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Does VEGF Have an Effect on the Survival of a Long Random Skin Flap by its Application at the Recipient Area?

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Abstract

Background: Vascular endothelial growth factor (VEGF) is a hormone-like molecule which has been shown to act on a specific receptor system and in this way to be the basic regulator of angiogenesis. The effect on the survival of a long random skin flap was examined by exogenous administration of this cytokine, at flap's recipient site.

Materials & Methods: A standard dorsal skin flap measuring 1.5 x 7.5cm was elevated in eighteen wistar rats with the pedicle centered and attached between the lower angles of the scapulae. The length to width ratio was relatively high (5:1). The rats were divided in two groups of nine. In group A, flap was elevated and a skin defect was created next to it. Normal saline was injected into the fascia of the defect and the flap was transposed and secured over the previously created recipient site. In group B, flap was elevated and transposed to a previous created defect, as before, where, this time, injections of VEGF were applied into the fascia of the recipient bed. Seven days later the rats were euthanized and the flaps were excised. The underlying fascias of the recipient beds were also excised in the same dimensions. The specimens were measured, photographed and put into formalin 10%. Immunohistochemical staining and histological analysis followed.

Results: The differentiation between the surviving and the necrotic skin was macroscopically clear within seven days time. In group A, the mean flap survival percentage was 36.8%. In group B the percentage was 56.3%, respectively. Neovascularization of the fascia of the recipient bed was also demonstrated when VEGF had been injected.

Conclusions: Exogenous administration of VEGF into the recipient bed of a skin flap improved the survival rate even though the flap's length was relatively high compared to its width.

Key words: flap survival, recipient site, angiogenesis, VEGF, neovascularization

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