Development of Fungal Mycelia as Skin Substitutes: Effects on Wound Healing and Fibroblast

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Abstract

In this study, Sacchachitin membrane, prepared from the residue of the fruiting body of Ganoderma tsugae, was estimated for its effects on wound healing and the proliferation and migration of fibroblast cells. Two mirror-image wounds were made on the back of female guinea pigs by dissecting a 1.5 x 1.5 cm2 skin surface of full thickness. Sacchachitin membrane was placed randomly on one of the wounds and gauze or Beschitin on the other. Changes in the wound area were measured and photographed after a predetermined amount of time postoperatively. Histological examination of the wound and surrounding tissue was also performed to reveal any interaction of tissue with the dressing. The results showed that the wound area covered with Sacchachitin membrane was statistically smaller than that covering with gauze on day 10, whereas there was no significant difference in the wound size compared to that with Beschitin. Fibroblast cells from the dermis layer of guinea pigs were used. The number of fibroblast cells were counted on the predetermined days in the culture suspended with or without 0.01% w/v dressing materials. By layering on DMEM plates, the number of fibroblast cells migrating across the center line or outside of the central hole were counted after five days. All the results indicated that both 0.01% w/v of Sacchachitin and chitin significantly enhanced the proliferation and migration of fibroblast cells.