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Autologous glandular stem cells (GSC) offer a new hope for burn patients

Haitham Salem
Cairo University, Egypt

Abstract

Objective: Major burn injuries remain a challenge for which more effective, novel and innovative skin regeneration strategies are desperately needed to avoid the resulting morbidity, mortality and the subsequent economic burden.

Materials and Methods: A deep partial thickness burn model of 20% surface area burn on the back of female nude mice was established. Mice were divided into two groups with two different management techniques. Injection-based technique, in which animals received 5x105 of isolated and characterized hSGSCs as direct injections into the burn wound margins (control: PBS injections). Scaffold-based technique, in which the coagulation zone was surgically removed leaving a margin of 1-2mm thick zone of stasis, then the defect was covered with a scaffold seeded with 5x105 hSGSCs (control: scaffolds only). Analysis of burn healing, vascular regeneration, immunohistochemistry and cytokine release were done after 2 weeks.

Results: hSGSCs expressed epithelial markers CK14, CK15, CK18 and CK19 in vitro. the injection-based technique group, showed a significant increase of the healing percentage in the hSGSCs-injected animals with an adherent epidermis and no underlying edema or histologically detectable cellular destruction, together with a significant increase of angiogenesis percentage compared to the PBS-injected controls. The Scaffold-based technique showed a significant increase of the healing percentage in the Matriderm-hSGSCs group associated with minimal edema and tissue destruction with a significant increase of angiogenesis percentage compared to its controls.

Biography

Dr. Salem has completed his Master's degree in Surgery on 2006 at Cairo University, Egypt. He obtained his PhD degree in stem cell biology and wound healing on 2008 from Germany, where he published a paper based on his PhD thesis in Biomaterials journal as an original article. He is currently a Lecturer of Plastic Surgery at Cairo University, Egypt. He attended numerous national and international conferences many of them as an active participant through an oral or a poster presentation. He has been serving as a selected reviewer for the Biomaterials journal since 2012.