HYPERTROPHY SCARS AND KELOID. HEALING TREATMENT BY APPLYING SILICON GEL LOCALLY

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INTRODUCTION

Hypertrophy scars and keloid are attributed to over production of connective tissue; the production of fibres and proteins which they normally replace the damaged ones by injury or intensive inflammation, is much bigger than this in normal condition. The hypertrophy scar remains restricted within the borders of initial wound, while the keloid goes further into the surrounding healthy skin.

General and local factors[1] favor their growing. Among the general factors are: heredity, age, sex, but also hormonal and metabolic disorders. Therefore, they appeared more often to females aged between 15 and 30, during pregnancy, and it is possible to come with disorders of growth hormone and calcium. Among the local factors are the presence of an outside particle inside the wound, the excessive tension during suturing the surrounds of the wound, the kind, the depth and the size of the wound, the transfection and finally the part of the body which the keloid grow. The outside particle could be even the keratin or stitch; burns favor their growth, while selective locations of scar and keloid appearance can be the neck, the shoulders and the feet.

It is difficult to confront hypertrophy scars and keloid and they often deteriorate. Many kind of treatment have been suggested with various results [1]. Silicon gel along or in conjunction with vitamin E, have been applied locally, imiquimod cream 5%, pressing damaging area, corticosteroid or interferon injection inside the wound, cryotherapy, incision, radiation therapy, or laser, or even a combination of two, or more of the above methods.

Applying silicon compounds for confronting hypertrophy scars and keloid, seem to be effective enough in clinical cases, as mentioned in several published studies [2-8]. In this study a different silicon compound was used, different from everything ever used so far, in order to evaluate his effectiveness against hypertrophy scars and keloid.

PATIENTS AND METHODS OF RESEARCH

Eleven (11) patients, five (5) males and six (6) females, aged 17-62 years old, in generally good health, were the subjects of our study. Patients have at least one keloid or hypertrophy scar, with no modification in size, color and subjectively symptoms for the last 6 months, with minimum diameter 0,5 cm and minimum depth 3mm. None of the women was in pregnancy, and none of the patients had undergone in therapy for scar or keloid for the last two (two) months before the study begins.

Dimensions of keloid or hypertrophy scar, hardness, pain, erythema, itchiness and the sense of tension were the evaluation parameters of the therapy. As much as it concerns the dimensions there was a measurement of length, width and height of the part of scar which bulged out the skin surface. All the parameters were estimated in a scale ranged from 0-3 (0 = no change, 1 = medium, 2 = significant, 3 = very significant).

The therapy results were also evaluated by the patients at the end of the 12month therapy.

The silicon gel compound which was used was in tube of 30 ml, with main ingredients: Polysiloxane, Rosa Moschata, Vitamin E, Allium Cepa, Triticum Vulgare and Filagrinol (Kelogel of VERSION Co). The gel was applied on the wounded area and 1 cm around the wound, for at least 12 hours per day and for a 12 week period.

The results and the estimation of parameters value are written down on the 4^{th}, 8^{th} and 12^{th} week when patients visited the hospital. All the patients completed the therapy.

OUTCOMES

The outcomes of the study were summarized in Table I. In details, as much as it concerns the dimensions, ten (10) out of eleven (11) patients (90.9%), when the 12 week therapy finished, they had a decrease of the keloid or scar surface which bulged out from the normal skin, related to the original skin. In six (6) patients (54.5%), the surface was in the same level with the skin (grate = 3). In four (4) patients (36.4%) the decrease was significant (more than 50%, grate = 2). In one (1) patient (9.1%) there was no change. The decrease was emerge from the first month in four (4) patients (36.4%) out of eleven (11), while in six (6) of them (54.5%) there was recorded after 6^{th} week.

There was no change in length and in depth of the damage area in any patient during the therapy (no growth or detumescence).

The sense of tension was reduced in nine (9) patients (81.8%), increased in one (1) patient (9.1%) and remained unchanged in one patient (9.1%). Full improvement was noticed on five (5) patients and significant improvement, over 50% (grate = 2) in four (4) patients.

Itchiness was reduced in ten patients (90.9%) and in one patient (9.1%) remained unchanged. Among those patients with itchiness reduction, the improvement was significant in four (4) of them (over 50%, grate = 2), very significant in two (2) patients (over than 90% grate = 2.5). In four (4) patients there was total restraint of the itchiness.

Erythema was improved in six (6) patients (54.5%), remained unchanged in four (4) (36.4%) and deteriorated in one patient (9.1%). Among those patients with improvement of erythema, four (4) of them had total erythema restraint and in two (2) restrained over 50% (grate = 2). There was significant improvement of hardness in all patients (over 50% grate = 2) but one, which it was improved about 25% (grate = 1).

Patient without improvement or deterioration in all indexes was the same.

Bursitis occurred in one patient on the surrounding healthy skin, probably as a side-effect which it was handled with local antibiotics, quickly and efficiently without the necessity of ending the local gel application.

Finally, after twelve weeks of therapy, the patients had expressed their opinion about the method's effectiveness. The results are presented in the Table II. Eight (8) (72.7%) out of eleven (11) patients were satisfied, five (5) (45.5%) were very satisfied (grate = 3) and three (3) (27.3%) were medium satisfied (grate = 2). Two (2) patients were little satisfied and one patient was no satisfied at all from the therapy (grate = 0)

DISCUSSION

Satisfying healing outcomes achieved when it was applied Kelogel silicon gel for 12 hours every day and for 3 months on hypertrophy scars and keloid, by patients of this study. The examined clinical parameters such as bulged scars, pain, and sense of tension, itchiness, erythema, and hardness had significant clinical improvement in most of the cases.

Since the first announcement in 1982 by Perkins et al.[2], most investigators noticed improvement in clinical appearance of hypertrophy scars and keloid when applying locally silicon gel. In 1992 Katz[3] announced improvement in 9 out of 15 cases that had keloid and hypertrophy scars for a period more than a year. Also, he noticed that recent scars, those who appeared in a less than 3 month period, did not become hypertrophy with the treatment. In 1993 and 1994 Gold[4,5] announced similar outcomes and in the second study, a placebo was used. Quin and al.[6,7] noticed that the use of silicon applications changed the skin hydration and the water loss by evaporation is half related to the normal skin. Davey[8] believes that the silicon gel covers the skin, makes it waterproof and works the same way in the corneous layer, achieving haemostasia by reducing the hyperemia and fibrosis. The way of silicon acts remain inexplicable. Sawada and Sone [9,10] and Palmieri and co.[11] support that the cover (waterproof) and the following hydration are the main factors which lead to handle keloid by

applying locally gels, but not silicon ones. Woods and al. support that the cover reduces the interleucin-1a levels. Interleucin-1a is a cytocin which acts in many ways and areas, including the growing production of fibrin connective tissue straight from the glucose amino glucanes (G A Gs), as well as putting forward the interleucin–6 production, which in its turn is also an activator of fibrin connective tissue production from extra cellular elements.

Regardless of the way that locally applied compounds act, it seems by recent comparative studies which use placebo, that the application is effective in dealing with hypertrophy scars and keloid. Treatment duration varies in several studies and ranges from 2 to 12 months. But in most studies it has been applied for 2 months and for 12 hours per day (Table III).

The results from our clinic study show that the silicon gel local application is useful and effective in the majority of hypertrophy scars and keloid. It seems by this study that the 12 week therapy is adequate for achieving definite improvement of clinical evidence. But it seems that the choice of therapy duration depends on the clinical features and on localization of keloid or hypertrophy scars.

Table I
Improvement of Clinic Spots after Applying Silicon Gel for 12 Weeks

Evaluation Parameters	Improvement (number of patients)				
	Very Significant	Significant	Medium	None	Deterioration
Swollen	6 (54,5%)	4 (36,4%)	-	1 (9,1%)	-
Pain	3 (27,7%)	4 (36,4%)	1 (9,1%)	2(18,2%)	1 (9,1%)
Sense of burns	5 (45,5%)	4 (36,4%)	-	1 (9,1%)	1 (9,1%)
Itchiness	6 (54,5%)	4 (36,4%)	-	1 (9,1%)	-
Erythema	4 (36,4%)	2(18,2%)	-	4 (36,4%)	1 (9,1%)
Hardness	—	10(90,9%)	1 (9,1%)	-	-

TABLE II
Evaluation of Therapy Results by the Patients

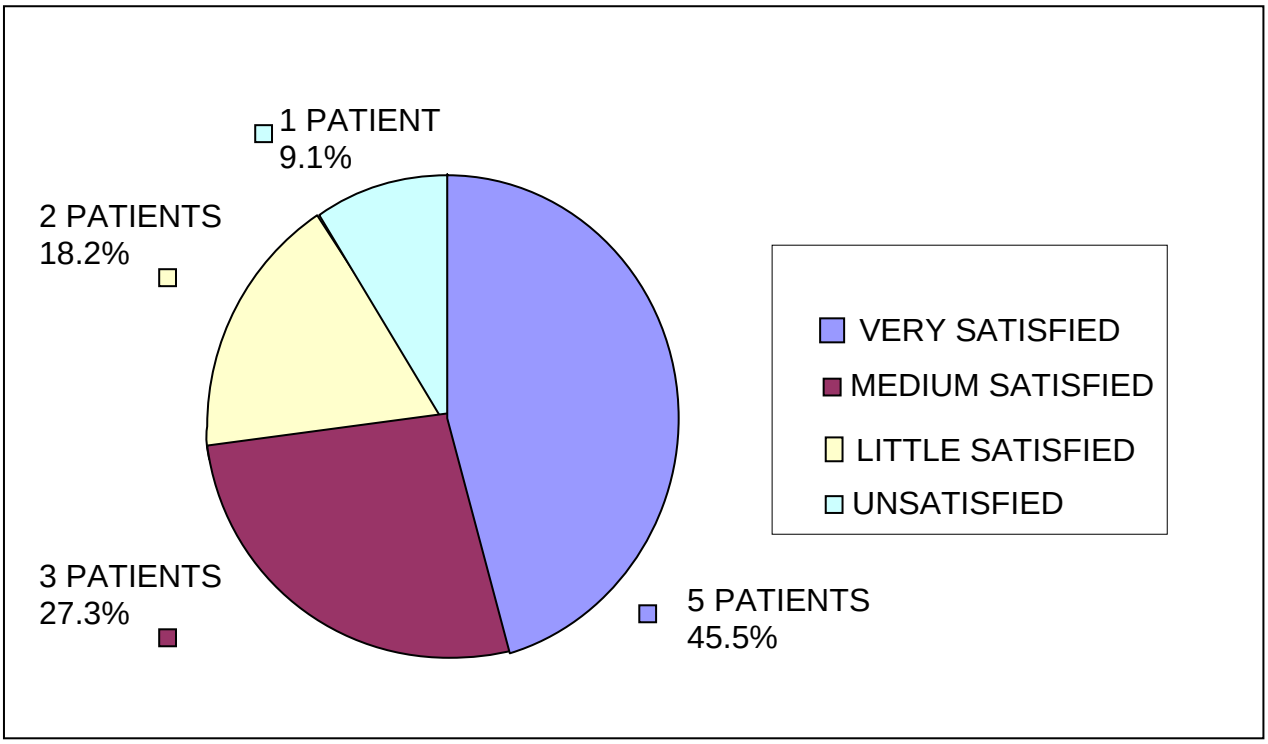

TABLE III
Main Studies Concerning Hypertrophy Scars and Keloid Therapy with Silicon Gel

Authors	Magazine year	Number of patients	Therapy duration	Evaluation parameters	Percentage of improvement
Quinn K J, Evans J H, Courtney J M, Gaylor JDS, Reid W H	Burns, 1985	40	2 months (12 hours per day)	color, depth, texture	79%
Quinn K J	Burns, 1987	129	2 months	color, depth, texture	80%
Ohmory S	Aesthetic Plastic Surgery ,1988	48	2-12 months (8-12 hours per day)	erythema, bulged out, itchiness, pain	90%
Ahn S, Monafo W, Mustoe TA	Surgery, 1989	14	2 months (12 hours per day)	color, depth, texture	75%
Mercer N S G	Br Plastic Surgery, 1989	22	6 months (8 hours per day)	color, depth, texture	86%

Ahn S, Monafo W, Mustoe T A	JAMA 1989, Aug 1990, Sept	14	2 months (12 hours per day)	color, depth, texture	77%
Vloeman J	JAMA 1989, Dec 1990, April	20	5 months	pain, healing, inflammation, color, erythema	75%
Ahn S, Monafo W, Mustoe TA	Arch Surgery 1992, April	48	2 months (12 hours per day)	Elasticity, color, depth, bulged out, size	76%
Katz BE	Cosmetic Dermatology 1992, June	23	2 months (12 hours per day)	color, erythema, size, bulged out, itchiness, pain	60%
Dockery GL, Nilson R Z	Journal of Foot and Ankle Surgery, 1994	94	2 months (24 hours per day)	Bulged out, color, depth, itchiness	95%
Gold M H	JAAD 1994, March	21	3 months (12 hours per day)	Bulged out, color, depth, itchiness	90,50%
Palmieri B, Gozzi G, Palmieri G	Int J Dermatol 1995, July	80	2 months (10 hours per day)	itchiness, pain, erythema, hardness, depth	95%
de Oliveira GV, Nunes TA, Magna LA, Cintra ML, Kitten GT, Zarpellon S, Raposo Do Amaral CM	Dermatology Surgery 2001, Aug	56	4 months (12 hours per day)	size, reddish, pain, itchiness, color, depth	78%

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