Trichloroacetic Acid Peeling in Koreans

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Background: There have been many articles about the chemical peeling of Caucasian skin, but there have been few reports about postpeel results among Oriental people.

Objective: The purpose of this report is to evaluate the effects of chemical skin peeling on the facial skin of Korean individuals over a two year period and compare these results with those relating to Caucasian skin.

Method: Using 15 to 50 per cent trichloroacetic acid (TCA), we have peeled 121 patients with fine wrinkling, irregular pigmented deposits, superficial acne scars, and melasma, and observed them for 2 years.

Results: In contrast to melasma, fine wrinkling and irregular pigmented deposits responded efficiently to TCA peeling. About 70 per cent of the patients showed satisfactory clinical results one year after treatment while 50 per cent of them did so two years after treatment. Postpeel hyperpigmentation and erythema lasted for 3.15 months and 6 weeks, respectively, on average.

Conclusion: If we select a fair-skinned woman in her fifties, even though she is an Oriental, TCA peeling can treat the fine wrinkling or irregular pigmented deposits to a satisfactory degree.(Ann Dermatol 7:(4)318~323, 1995)

Key Words: Trichloroacetic acid (TCA)

It is stated that the Ebers papyrus of circa 1560 B.C. contained a great deal of information on cosmetic treatment by early Egyptian physicians. Baker suggested that early chemosurgery would probably have taken the form of certain types of acid treatment. In the early 20th century, chemical peeling had been used by lay operators to treat aging skin. After Baker reported many articles about phenol peeling, its effect had been approved by other authors in the early 1960’s. In Korea, chemical peeling has been practiced by dermatologists, plastic surgeons, and lay operators since the 1980’s. Many complicated cases have also been noted. With regard to dermabrasion, which is considered to be a similar modality of treatment to chemical peeling, follow-up studies have been done in all races of patients. However, it seems that there have been few reports about postpeel results among Oriental people.

The purpose of this report is to evaluate a 2-year experience on chemical skin peeling of the face and to compare these results with those from Caucasian skin.

MATERIALS AND METHODS

We have treated more than 200 patients with melasma, fine wrinkling, irregular pigmented deposits, freckles, lentigines, superficial seborrhoeic keratosis, and superficial acne scar. During the 2-year follow-up period, 121 patients were observed. A TCA solution was made according to the formulae as Resnik recommended; trichloroacetic acid USP (crystals), 50gm, and distilled water, a sufficient quantity up to 100 ml. The resultant 50 per cent of TCA solution was further diluted for various

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strengths. We mainly selected 10 per cent to 35 per cent solution (light peeling). In a small group we tried 35 per cent to 50 per cent TCA solution without taping (intermediate peeling).

Complete history taking and thorough physical examination was done at the patient's initial visit. To remove oil and surface debris, thorough cleansing of the facial skin with soap, 75 per cent alcohol and acetone was done. The patient’s eyes were always closed while TCA was applied. The forehead was treated initially, and both cheeks, perioral area, chin and nose followed in sequence. Adequate preoperative analgesia and cold wet dressing soothed a rather marked burning sensation. Careful protection from the sun was advised for at least 3 months in order to minimize the likelihood of hyperpigmentation. In resistant cases of hyperpigmentation, we recommended the topical use of 5 per cent hydroquinone in ointment base.

To elucidate the relationship between treatment results and basic skin color, patients were classified into one of three groups, depending on the gross degree of pigmentation of the facial skin: Fair, Light Brown, Dark Brown. Each patient was evaluated on the basis of clinical improvement, and classified into three groups; satisfactory, unsatisfactory and no change. To determine the effect of peeling, we observed it in person on their visits to the clinics or by telephone contact. In addition, we surveyed the period of exfoliation, the postpeel hyperpigmentation, and any red appearance.

RESULTS

Considerable edema and erythema occurred during the first few days of TCA peeling. The erythema gradually gave way to a brownish hue over a period of several days, as the crust formed. Meanwhile the edema gradually subsided. Sometimes there were considerable serious exudation, eczematization, and pruritus for which topical antibacterial emollients or occasionally even oral corticoid medication was indicated. Separation of the crust generally began between the fifth and the seventh postoperative days and was usually completed by the tenth to fourteenth day.

A red appearance or postpeel erythema persisted for about 1 week to 1 year, on average 6 weeks. Almost all patients experienced postpeel hyperpigmentation that can arise following this procedure. Pigmentation following the original pattern persisted for 2 weeks to 18 months on average 3.15 months (see Table 1). Peeling didn't result in hyperpigmentation problems in women in their 20's already having acne scars.

Tables 2-4 illustrate the rate of improvement in relation to conditions treated, peeling depth, and skin color. In our series, one year after superficial chemosurgery, 70 per cent of the patients showed satisfactory results while in 50 per cent of them

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<tr>
<th>Table 1. Postpeel hyperpigmentation and erythema period</th>
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<td>Postpeel hyperpigmentation period 3.15 months (2 weeks-18 months)</td>
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<td>Postpeel erythema period 6 weeks (1 week-1 year)</td>
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<th>Table 2. The rate of satisfactory results in relation to the conditions treated</th>
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<td></td>
<td>After 1 year</td>
</tr>
<tr>
<td>Fine wrinkling</td>
<td>9/9 (100.0) *</td>
</tr>
<tr>
<td>Superficial acne scar</td>
<td>21/28 (75.0)</td>
</tr>
<tr>
<td>Irregular pigmentary deposits</td>
<td>22/35 (62.9)</td>
</tr>
<tr>
<td>Melasma</td>
<td>19/49 (38.8)</td>
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<tr>
<td>Total</td>
<td>71/121 (69.2)</td>
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<th>Table 3. The rate of effectiveness of peeling in melasma in relation to the depth of peeling</th>
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<tr>
<td></td>
<td>After 1 year</td>
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<tr>
<td>Light peel</td>
<td>11/32 (34.4)*</td>
</tr>
<tr>
<td>Intermediate peel</td>
<td>8/17 (47.1)</td>
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the results were satisfactory two years after treatment (Table 2). Among the several dermatologic disorders, fine wrinkling, freckles, lentigines, and superficial seborrheic keratosis responded effectively to chemosurgery (Fig. 1,2,3,4,5,6). The melasma of the face responded poorly to it (Fig. 7,8). Two years after chemosurgery, the rate of patients in whom the cosmetic result was acceptable was only
Table 4. The rate of satisfactory results in relation to skin color

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<th>Skin Color</th>
<th>After 1 year</th>
<th>After 2 years</th>
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<tr>
<td>Fair</td>
<td>14/20 (70.0)*</td>
<td>13/20 (65.0)</td>
</tr>
<tr>
<td>Light brown</td>
<td>34/56 (60.7)</td>
<td>21/56 (37.5)</td>
</tr>
<tr>
<td>Dark brown</td>
<td>21/45 (46.7)</td>
<td>20/45 (44.4)</td>
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* The number of satisfactory patients / total number of patients treated. (%)

Table 5. The indications of chemical peeling

1. Rejuvenation of the facial skin. : Subtle, fine wrinkling Mild/ moderate actinic degeneration
2. Superficial acne scarring. : Shallower, rounded margin type with flatter border.
3. Diffuse or patchy pigmentation of the facial skin. : Melasma, postinflammatory hyperpigmentation, freckles, lentigines.
4. Superficial seborrheic keratosis.
5. Superficial epithelioma.
7. Xanthelasma palpebraum.
8. Tinea versicolor.
10. Flattened scar.
11. Senile comedones.
12. Acne vulgaris.
13. Acne rosacea.
15. Flat wart.
16. Lupus erythematosus.

Fig. 7. Prepeel, 37-old patient with melasma and fine wrinkling.

Fig. 8. One year after peeling, note the lightening of preexisting pigmentation.

26 per cent. In cases with the shallower rounded margin type of acne scar, the improvement was remarkable and the result was very gratifying.

With regard to peeling depth, a high concentration of TCA solution, so called intermediate peeling, had a still deeper and more prolonged effect (Table 3). Although it was very troublesome to patients, its cosmetic result was more acceptable to patients than that of light peel after a long time. Unlike patients with dark skin, those with fair skin showed gratifying results (Table 4).
DISCUSSION

The skin conditions in which satisfying clinical results can be obtained are listed in Table 5. Among these, we obtained satisfying clinical results in fine wrinkling, superficial acne scars, irregular pigmented deposits, and melasma, in decreasing order. Among these diseases known as irregular pigmented deposits, freckles which are considered to be histologically epidermal melanosis, responded rapidly to it.

The reponse of melasma to superficial chemosurgery is contradictory. Monash reported that 20 per cent or 25 per cent TCA solution usually produced a lightening of the pigment skin. It is Baker's opinion that the chemical peeling will definitely remove the diffuse or patchy pigmentation of the facial skin. On the other hand Ayres recognized that chloasma-like pigmentation responds unpredictably to superficial chemo surgery, as it did to dermabrasion, showing a pronounced tendency to recur. We found that after superficial chemo surgery melasma has occasionally been exacerbated, or recurred in almost all patients. Even if patients obtained satisfying clinical results, it was due only to a lightening of the preexisting pigmentation. It is the author's conclusion that melasma does not respond to superficial chemo surgery satisfactorily, irrespective of peeling depth. The differences in results obtained between authors might result from the differences of peeling methods, and racial skin differences between Caucasians and Orientals.

During the peeling procedure various complications can occur. The most common local complication of face peeling is abnormal pigmentation. Postpeel hyperpigmentation might persist for 4-5 months (11 or 6 to 18 months). Almost all patients experienced it in our own series. Although we also experienced cases in which pigmentation persisted for 18 months, it lasted 16 weeks on the average. It is interesting that women in their early 20s did not experience it.

We have been unable to find reports regarding pigmentary complications after chemo surgery for cosmetic purposes in oriental patients, although observations after dermabrasion are plentiful. Johnson found that almost all Orientals experienced hyperpigmentation after dermabrasion. Boo-chai and Mutou reported a similar high rate of 96 per cent pigmentary problems in Japanese and Chinese patients after planing. The blond Caucasians had few complications of this nature. Through experience we learned that pigmentary problem after chemo surgery is similar to that after dermabrasion. We found that in this respect there were significant differences between the Caucasians and the Orientals. The Orientals develop more hyperpigmentation than the Caucasians do after chemo surgery.

How long does this clinical improvement last? Ayres reported that it persisted for at least 2 years after phenol application. Litton showed that in most cases, the rate of improvement after a year was 50 per cent. In some cases, after 3 years or more, the patient looked extremely well. Kligman also appreciated that the benefits obtained were long lasting. In our series 69 per cent of patients revealed some improvement one year after treatment while 50 per cent of patients revealed some improvement 2 years after treatment. Two years after treatment of melasma patients, satisfaction was seen in 28.1 per cent of lightly peeled patients and 29.4 per cent of intermediate peeled patients. These results are similar to Litton's. The duration of benefit might be proportional to the concentration of TCA solution used and may also depend on the patients' individual skin condition. It seems to vary with the kinds of peeling agents, peeling methods, and frequency of treatment, etc. Brody suggested that relative contraindications include skin type IV-VI individuals. Almost all Orientals can be included in these categories. However, in our experience if we do a better case selection, as satisfactory clinical results can be obtained in Orientals as in the case of the Caucasians. The good candidate is a woman in her 50s with fair skin which is finely wrinkled, and who doesn't spend a great deal of time in the sun.

* This system was developed at the department of dermatology, Havard Medical school, Boston Massachusetts; I-always burn, never tan; II-always burn, slightly tan; III-sometimes burn, always tan; IV-never burn, always tan; V-lightly pigmented; VI-blacks.
REFERENCES


