

Pressing and Stretching of Psoriatic Lesions Induces Their Involution

HIDEAKI TAKEMATSU and HACHIRO TAGAMI

Department of Dermatology, Tohoku University School of Medicine, Sendai, Japan

Remission of psoriatic lesions was induced when the lesions were firmly pressed with a plastic cap held in place by an elastic bandage for 24 h or stretched with a negative pressure of 200 mmHg for 2 h. Seven out of 10 patients showed a clinical improvement of the treated psoriatic lesions. These lesions cleared within 1–3 weeks after removal of the apparatus. Biopsy specimens taken from responding lesions showed a reduction in psoriatic epidermal and dermal changes as compared with those taken before treatment. Patients having extensive active psoriatic lesions experienced recurrence after approx. 3 weeks. No complications were seen except for an occasional formation of erosions at sites the edges of the apparatuses were apposed too firmly. *Key words: Physical damage; Epidermal kinetics; Suction blister.*

(Accepted October 9, 1989.)

Acta Derm Venereol (Stockh) 1990; 70: 176–179.

H. Takematsu, Department of Dermatology, Tohoku University School of Medicine, 1–1 Seiryomachi, Sendai 980, Japan.

A variety of physical methods such as local hyperthermia (1, 2) and cryotherapy (3, 4) have been shown to induce a clearing of psoriatic lesions. Physical destruction of psoriatic lesions, i.e. electrodesiccation (5), skin abrasion (6), surgical removal (7) and laser treatment (3, 8) have also been demonstrated to be a beneficial treatment for psoriatic lesions.

The pressing and stretching technique was evolved from a chance observation of psoriatic lesions where suction blisters were caused by applying a hollow syringe cylinder. Approximately a week after this procedure, we found areas devoid of lesions corresponding to the attached sites of the rims of the cylinders, whereas the psoriasis remained unchanged in other areas. Considering the possibility that physical damage induced by pressing and stretching inflicted on the psoriatic epidermis might lead to clearing of psoriatic lesions, we studied the effect of the pressing and stretching technique on psoriatic plaques. In this communication we report a beneficial effect of this technique on psoriatic lesions.

METHODS

Ten patients with long-standing, resistant psoriasis were selected for the study. Their ages ranged from 22 to 76 (average age 48 years). Earlier treatment had been discontinued for at least 2 weeks before entry into the study.

Plaques on the extremities or trunk were selected for the pressing or stretching. Plastic caps of bottles with a diameter of 2 to 3 cm were placed on psoriatic lesions with the flat side apposed to the skin, and were held in place with elastic bandages for 24 h. For stretching, a negative pressure of 200 mmHg was applied for 2 h with hollow cylinders of disposable syringes by placing the broad and flat end on the skin (9).

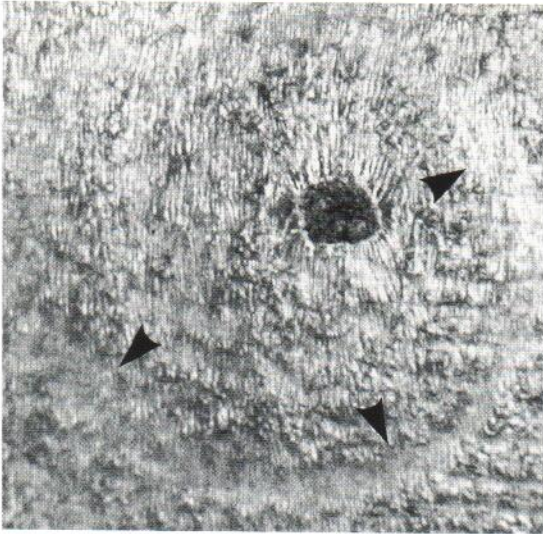


Fig. 1. Patient 1. Seven days after stretching a psoriatic lesion with a negative pressure of 200 mmHg for 2 h to raise a suction blister. Psoriatic lesions have disappeared only in the areas where the rim of a cylinder was applied (▶) whereas psoriasis is observed in the other areas. A crust is observed in the centre where a suction blister was formed.

After treatment with pressing or stretching, the treated areas and surrounding were simply protected by gauze. The severity of the lesions was assessed in induration, erythema and scaling. Differences were assessed at pretreatment and 4 and 7 days after each treatment (10).

Serial 2-mm punch biopsy specimens were obtained from the rim of the treated areas approximately 1 cm apart. The biopsies were taken before and 4 and 7 days after the treatment.

RESULTS

Clinical findings

Seven out of 10 patients enrolled in this study showed a clinical improvement. Progressive reduction in thickness, scaling and erythema was noted in the treated lesions (Fig. 1). Four days after pressing or stretching, the lesions showed a less scaly appearance, with diminished thickness and erythema. They had almost completely resolved within 1–3 weeks (Table I). The improvement was clearly observable at the sites where the rims of the caps or hollow syringe cylinders were applied for pressing or stretching. There was no improvement in the areas covered by gauze. In patients with extensive active psoriatic lesions (Patients 1 and 2), a gradual recurrence of psoriatic lesions was noted approximately 3 weeks later. Such recurrence was not observed in patients with only a few psoriatic plaques in other areas.

Histological findings

Histology prior to the treatment showed a characteristic epidermal hyperplasia, parakeratosis and accumulation of polymorphonuclear leukocytes (PMNs) beneath the stratum corneum (Fig. 2A). On day 4, PMN infiltration and dermal edema disappeared, and the epidermis was reduced in thickness (Fig. 2B). Seven days after the treatment the granular layer reappeared, parakeratosis was diminished or absent, and the epidermis showed a remarkable reduction in thickness (Fig. 2C).

Table I. Effect of pressing and stretching treatments in patients with psoriasis

Patient no.	Sex	Age	Application site	Duration of disease (years)	Disease activity	Method	Clinical response	Recurrence (week no.)
1	F	35	Back	10	Active	Pressing	Resolved	3
2	M	32	Arm	13	Active	Stretching	Resolved	3
			Arm			Pressing	Improved	3
3	M	59	Arm	8	Quiescent	Pressing	Resolved	No relapses
4	F	75	Forearm	15	Active	Pressing	Unchanged	— ^a
5	M	22	Abdomen	6	Quiescent	Stretching	Improved	No relapses
6	M	76	Thigh	11	Active	Stretching	Unchanged	—
			Forearm			Pressing	Unchanged	—
7	M	47	Thigh	8	Quiescent	Stretching	Resolved	No relapses
			Forearm			Pressing	Improved	No relapses
8	F	76	Forearm	15	Active	Pressing	Unchanged	—
9	M	51	Abdomen	6	Quiescent	Stretching	Improved	No relapses
10	M	27	Abdomen	10	Quiescent	Stretching	Improved	No relapses

^a Not assessed for recurrences.

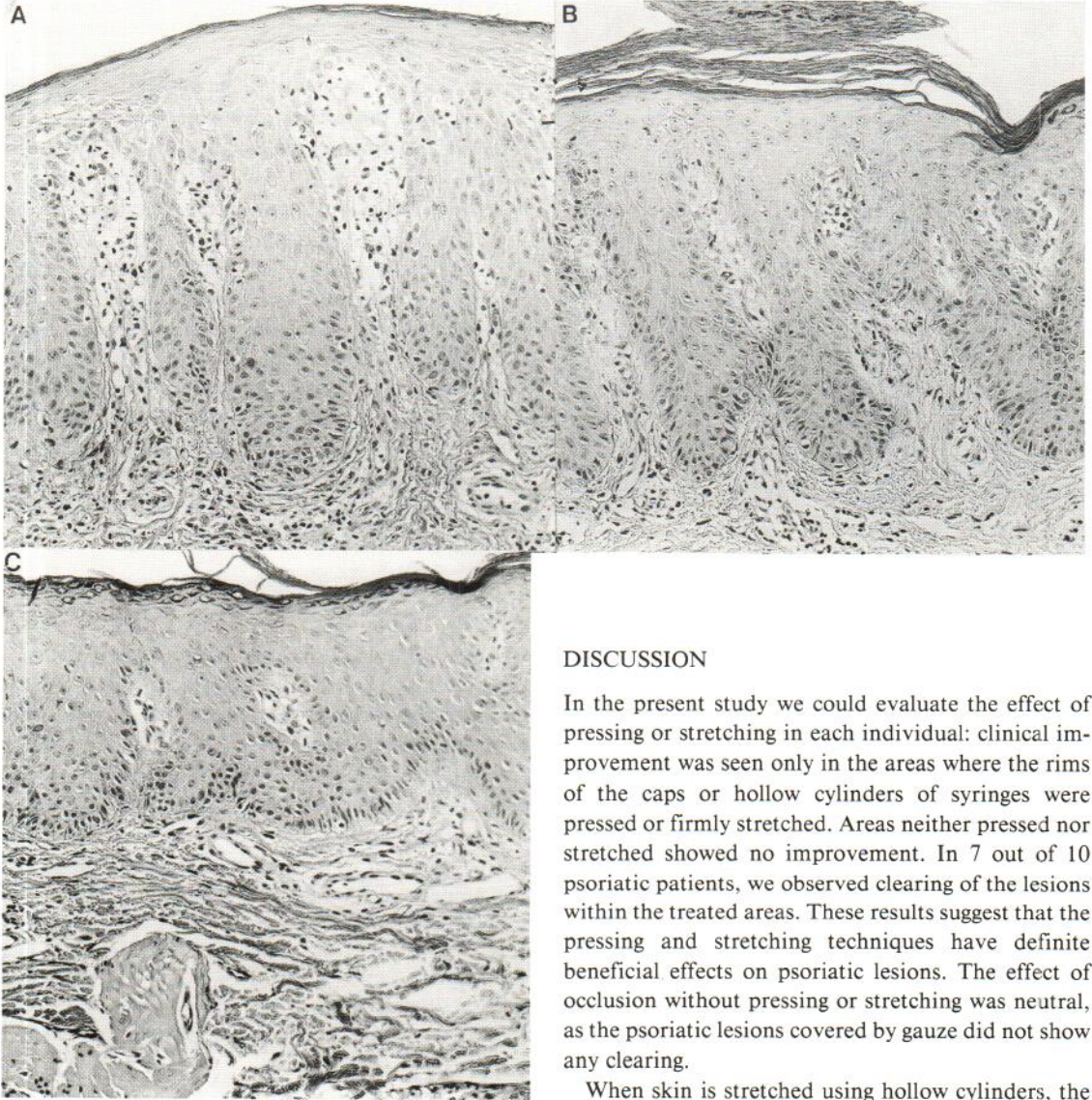


Fig. 2. Micrograph of biopsy specimen from psoriatic lesions. (A) Before treatment. Accumulation of polymorphonuclear leukocytes (PMNs) in the stratum corneum, acanthosis and edema of the dermal papillae are seen. (B) Four days after treatment. PMNs are not longer visible. Acanthosis and edema of the dermis are reduced. (C) Seven days after treatment. Acanthosis is markedly reduced and dermal edema is not observed.

Adverse effects

After removal of the plastic apparatuses, small eroded areas developed in 3 patients at the sites where the edges of the caps had pressed too firmly. However, the adverse changes did not persist.

DISCUSSION

In the present study we could evaluate the effect of pressing or stretching in each individual: clinical improvement was seen only in the areas where the rims of the caps or hollow cylinders of syringes were pressed or firmly stretched. Areas neither pressed nor stretched showed no improvement. In 7 out of 10 psoriatic patients, we observed clearing of the lesions within the treated areas. These results suggest that the pressing and stretching techniques have definite beneficial effects on psoriatic lesions. The effect of occlusion without pressing or stretching was neutral, as the psoriatic lesions covered by gauze did not show any clearing.

When skin is stretched using hollow cylinders, the rim of the cylinders is pressed firmly to the skin. The area in contact with the peripheral rims of caps or cylinders may be pressed downward and stretched sideways. Thus, it is rather hard to distinguish between pressing and stretching.

The histological studies showed disappearance of PMN infiltration, reduction in acanthosis, reappearance or increase in the granular layer and disappearance of edema in the papillary dermis. Thus, the pressing and stretching techniques have definite beneficial effects on psoriatic lesions.

Trauma inflicted on uninvolved skin of psoriatic patients is known to produce lesions of psoriasis (Koebner phenomenon). On the other hand, there are

observations not widely known that a traumatic injury made to psoriatic plaques may cause them to involute spontaneously (3). For example, during psoriasis treatment, unintentional dithranol burning, though usually aggravating the condition, may sometimes produce improvement (3). Eyre & Krueger (7) found that in 67% of the patients with psoriasis the lesions cleared after split thickness grafts of psoriatic plaques were taken ('reverse' Koebner reaction). The mechanism of this reverse Koebner phenomenon has not been elucidated.

Destruction of the dermal papillae, with preservation of deep dermal structures (5-7), has been reported to prevent the epidermal hyperplasia of psoriatic epidermis directly overlying the damaged site. On the other hand, Ryan (11) assumes the involvement of the dermal vasculature in promoting the Koebner phenomenon. Thus, the effects of pressing and stretching on the dermis, including subpapillary plexuses of arterioles and venules as sites of primary stimuli for epidermal change, should be taken into consideration. Another effect may be found in the psoriatic epidermis. Rapidly proliferating and metabolically active psoriatic epidermal cells may be more vulnerable to the physical influence of the environment than are non-lesional epidermal cells. Such a vulnerability of psoriatic epidermis is well known in explant cultures of lesional skin (12-15) as well as in cultures of psoriatic epidermal cells from a single-cell suspension (16).

REFERENCES

- Orenberg EK, Deneau DG, Farber EM. Response of chronic psoriatic plaques to localized heating induced by ultrasound. *Arch Dermatol* 1980; 116: 893-897.
- Urabe H, Nishitani K, Kohda H. Hyperthermia in the treatment of psoriasis. *Arch Dermatol* 1981; 117: 770-774.
- Harrison PV, Walker GB, Davies JE. Trauma for psoriasis. *Lancet* 1985; ii: 1063-1064.
- Scogging RB. Cryotherapy of psoriasis. *Arch Dermatol* 1987; 123: 427-428.
- Grekin DA, Van Scott EJ. Dermal role and controls in psoriasis. *Arch Dermatol* 1973; 108: 425.
- Olson ES. Abrasive treatment of psoriasis. *Arch Dermatol* 1972; 105: 292-293.
- Eyre RW, Krueger GG. Response to injury of skin involved and uninvolved with psoriasis, and its relation to disease activity: Koebner and 'reverse' Koebner reactions. *Br J Dermatol* 1982; 106: 153-159.
- Békássy Z, Ástedt B. Carbon dioxide laser vaporization of plaque psoriasis. *Br J Dermatol* 1986; 114: 489-492.
- Ohkohchi K, Takematsu H, Tagami H. Determination of anaphylatoxin concentrations in suction blisters in patients with psoriasis. *J Invest Dermatol* 1986; 87: 65-67.
- Lowe NJ, Weingarten D, Bourget T, Moy LS. PUVA therapy for psoriasis: Comparison of oral and bath-water delivery of 8-methoxypsoralen. *J Am Acad Dermatol* 1986; 14: 754-760.
- Ryan TJ. Microcirculation in psoriasis: Blood vessels, lymphatics and tissue fluid. *Pharmacol Ther* 1980; 10: 27-64.
- Chopra DP, Flaxman BA. Comparative proliferative kinetic of cells from normal human epidermis and benign epidermal hyperplasia (psoriasis) *in vitro*. *Cell Tissue Kinetics* 1974; 7: 69-76.
- Caron GA. Organ culture of normal and psoriatic skin. *Arch Dermatol* 1968; 97: 575-586.
- Hambrick GW Jr, Handwerger RL. The behavior of explants of psoriasis *in vitro*. *J Invest Dermatol* 1969; 52: 126-135.
- Nakayama J, Yasumoto S, Takagi Y, Nagae S, Yashima Y, Urabe H. Studies of cell and organ culture of psoriatic and normal epidermis *in vitro*. *J Dermatol* 1983; 10: 411-419.
- Baden HP, Kubilus J, MacDonald MJ. Normal and psoriatic keratinocytes and fibroblasts compared in culture. *J Invest Dermatol* 1981; 76: 53-55.