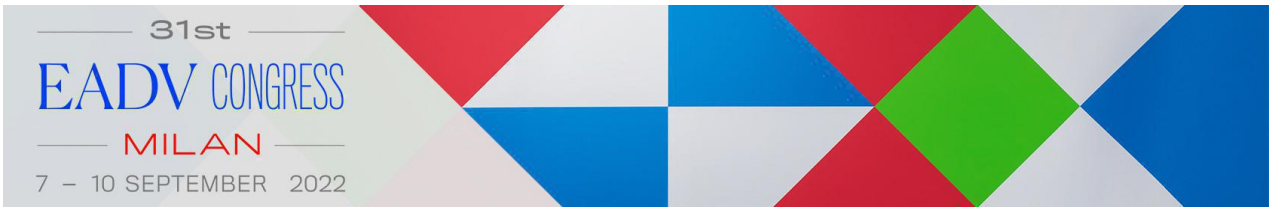

Abstract N°: 1914

Title: Line-field confocal optical coherence tomography for basal cell carcinoma: a retrospective study on diagnostic performance

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Introduction

Line-field confocal optical coherence tomography (LC-OCT) represents one of the newest non-invasive in vivo skin imaging techniques. Previous studies described morphologic criteria of basal cell carcinoma (BCC) under LC-OCT examination and suggested that this technique might facilitate BCC diagnosis and subtype discrimination.[1,2] However, data about LC-OCT diagnostic performance in the field of BCC are not yet available. The objective of the study was to report parameters of LC-OCT diagnostic performance [sensitivity, specificity, positive and negative predictive values (PPV, NPV), accuracy] in the field of BCC.

Materials and methods

A total of 303 histopathologically-confirmed lesions, including 173 BCCs and 130 BCC imitators [actinic keratosis; *in situ* squamous cell carcinoma (SCC)/Bowen's disease; invasive SCC; intradermal naevus; seborrheic keratosis; sebaceous hyperplasia; psoriasis; eczema; lichen; lichen planus-like keratosis] were imaged with a handheld LC-OCT device prior to surgical excision. Three observers, all blinded for histopathological diagnosis, retrospectively evaluated clinical, dermoscopic and LC-OCT images of all the included lesions in order to assess the diagnostic performance parameters of LC-OCT for BCC diagnosis and subtype classification.

Results

For the differentiation of BCC from BCC-imitators, the following diagnostic performance was found: sensitivity 75.7% (clinical examination), 85.5% (dermoscopic), 96.5% (LC-OCT); specificity 70.0% (clinical), 84.6% (dermoscopic), 97.7% (LC-OCT); PPV 77.1% (clinical), 88.1% (dermoscopic), 98.2% (LC-OCT); NPV 68.4% (clinical), 81.5% (dermoscopic), 95.5% (LC-OCT); accuracy 73.3% (clinical), 85.1% (dermoscopic), 97.0% (LC-OCT). Therefore, LC-OCT increased the diagnostic accuracy of the clinical examination by 23.7% and of dermoscopy by 11.9%.

For the discrimination of sBCC from other BCC subtypes, the following diagnostic performance was found: sensitivity 76.1% (clinical), 71.7% (dermoscopic), 84.3% (LC-OCT); specificity 72.9% (clinical), 84.3% (dermoscopic), 94.8% (LC-OCT); PPV 60.3% (clinical), 67.3% (dermoscopic), 87.8% (LC-OCT); NPV 84.9% (clinical), 86.9% (dermoscopic), 94.8% (LC-OCT); accuracy 74.0% (clinical), 80.4% (dermoscopic), 91.6% (LC-OCT). Therefore, LC-OCT increased the diagnostic accuracy of the clinical examination by 17.6% and of dermoscopy by 11.2%.

Discussion

The diagnostic performance in the field of BCC can be increased by the use of LC-OCT as compared to clinical and dermoscopic examination alone, both in terms of BCC differentiation from clinical imitators and in terms of BCC subtype discrimination. LC-OCT should be included in the diagnostic process and management of BCC.

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

		Histology		
		BCC	non-BCC	Total
Clinic	BCC	131	39	170
	non-BCC	42	91	133
Dermoscopy	BCC	148	20	168
	non-BCC	25	110	135
LC-OCT	BCC	167	3	170
	non-BCC	6	127	133
Total		173	130	303

	Sensitivity	Specificity	PPV	NPV	Accuracy
Clinic	75.7%	70.0%	77.1%	68.4%	73.3%
Dermoscopy	85.5%	84.6%	88.1%	81.5%	85.1%
LC-OCT	96.5%	97.7%	98.2%	95.5%	97.0%

BCC, basal cell carcinoma
LC-OCT, line field-confocal optical coherence tomography
PPV, positive predictive value
NPV, negative predictive value

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

		Histology		
		sBCC	non-sBCC	Total
Clinic	sBCC	35	23	58
	non-sBCC	11	62	73
	Total	46	85	131
Dermoscopy	sBCC	33	16	49
	non-sBCC	13	86	99
	Total	46	102	148
LC-OCT	sBCC	43	6	49
	non-sBCC	8	110	118
	Total	51	116	167

	Sensitivity	Specificity	PPV	NPV	Accuracy
Clinic	76.1%	72.9%	60.3%	84.9%	74.0%
Dermoscopy	71.7%	84.3%	67.3%	86.9%	80.4%
LC-OCT	84.3%	94.8%	87.8%	93.2%	91.6%

BCC, basal cell carcinoma
LC-OCT, line field-confocal optical coherence tomography
PPV, positive predictive value
NPV, negative predictive value

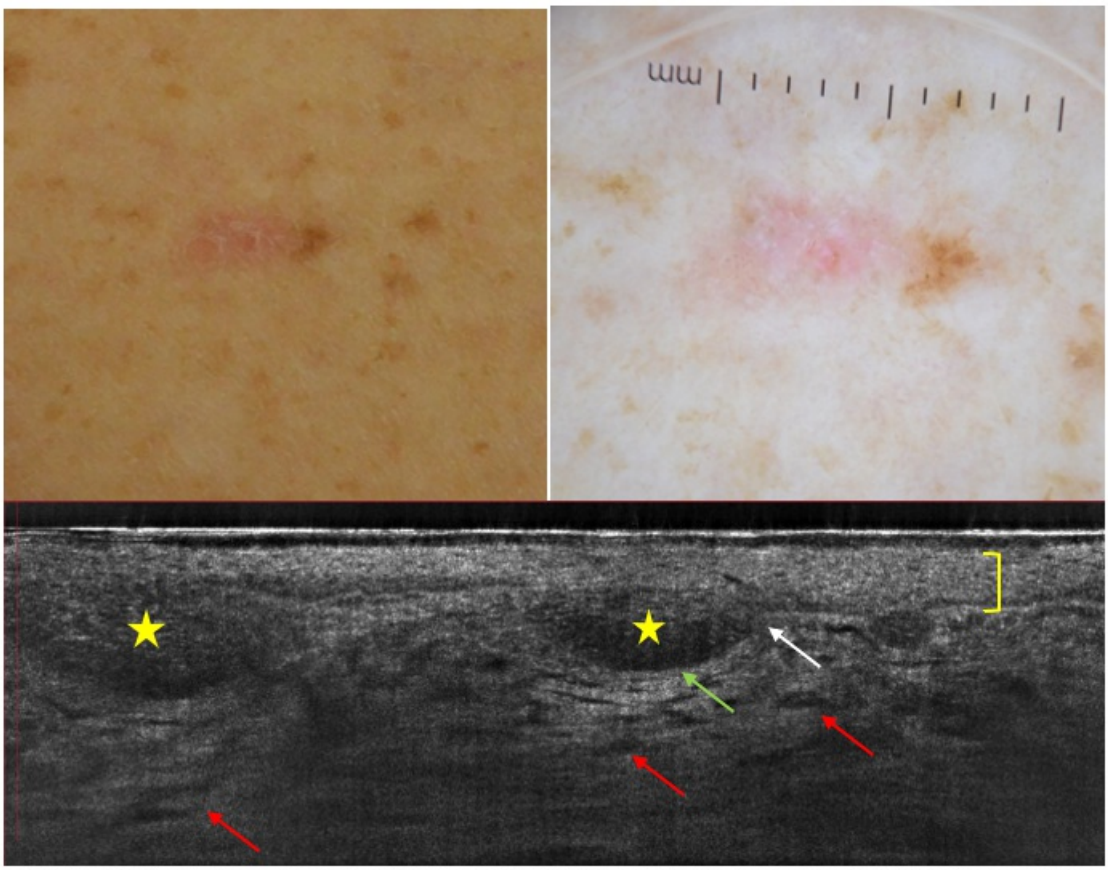

Figure 1. Superficial basal cell carcinoma (sBCC) on the left lateral thigh of a 61-year-old woman: (a) clinical, (b) dermoscopic and (c) LC-OCT images. LC-OCT examination reveals the presence of hemispheric lobules composed of an inner grey core featuring the *millefeuille* pattern (yellow stars), surrounded by a dark rim (green arrows). The lobules are connected to the epidermis (yellow brace). The dermal-epidermal junction is flat and disrupted by the lobules (white arrow). Dilated blood vessels are visualized in the dermis (red arrows).

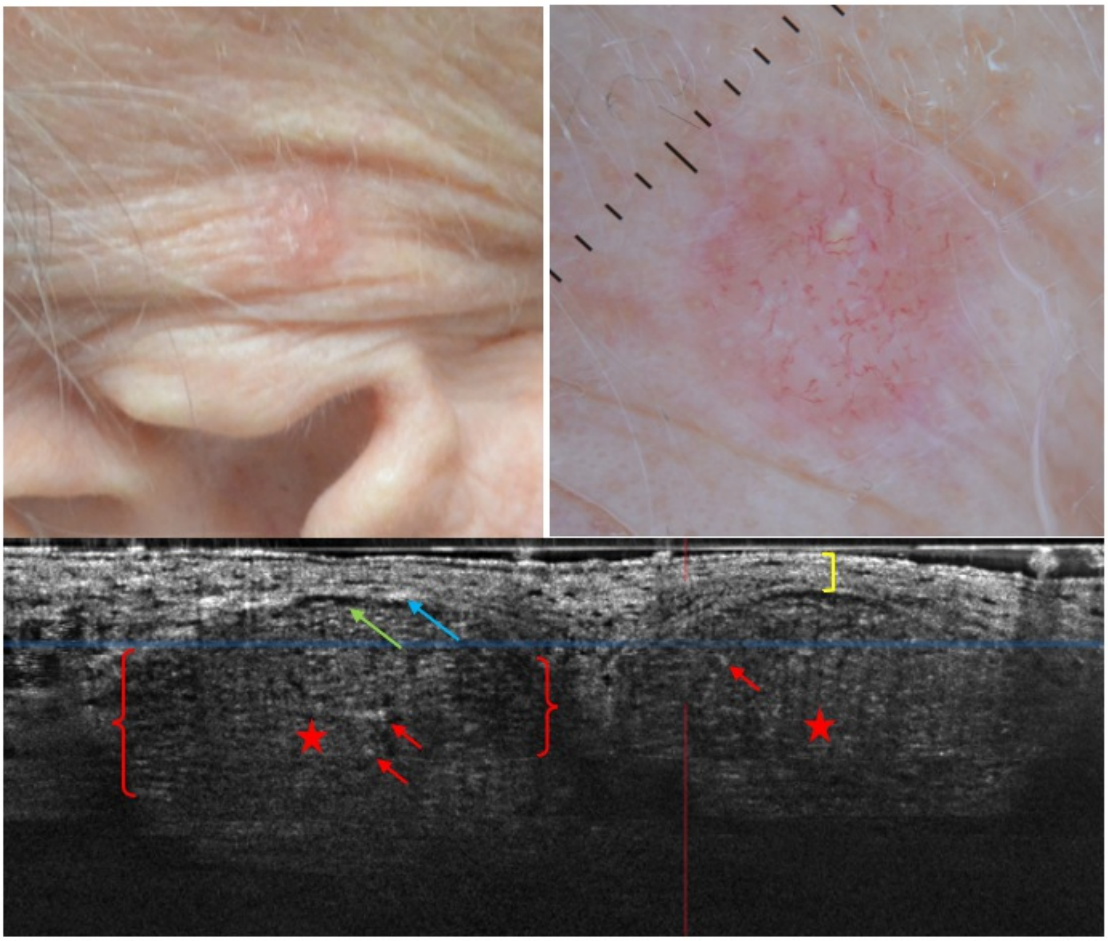

Figure 2. Nodular basal cell carcinoma on the left preauricular region of a 79-year-old woman: (a) clinical, (b) dermoscopic and (c) LC-OCT images. LC-OCT reveals the presence of round lobules composed of an inner grey core featuring the *millefeuille* pattern (red stars) surrounded by a middle dark rim (green arrow) and an outer bright rim (blue arrow). The lobules are separated from the epidermis (yellow brace). Big bright cells corresponding to melanophages can be seen within the lobules (red arrows). Palisading can be visualized on the borders of the lobule (red braces).

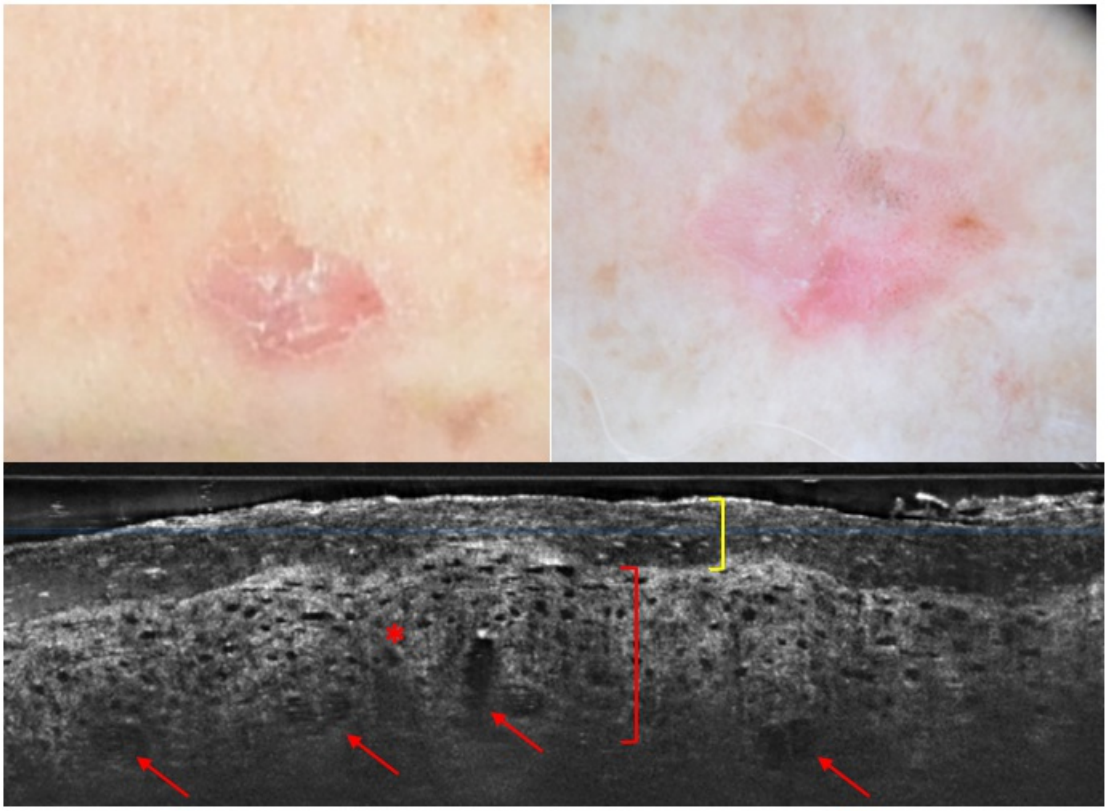

Figure 3. *In situ* SCC/Bowen's disease on the left radial border of wrist of a 41-year-old man: (a) clinical, (b) dermoscopic and (c) LC-OCT images. LC-OCT examination reveals the absence of lobules and the presence of hyperkeratosis with parakeratosis (yellow brace), acanthosis (red brace), large and atypical nuclei of keratinocytes inside the epidermis (red asterisk) and roundish hypo-reflective areas corresponding to glomerular vessels (red arrows).