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DIFFUSE LEPRA

THE LUCIO FORM OF LEPROMATOUS LEPROSY; REPORT OF A CASE [1]

M. E. OBERMAYER, M. D.
S. C. BONAR, M. D.
AND R. ROSENQUIST, M. D.

Birmingham Veterans Administration Hospital
Van Nuys, California

An unusual variety of the lepromatous type of leprosy was first described by the Mexican leprologist R. Lucio (6), in 1852, under the names "spotted" [*manchada*] or "lazarine" lepra. However, Lucio's report was soon forgotten, and the condition escaped further observation until 1937, when it was again identified by F. Latapí and his co-workers, who have added considerably to knowledge of it (2, 3). One of us (M. E. O.) became acquainted with it in 1944, when Latapí allowed him to observe patients in his clinic and leprosarium, and subsequently a brief account of it was included in the revision of a dermatologic text (1). In 1947 it was learned that some members of the seasonal labor force annually imported from Mexico had been found to be suffering from this form after their return home, although examinations by Mexican and American health authorities prior to their admission to the United States had disclosed no illness, and a warning to the physicians of the southwestern states was

[1] Reprinted, by permission, from the *Journal of Investigative Dermatology* **12** (1949) 243-248. With agreement of the authors the present subtitle has been inserted, to make clear the fact that the article deals with the peculiar form of leprosy which occurs in Mexico—and also in Costa Rica—and not the diffuse early form of the lepromatous type of India; the terminology in the text has been modified accordingly. Also, because this form of the disease has been dealt with repeatedly in recent issues of THE JOURNAL (notably the article of Latapi and Chevez Zamora [**16** (1948) 421-430] and that of Romero *et al.* [**17** (1949) 27-33]), the general description of it has been somewhat condensed. The principal interest is in the description of the case, the first such report seen since the treatise of Leloir (1886), and in the photomicrographs, copies of which were supplied by the authors. Two of the references have been brought up to date.—EDITOR.

published in the form of an illustrated article (7). These two publications are, to our knowledge, the only studies of this rare and bizarre form of lepra in the English language.

Even in Mexico this condition is regional, for it is encountered much more frequently in the state of Sinaloa (where it constitutes 60 to 70 per cent of the instances of lepromatous lepra) than in the other states (where it averages only 17 per cent of such cases). In view of the prevalent belief that the disease does not occur in countries other than Mexico, it is not surprising that we were unprepared to meet with it in the American-born patient who is the subject of this report.

The diffuse lepra of Lucio has two special features: diffuse infiltration of the skin of the whole body and a peculiar type of lepra reaction called the "Lucio phenomenon," or erythema necroticans.

The first manifestations, as in the ordinary lepromatous form, are frequently anidrosis, numbness of the extremities and slowly progressive loss of the eyelashes and the eyebrows; later all of the hair of the body is affected. Nodules are not formed; instead, there is a generalized diffuse infiltration. The skin may appear normal, but the histamine test will elicit an abnormal response, and *Mycobacterium leprae* can usually be obtained from any region. In some cases there is chronic, diffuse swelling of the face, hands or legs, and the patient may have the "moon-faced" appearance so frequently encountered in myxedema. There are often widespread small telangiectases, especially on the face and trunk.

After about 3 or 4 years the unique lepra reactions appear. In the beginning there are only a few lesions; later they are more numerous. They are tender and painful, erythematous, slightly infiltrated macules, irregularly shaped but often triangular, averaging 0.5 to 1.0 cm. in diameter. They appear first on the legs and, to a lesser extent, the arms; much later the face and trunk are involved as well. The development and involution of the individual macules are uniform and rapid; the entire cycle takes about 2 weeks. The lesions soon darken, and they become purpuric within 3 or 4 days. Central necrosis develops, and an eschar forms and falls off in a few days, leaving a superficial, sharply circumscribed atrophic scar. At times there is ulceration, usually on the legs, with a consequent delay in healing and the production of a deep residual scar. Since there are recurrent crops of these reactions, scars and lesions in all stages of development may be present simultaneously.

Many of the manifestations commonly encountered in the ordinary type of lepromatous lepra are also observed. For example, fever or other disturbances may accompany the cutaneous reactions. Hoarseness is common, and nasal involvement often results in the production of a saddle nose. Ocular involvement, however, is not observed. There are progressive weakness, loss of weight and anemia. Without modern therapy the disease terminates fatally after an average duration of 8 years.

The Wassermann and Kahn reactions are virtually always positive, and the sedimentation rate is extraordinarily high.

The reaction to the conventional lepromin (Mitsuda) test is negative, as one might expect in a lepromatous form of lepra. However, recent studies by Medina (3) indicate that there is an intense, short-lived intracutaneous reaction to lepromin which appears 4 to 6 hours after the test is performed. Latapí and Chevez (4) confirmed this observation and obtained identical reactions to streptococcic and staphylococcic antigens. They have suggested that the reactions to both *M. leprae* and pyogenic organisms resemble the Shwartzman phenomenon rather than the conventional reaction to lepromin and that they may indicate a bacterial synergy.

Until the advent of the sulfones the response to treatment was uniformly negative, but considerably better results have been reported with the use of promin and diasone (5).

REPORT OF CASE

M. V., a 21 year old American man of Mexican descent who had never left Southern California except for a six-months' visit to the state of Sonoca, Mexico, where his parents were born, entered the Birmingham Veterans' Administration Hospital in December 1946, because of recurrent ulcers of the extremities of more than 3 years' duration. He had always been in good health until June 1943, when a tender red spot appeared on his right thigh; it later ulcerated and left a deep scar. Since then similar lesions have continued to appear almost without cessation on both the upper and the lower extremities. At about the time the first lesions developed the patient noticed that his beard and eyebrows were becoming less heavy.

Since December 1943, when he entered an Army hospital, he had received continuous hospital care, in several institutions. Strongly positive reactions to the tests for syphilis were repeatedly obtained; even at the time of his induction into the Army, in January 1943, a doubtful reaction was recorded. However, since repeated examinations for *Treponema pallidum* were negative, microscopic study of specimens obtained from the ulcers showed only the features of obliterative endarteritis and no other evidence of syphilitic infection was uncovered, no antisyphilitic therapy was ever instituted.

At the Birmingham Hospital his disease went undiagnosed for several months. The bizarre, angular pattern of the numerous purpuric macules and punched-out ulcerations and their sharply circumscribed atrophic residual scars did not seem to fit into any known dermatologic entity except dermatitis artefacta. Because his general health was good at that time, his temperature was normal, and the application of occlusive dressings seemed to aid the healing of the ulcers, this diagnosis was considered as a possibility for a while.

In September 1947 the patient was discharged, but he returned two weeks later because of fatigue, increasing weakness, progressive loss of weight and the development of more intensely inflammatory new lesions. He had attacks of nausea and vomiting, and his temperature began to show daily elevations to 101° and 102°F. It was the alopecia of the eyebrows and eyelashes which at that time led to a consideration of the possibility that he had lepra. Once considered, the diagnosis was readily confirmed, and the hitherto inexplicable laboratory data became intelligible.

The patient was presented at the meeting of the Los Angeles Dermatological Society in January 1948. At that time he was poorly nourished. His eyelashes were absent, and the lateral thirds of the eyebrows were sparse. The anterior portion of the nasal septum was perforated. There were several small telangiectases on his neck and trunk. Many atrophic, sharply demarcated, irregular scars of varying size, surrounded by zones of hyperpigmentation, were visible on both the upper and lower extremities. On the legs there were a few angular, darkly erythematous, slightly raised macules which did not pale on diascopic pressure. On the right arm and the right leg two ulcers with irregular contours could be seen; they had granulating bases and exuded a little serosanguinous fluid.

The ulnar, median and common peroneal nerves were enlarged and could be palpated without causing pain. There was hypoesthesia to pain, temperature and touch in the proximal portions and anesthesia in the distal parts of the extremities. All of the lymph nodes were enlarged, and the liver was palpable 2 cm. below the costal margin. Roentgenologic examination of the chest, the long bones and the urinary tract disclosed no abnormalities.

The reactions to lepromin (Mitsuda test) and coccidioidin were negative and that to tuberculin was 2+ in the first dilution. Intracutaneous injection of an aqueous solution of histamine, 1:5,000, failed to produce an erythematous flare in either the involved or the apparently normal skin.

The results of quantitative Kahn tests ranged from 20 to 160 units. Urinalysis consistently demonstrated albumin (1+ to 3+) and moderate numbers of white and red blood cells. Tests for porphyrins, Bence-Jones protein, and amyloid gave negative results. Blood examinations showed 5,000 to 10,000 white cells, 3,000,000 to 4,000,000 red cells and 9 to 12 gm. of hemoglobin per 100 cc.; the differential count was within normal limits. Fragility of the red blood cells was normal, and there was no evidence of sickle-cell anemia. The total serum protein content was 6.7 gm. per 100 cc., with an albumin-globulin ratio of 3.6:3.1. Tests of renal and hepatic function showed marked impairment. The basal metabolic rate was normal. Spinal fluid negative.

In November 1947, material for microscopic study was obtained from the nasal septum, an area of apparently normal skin,

a lesion of erythema necroticans on the forearm, and an ulcer on the leg.

Sections of the nasal septum revealed that, beneath a squamous surface epithelium, the connective tissue was evenly and heavily infiltered with histiocytes, plasma cells and other mononuclear elements, with only a few polymorphonuclear leukocytes. There were dilated vascular channels, particularly close to the surface. In one area, where there were edema and separation at the dermo-epidermal junction, the lumens of several small vessels were occluded by thrombi. Acid-fast rods were scattered in abundance throughout the tissue. There were packets of them in many histiocytes, and their presence in the vascular endothelium was strikingly apparent.

Sections of the "normal" skin disclosed perivascular granulomas, composed chiefly of histiocytes. Larger infiltrates were present in the deeper subcutaneous tissue and fat (Fig. 1). Many cells of the infiltrate were vacuolated but could not be identified.

Sections of the erythema necroticans lesion showed cellular aggregates about the smaller vessels near the surface (Fig. 2) and the larger vessels in the deeper plexus, composed of mononuclear elements and extravasated red cells. There were similar collections about nerves and appendages. In some small vessels there was homogenization of the walls, and others showed thrombotic plugs. Acid-fast organisms could be seen in the perivascular inflammatory elements, and some appeared in the muscular layer of the vessels (Fig. 3).

The section of an exophytic ulcer (Fig. 4) showed a protruding mass of granulation tissue covered by a necrotic membrane and infiltrated by a variety of inflammatory elements, including eosinophiles. In the deeper layers were masses of lymphocytes and plasma cells in dense fibrous tissue. The dermis beneath the intact epidermis alongside the ulcer showed scarring and excessive vascularization.

The patient was released to the Los Angeles County General Hospital, preparatory to transfer to the National Leprosarium, at Carville, La., to which institution he was finally admitted.

COMMENT

The identification of the Lucio form of diffuse lepra in an American-born patient is evidence against the belief that the occurrence of this variety of lepra is confined to certain regions of Mexico. We suggest that it is its bizarre and unconventional features, so different from the characteristics of other forms of

the disease, which have impeded its recognition in other countries, even those in which lepra is endemic. It is of grave importance that physicians realize that diffuse lepra does occur in the United States and elsewhere, because patients with the disease may appear healthy on superficial inspection even though they are the bearers of a highly infectious type of lepromatous lepra.

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DESCRIPTION OF PLATE

PLATE 5.

FIG. 1. Section of apparently normal skin, low magnification. Granulomas resembling miliary lepromatous nodules are evident in the dermis and subcutaneous fat.

FIG. 2. Section of a lesion of erythema necroticans, medium magnification. The dilated dermal vessels are surrounded by inflammatory elements.

FIG. 3. High-power view of the lesion shown in Fig. 2. There are apparently fragmented bacilli in the walls of the small blood vessels of the dermis.

FIG. 4. Low power photomicrograph of an ulcer. A mass of inflammatory granulation tissue protrudes above the level of the skin.

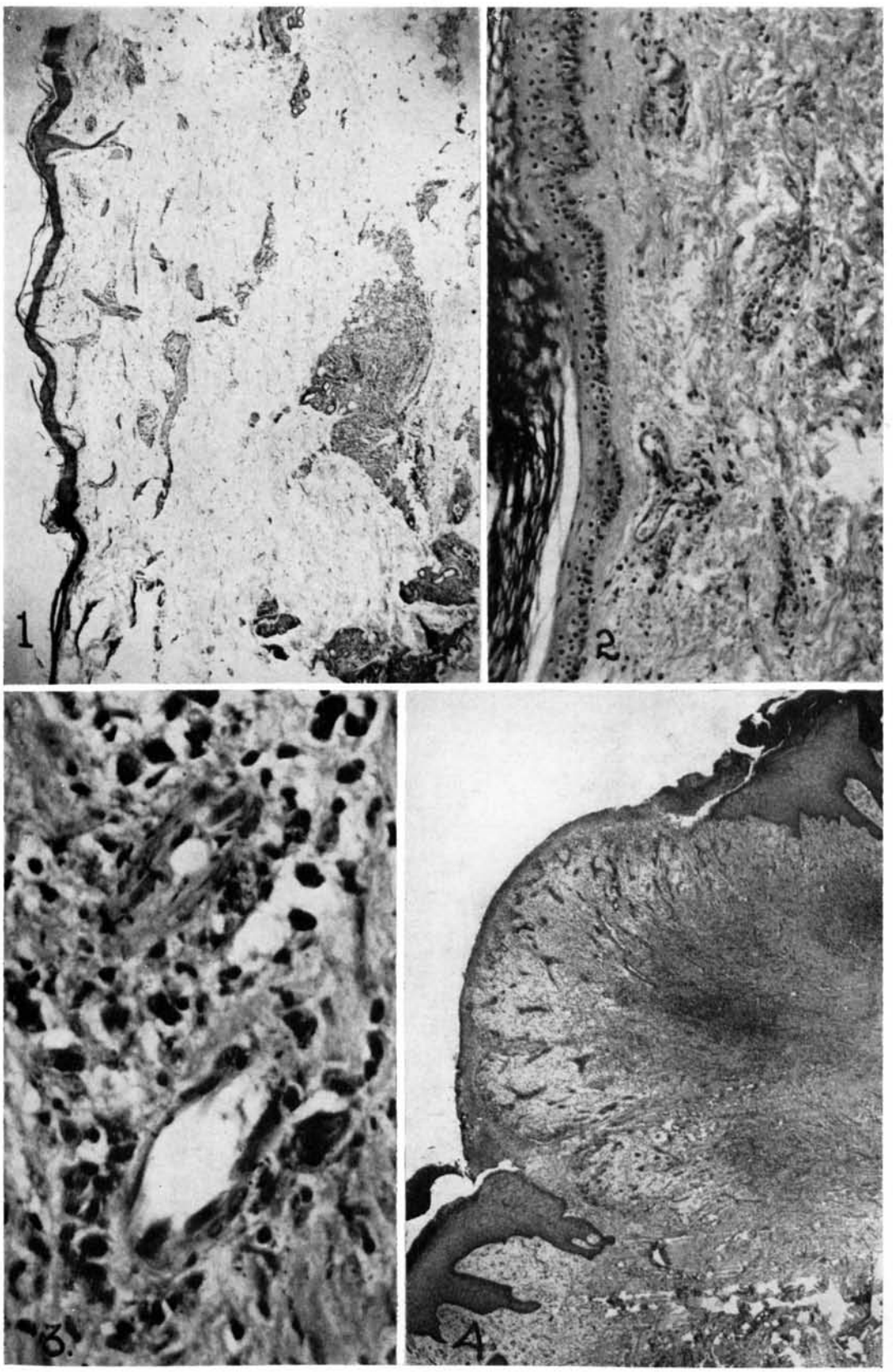

PLATE 5.