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Histological Study of Skin Wound Healing with Fish Swim Bladder Matrix

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ABSTRACT

Today, because of the variety of wounds, a wide range of wound dressings produce with different objectives. One of the wound dressing, that skin tissue engineering scientists were concerned, is the use of animal tissue models as biological dressing for wound healing. Since the collagen scaffold has many applications in skin tissue engineering, for the first time in this experiment, rutilus fish swimming bladder matrix (FSBM) was used as a model of collagen-containing tissue for wound healing in rats. In this study, first the FSBM was decellularized by using ionic materials. Then 6 randomly selected rats were wounded on the back with 2 wounds 4 mm length. Wounds were divided into two groups: the first group as control and the second group using FSBM wound dressing. Wound dressings were changed daily. On days 3, 5 and 7 of the start of the experiment, tissue samples were taken from ulcers' sections and wound assessment indicator were evaluated by specific staining criteria. Wound histology image analysis showed that the FSBM increased migration of skin fibroblast cells and the process of forming the epidermis layer and angiogenesis and finally improved wound healing in compare with the control. It is assumed that FSBM is an appropriate model for wound healing and can be used as a new clinical biological dressing.

Keywords: Biological dressing, Fish swim bladder, Rat, Wound. Restoration skin