Line-field confocal optical coherence tomography of inflammatory skin conditions: a pilot study

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Introduction.
The gold standard for the confirmatory diagnosis of inflammatory skin conditions is represented by histopathological confirmation. However, biopsies are invasive procedures not always well tolerated by patients. Line-field confocal optical coherence tomography (LC-OCT) is a new non-invasive imaging technology that allows high-resolution imaging of the skin in the vertical plane, similarly to histopathology.1 Imaging of inflammatory skin conditions by means of LC-OCT is yet to be described. The aims of this study were (i) to identify LC-OCT features of the three main groups of inflammatory skin conditions met in dermatology, namely spongiotic, interface, and psoriasiform dermatitis; and (ii) to examine their correlation with histopathological findings.

Methods.
This was a prospective study performed in the Department of Dermatology of the Hôpital Erasme from January 2019 to April 2019 (ULB, Brussels, Belgium). Patients with inflammatory skin lesions were consecutively enrolled for LC-OCT evaluation. A punch biopsy was performed in the same area of the imaging for those cases in which the presumptive diagnosis was unclear. Based on histopathological “Pattern Analysis Method”2 and criteria adapted from reflectance confocal microscopy,3 LC-OCT images were analyzed and compared to corresponding histopathological images.

Results.
Thirty-two patients with inflammatory skin conditions were included. Of these, 17 had spongiotic dermatitis, 5 interface dermatitis and 10 psoriasiform dermatitis. The main LC-OCT patterns were: for spongiotic dermatitis, spongiosis, vesicles formation and epidermal disruption; for interface dermatitis, altered dermal-epidermal junction; for psoriasiform dermatitis, papillomatosis, acanthosis, hyperkeratosis and parakeratosis.

Conclusion.
This pilot study described LC-OCT criteria for spongiotic, interface and psoriasiform dermatites for the first time. Potentially, LC-OCT could be a new method for non-invasively diagnosing common inflammatory skin conditions. Larger studies are needed to validate this hypothesis.

References