Accuracy of in vivo confocal microscopy for diagnosis of basal cell carcinoma: a comparative study between handheld and wide-probe confocal imaging.


ABSTRACT

BACKGROUND: Reflectance confocal microscopy (RCM) increases specificity of identification of basal cell carcinoma (BCC). A smaller-diameter handheld RCM (HH-RCM) allows better access to limited anatomic locations. OBJECTIVE: To compare accuracy of HH-RCM in identification of BCC to that of traditional wide-probe RCM (TWP-RCM). METHODS: Patients presenting at least one lesion clinically and dermoscopically suspicious for BCC, were recruited from two dermatology skin cancer clinics. Prior to excision, we attempted to image all lesions with HH-RCM and TWP-RCM using a standardized protocol. RCM images were retrospectively evaluated, jointly by two blinded readers. For purposes of comparative RCM, sensitivity and specificity analysis, we used a threshold of $\geq 3$ RCM criteria to identify BCC, whereby at least one criterion had to be presence of 'dark silhouettes' or 'bright tumor islands'. RESULTS: Among 54 lesions imaged with both RCM devices, 45 were biopsy-proven BCCs. Comparison between TWP-RCM vs. HH-RCM was as follows: sensitivity (100% vs. 93%), specificity (78% for both probes), positive predictive value (96% vs. 95%), and negative predictive value (100% vs. 70%) respectively. Notably, both TWP-RCM and HH-RCM demonstrated the presence of 'dark silhouettes' or 'bright tumor islands' in all 45 BCCs. CONCLUSION: Both RCM probes demonstrate high PPV. TWP-RCM shows higher NPV, since its broader field-of-view probably allows more exhaustive search for BCC criteria. The RCM criteria threshold for BCC identification should be further tested.