A new histological score grade for deep partial-thickness burn wound healing process

ABSTRACT

Burns are injuries on the skin or other tissues. Burns are divided into superficial, partial, and full-thickness, characterized by the depth of the affected tissues. Histological analysis is critical to assess the burn wound healing process. Thus, a systematic evaluation system is imperative for burn research. In the present study, a total of thirty Sprague-Dawley rats were randomly divided into five groups. Deep partial-thickness burn wound was induced on the dorsal part of the rats. Six animals from each group were sacrificed on the 3rd, 7th, 11th, 14th and 21st day post-burn, respectively. Half of the wound tissue was immediately fixed in buffered neutral formalin for hematoxylin & eosin staining. The healing of the epidermis was evaluated with scores ranging from 0 to 7 based on the state of crust on wound surface, the degree of epithelialization as well as the formation of rete ridges. Meanwhile, healing of the dermis was also evaluated with scores ranging from 0 to 7 according to the proportion of adipose cells, inflammatory cells and fibroblasts, the state of collagen deposition as well as the formation of hair follicles. Furthermore, temporal changes of histological score of epidermis and dermis in the skin tissue with deep partial-thickness burn was evaluated. In conclusion, a new comprehensive system for assessing microscopic changes in the healing process of deep partial-thickness burn wound in hematoxylin & eosin staining slides was established, which simplified the scoring process and helped to obtain reproducible and accurate results in the burn study.

Keyword: Burn wound; Histological evaluation; Partial-thickness burn; Score grade