Methods of Recording Dermatoglyphics

Dermatoglyphics offer at least two major advantages as an aid to the diagnosis of medical disorders: (1) the epidermal ridge patterns on the hands and soles are fully developed at birth and, thereafter, remain unchanged for life; (2) scanning of the ridge patterns or recording their permanent impressions (i.e., prints) can be accomplished rapidly, inexpensively, and without any trauma to the patient.

A number of methods for recording dermatoglyphics exists. The methods vary in their requirements for equipment, time, and experience and in the quality of the prints produced.

Dermatoglyphic patterns are usually recognizable by the naked eye. A simple magnifying lens, preferably with a light source such as is found in an otoscope, helps greatly in scanning dermatoglyphics, especially in infants and small children whose patterns are very fine. The scan alone often gives the investigator sufficient data for most medical purposes but permanent impressions or prints are necessary for quantitative analyses of dermatoglyphics.

To enhance the quality of dermatoglyphic prints, it is necessary to remove sweat, oil, and dirt from the skin. This can be accomplished by washing the ridged areas with soap and water and with ethyl alcohol or ether.

Care must be taken to print the ridged areas completely. The ridges are primarily on the volar surface but also pass upward along the lateral margins of the fingers, palms, toes, and soles. Therefore, a print of only the volar surface may be incomplete and it is often necessary to roll the digits, palms, and soles to insure obtaining a
print of the whole pattern. Palm prints must include the area from the distal crease of the wrist to the metacarpal–phalangeal creases, and complete printing of both ulnar and radial sides of the ridged areas must be assured. Similarly, the heel and areas of the sole under the proximal portions of the toes must be included to avoid missing important details of the patterns. The quality of each print should be inspected as it is made so that in cases of possible technical defects an improved print can be taken immediately.

For those who use dermatoglyphics regularly, it is convenient to prepare standardized dermatoglyphic cards with spaces for entry of name and other identifying information. A space may be designated for each fingertip as well as for other pattern areas. When standardized cards are not used, it is wise to add the identification data to the print immediately after it is taken so that the specific digit or area and right and left are clearly marked. When only selected areas are printed, each must be identified at the time the impression is taken to avoid confusion and possible mistakes when the prints are analyzed.

A magnification lens of approximately four or five power helps in inspecting ridge details of printed areas. This strength of magnification is sufficient for most ordinary purposes, including counting of ridges. A low-power binocular microscope (eyepiece 6×, objective 0.7) with a large field (25 mm) has been recommended for study of ridge detail (Holt, 1968). A needle or other object with a sharp point is needed for accurate ridge counting and in tracing the radiants.

Greater magnification may be required to study ridge detail in an aborted fetus or stillborn child. A technique for studying the dermal patterns in human fetuses has been described by Miller (1968), who has found the patterns discernible in fetuses from 90-mm C–R length to term. The observations were made under a dissecting microscope with a maximal magnification of 40×, although no magnification larger than 25 was needed. Problems in visualizing ridge detail were encountered in older fetuses because of the vernix caseosa and the thickness of the stratum corneum, but application of a commercial depilatory cream accompanied by vigorous rubbing with a dry tissue improved the quality in these specimens. In fetuses less than 4 months old but over 175-mm C–R length, bathing the surface is recommended to help bring out the ridge formation. Very fine ridges may be accentuated by a coloring agent, such as ink from felt pens.