The effect of b FGF mixed with fibrin glue on skin flap vascularization.

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Abstract:

The corporeal substance b FGF is known to possess a strong and rapid effect on mesoblastic cell proliferation, and now that b-FGF can be synthesized by gene cloning, its use in wound healing, such as in promoting vascularization, granulation, accelerating osteocartilaginous growth, and other activities associated with healing is of especial interest. Therefore, the authors have conducted a rat study to investigate the effect of b-FGF mixed with fibrin glue on flap vascularization. A 3 x 6cm island flap, based on the right superficial inferior epigastric vessels, was raised on the abdomen of rats that were then placed into 4 separate rat groups, A through D. After this flap elevation, the 4 rat groups were treated as follows: the group A rats received no medication and served as the controls; the group B rats received a direct application of a b-FGF solution onto the back of the flap; the group C rats had an 8 x 8 x 1mm sheet of fibrin glue placed onto the top of each flap; and, the group D rats received the same size sheet of fibrin glue mixed with b FGF at b FGF concentrations of 1, 10, and 100 mug/ml. The flaps were collected daily and their microvascular morphology inspected according to a modification of method used by Spalteholz. Compared to the group A controls, the flaps of the group B rats showed some vascularization but it was not distinct. The flap microvessels of group C showed no remarkable change, whereas the group D flaps showed remarkable vascularization mainly on the sheet of fibrin glue mixed with b-FGF on the second day after flap elevation. Although this vascularization disappeared on day 7, the propagation of vascularization was evident all over the flap. While b-FGF is known to play a very important role in vascularization, not a few details about this substance remain unknown, such as its production control, its mode of secretion, and the mechanisms behind its effect, to name a few. Further, how b FGF is applied appears to directly

linked to its effectiveness, and many experiments of the effect of b-FGF on flaps have been conducted, by applying b-FGF directly onto the flap or by drip or by transvenous administration. Until now, however, almost no papers have reported such distinctly noted flap vascularization. In previous b-FGF application studies, only the direct application of b-FGF was used for flap vascularization. This is the first study to use a mixture of b-FGF and fibrin glue, and the effect of this slow release of b-FGF led to remarkable vascularization.