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Wound healing for the hair transplant surgeon

Sara Wasserbauer, MD *Walnut Creek, California, USA* drwasserbauer@californiahairsurgeon.com

Introduction

As hair transplant surgeons, we often perseverate on aesthetic placement of grafts. However, getting grafts to grow optimally through effective wound healing is key to getting these good results whether one is discussing the donor area or the recipient zones.

Historically speaking, hair transplantation surgery was treated much like any other post-operative wound. The days of the whole head dressings, weeks of antibiotics, and punch grafts healing via secondary intention will bring a shudder of recognition to the experienced surgeon. More recently, the focus on minimally invasive techniques, scar minimization (through trichophytic closure and FUE most notably), and maintaining a moist (not wet OR dry) environment has improved both the wounds themselves and the patient experience. Without delving into extreme cases of poor wound healing, infection, or rare complications, following is an overview of the process and a point-by-point guide to optimizing wound care for your hair transplant patients.

Physiology of Wound Healing: A Quick Review

It is clear that for all wounds, achieving the optimal wound moisture balance is fundamental for optimal healing. Too wet and a wound gets macerated, too dry and reepithelialization is impeded and scar formation is encouraged (Figure 1).

Wounds for recipient sites, FUE, or traditional "strip" surgery are full-thickness wounds, and both granulation and contraction are a part of their healing process (Photo 1). It should be noted that trichophytic incisions are technically a partial-thickness wound with reepithelialization as the primary healing modality.

The acute period of wound healing lasts about 2 weeks and is divided into three phases. The *inflammatory phase* is the first and involves macrophage and neutrophil migration within the first 72 hours. Fibroblasts (and other inflammatory cells) will be activated by the damaged cells in the area. Vasodilation will permit these additional inflammatory cells to migrate to the area during this time, and fibroblasts will start to create the collagen structure. This means that from the moment the surgeon takes a strip or starts an FUE surgical process, the patient's "wound healing" clock is ticking (Figure 2A).

The second stage is the *proliferative phase* and for a hair surgeon the majority of this phase occurs out of the office and out of direct control. Neutrophil numbers decline and fibroblasts and epidermal cells perform the majority of the wound healing processes including collagen matrix formation and closing of the wound itself. The matrix is an essential structural component, allowing the rest of the cells (keratinocytes and epithelial cells for instance) to migrate to where they are needed and then proliferate. This phase is where maintaining an adequate moisture balance (and occlusion if possible) is also essential because reepithelialization occurs fastest in moist, occluded wounds. Revascularization also occurs during this period (Figure 2B.)

The third and final stage is *remodeling,* which is characterized by fibroblast activity that re-works the collagen matrix over time and myofibroblasts that create wound contraction. This collagen matrix is particularly interesting, with new therapies to encourage its formation gaining

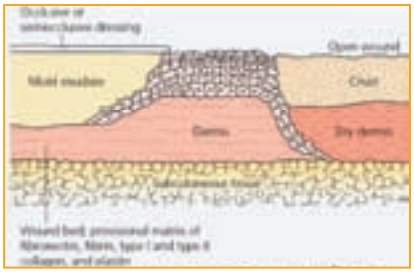

Figure 1. Occlusive dressing. The effects of tissue humidity on reepithelialization are shown. Occlusive dressings allow epithelialization to occur at the wound surface. In open wounds, the epithelium migrates beneath a desiccated crust and devitalized dermis. ©*2010 Elsevier Inc. Habif: Clinical Dermatology, 5th Edition*

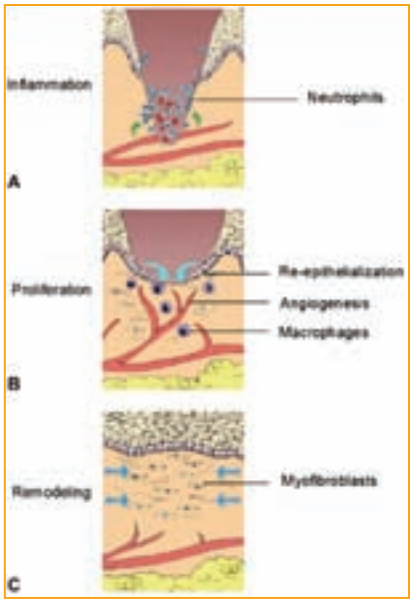

Figure 2. *A:* Inflammation; *B:* Proliferation; *C:* Remodeling. *From Habif: Clinical Dermatology, 5th Edition.*

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