ABSTRACT
In actinic keratosis (AK), clinical and subclinical lesions coexist across large areas of sun-exposed skin resulting in field cancerization. The lesions are part of a disease continuum which can progress into invasive squamous cell carcinoma (SCC). Conventional biopsy sampling together with histopathological analysis of the excised tissue is still the gold standard for differentially diagnosing AK from invasive SCC and identifying the characteristic pathophysiological features of these lesions. Given that biopsy sampling is invasive and not suited to the investigation of disease across large fields of skin, several imaging technologies have been applied to non-invasively investigate AK. Widely available imaging technologies such as cross-polarized light, fluorescence and dermoscopy can assist the dermatologist in diagnosing AK and in identifying different types of AK lesions. Modern imaging technologies such as reflectance confocal microscopy (RCM) and high-definition optical coherence tomography (HD-OCT) provide high-resolution images of the skin. These techniques can be used to image the histological changes that characterize AK and so can be used to diagnose the disease and its severity. They can also identify the presence of subclinical lesions and non-invasively monitor the effects of AK treatments on both subclinical and clinical lesions over time. Both RCM and HD-OCT have revealed a new vision of AK by visualizing in detail the cellular and histological changes that characterize both clinical and subclinical lesions, and confirming that the disease affects the entire sun-exposed field. As a consequence of these findings, the target for the treatment of AK now needs to be the detection and clearance of all clinical and subclinical lesions across the entire sun-exposed field.