Establishing the dynamics of neutrophil accumulation in vivo by reflectance confocal microscopy.


ABSTRACT
Reflectance confocal microscopy (RCM) is an imaging tool, which visualizes the epidermal skin layers in vivo with a cellular resolution. Neutrophil accumulation is a characteristic feature in psoriasis and is thought to play a role in the pathophysiology of psoriasis. Until now, imaging of neutrophil accumulation in vivo is not performed. We evaluated the dynamics of neutrophil migration in active psoriatic lesions by non-invasive RCM imaging. Additionally, we evaluated the time phasing and duration of neutrophil trafficking. We performed RCM imaging prior to the start of topical treatment and for seven consecutive days with a 24-h time interval at the Radboud University Medical Center, Nijmegen, the Netherlands. Twelve psoriatic lesions in three patients with a severe exacerbation of psoriasis were included. The four most active lesions were selected in each patient based on the highest degree of redness, induration and expansion in the previous 2 weeks. In all lesions, a cyclic pattern of neutrophil migration was observed, consisting of squirting papillae, transepidermal migration, accumulation in the stratum spinosum, accumulation in the stratum corneum and degeneration of the abscesses. The time interval of a neutrophil-trafficking cycle was 5-7 days and showed a synchronic time phasing. This study is the first to establish the dynamics and time phasing of neutrophil migration in vivo in psoriatic lesions. Previously reported theories were confirmed by these novel in vivo data. RCM might distinguish between active or chronic psoriatic areas, which might contribute to new insights into the pathogenesis of psoriasis.