

Abstract

Skin breakdown is a prevalent and costly medical condition worldwide, with the etiologic and healing processes being complex and multifactorial. Quantitative assessment of wound healing is challenging due to the subjective measurement of wound size and related characteristics. We propose that in vivo spectral reflectance measurements can serve as valuable clinical monitoring tool/device in the study of wound healing. We have designed a multi spectral camera able to acquire 18 wavelength sensitive images in a single snapshot. A lenslets array in front of a digital camera is combined with narrowband filters (bandwidth 10 nm) ranging from 460 to 886nm. Images taken with the spectroscopic camera are composed of 18 identical sub-images, each carrying different spectral information, that can be used in the assessment of skin chromophores. A clinical trial based on a repeated measures design was conducted at the National Rehabilitation Hospital on 15 individuals to assess whether Poly Carboxy Methyl Glucose Sulfate (PCMGS, CACIPLIQ20), a bio-engineered component of the extracellular matrix of the skin, is effective at promoting healing of a variety of wounds. Multi spectral images collected at different wavelengths combined with optical skin models were used to quantify skin oxygen saturation and its relation to the traditional measures of wound healing.