A Collision Tumor: Reflectance Confocal Microscopy Features and Correlation between Dermoscopy and Histopathology

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Abstract
Coexistence of two types of malignant neoplasms, called ‘a collision tumor,’ is relatively uncommon. Basal cell carcinomas (BCCs) are known to coexist with other cutaneous lesions, but the collision of BCC with malignant melanoma is rare. We report a rare case of BCC with underlying lentigo maligna melanoma, focusing on dermoscopic and reflectance confocal microscopic (RCM) findings and their correlation with histopathology. RCM and dermoscopy seem to offer important clues to increase clinical suspicion of collision tumors and improve clinical diagnosis.

KEY WORDS: Basal cell carcinoma, collision tumor, melanoma, reflectance confocal microscopy

Introduction
Coexistence of two types of malignant neoplasms, known as ‘a collision tumor,’ is relatively uncommon. Basal cell carcinomas (BCCs) are known to coexist with other cutaneous lesions, but the collision of BCC with malignant melanoma is rare.1 The clinical diagnosis in these cases is usually extremely difficult, particularly if one of the lesions is pigmented.2 Dermoscopy and reflectance confocal microscopy (RCM) are noninvasive imaging techniques that allow in vivo visualization of cutaneous morphologic structures. RCM provides high-resolution sectioning at the cellular level and allows visualization of the skin in vivo to the level of upper reticular dermis. In recent years, RCM has been commonly used as a complementary tool for diagnosis and follow-up of melanocytic and nonmelanocytic skin tumors.3 This technique offers useful data for assessing pigmented lesions, including cutaneous pigmented collision tumors.2,4 Here, we describe the clinical, dermoscopic, RCM, and histologic characteristics of a tumor that corresponded to the collision of melanoma and BCC.

Case History
An 80-year-old woman presented with an 8-year history of an asymptomatic pigmented lesion on the nose. The lesion had increased in size and become darker during the last year. The clinical examination showed a translucent beige-light brown 5-mm papule on a 3 cm × 4 cm, well-circumscribed, irregular pigmented patch on the right side of the nose. Dermoscopic and RCM imaging were performed before biopsy. Then, a 4-mm punch biopsy was taken including the papule and the surrounding pigmented patch.

Dermoscopically, there were atypical network, irregularly pigmented follicular openings, and a blue white veil and white homogeneous area corresponding to a beige-light brown papule [Figure 1a and b]. RCM revealed round and dendritic pagetoid cells disrupting the epidermis at the level of the lower epidermis [Figure 2a], and

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nonhomogeneous hyperreflective nests and multiple pagetoid cells surrounding the follicular opening at the level of the dermoepidermal junction (DEJ) [Figure 2b and c]. On the RCM mosaic at the level of the dermis, dermal islands of atypical basaloid cells and peritumoral clefting and well-defined dark spaces were also determined [Figure 2d].

The histopathologic analysis of the single 4-mm punch biopsy showed broad proliferation of melanocytes arranged as solitary units and nests of different size and shapes along DEJ. The melanocytes have hyperchromatic irregular nuclei. The pagetoid spread of atypical melanocytes was seen in the epidermis. In many foci, the atypical melanocytes involved the epithelial structures of adnexa, characteristic of lentigo maligna melanoma (LMM) in situ [Figure 3a and b]. The islands of basaloid cells with the characteristics of BCC, including peripheral palisading and stromal reaction, were noted in the middle of the biopsy material [Figure 3c]. The atypical melanocytes not only extended peripheral to BCC but also colonized the islands of BCC. Melan-A stained the atypical melanocytes in the epidermis and those interspersed in the islands of BCC [Figure 3d]. The lesion was completely excised with adequate margin. On excision, atypical melanocytes were found in the reticular dermis (Clark's level 4, 1.1 mm Breslow thickness). A diagnosis of a collision tumor of an LMM and BCC was made, which involved the colonization of basaloid cell nests by malignant melanocytes of melanoma.

**Discussion**

The combination of two or more distinct cell populations is well documented but uncommon entities, e.g., collision of melanoma and BCC, are even more unusual, with only few cases having been reported to date.\(^1\)\(^,\)\(^5\) Dermoscopy and RCM allow visualization of morphologic features not visible to naked eye, thus making preoperative diagnosis of these lesions possible.\(^2\)\(^,\)\(^6\)\(^,\)\(^7\)

A review of the literature showed that Satter et al. proposed to simplify the terminology used for these lesions and categorize them as collision, combined, colonized, or biphenotypic tumors.\(^8\) Our case is an example of a collision tumor due to two distinct neoplasms with well-demarcated boundaries occurring within close proximity of each other, and immunohistochemical stains showed that atypical melanocytes of LMM were not confined to the epidermis and epithelial adnexa but also colonized BCC.

In this report, we want to emphasize the importance of RCM in assisting the diagnosis of collision tumors. Our RCM findings were consistent with melanoma and multiple tumor islands, presenting them as dark silhouettes consistent with the histology of BCC.

The lesion dermoscopically demonstrated features
suggestive of an atypical melanocytic neoplasm. Although the BCC component was identified with RCM, specific dermoscopic criteria for the presence of a collision with BCC were not observed.

New technologies, especially RCM, provide useful information for identifying collision tumors prior to skin biopsy.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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