

# Abnormal Scars, Management Options

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**Abstract:** Scar management has always been important but never as much as today. People are now more aware of their scars, given the hype in the media about looking good. They are more likely than ever to seek treatment for scars from the cosmetic point of view. But scars can be problematic, they can itch and be uncomfortable and painful, they can be disfiguring and aesthetically unpleasant, and may cause sleep disturbance, anxiety, depression and disruption of daily activities. If they lay over the bone joint they can limit its function, so we should not always look at scars from the cosmetic point of view. This article aims to provide a physiological overview of wound repair, describing the options of therapy.

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**Wound healing overview**

Wound healing is a very complex process that is tightly regulated to achieve wound repair. The process can be classified into three distinct phases that have very different objectives: inflammation, proliferation, and maturation. Following the initial tissue injury, inflammatory mediators, known as cytokines, are released from the injured tissue cells and wound blood clot, and thereafter the inflammatory phase initiates. If the wound-healing process is uncomplicated, the proliferation stage begins several days after the injury. Platelet degranulation activates the coagulation cascade, and the resultant fibrin clot serves as a scaffold for the proliferation phase of wound-healing. During the proliferative phase, the number and density of fibroblasts in the extracellular matrix increase, and the fibroblasts synthesize tissue components, such as proteoglycans, fibronectin, and collagen. New vessels and epithelium are formed as rapidly as possible to maximize the tissue-replacement dynamics. All wound cells are maximally active and are sensitive to factors that regulate cell proliferation and protein biosynthesis. As the cells proliferate, metalloproteinases are simultaneously released into the extracellular fluid to activate a matrix breakdown process. The balance between tissue degradation and biosynthesis permits remodelling of the provisional tissue and also determines the net amount of scar tissue produced.

When enough provisional tissue is generated, turn-off signals received that initiates the final stage of wound-healing, the maturation. This phase is characterized by cellular apoptosis and a shift in balance from scar remodelling toward scar degeneration. The process is accompanied by extracellular matrix reorganization and reduction. Metalloproteinases synthesized during the proliferation stage continue to break down the extracellular matrix at a rate largely determined by physical and biochemical factors in the matrix. The amount of extracellular matrix biosynthesis is controlled by need for tissue strength and other operational parameters. Mechanical stress is an important contributory parameter in the net scar production.

The most important known determinants of scar production are the extent and duration of inflammation, the magnitude of mechanical tension acting on the scar, and the genetic phenotype of the individual. Also some other factors may play a role with not yet known importance.

Scar management fundamentally based on these three parameters can be effective in limiting unnecessary formation in most cases.

**Types of scarring**

It is important to differentiate between normal and abnormal scarring. All scarring is part of the natural continuum of tissue repair. The ideal end point is tissue regeneration, with the new tissue having the same structure as undamaged skin. Normal scars are determined when the quantity of newly synthesized collagen is not excessive, there is no undue redness, the tissue is not hard and the skin has

sufficient elasticity not to restrict movements (Carney, 1993). Normal scarring, therefore, should not be distinct from the surrounding skin and occurs as a natural process of remodelling during the stages of wound healing.

There are several different types of abnormal scars:

#### *Keloid scars*

Keloid scars are raised scars that spread beyond the margins of the original wound and invade the surrounding skin. They are considered to be benign growths that continue to grow over time and do not regress spontaneously. They are formed as the result of trauma such as insect bites, acne, surgery, ear piercing, lacerations, abrasions, tattoos, vaccination and burns. They invariably recur after simple excision and often grow on areas such as earlobes, sternum and the deltoid area (Munro, 1995). The mainstay of treatment for keloid scars is excision, appropriate wound care by equating dressing characteristics with phase of healing, clinical finding and patient needs.

#### *Hypertrophic scars*

Hypertrophic scars occur soon after surgery and often as the result of burns. These scars are red and rise above the level of the surrounding tissue, often occur over a point or skin crease and soften and flatten spontaneously with time and treatment (Carney, 1993).

#### *Contracture scars*

Causes tightening of skin that can impair the ability to move; additionally, this type of scar may go deeper to affect muscles and nerves.

#### *Acne scars*

There are many types of acne scars, ranging from deep pits to scars that are angular or wavelike in appearance. Possible treatments will depend on the types of acne scars.

### **Management**

Understanding the mechanism of scarring is important to assess the newly healed wound. It is much more effective to prevent than to treat them. Prevention implies using a therapy with the aim of reducing the risk of a problem scar evolving. Early diagnosis of a problem scar can considerably affect the outcome. The following therapies are used for scar management: massage, compression garments, surgery, laser therapy, cryotherapy, interferon therapy... etc.

In fact, keeping up with the ever-increasing number of wound dressings is a similar dilemma to staying informed about new drugs on the market. Wound care dressings have specific indications, contraindications, and characteristics. Selecting

the appropriate wound care products for the varied clinical situations depends on the type of wound, location of the wound, presence of infection, wound depth, surrounding skin integrity, product availability, care giver ability, cost, and goal of treatment. The goal of treating scars is to restore functionality, provide relief symptoms, enhance cosmetics, and prevent recurrence. Over the past several decades, a variety of new and exciting products from synthetic materials was designed to retain moisture at the biologically active coverings of the body.

According to the international clinical recommendation on scar management, silicon gel sheeting and intralesional corticosteroids play a primary role in the management of abnormal scars. We think that there is no single treatment for scars that is adequate, it is important to employ a combined treatment. Also, we should observe scars for a period of 12 to 24 months before we deem that the treatment has been successful or helpful. For example, if the scar has started to feel firm, is warmer than the surrounding skin, painful, itchy, redder or even slightly raised, then we should manage scar symptoms before another therapy be considered.

#### *Scar massage*

The favourite type of lotion and should be applied in a small amount at the scar when scabs are all gone (3–4 weeks after surgery). Massage with fingertips for 5 minutes should be provided twice daily, pressing hard enough so the tissue blanches. Pinching the scar hard between two fingers is the best technique.

#### *Topical Silicone Pads*

- *Dermatix Ultra*: Odourless, easy to use, combine with massage for 5 minutes twice daily. Use this product together with scar massage;
- *Kelo-cote*: Use at night since it is greasy;
- *Scargel*: Easy to use but you must wait for it to dry;
- *Scar Strip Pads, TopiGel*;
- *Scar Therapy Pad (Curad, others)*: Easy to use, reusable until sticky side wears off;
- *Cica-Care Silicone Sheeting*: More expensive, top-of-the-line, used for thick and problematic burn scars;
- *Paint-on treatment: Scarguard*: Easy to use, dries quickly, strong medicinal odor.

If this scar therapy together with massage is not effective within 3–6 months, there are additional options:

- *Low dose steroid injections*: Performed every 6–8 weeks for a maximum of 3 injections. May cause thinning and white pigmentation of skin;
- *Ultrasound treatments*: Take a few minutes, used with or without scar control gel;
- *Steroid creams*: Used once a day in the short term, may improve itching and redness;

- *Surgical revision*: As a last resort, when conservative management has failed. Scar therapy methods above to be initiated within 3–4 weeks and continued for at least 3–6 months to optimize scar maturation.

### Conclusion

Wound healing is a complex process. The success of healing involves many factors. Understanding the effects of appropriate wound care, knowing to equate dressing characteristics with the phase of healing, clinical findings, and patients' needs can positively impact healing outcomes.

Different scars require different treatments. For example, severe burns that destroy large sections of skin cause the skin to heal in a puckered way. As the skin heals, muscles and tendons may be affected in this „contracting“ movement. Keloid scars are a result of the skin's overproduction of collagen after a wound has healed. These scars generally appear as growths in the scar site. Hypertrophic scars, unlike keloids, do not grow out of the boundaries of the scar area, but because of their thick, raised texture, can be unsightly and may also restrict the natural movement of muscles and tendons (Edriss and Měšťák, 2005).

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