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The additional diagnostic value of optical coherence tomography in clinically diagnosed basal cell carcinomas undergoing direct surgical excision

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Dear Editor, Clinical examination appears to be very sensitive for diagnosing basal cell carcinoma (BCC) (90%), but the specificity is reported to be low (28·6–48·9%).[1,2] Additional use of dermoscopy can increase specificity to 54·3–55·6% compared with clinical examination alone.[1,2] With use of optical coherence tomography (OCT), a noninvasive diagnostic method, in addition to clinical and dermoscopic examination, it is possible to further increase the specificity to 76% at a sensitivity of 95%.[1,3,4] These results apply to a population of patients with a clinical suspicion of BCC who had an indication for biopsy (e.g. high-risk location or uncertainty about diagnosis). However, there are subgroups of patients, such as patients with a very high clinical suspicion for a low-risk BCC or patients with multiple BCCs, who undergo direct surgical excision without prior histopathological verification of BCC diagnosis.[5,6]

The aim of this study was to investigate whether OCT has additional diagnostic value in these subgroups of patients and whether it can help to reduce the risk of misclassification of non-BCC lesions as BCC. Patients were included from August 2019 to January 2021 in one academic hospital and two general hospitals in the Netherlands. The study was approved by the local ethics committee and was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all patients.

All included lesions were highly suspicious for BCC based on clinical and dermoscopic examination and were scheduled for surgical excision without prior histopathological verification. Before surgery, an OCT scan was obtained for study purposes and the OCT diagnosis did not influence the treatment decision. A commercially available OCT device (< 7·5 μm lateral and < 5 μm axial optical resolution) was used for imaging (VivoSight, Michelson Diagnostics Ltd., Maidstone, UK). Analysis of OCT images was performed by one experienced observer using the morphological characteristics of BCC as previously described.[7] Histopathological diagnosis was used as the gold standard.

In total, 114 patients with a high clinical and dermoscopic suspicion of BCC were included; 59 (51·8%) in an academic hospital and 55 (48·2%) in general hospitals. The median age was 71 years (21–91) and 63 patients were male (55·3%). Lesions were located on the trunk (47·4%), head or neck area (35·1%) and extremities (17·5%).

The results with respect to diagnostic accuracy of OCT are summarized in Table 1. According to histopathological diagnosis, 109 of 114 lesions were BCCs, which corresponds to a positive predictive value (PPV) of 95·6% for clinical and dermoscopic diagnosis. All 109 histopathologically verified BCCs were identified as such by OCT (sensitivity 100%) and the negative predictive value in cases with a negative OCT result was 100% (four of four). In only five of 114 lesions (4·4%) histopathology revealed an alternative diagnosis, i.e. seborrhoeic keratosis, solar elastosis, benign lichenoid keratosis, warty dyskeratoma and squamous cell carcinoma (SCC). OCT identified four of these five lesions as non-BCC lesions. A benign lichenoid keratosis was misclassified as BCC by both clinical and dermoscopic examination and OCT. Furthermore, the SCC was excised with a 3-mm margin and was radically removed.

The majority (97·4%) of the lesions in this study, all scheduled for excision, were diagnosed as nodular BCCs according to clinical and dermoscopic findings. There were only three superficial BCCs, as noninvasive treatment is usually preferred in superficial BCC. Of all 109 BCCs, 11 (10·1%) were superficial, 81 (74·3%) were nodular and 17 (15·6%) were found to be infiltrative upon histopathology. Clinical and dermoscopic examination misclassified eight of 11 (72.7%) superficial BCCs as nodular, whereas with OCT seven of 11 (63.6%) were misclassified as mixed superficial/nodular BCC. In total, 17 (100%) infiltrative BCCs were misclassified as nodular by

Table 1 Diagnostic parameters for OCT in patients with high suspicion of low-risk BCC according to clinical and dermoscopic diagnosis

	Histology		
	BCC	No BCC	Total
OCT positive for BCC	109	1	110
OCT negative for BCC	0	4	4
Total	109	5	114

BCC, basal cell carcinoma; OCT, optical coherence tomography.

clinical and dermoscopic examination and 14 (82.4%) were misclassified by OCT.

With additional use of OCT, the PPV increased from 95·6% (without OCT) to 99·2% (109 of 110) with OCT. The decrease in the percentage of misclassifications was not significant, but a study with enough power to detect differences in this order of magnitude would require a much larger sample size.

In another prospective study, the PPV of an OCT diagnosis that was made with high confidence was only 80%, but the BCC prevalence in that study was also lower (58·2%) than in the present study (95·6%). The PPV depends on prevalence and becomes lower if prevalence decreases.[8]

The use of OCT in addition to clinical and dermoscopic examination may reduce the risk of misclassification of non-BCC lesions as BCC; however, this study also shows that in cases of high clinical and dermoscopic suspicion of BCC, this risk is already very low. The gain from additional use of OCT in patients with high clinical suspicion of BCC must be balanced against the financial investment required for the purchase of an OCT device and training of OCT users.

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The BIOMarkers in Atopic Dermatitis and Psoriasis (BIOMAP) glossary: developing a lingua franca to facilitate data harmonization and cross-cohort analyses

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Dear Editor, The BIOMarkers in Atopic dermatitis and Psoriasis (BIOMAP) is a large European consortium aiming to advance personalized medicine for atopic dermatitis and psoriasis by identifying biomarkers that predict therapeutic response and disease progression. BIOMAP brings together clinicians, researchers, patient organizations and pharmaceutical industry partners, and encompasses data from over 60 individual studies, including randomized clinical trials, population-based cohorts and deeply phenotyped disease registries. The curation and harmonization of data and biosamples from these established studies will facilitate cross-cohort clinical and molecular analyses, increasing the potential to identify small-effect estimates and to better stratify disease subtypes. This research letter serves to disseminate BIOMAP's pathway to data harmonization and will inform future collaborative research endeavours.

Pooling data from diverse studies presents inherent challenges. Each study has different methodologies, research objectives and outcomes. Data harmonization improves the comparability of existing studies by converting similar variables to a common format and creating 'harmonized datasets', which can be used for cross-cohort analyses. Figure 1 outlines how BIOMAP follows existing data harmonization guidelines,[1] ensuring that clinically appropriate and meaningful conclusions can be drawn.

BIOMAP's objectives were outlined in the project proposal (step 0). During protocol development, a list of variables pertinent to BIOMAP's key research questions was devised. These predefined 'BIOMAP categories' included clinical phenotypes, disease associations, environmental/lifestyle factors, treatments and outcome measures. Next, a detailed mapping exercise was performed to explore what data were available in a subset of the studies underpinning BIOMAP. This involved the custodians of individual study datasets assigning a BIOMAP category to each variable in their study's data dictionary. Annotated data dictionaries were assimilated