

Fibroblast Growth Factor-2 (Fiblast Spray) Improves Scar Quality as well as Accelerates Wound Healing in 2nd Degree Burns and Burn Ulcer Surgeries

Senior Assistant Professor, Dept. of Plastic and Reconstructive Surgery,
Graduate School of Biomedical Sciences, Nagasaki University

Sadanori Akita, M.D., Ph.D.

Introduction: Although a number of cytokine or growth factor therapies for wound acceleration have been reported, few mentioned the quality of the outcome, which would be very important for patients' quality of life (QOL). Recently, a growth factor, the human recombinant fibroblast growth factor-2 (FGF-2) or basic fibroblast growth factor, (bFGF) first in the world, commercially named "Fiblast Spray", is available for clinical use since the year of 2001 in Japan and now widely used for burn wounds at early stage of the injury and surgery and for difficult wounds. Thus, clinical effectiveness and versatility were evaluated by objective tools.

Methods: First, the treatment for burn ulcers with or without bFGF administration at the time of debridement and continual administration over the mesh-skin grafting was compared with normal control in terms of quantitative and qualitative wound healing by clinical assessment, measurement for hardness using a durometer at one year after complete wound healing. Then, the comparison in the pediatric 2nd-degree burns with or without bFGF until healing were performed in the assessment of the clinical Vancouver Scar Scale and the corneal layer moisture parameters at least six months after the final wound healing and procedures. Finally the early application of bFGF for the adult 2nd-degree burn wounds (average age 57.8 ± 13.9 years old) were tested in terms of clinical parameters by a Vancouver Scar Scale, the frequency of the hypertrophic scars, the barrier function, represented by the moisture meter, the extensibility and elasticity by a Cutometer and the relative scar hardness by a durometer at one year after complete wound healing.

Results: Healing rate was significantly accelerated by early administration of bFGF in burn ulcer surgery and 2nd-degree burn treatment. Clinical hardness and parameters by a Vancouver Scar Scale were significantly improved when the bFGF was applied from the early stage of burns. Moisture parameters, which reflect the barrier function of the skin, such as effective contact coefficient, TEWL, water content and thickness in non-bFGF treatment were all significantly greater than those in bFGF treatment, while water content and thickness in bFGF treatment were comparable to those of the control. The durometer values are significantly lower in the burn wounds treated by bFGF and the extensibility and elasticity in the bFGF treatment demonstrated the significant better than those of the non-bFGF treatment.

Conclusion: The use of bFGF (FGF-2) from the early stage of burn surgery and 2nd-degree burns demonstrated better clinical quality as well as accelerating healing rate.