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ROLE OF ULTRASONOGRAPHY IN THE DIAGNOSIS OF INTRASCROTAL SWELLINGS

THESIS

SUBMITTED IN PARTIAL FULFILLMENT

OF MASTER DEGREE IN
RADIO-DIAGNOSIS

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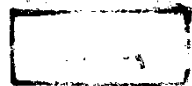
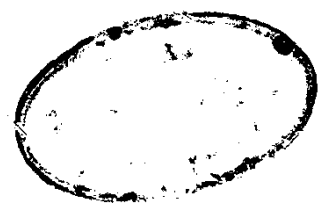
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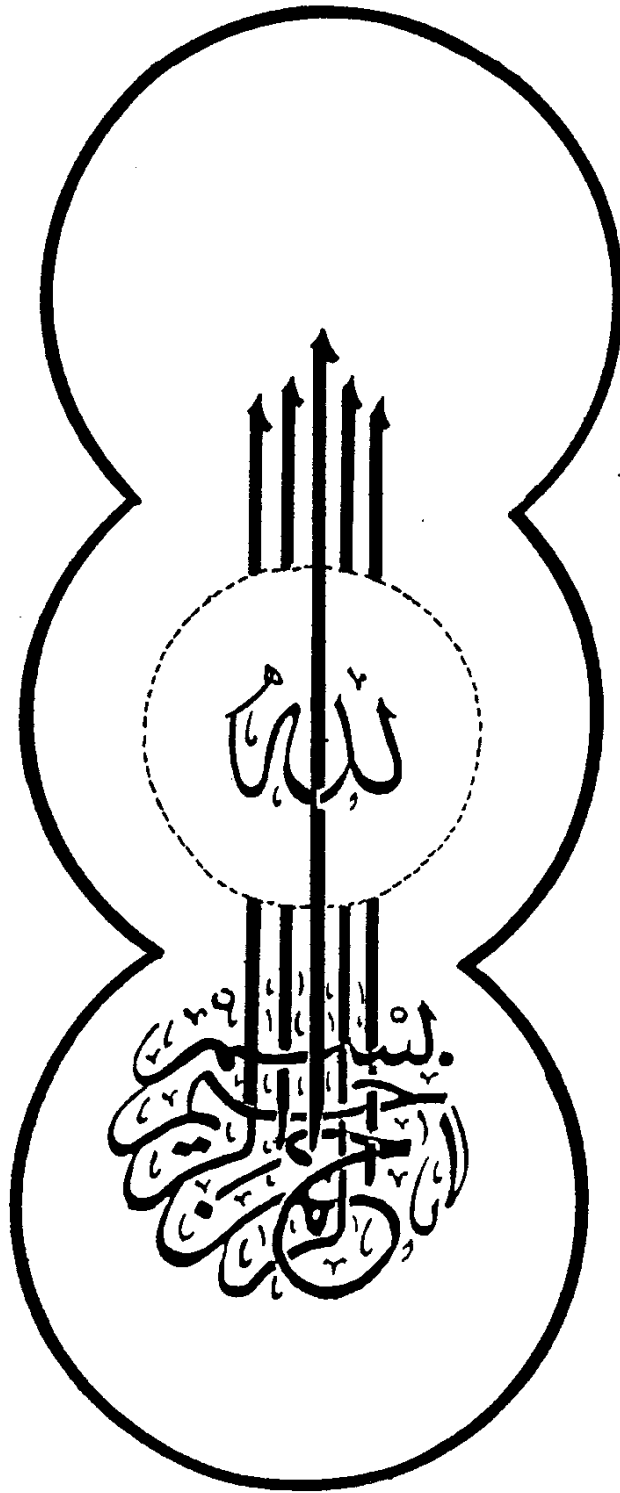
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INTRODUCTION
&
AIM OF THE WORK

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Ultrasonography has gained an exceptionally outstanding role in the diagnosis of many diseases during the past two decades due to its non-hazardous nature and its accuracy.

Its uses in obstetrics and in the diagnosis of gynaecological, abdominal and urinary diseases need no further emphasis.

Increasing attention has been directed to its role in the evaluation of pathology of superficial organs such as the breast, the thyroid gland, the orbit and the scrotum. This occurred after the development of highly sophisticated ultrasound system specially designed for such an evaluation.

Ultrasound examination of the scrotum has been reported since the mid-seventies (Miskin and Bain, 1974). Until that time scrotal examination was limited to inspection, palpation and transillumination. Pathology, sometimes eluded clinicians as the clinical history and presentation were non-specific. Since that time scrotal sonography has found a wide acceptance as it offered a non-invasive, non-ionizing, sensitive and rapid modality for scrotal examination.

The aim of this work is to highlight the increasing role of scrotal sonography in the evaluation of the various intrascrotal pathologies.

In order to understand the sonographic anatomy and pathology of the intrascrotal swellings, a resume of the embryology and anatomy of the scrotum and its contents, as well as the pathology and clinical presentations of the various intrascrotal swellings is given.

**EMBRYOLOGY AND ANATOMY OF
THE SCROTUM AND ITS CONTENTS**

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EMBRYOLOGY OF THE SCROTUM:

At the end of the 5th week of intrauterine life a surface elevation called "the genital tubercle" appears in both sexes at the cranial end of the cloacal membrane. It lengthens to form the phallus, behind which appears a pair of rounded swellings called "the labioscrotal or genital swellings".

The genital swellings in the male shift caudally and meet each other anterior to the anus where they unite to form the scrotum (Gray's, 1973).

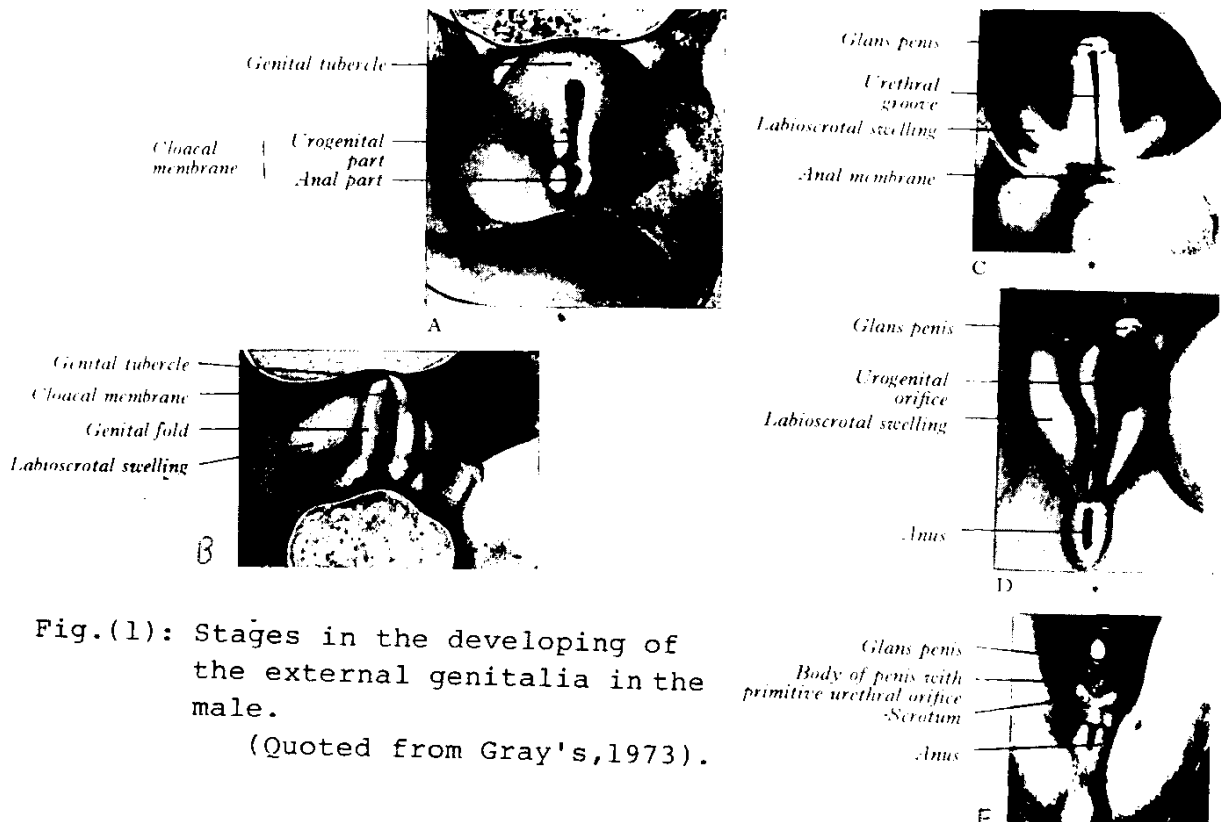


Fig.(1): Stages in the developing of the external genitalia in the male.

(Quoted from Gray's, 1973).

The Formation of Gonads: (Gray's, 1973)

An area of thickened epithelium appears on the medial side of the mesonephric ridge in the 5th week of intrauterine life.

This thickened epithelium proliferates forming a projection into the coelomic cavity called "the gonadal ridge".

The ridge is connected to the mesonephros by a mesentery called "the mesogenitale".

Up to the 7th week of intrauterine life the gonad possesses no differentiation. The proliferating epithelium now forms a number of cellular gonadal cords separated by mesenchyme.

At this stage in the male an extension of the mesenchyme rapidly thickens to form "the tunica albuginea".

The cellular gonadal cords lengthen and unite with the network derived from the mesenchyme which ultimately becomes the testicular rete.

Primordial germ cells are incorporated in these gonadal cords which later become enlarged and canalized forming the seminiferous tubules.

The cells derived from the surface of the gonad form the supporting cells (of Sertoli).

The cords of the testicular rete, which canalize later, become connected to the mesonephric duct by 5 - 12 tubules and these become exceedingly convoluted and form the lobules of the head of the epididymis.

The mesonephric duct which was the primitive ureter of the mesonephros becomes the canal of the epididymis, the ductus deferens and the ejaculatory ducts.

The Descent of the Testis:

The intra-abdominal temperature is slightly higher than the scrotal temperature . This would destroy the spermatogenic tissue sparing the androgenic tissue. That is why the testis must descend to the scrotum.

At the beginning of the 3rd month of intrauterine life, two peritoneal passages, one on each side, are formed in the lower part of the anterior abdominal wall , in the inguinal canal, each is called the saccus vaginalis. Its extension in the scrotum is called the processus vaginalis.

At that time the testis lies high up on the the posterior abdominal wall (Mahran et al.,1973). See Fig.(2).

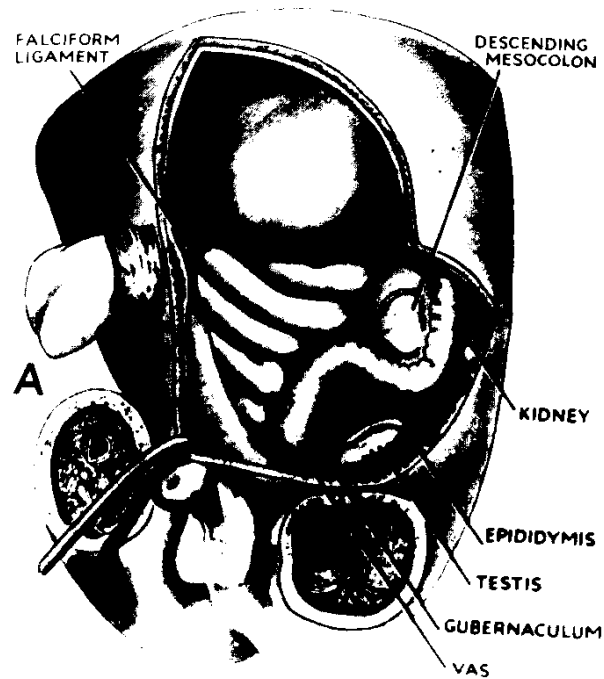


Fig.(2): The testis lies on the posterior abdominal wall below the kidney.
(Quoted from Last, 1981).

It is attached to the mesonephric fold by a peritoneal fold "the mesorchium".

The mesonephric fold becomes connected to the lower part of the anterior abdominal wall by an inguinal fold of peritoneum.

The mesenchymal cells included in this inguinal fold form a cord (the gubernaculum testis), extending from the skin which will later form the scrotum through the inguinal fold and the mesorchium to the caudal pole of the testis.

The caudal pole of the testis is retained in apposition with the deep inguinal ring by the gubernaculum until the 7th month of intrauterine life when it suddenly and rapidly passes through the inguinal canal and gains the scrotum.

As the testis descends it is necessarily accompanied by its peritoneal covering.

The distal end of the processus vaginalis into which the testis projects, forms the tunica vaginalis, but its proximal part associated with the spermatic cord in the scrotum and in the inguinal canal normally becomes obliterated.

The fascial coverings of the testis and spermatic cord including the cremaster are developed from the gubernaculum testis (Gray's, 1973).

Mechanism of Descent:

The true mechanism is not known but it may be due to:

1. Shortening and active contraction of gubernaculum.