracytoplasmic brown pigment deposits; D: Tumor cells showing negativity for the IHC marker Melan A.

Discussion

BCC is the most common cutaneous malignancy arising from the basal layer of the epithelium. It constitutes 80% of all non-melanoma skin cancers (8). It usually occurs in sun-exposed areas such as the head, neck, and trunk, with the nose and cheek being the most common sites (1). In non-sun-exposed areas, occurrences are rare, with the genital area, axilla, and nipples being the sites of involvement (8). BCC in the inguinal region has an overall incidence of 0.094% (9) and is mostly attributed to chronic inflammation and immunosuppression (10). In our case, the patient did not have any history of immunosuppression or chronic inflammatory disorders. Although Hepatitis B was detected preoperatively, this appears to be an incidental finding with no established correlation to BCC. Other common causes of BCC include genetics, UV radiation, arsenic exposure, and immunosuppression. Aberrant activation of the Hedgehog signaling pathway is the most important genetic cause, followed by PTCH1 and PTCH2 mutations (3). BCC can also be associated with other skin conditions such as Kaposi sarcoma, herpes, oral candidiasis, and leukoplakia (10).

Generally, BCC measures less than 5 cm in size, and any BCC measuring more than 5 cm is termed a giant BCC, which is again a rare entity (9). In our case, the tumor measured 7 cm in greatest dimension, making it a giant BCC. These tumors are locally destructive and rarely metastasize (1), as seen in our case, with no regional lymph node involvement or distant metastasis. Clinically, basal cell carcinoma presents as a pink, pearly papule with rolled-out borders. It usually ulcerates and bleeds (1). In this case, it presented as an ulceroproliferative growth with focal blackish discoloration. The pigmented nature of the lesion and its location in the inguinal region made malignant melanoma a more likely clinical diagnosis, with squamous cell carcinoma as a close differential.

Cytology is an uncommon diagnostic method for evaluating skin tumors such as BCC. An important drawback is the inability to subtype the tumor and to differentiate BCC from malignant skin adnexal tumors (7).

Histopathology and immunohistochemistry are always confirmatory. However, the exclusion of BCC from the differential diagnoses led clinicians to pursue a cytological diagnosis by FNA and imprint cytology in our case. Imprint smears and fine needle aspiration from BCC typically show cohesive clusters of small cells with uniform, dark nuclei, dense chromatin, and scant cytoplasm. Peripheral palisading of nuclei and mucin may also be seen. However, in our case, the FNA and imprint cytology smears showed clusters and singly scattered round-to-oval tumor cells with hyperchromatic nuclei, many with prominent nucleoli, and moderate amounts of cytoplasm, with many tumor cells showing intracytoplasmic brown-to-black pigment. The characteristic features of BCC, including peripheral palisading of nuclei and mucin, were absent in the cytology smears. Hence, BCC was excluded, and a cytological diagnosis of malignant melanoma was made.

Jain M et al. presented a case of pigmented basal cell carcinoma occurring on the thigh of a 55-year-old woman. Cytology smears showed small basaloid cells with scant cytoplasm, with areas showing peripheral palisading. Intracytoplasmic brown pigment was noted, and Masson's Fontana stain was positive. A cytological diagnosis of pigmented basal cell carcinoma was rendered. Excision biopsy was received and reported with the same diagnosis (11). Boya Abudu presented three cases of pigmented basal cell carcinoma in the head and neck region masquerading clinically as melanoma. All cases were proven to be basal cell carcinoma after excision biopsy (12).

The factors that misled the cytological diagnosis toward malignant melanoma were the clinical presentation at a rare site (Inguinal region), a size greater than 5 cm, and cytological features such as cells with moderate amounts of cytoplasm, many with prominent nucleoli, intracytoplasmic brown-to-black pigment (Features commonly seen in malignant melanoma), and the absence of common findings such as peripheral palisading and mucin. Histopathology and immunohistochemistry, which are the gold standard for the diagnosis of skin tumors, were also considered in our case and showed tumor cells arranged in nests, cords, sheets, and trabeculae. The tumor cells were round to oval with hyperchromatic nuclei, a high nuclear-to-cytoplasmic ratio, scant cytoplasm, and intracellular brown-to-black pigment. The tumor cells exhibited peripheral palisading of nuclei and retraction clefts. Based on these findings, a histopathological diagnosis of pigmented BCC was made. However, to rule out the possibility of malignant melanoma, immunohistochemistry for Melan A was performed, which was negative in the tumor cells and positive in melanocytes.

Histologically, the common variants of basal cell carcinoma are adenoid, nodular, infiltrative, morpheaform, keratotic, basosquamous, pigmented, superficial, and ulcerative. The unusual variants include pleomorphic, clear cell, signet ring cell, granular, infundibulocystic, metaplastic, and keloidal BCC (7). Pigmented BCC accounts for 6% of all BCC (8). Immunohistochemistry is an important tool in differentiating BCC from malignant melanoma. Melan A and HMB45 show cytoplasmic positivity in tumor cells of malignant melanoma, whereas BerEP4 shows membranous staining in tumor cells of BCC (13). It is very important to rule out Nevoid basal cell carcinoma syndrome (Gorlin syndrome) in these unusual locations (14).

The gold standard treatment for basal cell carcinoma is wide local excision of the tumor, as it usually does not metastasize, which was performed in our case as well. At least 6 mm of margin clearance is advised in high-risk cases (10). However, in locally advanced disease and metastasis, targeted therapy is indicated (15). Usually, intralesional chemotherapy and laser therapy are administered. 50% of cases have a risk of developing secondary BCC within 5 years; therefore, regular full-body screening for BCC is mandatory (8). The prognosis of basal cell carcinoma, irrespective of the location, is good; however, long-term follow-up is advised due to the risk of recurrence (1).

Conclusion

This case emphasizes the importance of considering pigmented BCC as a differential diagnosis for melanoma, especially in uncommon locations. When cytological features are inconclusive, histopathology and immunohistochemistry remain essential for an accurate diagnosis.

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Ethical Statement

The authors declare that this study was conducted in accordance with accepted ethical standards. Written informed consent was duly obtained.

Conflicts of Interest

The authors declare no conflict of interest.

Author Contributions

Writing-Original draft: Dr. V. V.; Writing-Final review and Editing: Dr. P. V.; Conceptualization and Supervision: Dr. J. M., Dr. K. S., and Dr. A. S.

Data Availability Satement

All data regarding this case report are included in this article and the supplementary files provided.

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