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# Differential Aspects of Solcoderm Therapy as a Function of Dermatologic Diagnoses

*O. Binet, J.-P. Césarini, C. Bruley, R. Aron-Brunetière*

Department of Dermatology, Fondation A. de Rothschild, Paris, France

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**Abstract.** Experience with 265 Solcoderm-treated lesions in 131 patients followed for 1 year is the basis of delineating the preferred methods of treating skin tumors with this new caustic agent. General principles and diagnosis-specific suggestions are presented.

Solcoderm has been studied at the Rothschild Foundation Clinic in Paris since 1979 in several hundred patients with a wide variety of skin tumors. Our experience indicates that different dermatopathologic conditions require different approaches in the technique and schedule of application of this unique caustic to achieve the best results. This report reviews the nature and rationale of these varying techniques and summarizes the results achieved at our clinic in 131 patients who were followed up 1 year after treatment.

## Data Source

The records surveyed for this review are those of patients who had been followed for at least 1 year, and the results analyzed are those noted at the time of the 1-year follow-up. A specific diagnosis had been established primarily by punch biopsies or smears before treatment.

## Results by Diagnostic Category

Table I presents 3 sets of data for each of 8 diagnostic categories: (1) the number of patients, the number of lesions treated, and the number of treatments in each instance; (2) the results summarized for each group as the number of treatment failures, defined as lesions requiring other treatment at or before the time of 1-year follow-up, the number judged to have achieved excellent results by both physician and patient, and the number of satisfactory but not excellent results; (3) the number of patients from whom lesion

crusts were recovered, the number of these that proved adequate for diagnosis, and the number in which the original diagnosis was so confirmed.

Small numbers of patients in other diagnostic categories were also treated, including 2 with verruca plana, 1 with multiple sebaceous adenomas, 1 with Koenen tumor, 1 with squamous cell carcinoma, 3 with skin papilloma, 2 with nevus verrucosus linear, and 1 with condyloma acuminatum. Experience with condyloma acuminatum in our clinic is too limited for comment.

In the tabulated data, the 5 treatment failures (table I) consist of hypertrophic scars in 2 cases with Dubreuilh melanosis, incomplete treatment and excision by surgery of 1 basal cell carcinoma, a recurrence of 1 verruca vulgaris, and focal repigmentation in 1 patient with nevus cell nevi.

Failures in reconfirming the diagnosis by histology of the crust (table I) were generally a result of crust specimens which were too superficial to be representative of the lesion. 1 of the 2 errors in the histological diagnosis of actinic keratoses was seborrheic keratosis. There was no sign of basal cell epithelioma in the crust specimen from 1 basal cell epithelioma lesion. In 6 of the crusts from nevus cell nevi no nevus cells were observed in the recovered specimen.

## Discussion

### *General Aspects*

The histologic and electron microscopic characteristics of the consequences of Solcoderm treatment are reported in detail in a companion paper in this volume *[J.-P. Césarini]*. Of significance to the diagnostic/treatment technique relationship are the general observations that (1) pathologic tissues with loose intercellular bonds are more easily penetrated by an applied liquid, while densely packed and cornified lesions require more vigorous treatment; (2) subcutaneous collagen is barely affected by and limits the further penetration of Solcoderm; (3) tissue reached by Solcoderm is devitalized by fixation (covalent denaturation with structural integrity maintained) rather than dissolution (peptide hydrolysis, ulceration); (4) an erythematous reaction and particularly a white pallor (vasoconstrictive) ring in the skin surrounding the treated lesion is generally a sign that the intensity of treatment has been adequate.

The number of treatments required is generally dependent not only on the responsiveness of the lesion, but also on the therapist's conception of the importance of being certain that the lesion is totally eradicated. Thus verruca plantaris generally requires more treatment because of the density of the lesion, while basal cell epitheliomas, which are very responsive, are likely to receive more treatments to assure their elimination. As a rule, many keratoses and nevi are satisfactorily eliminated with one treatment. Because of the relatively large size of Dubreuilh's melanotic lesions, they are likely to be treated in portions in several sessions.

### *Aspects of Specific Diagnostic Categories*

*Seborrheic Keratosis.* The presence of malignant melanoma should be carefully excluded from this diagnostic category. A few minutes after application, the surface of the treated lesion turns yellow-white. One application is generally sufficient, but the treated surface should not exceed a maximum of 1 $cm^2$. Larger or thicker lesions are best

**Table I.** Summary of treatment results

| Diagnoses | Number of | | | Treatment results[1] | | |
|---|---|---|---|---|---|---|
| | patients | lesions | treatments per lesion[3] | excellent | acceptable | failures[2] |
| Seborrheic keratosis | 14 | 68 | 2.3 | 12 | 2 | 0 |
| Actinic keratosis | 26 | 49 | 2.3 | 16 | 10 | 0 |
| Dubreuilh melanosis | 15 | 15 | 2.9 | 12 | 1 | 2 |
| Lentigo senilis | 5 | 7 | 2.4 | 5 | 0 | 0 |
| Basal cell epithelioma | 11 | 12 | 2.8 | 7 | 3 | 1 |
| Verruca vulgaris | 13 | 26 | 2.2 | 8 | 4 | 1 |
| Verruca plantaris | 3 | 3 | 3.3 | 3 | 0 | 0 |
| Nevus cell nevi | 44 | 85 | 2.2 | 31 | 12 | 1 |
| Total | 131 | 265 | 2.3 | 94 | 32 | 5 |

[1] Presented as overall per patient rather than by individual lesions.
[2] See text for further details.
[3] Average number in each group.

treated with a second application about 8 days after the first.

*Actinic Keratosis.* Only one application is usually required. The dyskeratotic skin is more rapidly penetrated than is normal skin, and abnormal keratinized skin changes color more readily, often in less than 2 minutes. Pathological tissues revealed by such color change may be treated immediately with a second application.

*Dubreuilh Melanosis.* With these usually large flat lesions, two sessions separated by an interval of 4–5 weeks are advisable. Great care should be taken not to treat invasive lentigo malignant melanoma or superficial spreading melanoma, lesions which are definitively not an indication for Solcoderm.

*Lentigo senilis.* Solcoderm has been used only occasionally for these flat and slightly depressed pigmented lesions. The skin is very thin, so that care is necessary to avoid scars. The whitish new skin which forms contrasts with its more or less pigmented surroundings, and the final cosmetic result may be influenced accordingly.

*Basal Cell Carcinoma.* Superficial forms can be readily treated by Solcoderm after Papanicolaou cytology of exfoliative smears. Recurrent or sclerodermiform varieties of basal cell epithelioma are not good candidates for Solcoderm treatment. Application should be vigorous. A white discoloration quickly appears, and very often its extent indicates a larger than expected lesion that reaches beyond the originally observed margin. Application should be repeated after 4 days to ensure complete destruction of the pathological tissues.

*Verruca vulgaris, Verruca plantaris.* These warts consist of accumulations of multiple layers of dyskeratotic cells. The responsible virus is present within the cells of the upper layers and is also integrated into the genome of basal cells or free in the basal cell layer. For a complete cure of the lesion, the involved basal cells must be devitalized.

| Crust histology[1] | | |
|---|---|---|
| crusts recovered | adequate for diagnosis | diagnoses confirmed[2] |
| 12 | 10 | 8 |
| 23 | 23 | 21 |
| 12 | 12 | 11 |
| 4 | 4 | 2 |
| 7 | 7 | 6 |
| 5 | 5 | 4 |
| 2 | 2 | 1 |
| 34 | 34 | 27 |
| 99 | 97 | 80 |

When cells are fixed by the caustic properties of Solcoderm, the virus is also killed, and the crust is 'sterilized'. There will be no recurrence if all the involved cells have been in contact with the liquid. Achieving this full treatment can be tedious; as long as 30 min may be required. The yellow discoloration should be complete. As with basal cell epithelioma, in many instances, after a few minutes of contact with Solcoderm, a larger lesion than previously estimated becomes apparent. Three or more applications at 48-hour intervals are often advisable, particularly for plantar warts.

*Nevus cell nevi.* This type of lesion should be approached with attention to the possibility of the presence of a malignant melanoma. Excellent cosmetic results have been achieved with pure dermal amelanotic hairy nevi of the face and neck, leaving little or no scar. The clinical and historical data concerning the lesion should be carefully noted by a dermatologist knowledgeable about pigmented tumors. Any doubt about the nature of a pigmented lesion (rapid change, discoloration, irregular margin, inflammation, bleeding) should rule out treatment with Solcoderm. Usually, a single application is adequate, and the crust should be recovered whenever possible for histological 'a posteriori' confirmation of the presumed benign nature of the treated lesion.

*Undesired Reactions*

Local discomfort and damage to surrounding normal tissue has been minimal, owing to the factors described above which limit the extent of caustic damage beyond the site of treatment. To evaluate possible systemic toxicity, blood and urine tests were performed before and on the 8th day after treatment in the first group of 35 treated subjects. The tests included complete blood count, erythrocyte sedimentation rate, blood urea nitrogen, glucose, SGOT, SGPT, alkaline phosphatase, and urinalysis, all of which were negative in all instances. Further testing of routine laboratory parameters seemed pointless, since the quantity of Solcoderm employed is systemically negligible, and all of its ingredients are normal constituents of the body.

There were 30 patients who had treatment for additional lesions 3 months or more after prior Solcoderm treatment. None of these showed any evidence of local or systemic sensitivity reactions.

## Conclusions

There was a 96% overall success rate in patients followed up for 1 year after Solcoderm treatment (265 lesions in 131 patients). The few failures did not result in any signif-

icant consequences. The major indication for Solcoderm is keratogenous benign proliferations. Clinical trial over a 3-year period by 3 different consultants in a wide variety of patients show that Solcoderm treatment is painless, very reliable, and at least equal if not superior to previously employed treatment for selected indications. An 'a posteriori' histological confirmation of diagnosis is made possible by the properties of Solcoderm, giving reassurance to the practitioner. While the treatment of some lesions may be time consuming (10–20 min), the use of Solcoderm avoids the necessity of local anesthesia, disposal or sterilization of instruments, stitches and closures. Both treatment and aftercare are more comfortable for the patient since bathing is allowed. The only requirement is to apply alcohol during the healing period to ensure dryness and to avoid infections.

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O. Binet, MD.
Department of Dermatology,
Fondation A. de Rothschild,
25–29 rue Manin,
F-75019 Paris (France)