Dermatology Practical & Conceptual

Enhancing Diagnosis of Flat Pigmented Basal Cell Carcinoma with Line-Field Confocal Optical Coherence Tomography

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Introduction

Line-field confocal optical coherence tomography (LC-OCT) is a novel, noninvasive imaging modality that merges the depth resolution of optical coherence tomography with the cellular detail of reflectance confocal microscopy [1,2]. By providing real-time, high-resolution, en face and cross-sectional images of the skin, LC-OCT has enhanced the in vivo diagnostic evaluation of numerous dermatologic conditions, including both benign and malignant tumors [3]. We report a rare and diagnostically challenging case of basal cell carcinoma (BCC) presenting as a pigmented macule in which LC-OCT played a pivotal in establishing the diagnosis.

Case Presentation

An 84-year-old male presented with a pigmented lesion on the dorsum of his nose, present for approximately two years and progressively darkening. The lesion was asymptomatic and had not undergone any significant changes in size or texture. The patient had no history of skin cancer or chronic sun exposure. Clinically, the lesion appeared as a flat, pigmented macule measuring 7 mm in diameter, with irregular yet sharply demarcated borders. Differential diagnoses included lentigo maligna, solar lentigo, and pigmented actinic keratosis. Dermoscopy revealed rhomboidal structures, an annular granular pattern, white circles around a keratotic

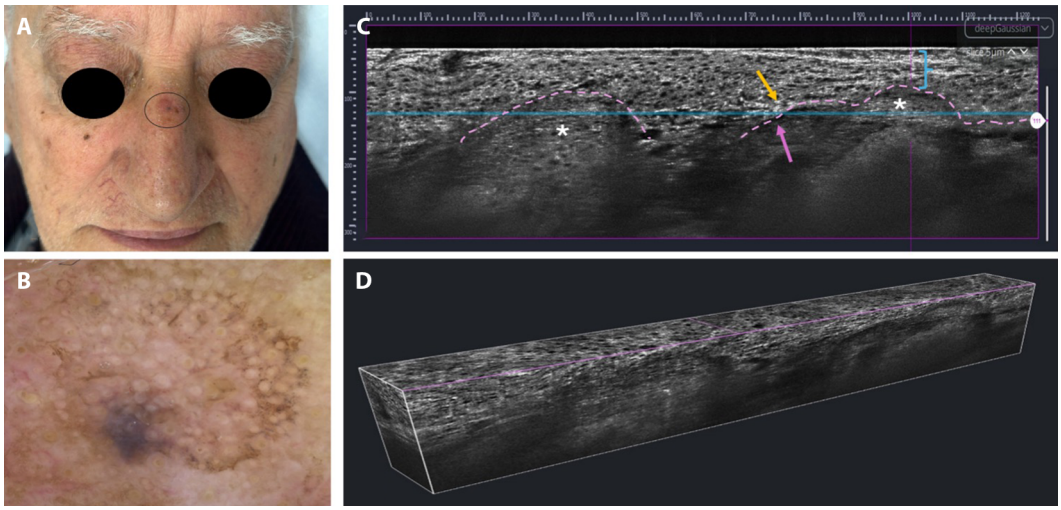

Figure 1. (A) 84-year-old mle with a flat, pigmented macule measuring approximately 7 mm in diameter. (B) Dermoscopy under polarized mode showed rhomboidal structures and an annular granular pattern, along with white circles surrounding a keratotic plug and a solitary pigmented globule at the lower pole of the lesion. (C) LC-OCT examination revealed dermal lobules (dashed purple lines), clefting (purple arrow), bright rims (yellow arrow), a thinned epidermis (blue brace), and a millefeuille pattern within the lobules (white asterisks). (D) The 3D reconstruction allows for a clear visualization of the dermal lobules, corresponding to basaloid islands.

plug and a solitary pigmented globule at the inferior edge. These findings suggested a malignant process but were not diagnostic. LC-OCT (Damae Medical, Paris, France) imaging was performed. En face and vertical images revealed sharply demarcated dermal lobules surrounded by a dark hyporeflective rim, consistent with the "clefting" pattern typical of BCC. These lobules were encased by an outer hyperreflective "bright rim," while the central portions displayed a millefeuille pattern, indicating dense basaloid cell proliferation [4]. The homogeneous distribution of findings throughout the lesion, excluded a focal process. Based on these features, an excisional biopsy was performed and histology confirmed the diagnosis of pigmented BCC (Figure 1).

Conclusion

Pigmented BCCs presenting as macules, can closely mimic melanocytic lesions, both clinically and dermoscopically. As highlighted by Navarrete-Dechent et al., such lesions may show angulated or rhomboidal lines on dermoscopy, typically associated with lentigo maligna [5]. In this setting, LC-OCT provides high-resolution architectural and cytologic detail that facilitates noninvasive identification of hallmark BCC features, including lobular arrangements, peripheral clefting, and characteristic reflectivity profiles [1].

In our case, LC-OCT allowed confident pre-biopsy identification of BCC, supporting a timely excisional approach and guiding therapeutic planning. The integration of dermoscopy and LC-OCT may significantly enhance diagnostic accuracy for atypical lesions, reduce unnecessary biopsies, and streamline clinical decision-making. As LC-OCT becomes more accessible in clinical practice, its role as a "virtual histology" tool is likely to expand, offering substantial benefit in evaluating equivocal or high-risk lesions.

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