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Metric Evaluation of Axial Triradius of Palm

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ABSTRACT The axial triradius is usually present in the proximal part of the palm in alignment to the fourth metacarpal bone. Sometimes there may be two or three and rarely none. Accordingly starting from the proximal part of the palm, they are referred to as proximal (t), intermediate (t') and distal (t") and when absent (O). However these terms are qualitative and lack precision. The present paper proposes the logical method for the quantitative evaluation of the positions of the axial triradii.

Skin is a tough cutaneous membrane that covers the entire surface of our body protects from the external environment. It is not the same all over the body, as the skin in the palmar and plantar surfaces of the hands and feet is corrogated with the ridges and configurations. A critical look on these surfaces makes us feel as if something has been carved out of this skin. Cummins in 1926 called it as dermatoglyphics (Derma, skin; Glyphe, to carve). Cummins and Midlo in their book (1943) 'Fingers, Palms and Soles - An Introduction to Dermatoglyphics, have very intensively, extensively and critically dealt with various aspects and importance of the dermatoglyphics.

The present paper is devoted to the axial triradius of the palm, the determination of its level metrically and its importance. In a normal individual, there is a presence of the axial triradius on the proximal part of the palm in alignment with the fourth metacarpal bone. This proximal axial triradius is denoted as 't' and the axial triradius which occupies the distal position has been denoted as 't"', while the triradius occupying the intermediate position is called as 't'' Commonly there is a single triradius in the palm, but sometime there may be two or even three triradii present. In very rare cases it may be absent. These various levels of the axial triradii has been suggested by Cummins and Midlo (1943). The proximal, intermedite and distal positions are only qualitative. These authors have in their book page 99 suggested that more refined methods might be developed to evaluate the levels of the axial triradii. It is statement which motivated the present author to suggest and put forth the latest method which quantifies various levels of these axial triradii-t,t' and t". There are two most important landmarks involved in the determination of the levels of the axial triradii the axial triradius itself and the metacarpal of the fourth digit. It is suggested and logical also to join the proximal axial triradius with the triradius of the fourth digit called 'C' and extend this axis at both the ends, proximally to the bracelet crease and distally to the metacarpo-phalangeal crease as is shown in the figure 1

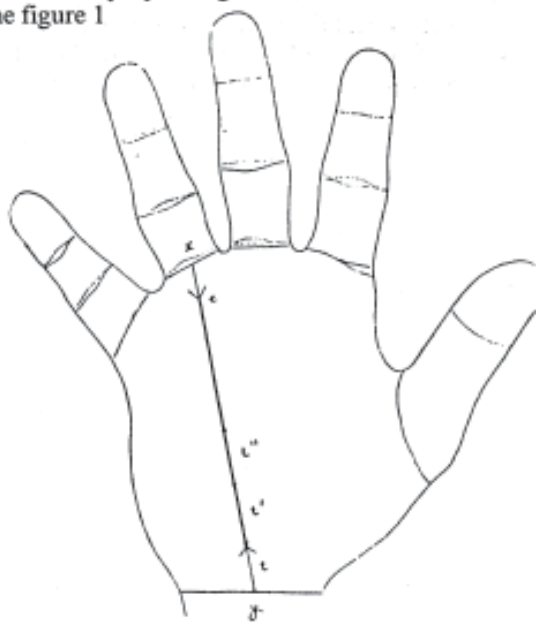

Fig. 1. Metric evaluation of axial triradius

This entire axis 'xy' is then measured. These triradii are mostly found on the lower part of the palm in the hypothenar area. The lower half of this axis is then made into three equal parts start-

ing from the bracelet crease the proximal axial triradius is denoted as 't' and the next level is called 't''; while the distal one is deciphered as 't''' : as mentioned earlier there may be more that one axial triradii, but while making the axis xy only the proximal triradius is taken into account. When there are two three axial triradii present, they are noted as tt', t' t'', tt' t'' etc. depending upon their respective levels. The absence of the triradius of the fourth digit poses a problem for making the axis xy. In such situations the proximal axial triradius is joined with the mid-point of the metacarpo-phalangeal crease of the fourth digit and the axis is drawn. However, this axis can only be made when the palm print is complete with the bracelet crease and when metacarpo-phalangeal crease are intact. In cases when the palm print is not printed completely or is damaged or when either of the creases can not be deciphered, the position of the axial triradius can not be ascertained with accuracy.

The Importance of The Axial Triradius

All the features of the dermatoglyphics are under the control of genes and as such they are extremely useful tools in the cases paternity dispute cases. The finger. palm and sole prints are taken from the disputed child, the biological mother and the putitative father. These prints are then compared. However, in such cases some other morphological traits are also taken into considerations. The axial triradius is invariably distally displaced in patients afflicted with various chromosomal aberrations as the Down's Syndrome, Edward's Syndrome and Patau's Syndrome to cite only a few. This study is also important in the personal identification. At the time of the immigration to other countries like America not only the finger prints but even the prints of the palms with fingers intact are made for the records. The frequency variation of the axial triradius at various levels is a useful criteria in the study of the population genetics. Above all the features of dermatoglyphics have been extensively useful in the inheritance of patterns and also in the identification of the monozygotic twins from dizygotic twins.

REFERENCE

Cummins, H. and Middlo. C. : *Finger, Palm and Soles - An Introduction to Dermatoglyphics.* Dover Publications, Inc. New York (1943).