High-resolution imaging of basal cell carcinoma: a comparison between multiphoton microscopy with fluorescence lifetime imaging and reflectance confocal microscopy.


ABSTRACT

AIMS: The aim of this study was to compare morphological aspects of basal cell carcinoma (BCC) as assessed by two different imaging methods: in vivo reflectance confocal microscopy (RCM) and multiphoton tomography with fluorescence lifetime imaging implementation (MPT-FLIM). METHODS: The study comprised 16 BCCs for which a complete set of RCM and MPT-FLIM images were available. The presence of seven MPT-FLIM descriptors was evaluated. The presence of seven RCM equivalent parameters was scored in accordance to their extension. Chi-squared test with Fisher's exact test and Spearman's rank correlation coefficient were determined between MPT-FLIM scores and adjusted-RCM scores. RESULTS: MPT-FLIM and RCM descriptors of BCC were coupled to match the descriptors that define the same pathological structures. The comparison included: Streaming and Aligned elongated cells, Streaming with multiple directions and Double alignment, Palisading (RCM) and Palisading (MPT-FLIM), Typical tumor islands, and Cell islands surrounded by fibers, Dark silhouettes and Phantom islands, Plump bright cells and Melanophages, Vessels (RCM), and Vessels (MPT-FLIM). The parameters that were significantly correlated were Melanophages/Plump Bright Cells, Aligned elongated cells/Streaming, Double alignment/Streaming with multiple directions, and Palisading (MPT-FLIM)/Palisading (RCM). CONCLUSION: According to our data, both methods are suitable to image BCC's features. The concordance between MPT-FLIM and RCM is high, with some limitations due to the technical differences between the two devices. The hardest difficulty when comparing the images generated by the two imaging modalities is represented by their different field of view.