

Regenerative Medicine for Diabetic Foot Ulcer

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ABSTRACT

Chronic or non-healing wounds are wounds that have not made significant improvements after several weeks or fail to respond to medical or surgical management. They are wounds that do not undergo the normal healing process that includes inflammation, proliferation and matrix deposition and remodeling. They can be caused by diabetes, poor circulation, burns, pressure and other conditions, and are characterized by redness, warmth and pain, increased drainage or drainage with an odor, tenderness and swelling. Therefore, they can be found in patients with issues and conditions that inhibit tissue repair, including diabetic wounds, vascular insufficiency ulcers, compromised amputation sites, radiation necrosis and gas gangrene.

People with diabetes are especially at risk to develop chronic wounds, usually in the form of foot ulcers. Although traditional wound care often aids the healing process of chronic, non-healing wounds, as many as one-third of these wounds fail to heal. Regenerative medicine technologies thus have great potential to bridge the success rate gap for treatment of these ailments. The field of regenerative medicine has been focusing next generation technologies to help heal cutaneous wounds. One successful approach is the creation and use of three-dimensional scaffolds as extracellular matrix analogs that mimic the natural extracellular matrices. These scaffolds, when seeded with a range of molecules, including fibroblasts (the cells that synthesize the extracellular matrix and collagen), help foster cell adhesion, growth and differentiation to form skin functional and structural tissue. Stem cells, growth factors, chemokines, cytokines and other molecules are also being explored as regenerative medicine products to renew endogenous healing processes in chronic, non-healing wounds.

Keywords: Regenerative Medicine, Wound Healing, Foot Ulcer

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