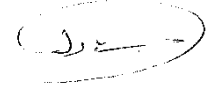


HAND INFECTIONS

THESIS

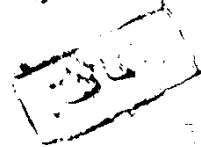
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Master Degree
in
General Surgery



By

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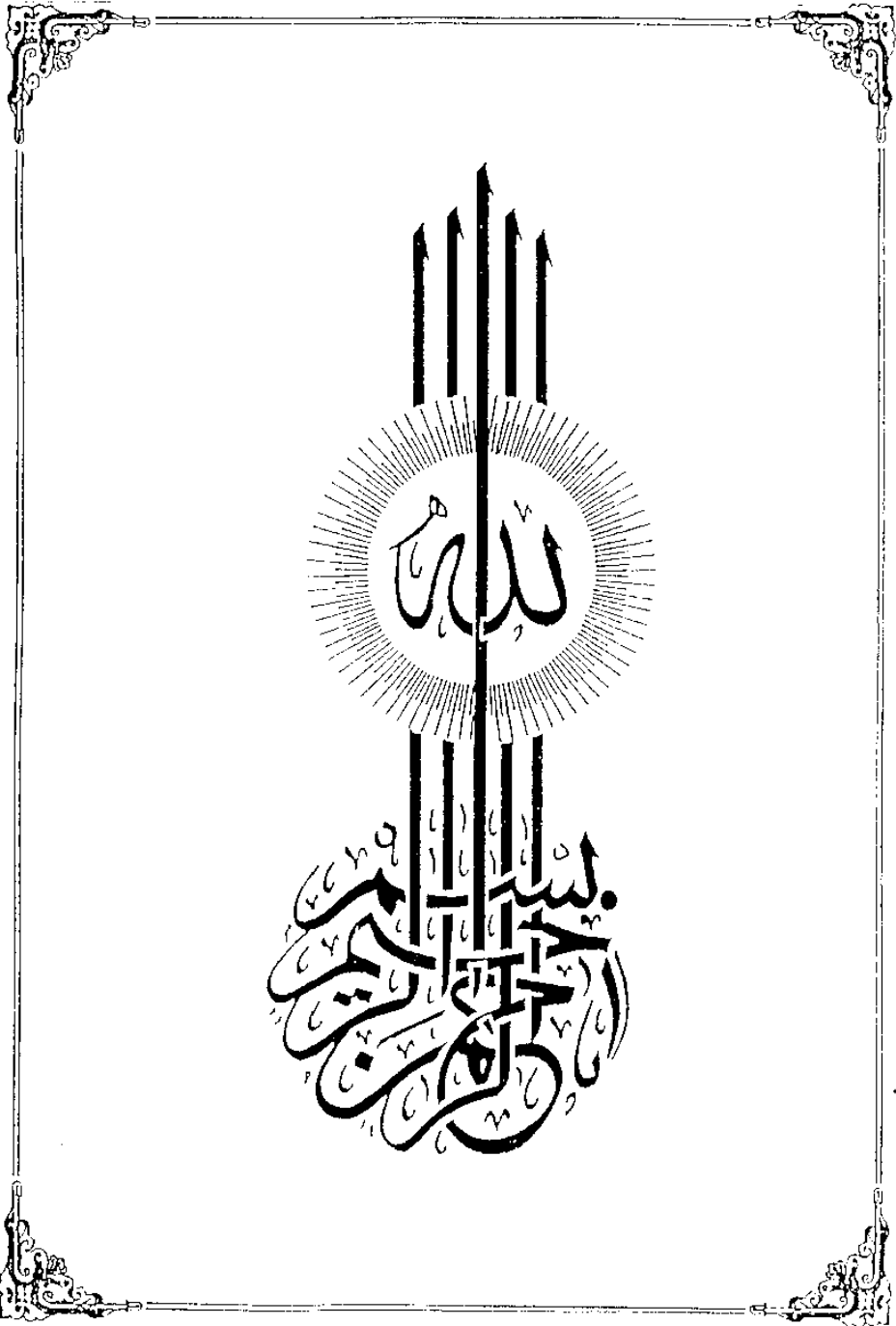
Faculty of Medicine

Ain - Shams University

1989

**DEDICATED
To
MY PARENTS**

**Who gave
Too much and received
too little.**



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INTRODUCTION

INTRODUCTION

Infections of the hand is a common problem in our country. A large sector of our population " manual workers and house wives " are affected by this problem. It is responsible for the loss of many work hours which may be reflected upon our economy. Infection can destroy the function of the hand by creating an oedematous reaction which if unobserved and untreated can be a crippling agent. (Barron 1980) . Understanding the etiology, pathology, types, early diagnosis and prompt treatment is important in order to maintain function in the digitis and to avoid serious complications. For proper diagnosis and treatment of the hand infections, detailed knowledge of anatomy and physiology is essential (Flynn 1976) .

Classification of the hand infections, diagnosis, treatment and Complications that follow this problem will be discussed in this study.

REVIEW OF LITERATURE

EMBRYOLOGY OF THE HAND

The study of the embryology of the hand is of utmost interest to the specialized surgeon. It helps in understanding some unusual aspects of the anatomy of the hand and in interpreting its various anomalies

(Malek 1981)

The embryology of the hand can not be studied separately from that of the upper limb of which, it forms the extremity.

Morphological Stages in the development of the hand

Figure 1 - 1 to

Figure 1 - 6 .

(I) End of the first month of gestation

A faint outline of the upper limb is recognizable at the end of the first intrauterine month. It consists at first of a simple thickening of the ectodermallayer which becoming apparent as a sessile outgrowth at the beginning of the fourth week . This appears opposite the cervical

Embryology of the hand

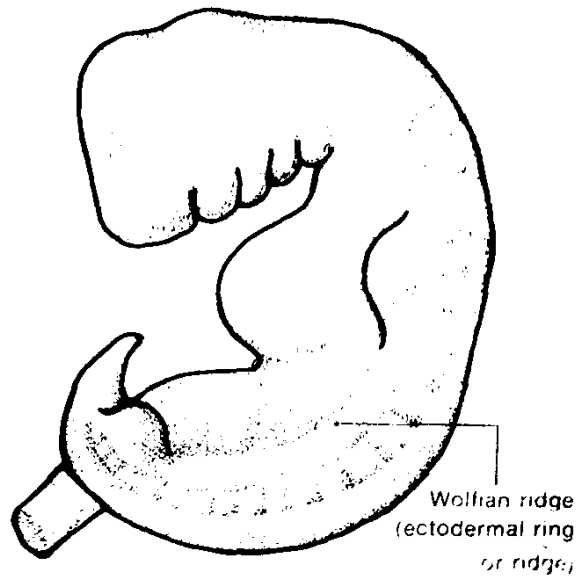
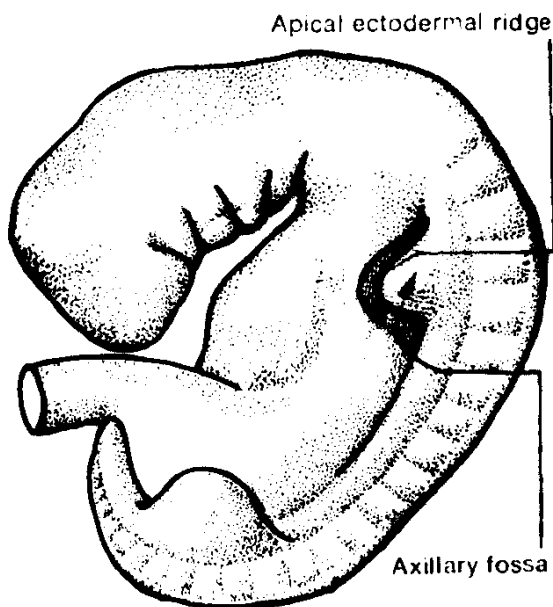


Figure 1-1. The buds of the upper and lower limbs.



Embryo at 32 days, 5 mm long. (Adapted from Hamilton et al. 1964.)

Figure 1-2 Embryo 6 to 7 mm long. the budding is anterior. It flattens out and forms the posterior limit of the axillary fossa. There is ectodermal thickening on the outer edge. (apical ectodermal ridge).

(From Malek R. : Embryology of the hand. In :
The Hand, edited by R. tubiana
Vol. I, W.B. Saunders Comp.
Philadelphia, London, Toronto 1981)

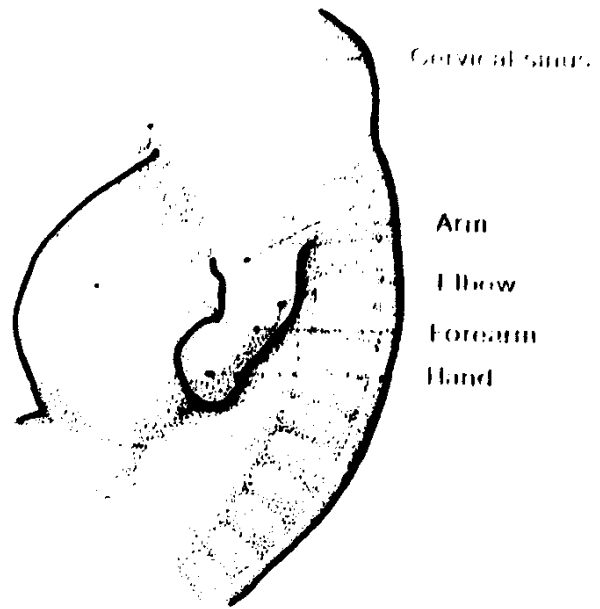


Figure 1-3. Embryo at 37 days 10,50mm long. The elbow and the hand appear.

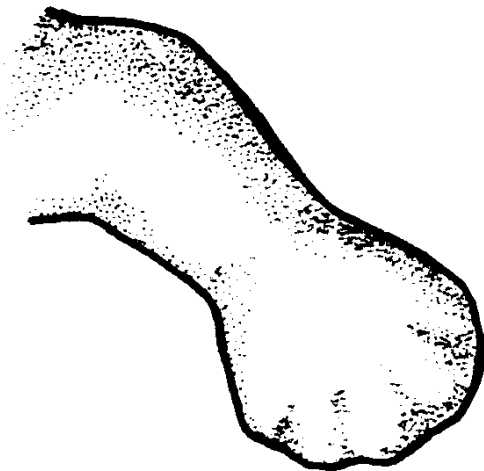


Figure 1-4. Embryo at 40 days, 13.4 mm long, out line of the hand (which equals the dimensions of the remainder of the upper limb)

(From Malek R. : Embryology of the hand. In:
The Hand, edited by R. tubiana Vol.I,W.B.
 Saunders Comp. Philadelphia, London, Toronto 1981)

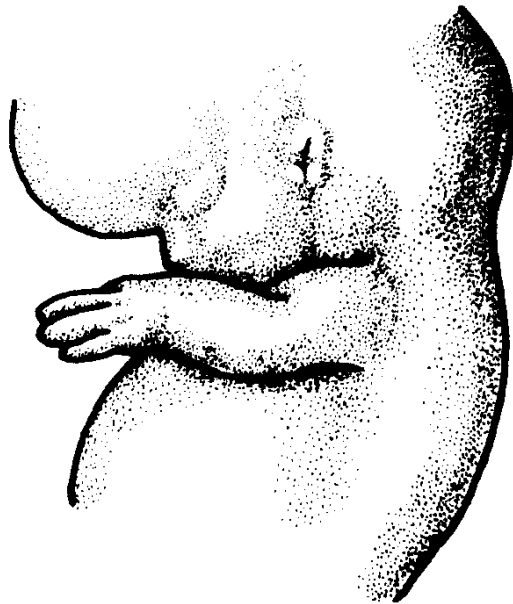


Figure 1-5. Embryo at 46 days, 17 mm long. Tridactyl hand.

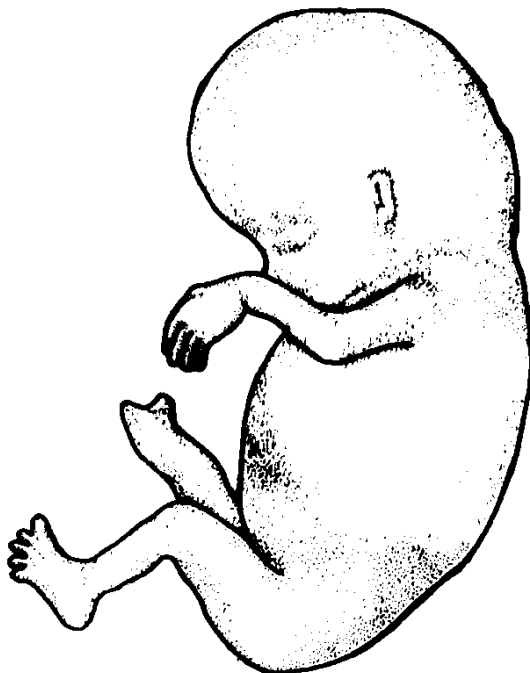


Figure 1-6. Embryo at 60 days, 30mm long : Fetus.

The hand is pentadactyl, in a position of wrist flexion and pronation.

(From Malek R.: Embryology of the hand. In :
The Hand, edited by R. tubiana Vol.I,W.B.
Saunders Comp. Philadelphia, London, Toronto 1981)

and first two dorsal somites at the level of the ectodermal ring, and consists of a mass of mesenchymal tissue coated with thickened ectoderm. At the end of the fourth week, the bud starts enlarging from above downward toward the caudal end of the embryo.

(II) At the beginning of the second month

The bud now flattens anteroposteriorly and straightens toward the ventral region to form the posterior wall of a depression known as "The axillary fossa". At its extremity there develops an ectodermal thickening, called "apical ectodermal ridge" which appears to exert an influence on further growth. At "37" days the outline of the hand appears as circular and flattened palmar-like structure, and the bud shows a bend at the site of future elbow. Histologically, the interrelation between mesoderm and ectoderm is of fundamental importance.

(Hamilton 1964).

The ectoderm will give rise to the skin and its "adnexae" hair, nails, sweat glands, sebaceous glands". The mesoderm will form the skeleton, muscles and connective tissue. A foramen appears in the forearm for the interosseous

artery: this is the antebrachial foramen, the early separation between radius, & ulna.

(III) From Six to eight weeks

- (a) The apical ectodermal ridge shows five thickened areas which correspond to the fingers, while the mesoderm shows five radial condensations, the premetacarpals.
- (b) The three middle fingers become individualized earlier giving the embryonic hand, a tridactyl appearance.
- (c) The thumb and little finger are at first limited to two short proximal buds, while the carpus starts to take shape within the mesodermal mass. The hand becomes gradually cupped but the carpal tunnel will appear only toward the Sixty - first day. The fingers continue to grow during the process of chondrification. The hand becomes pentadactyl, with the five digital rays widely divergent. The thumb remains quite small and its early posture is in opposition and marked adduction.

(IV) At the end of the eighth week

The growth of both upper and lower limb buds follow the same pattern but at the end of eighth week, adduction and rotation of the limbs occur along their long axis. The upper limb is adducted and rotated laterally and as a result of this, its ventral surface " flexor " becomes anterior and the radius which is the preaxial bone of the forearm becomes lateral. For these reasons, the preaxial border becomes lateral and its skin is innervated by the upper segments of the brachial plexus (C₄- C₆), whereas the postaxial border becomes medial and its skin is innervated by lower segments of plexus (C₈ - T₁ and T₂).

Also at the end of the eighth week the limbs acquire their fetal position and the direction of the elbow is caudally. At this period the hand is represented by a palate - like enlargement at the extremity of the bud. The mesenchymal core of the peripheral part of the palate becomes condensed to outline the digits and the thinner intervening areas break down from the circumference towards the centre. This process may be