

# The Histologic Recognition of the Early Lesions of Leprosy

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Chapman H. Binford

During recent decades the greatly increased travel to and from countries where leprosy is endemic necessitates that pathologists and dermatopathologists practicing anywhere in the world pay attention to the histologic recognition of leprosy. In their surgical pathology practice they may have the opportunity and the responsibility for diagnosing leprosy even though the clinician did not suggest that possibility. They also may be asked by the clinician who submits a biopsy specimen to confirm or rule out a diagnosis of leprosy.

A pathologist or dermatopathologist who makes or confirms a diagnosis of leprosy, while the disease is still in an early stage, makes possible the administration of effective treatment before irreversible deformities occur. In order to recognize leprosy in its earliest forms, the pathologist must realize that the first histologic changes in the skin may be so insignificant that in many lesions on morphology alone he can only make a diagnosis of "mild chronic dermatitis." The failure by the pathologist to correctly diagnose leprosy when the histologic changes are indeterminate, may result in the development of progressive disease and severe deformities before treatment is started.

To illustrate the importance of diagnosing leprosy while the lesion is histologically indeterminate, the following case from the files of the Armed Forces Institute of Pathology in Washington, D.C. is presented.

A physician submitted to a pathologist a biopsy specimen of skin from a six-year old boy with the request that it be studied for the possibility of leprosy.

Histologically with the exception of a very mild lymphocytic infiltrate around a few blood vessels and nerves there were no

significant findings (Figs. 1 & 2). No bacilli were observed in a slide stained by the Fite-Faraco method (<sup>2</sup>). The histopathologic diagnosis was dermatitis, chronic, mild.

Eight years later the boy, now age 14, was admitted to a hospital with the clinical and histologic picture of advanced lepromatous leprosy. The slides of the skin lesion made eight years before were reviewed. Within sections of the nerves in the deep dermis there were a small number of acid-fast bacilli (Fig. 3). With present day knowledge, leprosy is the only mycobacterial disease afflicting man in which the bacilli show a predilection for peripheral nerves. A diagnosis of leprosy therefore could have been made in 1950, when the first biopsy specimen was studied by a pathologist.

In 1950 the brilliant observation of Khanolkar on the presence in early leprosy of mycobacteria in the small nerves of the skin was unknown to pathologists in the U.S.A. Only after Khanolkar's report of 1951 (<sup>3</sup>) did pathologists, when bacilli were not seen in infiltrates, give special attention to the small dermal nerves which did not show intraneural infiltrates. If the diagnosis of leprosy had been established in this boy at the time of the first biopsy, it is of course probable that the disease would have been arrested before irreversible deformities occurred.

When the histologic changes in a skin biopsy are indeterminate and the possibility of leprosy is considered, all small nerves should be searched for acid-fast bacilli, even though in the hematoxylin and eosin stain they appear entirely normal. On numerous occasions at the Armed Forces Institute of Pathology pathologists have been able to confirm the diagnosis of early lepro-

<sup>1</sup>C. H. Binford, M.D., Medical Director, Leonard Wood Memorial (American Leprosy Foundation), and Chief, Special Mycobacterial Diseases Branch, Armed Forces Institute of Pathology, Washington, D.C.

<sup>2</sup>Courtesy of R. Abalos, M.D. and T. Fajardo, M.D., Philippine Division, Leonard Wood Memorial.

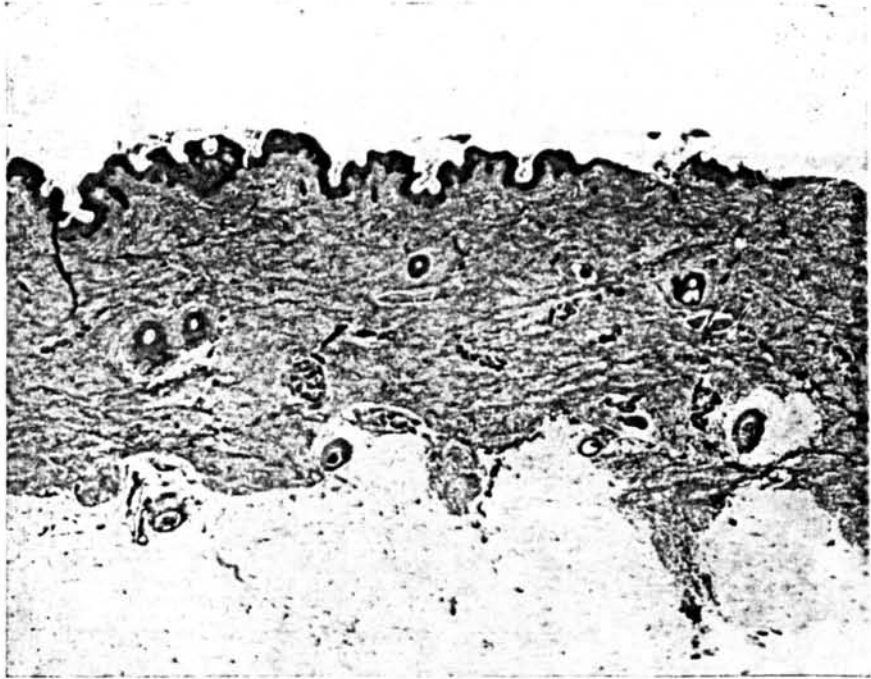


FIG. 1. Skin, six-year old boy, biopsy in 1950. Note that there is no appreciable infiltrate. H & E stain  $\times 23$ . AFIP neg. 66-7295.

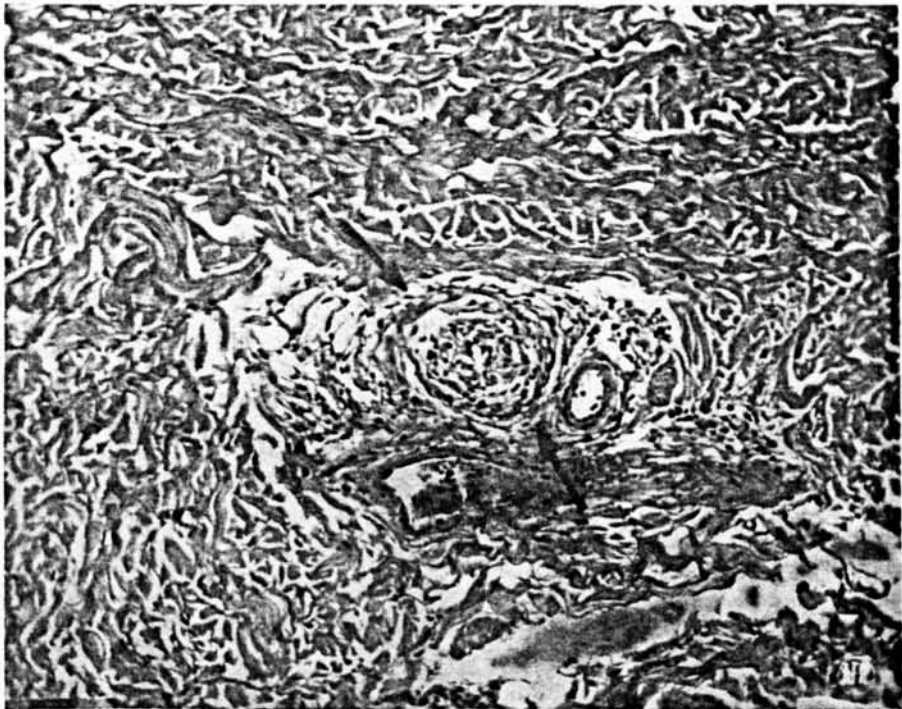


FIG. 2. The nerve (between arrows) is deep in dermis of the section shown in Fig. 1. There are a few more cells within the nerve than is normal and a very mild lymphocytic infiltrate around the nerve and blood vessel. H & E  $\times 144$ . AFIP neg. 66-7300.

sy by carefully searching the tiny dermal nerves for acid-fast bacilli. In some cases, however, particularly when few nerves were present, ten or more slides were examined before a positive diagnosis was made by finding bacilli in nerves.

During the past five years the Leonard Wood Memorial staff in Cebu, Philippines, has been making intensive clinical and histopathologic examinations of patients who were under observation for indeterminate leprosy. In this study special attention has been paid to the histologic examination of the tiny dermal nerves. In a preliminary report, made in 1966 by Abalos and Ortigoza (<sup>1</sup>), they confirmed the diagnosis of indeterminate leprosy in 20 patients by demonstrating bacilli in tiny dermal nerves. In only one of these 20 patients had bacilli been found in smears made from skin slits.

As an example of the value of studying nerves to obtain confirmation of diagnoses in indeterminate leprosy, the following case is presented.<sup>2</sup>

Filipino man, age 23. For two years he had noted a pale area on the skin of the left thigh which he described as being numb. On examination, a flat ill-defined, faintly hypochromic macule, with slightly reddish borders, was found on the lateral aspect of the left thigh. There was somewhat less hair in this area, as compared with the corresponding area on the right thigh. The lesion measured 14 × 16 cm. In the central portion of the lesion, pain and tactile stimulation revealed anesthesia or hypesthesia. On the peripheral parts of the lesion there was sensory loss. Nerves were not enlarged. A biopsy taken from the margin of the lesion showed only very minimal infiltrate (Figs. 4 and 5). There were a few round cells (lymphocytes or histocytes) around some blood vessels and a small nerve (Fig. 6). A small nerve, deeper in the dermis, showed a slight increase of intraneural cells, and there was a very mild round cell infiltrate around it and an adjacent blood vessel.

A Fite-Faraco acid-fast stain showed no bacilli in the infiltrate, but there were several well stained bacilli within the nerve

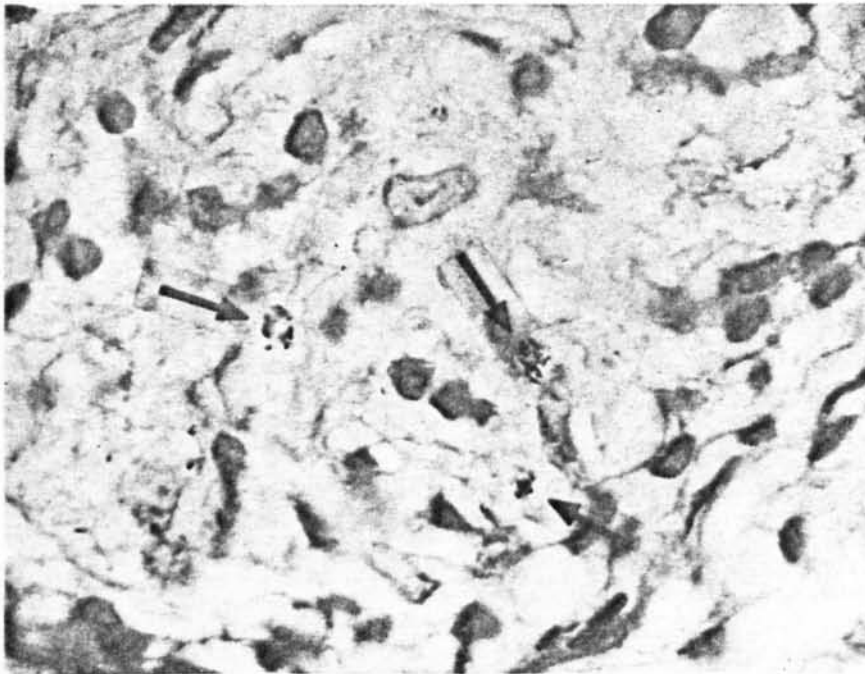


FIG. 3. A Fite-Faraco acid-fast stain of the nerve in the slide illustrated in Fig. 1. Observe the bacilli indicated by arrows, which were photographed with a green filter for better demonstration. × 1260. AFIP neg. 66-7303.



FIG. 4. Skin macule, left thigh. Observe the very minimal infiltrate. H & E  $\times 21$ , AFIP Neg. 70-8955.

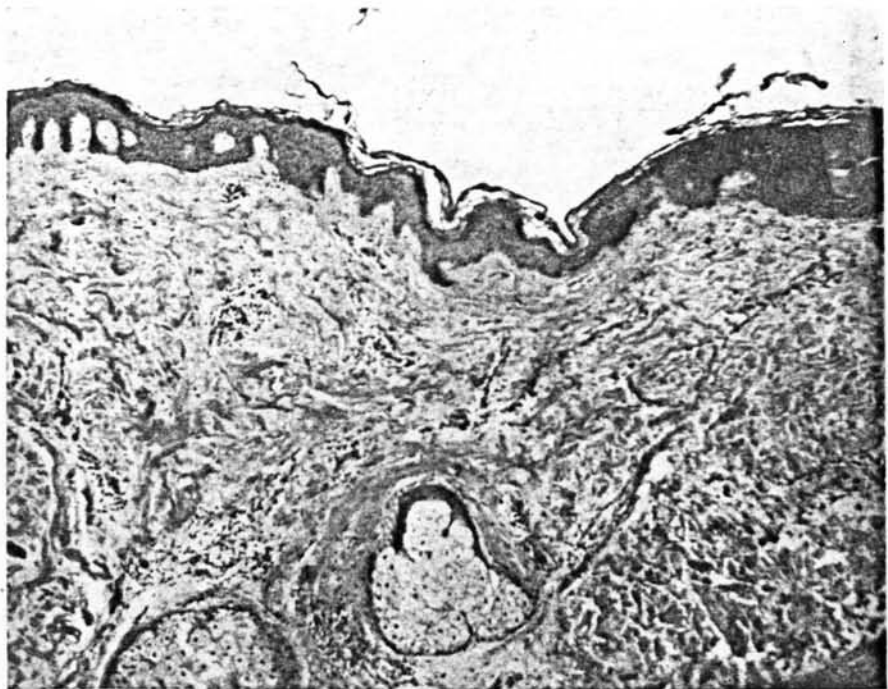


FIG. 5. Higher power ( $\times 70$ ) of slide shown in Fig. 4. Observe the paucity of infiltrate. H & E. AFIP Neg. 70-7904.





FIG. 6. Same slide shown in Fig. 4. A small nerve located deep in the dermis is marked by the arrows. Within the nerve there is a very slight increase in cells and around the nerve and blood vessel there is a small amount of round cell infiltrate. H & E  $\times$  215. AFIP Neg. 70-7901.



FIG. 7. Fite-Faraco acid-fast stain of nerve in slide shown in Fig. 4. Arrows point to two well-stained bacilli. AFIP Neg. 70-7895.

(Fig. 7). A histopathologic diagnosis of indeterminate leprosy was made.

#### SUMMARY

To prevent irreversible deformities leprosy should be diagnosed in its earliest stages. The searching of small dermal nerves for acid-fast bacilli emphasized by Khanolkar has enabled pathologists in many cases to diagnose leprosy even though the histologic picture is only that of mild chronic dermatitis. Two illustrative cases are presented.

#### REFERENCES

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