Cutaneous basal cell carcinoma with mixed histology: Cytomorphological features of two unusual cases

ABSTRACT
Cutaneous basal cell carcinoma (BCC) is a slow growing locally aggressive malignant tumor. It is usually diagnosed on histopathological examination of the excised biopsy. Recently, fine needle aspiration cytology (FNAC) is emerging as a simple alternative technique for rapid diagnostic work of nodular and plaque-like skin lesions. We report the cytomorphological features of two cases of cutaneous BCC having unusual clinical presentation and mixed histology (MH); emphasizing the diagnostic difficulties encountered on cytology, the plausible explanation and the precautions to keep in mind to avoid misdiagnosis.

Key words: Basal cell carcinoma; fine needle aspirate; fine needle aspiration cytology; histopathology
Introduction

Basal cell carcinoma (BCC) is a slow growing malignant cutaneous tumor that is locally aggressive but it rarely metastasizes.\(^1\)\(^2\)\(^3\) Histopathological examination of the excision biopsy has been the mainstay for diagnosis. Fine needle aspiration cytology (FNAC) has been recently employed as a simple alternative tool in diagnosing various cutaneous tumors, however, extensive search of literature revealed only few reports of cytological diagnosis of BCC.\(^4\)\(^5\) We report the cytomorphological features of two unusual cases of cutaneous BCC and compare them with their corresponding histopathology to explain the diagnostic difficulties encountered on cytology.

Case Reports

Case 1

A 65-year-old female presented to the ophthalmology outpatient department with a polypoidal painless swelling in the lateral canthus involving both the eyelids of the right eye for the last 15 years. The swelling had gradually increased to the present size of 1.8 cm × 1 cm. She gave a history of bleeding from the surface on scratching. The swelling was nodular, firm, nontender, and black in color with focal overlying skin ulceration. General physical examination and systemic examination were normal.

Fine needle aspirate (FNA) from the swelling yielded a brownish tinged aspirate. Smears prepared were highly cellular showing islands of interconnected epithelial fragments embedded within the stroma [Figure 1b]. Few of these fragments showed evidence of glandular/tubular differentiation [Figure 1a]. No definite palisading was found in the epithelial fragments. The tumor cells showed marked nuclear overcrowding and overlapping with mild anisonucleosis and pleomorphism. The cells were small basaloïd, having scant cytoplasmic cytoplasm, indistinct cell borders, and round hyperchromatic nuclei showing coarse granular chromatin and inconspicuous nucleoli [Figure 1c]. Many epithelial fragments showed cells embedded in metachromatic basement membrane-like matrix with numerous fibroblasts and melanophages. Fair amount of brown-black pigment was seen within the tumor cells and the stromal macrophages [figure 1b].

Keeping in view the clinical and cytomorphological features, differential diagnoses of:

1. A melanocytic lesion, inconclusive for malignancy with the possibility of dysplastic nevus and
2. BCC were offered.

Excision with a 1-cm margin was performed. Gross specimen consisted of a skin covered hyperpigmented polypoidal tissue measuring 2.5 cm × 2 cm × 1.5 cm. Overlying skin was focally ulcerated with the presence of hemorrhagic crusts. The frozen section revealed a predominantly circumscribed nodular tumor composed of glands and tubular lumina filled with some amorphous material. The loss of tumor cells and the collection of blood along the FNAC needle track in the center of the lesion were clearly evident. Paraffin-embedded hematoxylin and eosin (H&E) sections confirmed the frozen section findings. Higher magnification showed small basaloïd cells surrounding the lumina, which were filled with pink amorphous material. There was no peripheral palisading noted in the deeper interlacing strands. The periphery of the tumor islands showed characteristic palisading and focal areas of retraction artifacts. At places, the tumor cells showed melanin surrounded by melanophages present in the stroma. A final diagnosis of BCC-mixed histology (MH) (adenoid, pigmented, and micronodular) was rendered on histopathology. The patient is well 12 months after the excision, with no recurrence.

Case 2

A 70-year-old male, a known case of chronic actinic dermatitis, presented to the dermatology outpatient department with a hyperpigmented painless plaque measuring 2.5 cm in diameter over the scalp in the right temporal region for the last 3 years. On examination, it was a firm, nontender, black colored hyperpigmented plaque-like lesion with rolled out margins and central ulceration. General physical examination and systemic examination were normal.

FNA smears were highly cellular showing many syncytial, branching epithelial fragments with peripheral palisading of the nuclei in some of them [Figure 2]. These fragments comprised predominantly of small basaloïd cells with mild pleomorphism, having scant cytoplasm, indistinct cell borders, round hyperchromatic overlapping nuclei with coarse granular chromatin, and inconspicuous nucleoli [Figure 2b]. Few fragments were embedded in the metachromatic basement membrane-like material with numerous fibroblasts and melanophages [Figure 2a]. Brown–black pigment was seen within the tumor cells and the stromal macrophages [Figure 2d]. Based on clinical and cytological features, a diagnosis of BCC was offered.

Microscopic examination of the excision biopsy revealed a dermal tumor composed of basaloïd cells originating from the epidermis and predominantly in the form of interlacing strands. It was noted that most of the tumor islands in the biopsy had peripheral palisading, which was missing in the areas where the tumor was in the form of interlacing strands and glandular/tubular structures. Occasional artifactual
clefting was seen in the biopsy. Melanin was seen within the melanophages and in the surrounding tumor cells. A final diagnosis of BCC-MH (adenoid and pigmented) was rendered on histopathology. The patient was lost to follow-up.

Discussion

BCC is a common type of skin cancer localized on face, making up more than 80% of the nonmelanoma cancers.\[1\] The scalp is an unusual site of presentation for BCC. Cytological diagnosis of BCC is reliable if sufficient material is aspirated and characteristic cytomorphological features are present.\[2-5\] Problem arises in situations where clear-cut diagnostic features are not evident as was seen in one of our cases.

On histopathology, we found predominantly adenoid BCC with few other patterns — Pigmented and micronodular. The incidence of BCC-MH varies from 19 to 43%.\[5,6\]

Cytological differential diagnoses in our case included tumors containing small basaloid cells, i.e., BCC, adenoid cystic carcinoma (ACC), small cell neuroendocrine carcinoma, and atypical melanocytic lesion of inconclusive category. ACC shows cohesive three-dimensional clusters and finger-like tissue fragments, and hyaline globules surrounded by tumor cells. The fragments show intense crowding and overlapping of small hyperchromatic irregular nuclei, some of which have conspicuous nucleoli. Small cell neuroendocrine carcinoma has more dispersed atypical cells exhibiting nuclear molding with marked pleomorphism, mitoses, and necrosis. None of these lesions is pigmented.

Cytomorphological features that help in excluding the diagnosis of dysplastic nevus include small, uniform basaloid cells having hyperchromatic nuclei without nucleoli and lack of pleomorphism. Large epithelioid cells having moderate-to-abundant cytoplasm, intracytoplasmic melanin, vesicular nuclei with conspicuous nucleoli and marked pleomorphism, and maturation into neural cells are some of the morphological hallmarks of a melanocytic lesion.

Classical cytomorphological features of BCC include cohesive clusters and syncytial branching fragments of basaloid tumor cells surrounded by basement membrane-like stromal matrix. Cells are uniform, round-to-oval, have scant cytoplasm, coarsely granular chromatin, and inconspicuous nucleoli. Smooth external contours of club-shaped epithelial fragments along with peripheral palisading of the nuclei are a striking feature of BCC. Intracytoplasmic brown–black pigment (melanin) is often seen in the tumor cells in the pigmented variant of BCC.\[5\]

On review of histopathology slides in case 1, we found the aspiration site as indicated by FNAC needle track in the center of the tumor, which lacked peripheral palisading. Only the periphery of the tumor (micronodular pattern) had conspicuous nuclear palisading. This explained the absence of palisading in epithelial fragments on smears. We infer that chances of getting characteristic nuclear palisading might be higher if aspiration is done from the periphery of the tumor nodule. Basaloid hyperchromatic cells and nuclear palisading are important features for a definitive diagnosis of BCC on FNA.

Our cases of BCC had unusual clinical presentation and both had MC. Evidence of glandular differentiation along with melanin production on cytology smears were suggestive of...
mixed (adenoid and pigmented variants) histology BCC. One of them could not be confidently diagnosed on FNAC due to the lack of characteristic nuclear palisading, and the presence of abundant melanin and stromal matrix. If the predominant pattern is adenoid BCC, nuclear palisading may not be always evident on cytology smears. This holds particularly true if aspiration is done only from the center of the lesion as was seen in case 1. Both of our cases highlight the problems one might encounter in the diagnosis of BCC on cytology, the plausible explanation and the precautions to keep in mind to avoid misdiagnosis.

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Conflicts of interest
There are no conflicts of interest.

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