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Convenience of the optical coherence tomography use for the diagnosis of oral lichen planus: an ex-vivo evaluation.

El Haddad G.[1*],Spampinato F.[1],Martina E.[1],Arduino P.G.[1],Gambino A.[1]

[1]*Department of Surgical Sciences, Oral Medicine Section, CIR-Dental School, University of Turin, Turin, Italy*
* corresponding e-mail: giorgia.eh@gmail.com

Background: The optical coherence tomography (OCT) is a non-invasive imaging technique used to obtain 2D or 3D pictures of biological structures. The aim of this study was to verify the correspondence between the thickness of the epithelium (EP) and the lamina propria (LP) by OCT scans and histopathological evaluation of oral lichen planus (OLP) specimens.

Material and Methods: From September to December 2021, 16 patients with oral clinical signs of OLP were selected for the purpose. Patients underwent an oral mucosal biopsy on a typical white OLP lesions; at the same time a healthy specimen nearby was also collected. Both biopsy samples were immediately scanned with a Thorlabs SD-OCT System Telesto 220. Later, a single examiner compared the histological images with those obtained with the OCT system.

Results: Most of the OCT measurements showed an increased thickness of the OLP layers compared to the healthy ones. (fig.1,2,3) Firstly, the average of the measurements of the healthy EP was 0.26 mm whereas the OLP EP appeared thicker (0.31 mm). Furthermore, the average of the width of the healthy LP was 0.43 mm while the OLP LP average was 0.49 mm. Thus, the difference in the comparison between the OCT measurements and the histological ones were statistically significant (p-value<.05). (Fig 4,5,6)
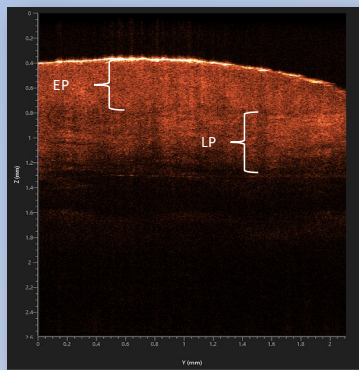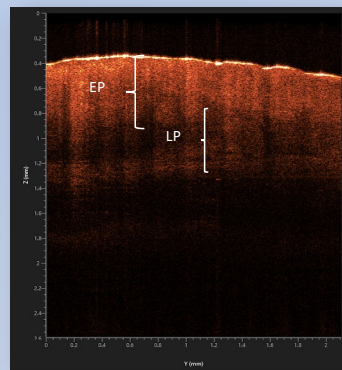

Fig.1 2D scan of healthy buccal mucosa
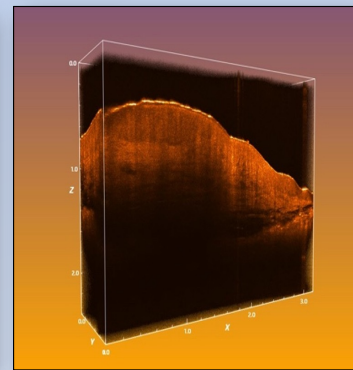

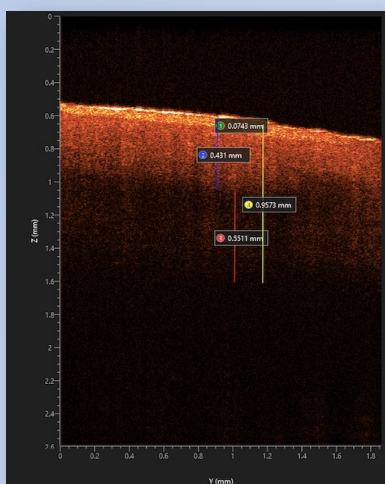Fig.2 2D scan of OLP buccal mucosa

Fig.3 3D scan of OLP buccal mucosa

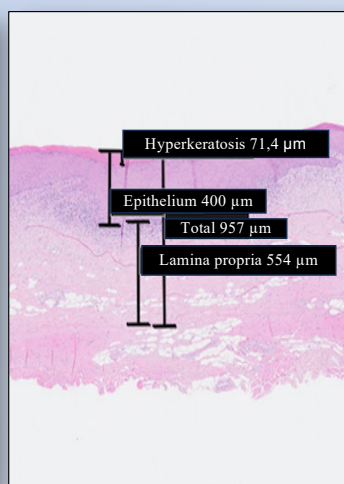Fig.4 Representative image of measurements via OCT. 1. Hyperkeratosis, 2. Epithelium, 3.Lamina Propria, 4. Total

Fig.5 Representative image of histological measurements

	OCT (mm)	Histological (mm)
Healthy EP	0,26	0,24
OLP EP	0,31	0,29
Healthy LP	0,43	0,41
OLP LP	0,49	0,47

Fig.6 Comparison table between averages of EP and LP measurements with OCT and histology

Conclusions: The OCT allows us to describe the ultrastructural patterns of white OLP highlighting a sharp correspondence with traditional histopathology. However, further *ex-vivo* studies are needed to confirm the usefulness of the OCT.

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