

Burned skin healing assessed by optical coherence tomography, histology and ATR-FTIR spectroscopy

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The skin is considered the largest organ of the body and has many different functions. Its integrity is essential for the function in thermoregulation, protection, metabolic functions and sensation. The anatomy of the skin is complex, and there are many structures within the layers of the skin. Damages in skin anatomical structure can be caused by physical, chemical and microbiological reasons. The burns, for example, cause changes in the structure of the skin associated with the tissue trauma. To treat burn victims it is required knowledge of pathophysiological changes that occur in the affected area. The depth of the burn injuries determines whether the burn is first, second or third degree. The third-degree burns destroy the outer layer of skin, epidermis, and the entire layer beneath, dermis. The treatments of third-degree burn search for more conservative and quick in the repair to a functional and aesthetic satisfactory result. Thus, the proposal of this study is to evaluate the third-degree burn wound healing process in Wistar rats. Two regions of the animals back were exposed to a source of boiling water, burning the skin. At days 0, 4 and 8 post burn, normal skin/wound interface images were obtain using optical coherence tomography (OCT), as well as, skin samples was collected to histology analyses and ATR-FTIR spectroscopy. The results shown that ATR-FTIR and OCT can potentially be used to investigate wound healing process in the skin. The intensity ratio of the amide I/amide II bands, also called the moisture factor, is assumed to be a relative measure of the stratum corneum hydration. The ATR-FTIR results of moisture factor shown hydratation increase post burning and decrease along time. This suggest a hydration due to the inflammatory response of trauma according to reported in literature studies. Histology analyses suggest a regeneration of tissue due to high amount of fibroblasts in dermis at day 8. Support: Fapeam - programa rh-posgrad; Fapesp/Cepof(05/51689-2); Capes/Procad(0349/05-4).