ROLE OF ULTRASONOGRAPHY AND OTHER IMAGING TECHNIQUES IN FEMALE PELVIC MASSES.

THESIS

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BY

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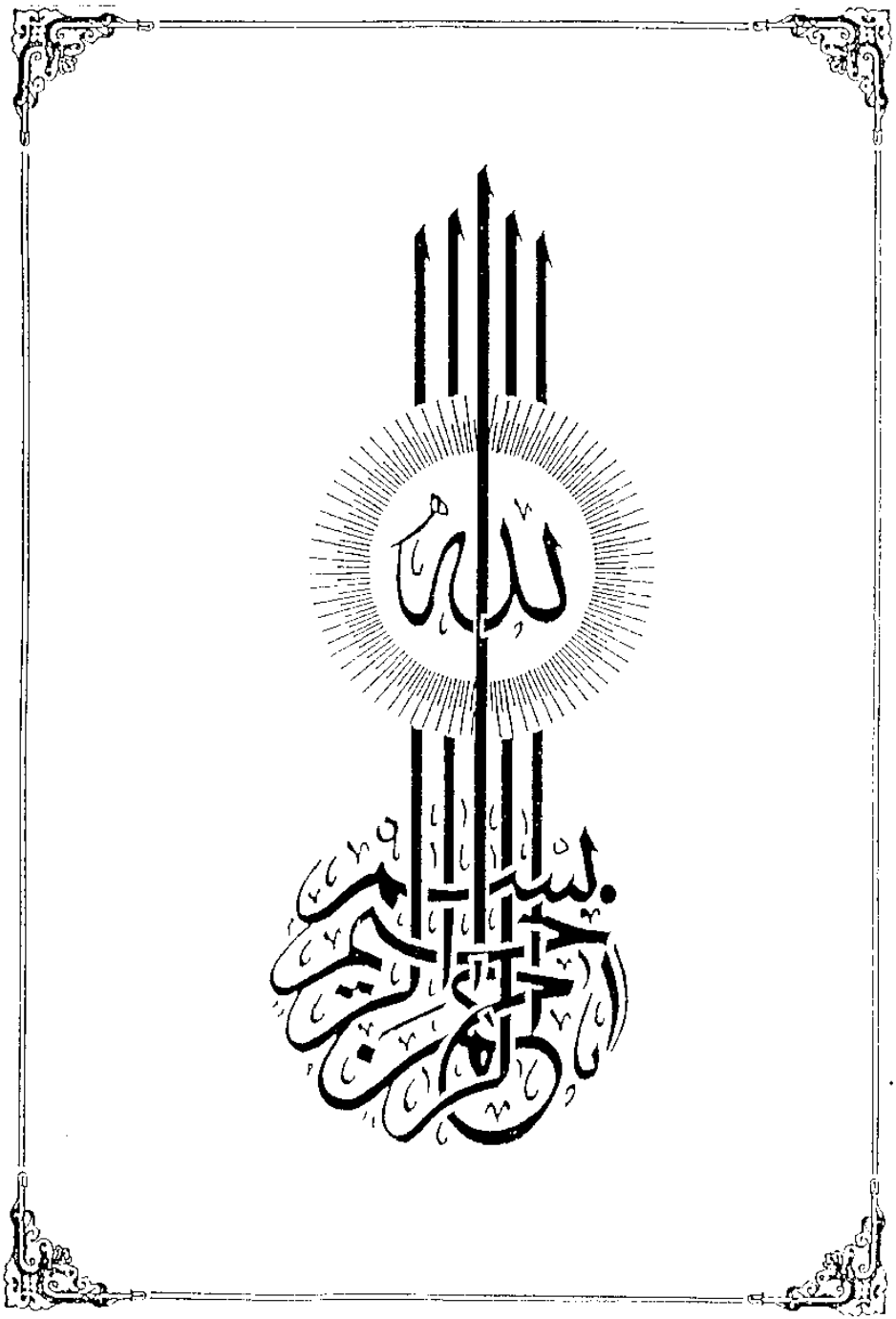

DEDICATION

This work is dedicated to

MY PARENTS

Who brought me up.

My BELOVED HUSBAND

Who made this work possible

with his encouragement, tolerance

and kind supervision.

MY TWINS

Ahmed and Magda GHONEIM

who are my hope of a brighter future.

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Introduction and Aim of the Work

INTRODUCTION AND AIM OF THE WORK

Numerous technological advances have occured in the past few years in ultrasound instrumentation. Focusing of the sound beam, gray scale signal processing and the incorporation of computer components have contributed to the improved spatial and contrast resolution.

The increased information contents of sonograms has provided more specific boundary landmarks for the various abdominal organs and a specific tissue characterization.

Ultrasound is a relative new comer to the field of diagnostic imaging, which proved to be safe, non invasive and applicable to a variety of organs.

Pelvic masses in general, present sometimes great diagnostic problems. Various methods of investigations were introduced to help in the elucidation of these masses.

Ultrasound scanning is proved to be the safest, simplest and cheapest method for localising and outlinning pelvic masses and differentiating solid and cystic types.

CT imaging may provide additional information or increased diagnostic confidence in patients who underwent u/s examination, it is considered actually a promising problem solving modality after ultrasound in the study of adnexal abnormalities.

It is helpfull in detection of the extension of the tumoral process to the surrounding areas and adhesions of ovarian neoplasm to the surface of the uterus and bowel loops.

CT findings in selected cases permit a satisfactory pre-operative investigation as well as a post-operative tool, where recurrence is suspected.

The aim of this present work is to evaluate the actual role of ultrasonography and other imaging modalities in the diagnosis of the various female pelvic masses and to correlate the imaging findings with the final diagnosis obtained by the per and post-operative histopathology, and by laparoscopy.

Gross Anatomy

GROSS ANATOMY

Gross Anatomy of the Female Pelvis

All new imaging techniques require a knowledge of cross sectional anatomy of the pelvis.

The pelvic anatomy includes a systematic anatomy as regards bony pelvis, associated ligaments and foramina, and a regional anatomy for the different pelvic organs.

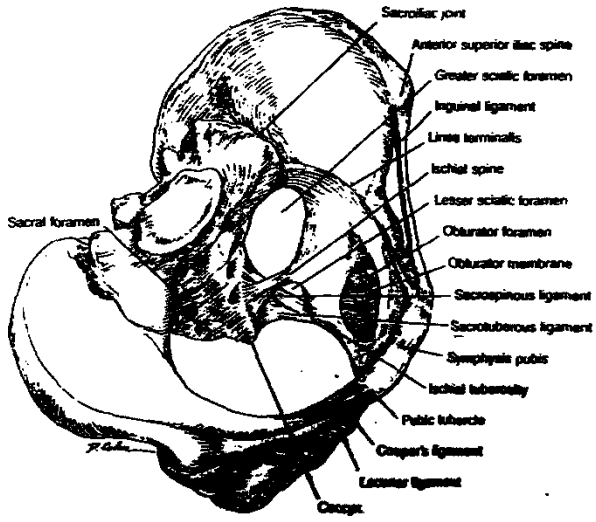
Systematic Anatomy

1. The bony pelvis: (Fig.1)

Is formed posteriorly by the sacrum and coccyx and laterally and anteriorly by the hip bones which unite anteriorly to form the symphysis pubis.

The paired hip bone consists of three parts: the ilium, the ischium and the pubis which come together in the area of the acetabulum.

The ilium is the upper most portion of the hip bone and includes the ala or wing which, above the linea terminalis, forms the bony lateral boundary of the false pelvis.



1) View of the pelvis from above

(Burnett, 1988. Novak's textbook of Gynecology, p.41)

The linea terminalis is a well defined bony landmark of the pelvis that separates the major and minor pelvic cavities. The major or false pelvis is, above it, in fact it represents the lower portion of the abdomen. The true or minor pelvis lies below the linea terminalis which forms the boundary of the superior aperture of the lesser pelvis. The outlet of the bony pelvis is bounded anteriorly by the lower border of the symphysis, laterally by the ischeal tuberosities and the sacrotuberous ligaments and posteriorly by the tip of the sacrum. (Burnett, 1988)

2. Ligaments and foramina: (Fig.1)

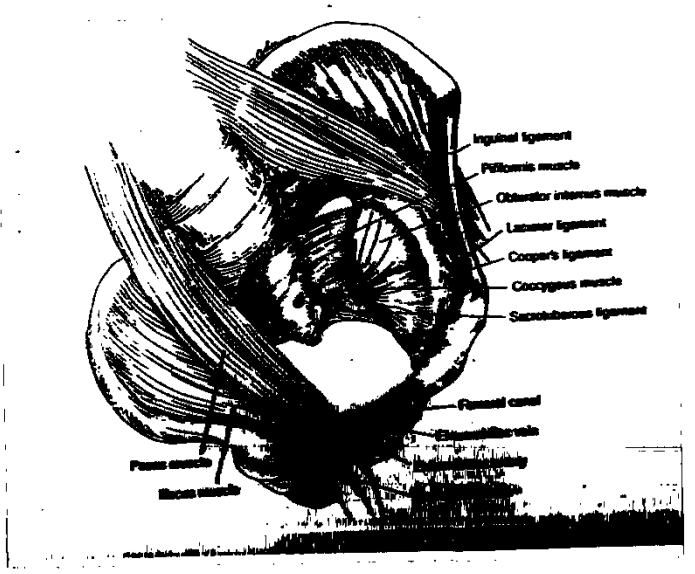
* The inguinal ligament extends between the anterior superior iliac spine and the pubic tubercle.
* The lacunar ligament extends between the inguinal ligament medially and the pectineal portion of the pubic bone, it forms the medial boundary of the femoral ring.
* Cooper's ligament extends along the pectineal portion of the pubic bone.
* The sacrotuberous ligament is attached to the posterior portion of the iliac crest and the adjacent sacrum and coccyx.

* The sacrospinous ligament lies inside the sacrotuberous ligament.

Bones, ligaments & foramina of the pelvis (Burnett, 1988)

Pelvis	Ligaments	foramina
Ilium Ischium Pubis Sacrum Coccyx	Inguinal Cooper's Lacunar Sacrotuberous Sacrospinous	Obturator Greater Sciatic Lesser Sciatic

* The greater sciatic foramen is bounded anteriorly by the greater sciatic notch of the hip bone and elsewhere by the sacrotuberous and sacrospinous ligaments. Through this foramen pass the pyriformis muscle, the gluteal vessels and various nerves from the sacral plexus, the internal pudendal vessels and pudendal nerve.
* The lesser sciatic foramen is separated from the greater sciatic foramen by the sacrospinous ligament. It transmits the obturator internus muscle. The internal pudendal vessels and nerve enter the pelvis through it.
* The obturator foramen is a bony window closed by the fibrous obturator membrane. (Burnett, 1988)



2) View of the right pelvis

(Burnett, 1988. Novak's textbook of Gynecology, p.41)

3. Muscles of the Pelvis: (Fig. 2)

The iliopsoas muscle originates from the lateral margin of the lumbar vertebrae and passes beneath the inguinal ligament to insert on the lesser trochanter of the femur. Within the substance of this muscle is formed the lumbar plexus.

The piriformis originates from a broad area over the lateral surface of the sacrum, and it converges into a muscle belly, that leaves the pelvis through the greater sciatic foramen to be inserted into the greater trochanter of the femur.

The obturator internus originates from a broad area on the inner surface of the pubis, ilium and ischium as well as the obturator membrane. It converges toward the lesser sciatic foramen to be inserted into the lesser trochanter of the femur.

The pelvic floor muscles include the pelvic diaphragm internally and the urogenital diaphragm as a second layer anteriorly.

The pelvic diaphragm consists of voluntary muscles including the coccygeus muscle posteriorly and the levator ani muscle anteriorly.

The coccygeus arises from the tip of the ischial spine and inserts into the lower anterior surface of