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Evaluation of the Effect of Surgical Treatment on Facial Scar

2971

THESIS
Submitted in Partial fulfillment
For Requirement of the
M. Sc. in General Surgery

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2001

ACKNOWLEDGMENT

FIRST AND FOREMOST "THANKS TO GOD, THE BENEVOLENT AND MERCIFUL"

I would like to thank all of persons who helped me in my research, especially our staff in the department of 27B surgery in KASR EL-AINI Hospital. Great thanks to our **Professor Dr. Mostafa El-Sharkawy**, the head of the department. Also I would like to express my supreme gratitude for **Prof. Dr. Salah El-Din Abdelghani**, who willingly offered his expertise, time and resources to provide this work.

I am extremely grateful for **Dr. Wael Sakr**, the Lecturer of surgery for his expert assistance and guidance throughout the preparation of this work.

Last but not least to my little family especially my wife for her patience, and my dear daughter Yasmina.

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INTRODUCTION

Whether caused by injury, surgery or burn, scar can be disfiguring. Scars stand out against the rest of the skin because scar tissue is made of collagen cells rather than ordinary skin cells (Bernard et al., 1998).

As a result, scars are usually a different color, and do not have sweat glands or hair follicles. The severity of a scar depends on many factors, including the size and depth of the wound, the blood supply to the area, the thickness and the color of the skin. Some people especially those with deeper skin tones have a tendency to produce prominent, raised scars called Keloid (Wong et al., 1998).

Scars can negatively affect self-esteem or remind patients of traumatic accident. They may be a focal point of unkind attention as well. They can itch or hurt (in case of many keloid scar) or even restrict activity. While scar revision can't make a scar vanish completely, scar revision procedure can diminish the appearance of scars, and help restore a damaged self- image. Sometimes the procedure can even improve the function of the site treated by easing the stiffness of the skin (Phillips et al., 1998).

Control of scarring is certainly one of the most difficult challenges of surgical practice, presents a difficult therapeutic problem and most surgeons have sought to achieve the most aesthetic scars. A major factor determining the final cosmetic appearance of cutaneous (facial) scar is tension acting on the wound edges during the healing phase. Since The Oder Kocher Pioneered the alignment of skin incisions with Langer's Lines in 1892, surgical techniques that attempt to overcome closing tension have become standard yet; no treatment has been available to minimize underlying muscle contractions, which are the major cause of this tension (Norris, 2000).

Treatment of facial scars can be a challenging proposition even for the experienced physicians. Numerous treatments exist that the physician can use to treat the patient. Because each of these methods can partially improve the scar in a particular way, a combination of treatments is frequently required to achieve maximal results. Patients can have unrealistic expectations about the resolution of their lesions, and the physician must therefore counsel the patient on which type of improvements can be seen. One must also emphasize that complete resolution of the scar may not be possible, and the multiple treatments (of one or varying procedures) frequently are required. Scars on the face also frequently carry more psychological impact for the patient, and these issues need to be addressed. Hence, extra care should be taken when treating facial scars. Many of the studies on scars are done on other parts of the body. Precautions should be taken when taking this information and extrapolating it for use on the face. Facial skin is thinner, particularly in the orbital area. Skin also has more appendages, including hair follicles, which should be taken into consideration with the different treatments (Raphael et al., 1994).

One of the most current lines of treatment including surgery described by Druit as early as 1884 and adjunctive radiation (Ship et al., 1993). Cryosurgery (Layton et al., 1994), laser surgery (Tina and Carmen, 1995), and immunotherapy (interferon) (Pittet et al., 1994). Other lines include pharmacological therapy like silicon gel occlusive sheeting (Bernard et al., 1998), intralesional corticosteroids injection (Oikarine, 1992), calcium channel blockers (verapamil) intralesional injection (Lawrence, 1996), topical retinoic acid (0.05%) (Rockwell et al., 1989), Aciatic acid (Bosse et al., 1979), adhesive zinc tapes (Soderberg et al., 1982), colchicine (Waki et al., 1991)

and D-penicillamine topical form (Peacock, 1996). The success of scar revision often depends on the type of the scar.

Evaluation and Classification of scars

It is necessary to evaluate the type of scar on the initial consultation. Different scars respond to different modalities of treatment with varying degrees of success. In the initial consultation, the physical characteristics of the scar that make it different from the surrounding skin should be identified. For most scars, several aspects need to be addressed, possibly in different ways. Is the scar elevated or depressed? Even a one-mm difference can cast a shadow on the face that can make a scar more apparent. An elevated scar must be made flatter. This can be accomplished with topical treatment or dressing, injections, resurfacing, or vascular laser surgery. A depressed scar must be elevated.

Is the depressed scar distensible? A non-distensible scar either must be treated by subcision if amenable, or removed surgically. A distensible or partially distensible scar can be minimized either with fillers or with laser resurfacing and possibly vascular laser surgery.

Is the color different? An erythematous scar can be made less red, this is most easily accomplished with topical preparations and vascular laser treatment. A white or hypopigmented scar, however, must have pigment added to it, with micropigmentation. A hypopigmented scar needs to be treated with bleaching creams and possibly a pigmented lesion laser.

Is there is difference in texture? The scar can be smooth because of increased depositions of fibrous tissue in the area. This can be improved with lasers or occlusive treatments.

Is the surface wrinkled owing to atrophy below? This is difficult to treat but appearance can be improved with the use of filler materials or possibly laser surgery.

The clinicians must evaluate all of these aspects of the scar and treat each identifiable one to improve the scar maximally. Scars can further be classified by the type and maturity of lesion. (Noris et al., 2000).

AIM OF WORK

This work is planned for re-evaluation of the effect and success of different lines of treatment of facial scars, especially surgical excision.

REVIEW OF LITERATURE

Healing of wounds in most terrestrial vertebrates occurs by *scar* formation. So *scar* or *cicatrix* may be defined as the new tissue that is formed in the healing of a wound (Dorland, 1974).

Human soft tissue healing is basically non regenerative. That which is destroyed is not restored but replaced by a less well-differentiated tissue –scar- which contracts and draws the remaining normal parts together (Van Den Brenk, 1956). A scar is the inescapable results of the healing process. Despite the inevitability of the scar formation process plastic surgeons are frequently asked to revise or improve scars. In considering the realities of scars, the discussion will be divided under five headings: -

- 1) Basic observations of cutaneous scars.
- 2) The physical basis of scar contraction.
- 3) Skin sutures and skin suture marks.
- 4) Keloid and Hypertrophic scars.
- 5) Scar revision and its complication.

I- Basic Observations of Cutaneous Scars:

A 'good scar' is one which is no more than a fine line, level and even with the surrounding surface; it is the same color as the surrounding skin and causes no contracture, pull, or distortion of the surrounding structures.

Some areas of the body rather consistently heal with less noticeable scars than others. For example, incision in the eyelids usually leaves fine, almost invisible scars. The forehead, palms, soles, penis, scrotum, and all mucous membranes generally share this happy result.

Other areas are not so kind to the surgeon or the patient (Nicolai et al., 1997).

Scars over the lower portion of the nose often become depressed. This all too frequently happens despite proper attention to the best surgical precepts. Certain conditions such as lymphedema also predispose to unsightly scars. To clarify the etiology of the scar formation we have to give a highlight on the "*healing wound process*" (Waki et al., 1991)

II- The Physical Basis of Scar Contraction

Wound healing is a complex cascade of biochemical and cellular events designed to achieve restoration of tissue integrity following injury. Much has been known about individual event that compromise this cascade, however, little is known about special and temporal interviewing of these events and how one biologic step sets the stage of subsequent observed phenomena (Barbul, 1990).

The healing by "Primary intention ": This refers to the process, which takes place when the wound is pulled together by sutures or adhesive so that the epidermal edges are brought into apposition. But it is important to stress that, although the edges may be easily brought together and re-epithelization may be rapid, the eventual strength of the closed wound will depend upon subsequent healing in the dermis (Burton, 1992).

Healing by "Secondary intention": If there is a major loss of the skin, the wound may be allowed to heal from the base by the formation of granulation tissue. In this process there is deposition of new collagen, but contraction of the wound is also important in repairing the defect. This simple method of wound management can produce excellent cosmetic results, especially on concave surfaces (Berntien, 1989).

Stages of wound healing:

Classically, three stages of normal dermal healing are described, the inflammatory, the fibroblastic and the maturation phases (Rudolph, 1987).

In the first "Inflammatory" phase, wounding is immediately followed by a classic inflammatory reaction. Capillaries dilate and pour out fluid into the wound, fibrin clots and seals the wound. Biochemical substances are released that cause vasodilatation and pain. Inflammatory cells are mobilized and move into the wound area. During this phase the epithelium grows across the sealed wound.

In the second "Fibroblastic" Phase. The main strength of the wound is generated. Fibroblasts move into fibrin clot and begin synthesizing large amount of new collagen in a structural framework. During this phase the strength of the wound rapidly increases.

In the "Maturation" phase the nodularity and redness of the fibroblastic phase gradually soften and flatten. Biochemically, There is ongoing simultaneous collagen synthesis and degradation. There is a continuing slow increase in wound strength up to a year following injury.

Pathological events in the process of wound healing: Tissue repair is accompanied by an orderly and definable sequence of events starting with wound closure and progressing into repair and remodeling of the damaged tissue (Falcon & Caldwell, 1990).

The first event to take place after injury is hemostasis with platelets and clotting factor release. Platelet degranulation leads to increase levels of factors such as platelet derived growth factor (PDGF) which along with other growth factors, transforming growth factor-alpha (TGF- α), transforming growth