Dermatology Practical & Conceptual

Line-Field Confocal Optical Coherence Tomography (LC-OCT) Enables Accurate Pre-Biopsy Differentiation of Clinically Similar Pigmented Scalp Lesions

Chiara Battilotti[1], Silvia Stamegna[1], Alessandro Lorenzetti[1], Giovanni Pellacani[1], Flavia Persechino[1]

1 Dermatology Clinic, Department of Clinical Internal, Anesthesiological and Cardiovascular Sciences, Sapienza University of Rome, Rome, Italy

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Corresponding Author: Chiara Battilotti, MD, Dermatology Clinic, Department of Clinical Internal, Anesthesiological and Cardiovascular Sciences, Sapienza University of Rome, 00161 Rome, Italy. ORCID ID: 0009-0008-1773-3370. E-mail: chiara.battilotti@gmail.com

Case Presentation

We report two cases: the first, a 73-year-old male with a 4 cm pigmented scalp lesion, clinically and dermoscopically suspicious for melanoma, showing chromatic heterogeneity, atypical pigment network, peripheral brown blotches, and gray areas of regression. The second, an 80-year-old male, presented with a 2.8 cm pigmented lesion in the same region whose dermoscopic features were more suggestive of seborrheic keratosis (cerebriform surface and mixed gray-brown pigmentation). Both lesions were further assessed using line-field confocal optical coherence tomography (LC-OCT). In the first case, LC-OCT demonstrated pagetoid spread of atypical roundish cells along the dermo-epidermal junction (DEJ) and upward into the epidermis, an irregular epidermal layer, disrupted junctional architecture, and atypical nests. In the second case, LC-OCT revealed papillomatous proliferation of the epidermal basal layer with hyperreflective keratinocytes arranged in a reticular pattern, presence of milia-like cysts, and absence of cytologic atypia or disrupted architecture (Figure 1). Biopsy was subsequently performed on both lesions and confirmed the LC-OCT hypotheses: superficial spreading melanoma in the first patient and seborrheic keratosis in the second.

Teaching Point

LC-OCT is an innovative noninvasive imaging modality that enables real-time, high-resolution visualization of the

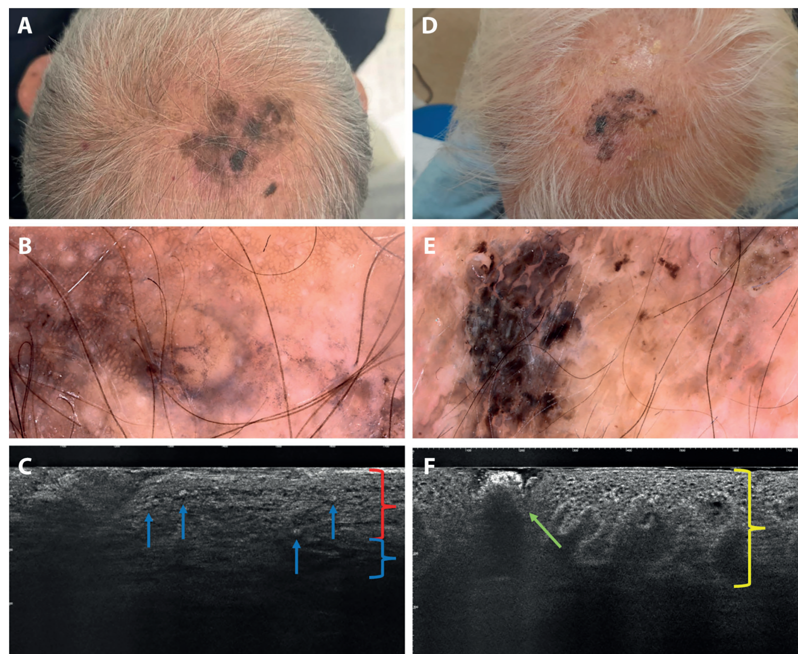

Figure 1. Clinical, dermoscopic, and LC-OCT features of two pigmented scalp lesions. (A–C) Lesion from a 73-year-old male, histopathologically confirmed as superficial spreading melanoma (Breslow thickness: 1.2 mm). A) Clinical image of a 4 cm pigmented lesion on the scalp. B) Polarized dermoscopy reveals marked chromatic heterogeneity. Notable structures include an atypical pigment network, peripheral brown blotches, and gray areas of regression. C) LC-OCT imaging shows pagetoid spread of atypical roundish cells along the DEJ and upward into the epidermis (blue arrows), an irregular epidermal layer (red bracket), disrupted junctional architecture, which makes it impossible to visualize the DEJ (blue bracket). (D–F) Lesion from an 80-year-old male, histopathologically confirmed as seborrheic keratosis. D) Clinical image of a 2.8 cm pigmented lesion on the scalp. E) Polarized dermoscopy displays a cerebriform surface and mixed gray-brown pigmentation. F) LC-OCT reveals intense papillomatous proliferation of the epidermal basal layer with hyperreflective keratinocytes arranged in a reticular pattern (yellow bracket). Additional features include milia-like cysts appearing as round, hyperreflective structures within the epidermis (green arrow), with no evidence of cytologic atypia or disrupted architecture.

epidermis down to the mid-dermis [1]. The device can generate vertical and horizontal scans, videos, and 3D reconstructions [2]. In this report, LC-OCT revealed hallmark features that closely mirrored histopathology, raising strong diagnostic suspicion. Additional research is required to establish its role in melanocytic lesions; however, LC-OCT is already a useful tool in refining differential diagnosis and guiding biopsy site selection, for which dermoscopy remains limited.

References

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