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### Dynamic skin changes of acute radiation dermatitis revealed by in vivo reflectance confocal microscopy.

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#### ABSTRACT

**Background:** A better knowledge of the dynamic biological changes that the skin undergoes in response to ionizing radiation is advisable to improve the management of radiation dermatitis, allowing selection of patients needing treatment or close monitoring.

**Objective:** To describe the evolution of the skin in response to ionizing radiation through the reflectance confocal microscopy (RCM) features of acute radiation dermatitis. **Methods:** In this prospective descriptive study, six women (median age, 55 years; range, 45-80 years) diagnosed with breast cancer in stages IA-IB undergoing adjuvant radiotherapy were included in the study through consecutive sampling. Clinical, dermoscopic and RCM evaluation of the skin were performed prior to treatment and on days 1, 15, 30 and 45 after radiotherapy. **Results:** While clinical features of radiation dermatitis emerged after 30 days on average, histopathological changes were detectable by RCM after a mean time of 15 days. The main RCM features included initial appearance of spongiosis, exocytosis and inflammatory cells followed by the presence of dendriticshaped cells, 'streaming-like figures', 'broken geographic papillae', epidermal architectural disarray, effacement of rete ridges, melanophages and, finally, hyperpigmentation of the basal layer.

**Conclusions:** RCM may safely detect the dynamic biological changes that the skin undergoes in response to ionizing radiation, even before than clinical onset of acute radiation dermatitis. Therefore, RCM may be useful to make an early and non-invasive diagnosis of radiation dermatitis during radiotherapy, allowing an early selection of patients needing treatment or close monitoring and avoiding skin biopsies.