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"Hyfrecator"* Sparking in the Management of Leprosy

An Auxiliary Treatment

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'Hyfrecator' sparking has been found to be very useful in the treatment of many skin disorders and the writer has developed various specialized techniques of this procedure over the last seven years (Tio, to be published).

In 1964 the writer applied this method in two leprosy patients of long standing, essentially as a psychological prop to bolster up the patients' morale. The patients' statements, however, indicated a far greater improvement than could be explained on purely subjective grounds. And the writer himself got the impression that perhaps the sparking procedure really had had a favourable influence on the lesions.

In January 1965 the writer had occasion to apply this treatment to anaesthetic patches of seven years standing. The response in this patient was truly dramatic and after about two weeks of intensive sparking, normal sensation returned to all the areas treated. Since this patient was an intelligent woman the writer was now convinced that the method had a definite place in the management of leprosy. Subsequently the writer tried out the method in a few other cases in his private practice with less dramatic but nevertheless remarkable response. This experience encouraged the writer to carry out trials with this method on a large scale in the out-patient department of the Institute.

Instrumental technique

The 'HYFRECATOR' is essentially a high frequency spark-gap diathermy instrument which is provided with a variety of needles, the points of the needles normally being used for coagulation, desiccation and fulgurization. By holding the needle-point a short distance away from the skin a spray of sparks is produced. For obtaining a broad spray for treating larger areas the writer has used the shaft (and the back of the angle) of the curved desiccation needle No. 711B. The intensity of the sparks can be controlled by turning the adjustment knob on the instrument. On the recommendations made by the writer the manufacturers have made special modifications of the needles for the sparking technique which hitherto had not been used by any other worker. The modifications consist mainly of making the needle end in a ball. This ball permits the spraying of lesion in awkward locations. Further modifications of the needles in consultation with the writer are being made.

Precautions

In employing the sparking technique it is important to guard against three hazards:

- unsteadiness of the operator's hand;
- the patient's liability to move the target area;
- the liability of the town's electricity supply to vary in voltage.

The spraying of sparks give rise to a heat sensation and this can be very unpleasant for the patient, especially on the face. On anaesthetic areas, of course, this problem does not arise. The heat sensation can be made bearable by blowing of cooled air from a hair-dryer on the area being treated.

The investigations carried out in the Institute were planned with the purpose of evaluating the effects of sparking on a variety of skin lesions and the results are similarly favourable.

Patients

Most of the patients were obtained from the male outpatient clinic of the National Institute of Health Surabaya. Only those who showed symmetrical similar lesions were selected for this investigation. (From the private clinic some were treated by the method as described below, others were sprayed with sparks on all lesions).

*Trade mark of the Birtcher Corporation, 4371 Valley Blvd., Los Angeles 32, California, U.S.A.

Technique

Sparks were sprayed on leprosy lesions on the left half of the body only, the other side of the body serving as control. The evaluation can be divided into two categories:

(a) *Visible changes*, viz., diminishing of the lesions in redness, size and thickness. This includes the *aesthetic* aspect of the treatment of leprosy.

(b) *Functional changes*, viz., the return of the normal functions of the skin such as: sensations – touch, heat and pain, secretion of the sweat and sebaceous glands, (re)growth of hair.

Special Cases

In addition to the selected patients in the Institute, the writer has treated several patients in his private practice, some of which are of special interest and as such brief reports on these cases are given below.

D. Female, 31 years, first examined January 1963. History: discoloured spot seen on right thigh in 1958.
Clinical findings: other discoloured hypo-aesthetic spots discovered on the back, buttocks and near anus. Despite the long duration this was a mild case.
Diagnosis: M. Hansen T-type.
Therapy: Sulphones caused drug fever and giant urticaria; therefore discontinued. Put on CIBA 1906 and later additional Vadrine.
No improvement seen after one year and spot on the right thigh actually increased in size.
January 1965 two weeks of intensive sparking (3 x a week heavy doses) resulted in complete return of all sensation.
Maintenance sparking continued 1 x week till July when patient left town.
Re-examination on 5 September 1965: all areas had normal sensation.

Note: Hypo-aesthesia had existed for over seven years and only two weeks of the intensive sparking treatment caused a return of normal sensation.

L.T.T. Male, 20 years, first examined 9 April 1963. Clinical findings: anaesthetic patches right arm and right thigh.
Duration 10 years. Patient's account of therapy received very vague, presumably had been on Sulphones, since he had seen other dermatologists.
Diagnosis: M. Hansen T-type.
Sulphones prescribed, visits infrequent.
20 December 1964 some return of sensation noted. Progress considered very slow.
Sparking begun and repeated whenever the patient could visit – on an average once every two months. Return of sensation much more rapid in spite of infrequent spraying.

N.T.P. Male, 42 years, first examined 7 July 1965. Clinical findings: erythema cheeks; extensive anaesthetic areas with red annular margin on thighs.
Duration?
Diagnosis: M. Hansen T-type.
June 1965 put on Sulphones by a colleague; July 1965 no improvement.
After first sparking redness of margin reduced and sensation returned.
Sulphone dosage increased.
24 July sensation practically normal, margin of patches turned violet-brown.
Patient gone away to home island.

P.T.S. Male, 29 years, first examined 4 March 1964. Clinical findings: large anaesthetic area right leg.
Duration?
Diagnosis: M. Hansen T-type.
Sulphone therapy started; patient not seen again till May 1965. 17 May 1965 St.q.a; weekly sparking started; after two weeks heat of sparking felt; during three months of fairly regular sparking all sensations gradually returned, first in the upper part and later the lower part. 20 August 1965 all sensations practically returned to normal.

T.K.B. Male, 31 years, first examined 24 August 1960. Clinical findings: red plaques on body.
Duration three years.
Diagnosis: M. Hansen T-type.
Therapy: Sulphone therapy with several interruptions during which his condition used to get worse. During 1964 additional sparking therapy was given and this speeded up the recovery (disappearance of lesions, return of sensations) as compared with the time needed for the subsidence of previous exacerbations with Sulphones alone.

Comments on the results obtained

(a) The *regression* of all types of visible *leprosy lesions* in colour, size and volume including the reactionary lesions is of importance from the aesthetic (psychologic) point of view.

(b) *Speeding up the return of sensation:* the first to return is the thermic sensation; sparking can be felt by the patient more and more strongly. Afterward tactile (cotton wool) and pain (pin prick) sensations seem to come back simultaneously.

(c) *Sweat and sebaceous glands are both stimulated by sparking:* sometimes the sweat glands respond immediately during the sparking session although the restoration of normal function may take some time. Sebaceous glands, on the other hand, seem to start functioning normally sooner than the sweat glands. Remote indirect stimulation of sweat glands: sparking of the L pectoral area also induced the sweat glands on the R pectoral side to produce more sweat (Figs. 1, 2, 3 and 4).

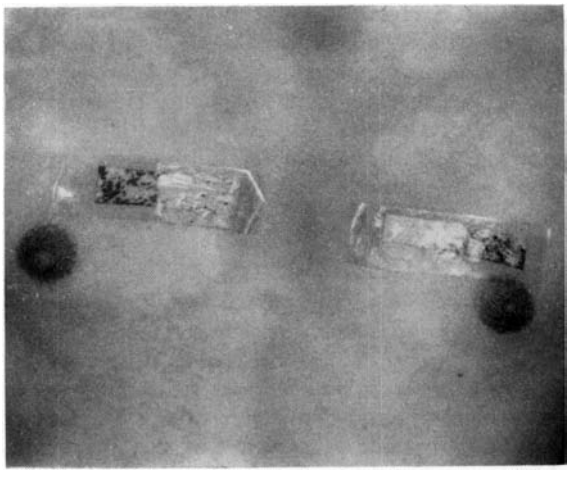
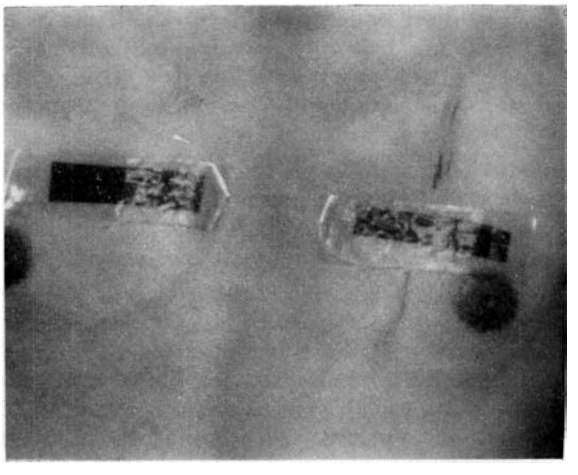


FIG. I. CASE 7.
Before sparking. Starch-iodine paper strip and negative Goenawan's copying pencil test.



III. CASE 7.
Five minutes after sparking. Starch-iodine test and copying pencil test (performed on the left side only)

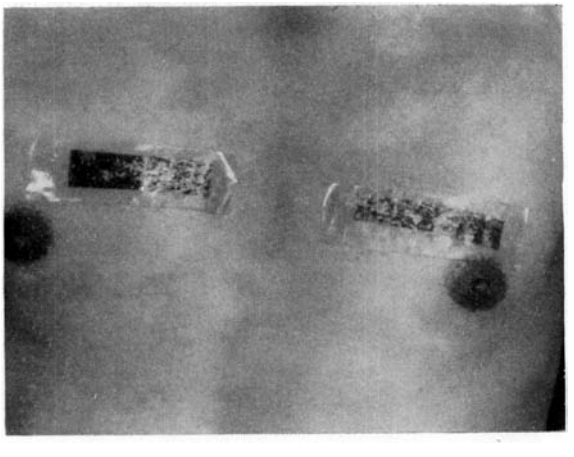


FIG. II. CASE 7.
Starch-iodine test immediately after sparking left side only. (Note response also on opposite side)

CASE II.
Before sparking face, ears and hands on both sides were affected. Picture taken on 29/9/65 after 5 months of regular weekly sparking.

(d) The endorgans of the nerves respond earlier to sparking than the sweat glands.
(e) In one case improvement of sensation (thermic, tactile as well as pain) occurred after one sparking treatment only, as compared to the control side.

(f) Sparking also seems to influence the *nerve* itself; not only the diameter became smaller, its consistency also got softer. It is noteworthy that the nerve itself was not sparked but only its neighbourhood.

(g) In three patients the *eyebrow* hair started to grow again. This may be caused by the stimulating effect of sparking itself or as a result of the regression of lesion and relief of pressure from the infiltration or both.

(h) With regard to the return of sensation there seems to be one example of failure after six months' of fairly regular sparking treatment. The disease was of long standing (20 years).

(i) In one patient one fairly large red area was sprayed with sparks while half of this area got an additional 5 mg Cortisone injection s.c. The injected half became less red but sensation did not return as quickly as in the other half. Did Cortisone suppress the stimulating effect of sparking?

DISCUSSION

(1) The loss of functions of the endorgans of the nerves, the sweat and sebaceous glands and loss of hair is asumed to be caused by the pressure of infiltration of round cells. The restoration of these functions combined with the regression in size and volume of the lesions suggests that spraying of sparks diminishes the infiltration thus relieving those organs from the pressure of them.

(*Note:* so far, for technical reasons, no biopsies before and after sparking treatment could be performed).

(2) It seems possible that the quantitative estimation of the function of the sweat glands (paper strip technique) and of the sebaceous glands (so far technically not possible) can be used as *indicators* with regard to the *prognosis*.
(3) Dr Araujo in Brazil has used galvanocautery for making multiple skin punctures by fulguration (as a substitute for intradermal injections) to introduce hydrocarpus into the skin (Muir, p. 121). Dr Araujo's technique would seem to bear no similarity with the 'sparking' procedure described in this paper.
(4) The writer feels that, because of its simplicity and effectiveness, the sparking procedure has a definite place in the management of leprosy. This auxiliary treatment could be adapted even for mass campaigns in the field. However, a heavy-duty model of the apparatus will be necessary for large scale continuous use in the field, as the present type of the instrument tends to get overheated when used for long periods.

SUMMARY

A new sparking technique with a high frequency diathermy apparatus has been described. Favourable influence on the skin lesions of leprosy by the local application of 'Spark-spray' have been kept in over 40 patients. Records of the lesions and therapy are preserved but not presented here.

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