Revascularization of rat fasciocutaneous flap using CROSSEAL with VEGF protein or plasmid DNA expressing VEGF.

Authors: McKnight C.D., Winn S.R., Gong X., Hansen J.E., Wax M.K.

Publication Date: 2008

Abstract:

Background: Fasciocutaneous tissue transfer is a common reconstructive procedure. Revascularization of flap tissue is an important component of tissue healing. Gene therapy offers an avenue through which the period of pedicle vascular dependency can be reduced. Materials and Methods: Rat fasciocutaneous flaps were elevated and a two-hour ischemic time induced. Polycation complex (jet PEI) and human fibrin sealant CROSSEAL was applied between flap and underlying abdominal tissues. Group 1 (six rats) was the control; Group 2 (seven rats) had vascular endothelial growth factor (VEGF) protein applied; Group 3 (seven rats) had plasmid DNA expressing VEGF applied. Vascular pedicles were ligated on postoperative day 5, percentage flap survival evaluated on day 7. Results: All flaps survived initial ischemia. Mean +/- SD percentage area of the flap that survived was 28.1 +/- 12.4 (Group 1), 71.6 +/- 16.2 (Group 2), and 77.5 +/- 12.7 (Group 3) ($P < 0.001$, Group 1-3, 2-3). No differences were observed between Groups 2 and 3. Conclusions: Locally administered VEGF protein or plasmid DNA expressing VEGF enhanced survival of fasciocutaneous flaps.