

Line-field confocal optical coherence tomography for basal cell carcinoma: preliminary results of a prospective study on diagnostic performance

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Introduction

Line-field confocal optical coherence tomography (LC-OCT) is an innovative non-invasive imaging technique. Previous LC-OCT studies described morphologic criteria of **basal cell carcinoma (BCC)** and suggested that this technique facilitates BCC diagnosis and subtype discrimination.¹⁻³ Available data about LC-OCT diagnostic performance in the field of BCC are derived from retrospective evaluations.

Objectives

The objective of the present analysis was to report parameters of LC-OCT diagnostic performance for BCC (sensitivity, specificity, accuracy) derived from a prospective study performed at patients' bedside.

Materials & methods

Lesions clinically equivocal for BCC were prospectively included. Dermoscopic and LC-OCT diagnoses were obtained at patients' bedside by a single observer expert in LC-OCT imaging prior to surgical excision. Discordances between LC-OCT and histopathological diagnoses were reviewed by 3 board-certified pathologists.

Results

BCC vs non-BCC	Sensitivity	Specificity	Accuracy
Dermoscopy	98%	37%	83%
LC-OCT	98%	90%	96%

Table 1. Diagnostic performances for the differentiation of BCC from BCC-imitators.

sBCC vs non-sBCC	Sensitivity	Specificity	Accuracy
Dermoscopy	62%	84%	77%
LC-OCT	72%	97%	89%

Table 2. Diagnostic performances for the differentiation of sBCC from others BCC subtypes.

A total of 214 lesions were included belonging to 119 patients [60 (50.4%) females; median age 66.4 (32.4-89.4) years; 97 (82.35%) with skin type I-II].

For the differentiation of BCC from BCC-imitators, LC-OCT increased and the specificity of dermoscopy (90% versus 37%) by 53% and the diagnostic accuracy (96% versus 83%) by 13%.

For the discrimination of superficial BCC (sBCC) from other BCC subtypes, LC-OCT increased the diagnostic accuracy of dermoscopy (89% versus 77%) by 12%.

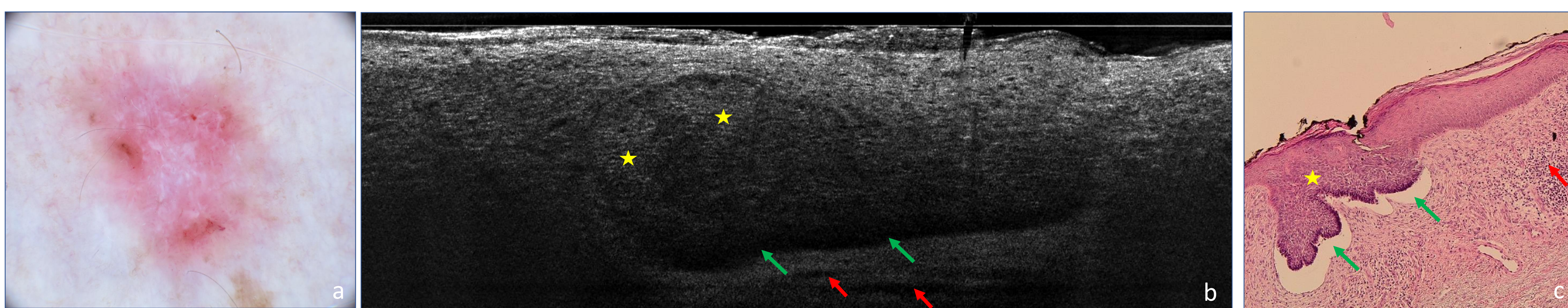


Figure 1. Superficial basal cell carcinoma (sBCC) on the anterior left leg of a 74-year-old woman: (a) dermoscopy, (b) LC-OCT images, (c) histology. LC-OCT examination displays the presence of a hemispheric lobule composed of an inner grey millefeuille pattern (yellow stars) surrounded by a dark cleft-like rim (green arrows). The lobule is connected to the epidermis. Dilated blood vessels are visualized in the dermis (red arrows).

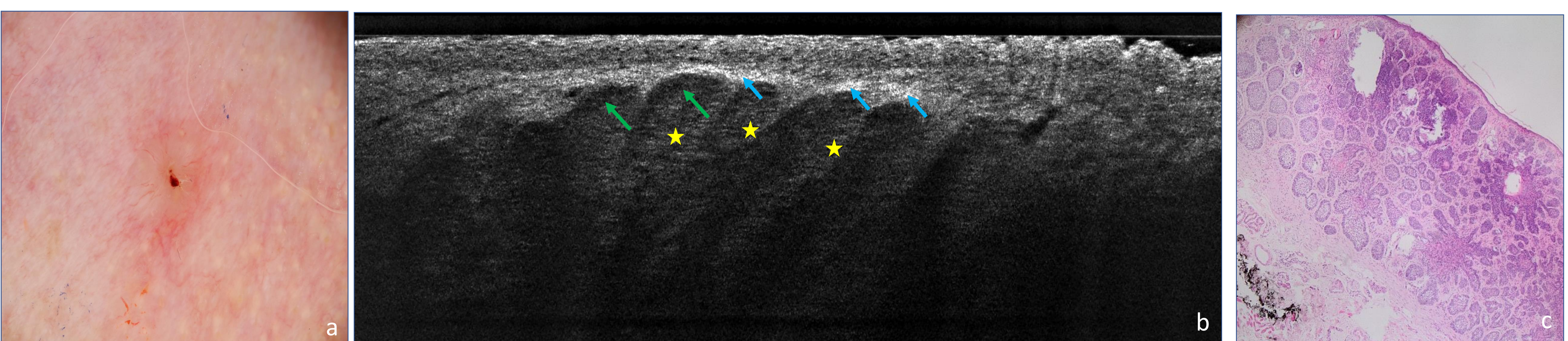


Figure 2. Micronodular basal cell carcinoma on the lower right eyelid of a 49-year-old man: (a) dermoscopy, (b) LC-OCT images, (c) histology. LC-OCT examination displays the presence of multiple adjacent round lobules composed of an inner grey millefeuille pattern (yellow stars) surrounded by a middle dark rim (green arrow) and an outer bright rim (blue arrow). The lobules are separated from the epidermis.

Conclusion

This prospective study confirmed that the diagnostic performance for BCC can be increased by LC-OCT compared to dermoscopic examination alone, both in terms of BCC differentiation from clinical imitators and in terms of BCC subtype discrimination; positioning this technique as a suitable tool to refine diagnosis of equivocal lesions. Therefore, our data encourages the inclusion of LC-OCT in the diagnostic process and management of BCC.

References

- Suppa M, Fontaine M, Dejonckheere G, Cinotti E, Yélamos O, Diet G, et al. Line-field confocal optical coherence tomography of basal cell carcinoma: a descriptive study. *Journal of the European Academy of Dermatology and Venereology*. 2021;35(5):1099-110.
- Ruini C, Schuh S, Gust C, Kendziora B, Frommherz L, French LE, et al. Line-field optical coherence tomography: in vivo diagnosis of basal cell carcinoma subtypes compared with histopathology. *Clinical and Experimental Dermatology*. 2021;46(8):1471-81.
- Gust C, Schuh S, Welzel J, Daxenberger F, Hartmann D, French LE, et al. Line-Field Confocal Optical Coherence Tomography Increases the Diagnostic Accuracy and Confidence for Basal Cell Carcinoma in Equivocal Lesions: A Prospective Study. *Cancers (Basel)*. 2022 Feb 21;14(4):1082. doi: 10.3390/cancers14041082.