Assessment of Optical Coherence Tomography Imaging in the Diagnosis of Non-Melanoma Skin Cancer and Benign Lesions Versus Normal Skin: Observer-Blinded Evaluation by Dermatologists and Pathologists

BACKGROUND Optical coherence tomography (OCT) is an optical imaging technique that may be useful in diagnosis of non-melanoma skin cancer (NMSC). OBJECTIVES To describe OCT features in NMSC such as actinic keratosis (AK) and basal cell carcinoma (BCC) and in benign lesions and to assess the diagnostic accuracy of OCT in differentiating NMSC from benign lesions and normal skin. METHODS AND MATERIALS OCT and polarization-sensitive (PS) OCT from 104 patients were studied. Observer-blinded evaluation of OCT images from 64 BCCs, 1 baso-squamous carcinoma, 39 AKs, two malignant melanomas, nine benign lesions, and 105 OCT images from perilesional skin was performed; 50 OCT images of NMSC and 50 PS-OCT images of normal skin were evaluated twice. RESULTS Sensitivity was 79% to 94% and specificity 85% to 96% in differentiating normal skin from lesions. Important features were absence of well-defined layering in OCT and PS-OCT images and dark lobules in BCC. Discrimination of AK from BCC had an error rate of 50% to 52%. CONCLUSION OCT features in NMSC are identified, but AK and BCC cannot be differentiated. OCT diagnosis is less accurate than clinical diagnosis, but high accuracy in distinguishing lesions from normal skin, crucial for delineating tumor borders, was obtained.