الآيــة

{ يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ}

صدق الله العظيم

سورة المجادلة

الآية 11

Dedication

To my family

To my brothers

To my teachers

**** To my friends***

And to soul of our friend, loay

Acknowledgment

The first and last all thanks to Allah. I would like to thank my mother and father who are work very hard to make me reachthis stage. Thanks extend to my husband. Also thanks to my supervisorDr. Abukonna. And thanks to my friends who helped me and all people who are support me and who are always see I’m a qualify.

ABSTRACT

Adnexal masses are an imaging dilemma because they may represent metastases to the ovaries, primary ovarian malignancy, or incidental benign pathology.

The aim of this study was to evaluate female pelvic masses using computed tomography. 76 patients with pelvic tumor from different diagnostic centers were enrolled in the study. Patients with Allergy to contrast agent, Pregnancy, Renal insufficiency were excluded from the study. All subjects were scanned with MDCT64-Slice scanner.

The result of this study revealed that the uterine and ovarian masses were the most common type pelvic masses; furthermore the majority of masses were malignant and characterized with ill-defined margin, irregular, heterogeneous and enhanced with contrast agent. The sensitivity of CT scan was high as compared with other imaging modalities; it can differentiate the benign from malignant tumor based on its features.

The contrastenhanced MDCT have high accurate in the detection and characterization of adnexal mass, and can have an important role in the diagnosis of malignant ovarian tumor.

الخلاصة

تشخيص اورام الحوض بصورة عامة تشكل معضلة في التشخيص التصويري بسبب عدم امكانية توضيح الانتشار الخبيث لاورام المبيض في مراحله الاولي.

الهدف من هذه الدراسة هو تقييم اورام الحوض عند النساء باستخدام الاشعة المقطعية المحوسبة متعددة الكواشف ,تم دراسة 76 حالة جمعت بياناتهم من عدة مراكز تشخيصية .

تم استبعاد الحالات التي لديها فرط الحساسية من استخدام الصبغة الملونة للتصوير والحوامل من النساء وذوات امراض الكلي .

اوضحت نتائج هذه الدراسة انا اورام الرحم والمبيض هي الاكثر انتشارا" ,وصنفت الاغلبية علي انها اورام خبيثة وذلك حسب وصف الاشعة المقطعية المحوسبة للورم , وجد ان للاشعة المقطعية المحوسبة قدرة عالية في التفريق بين الاورام الحميدة والخبيثة حسب صفاتها.

خلصت الدراسة ان التباين المحسن للاشعة المقطعية المحوسبة متعددة الكواشف له القدرة العالية والدقيقة في تشخيص اورام الحوض خصوصافي حالات اورام المبايض الخبيثة.

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CT **COMPUTED TOMOGRAPHY**

MDCT **MULTI-DETCTOR COMUTED TOMOGRAPHY**

MRI **MAGNATIC RESONACE IMAGE**

US **ULTRASONAGRAPHY**

HSG **HISTOSALPINGOGRAPHY**

HPV **HUMAN PAPILLOMAVIRUS**

DCE-MRI **DYNAMIC CONTRAST ENHANCED -MRI**

DW-MRI **DIFFUSION WEIGHTED-MRI**

Contents

Chapter One

1.1. Introduction:

The female pelvis is an anatomic region which is quite complex, because it contains some organs and systems accomplishing different and independent functions. The urogenital system represents the main part of the female pelvis but there are also portions of other organs and systems such as some important blood vessels, gastrointestinal tracts, lymphatic, nerves and parts of the musculoskeletal system. All these structures might house or generate pelvic masses even in para-physiologic conditions, and not necessarily because of current diseases, or congenital alterations, inflammatory illness and tumors. Approximately 20% of women will develop a pelvic mass at some time in their lives. Pelvic masses present gynecologists with difficulties in both diagnosis and management. When a patient presents with a pelvic mass, the gynecologist needs to first determine if the mass is gynecologic in origin and then determine whether it is benign or malignant (Rockall et.al, 2013).

In evaluating any pelvic mass, it is important to first determine if the mass is arising from the ovaries, the uterus, or another location. If the anatomical location of the mass can be determined, then imaging may be extremely helpful in establishing a more precise diagnosis. For instance, if the mass is of ovarian origin, determining whether it is cystic, solid, or complex is very helpful. Likewise, identifying the presence of any fat or calcium in the mass is important. Computed tomography (CT) is primarily utilized for staging of pelvic malignancies or suspected bowel abnormalities, such as appendicitis or diverticulitis. However, CT performed for other reasons, including abdominal pain, may detect and may be diagnostic in certain pelvic abnormalities.CT may be helpful for staging and

evaluating the extent of malignancy. CT may be used to diagnose appendicitis or diverticulitis. In other circumstances, CT may also be helpful to determine the location of the mass and if it is cystic, solid, or complex. CT is helpful to identify fat, calcium, or air within a structure. Thus, in some cases, such as a dermoid cyst, CT findings are fairly specific (Gahan et.al, 2014).

This study was highlighted on evaluation of female pelvic malignancy using MDCT scanner, once we need faster and accurate diagnostic modalities in this situation in order to have high diagnostic accuracy in assessing the tumor and its related morbidity since MDCT has been proposed as an alternative to conventional studies for the diagnosis of most pelvic organs.

1.2. Problem of the study:

The neoplasia rapidly has been spread all over the world in both genders, Female pelvic is common affected site among the female malignancy. In which incorporate GIT organ which have a wide range of malignancy, moreover the detection of these tumor radiologically is quite difficult in case of older fashion (x-ray and US) so the need for more accurate imaging procedure such as MRI, CT compared to the histological diagnosis is consider as important in developing a diagnostic criteria and assessing the accuracy of detection.

1.3 Objectives of the study:

1.3.1. General objective:

Assessment of female pelvic tumor using computed tomography relative to the other diagnostic tool(Histology).

1.3.2. Specific objectives:

- To evaluate the efficiency of CT in detecting the female pelvic tumor.
- To find out the most common type of tumor that affect female pelvis.
- To correlate the radiological findings with patient age.

1.4. Overview of the study:

This study was consist of five chapters, chapter one was an introduction introduce briefly this thesis and contained (general introduction, problem of study also contain general, specific objectives, significant of the study and overview of the study). Chapter two was literature review about role of MDCT scanner in diagnosis of pelvic tumor, and other modalities used. Chapter three was describe the methodology (material, method) used in this study. Chapter four was included result of presentation of final finding of study; chapter five included discussion, conclusion and recommendation for future scope in addition to references and appendices.

Chapter Two

Literature Review

2.1. Anatomy:

The ovaries are the organs in a woman's reproductive system that produce eggs (ova.) They are almond-shaped and about 3.5 cm (1.5 inches) long. The ovaries are deep in a woman's pelvis, on both sides of the uterus (womb), close to the ends of the Fallopian tubes.

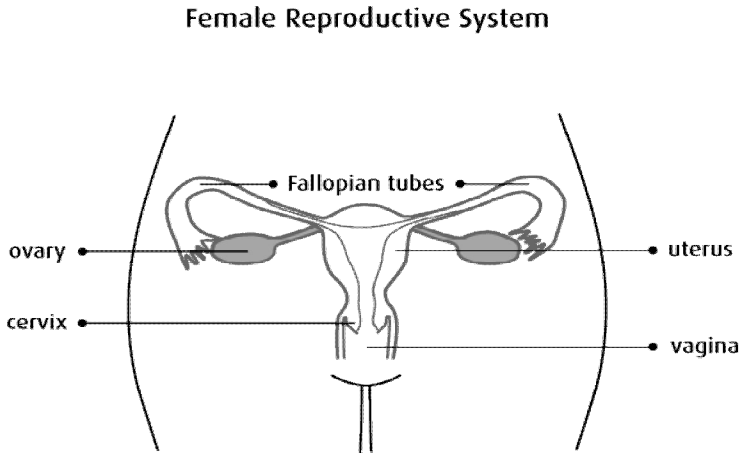

Figure (2-1) normal structure of the female reproductive system

The ovaries are made up of 3 different types of cells:Epithelial cells make up the outer layer covering the ovary (epithelium).Germ cells are inside the ovary. They develop into eggs. And Stromal cells form the supportive or connective tissues of the ovary (stroma).Each ovary is surrounded by a thin layer of tissue called the capsule (American Cancer Society, 2011).

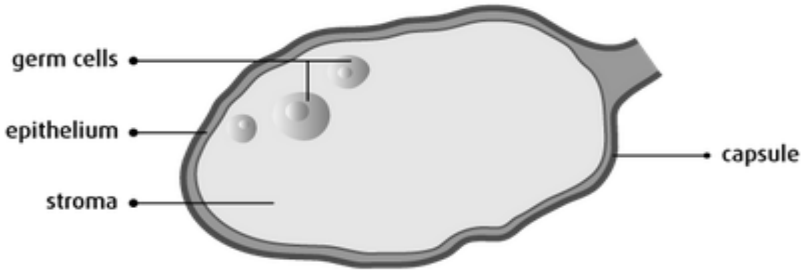

Figure (2-2) normal structure of the ovary

The ovaries have 2 main functions. They produce mature eggs. They also make the female sex hormones, which control reproduction and sexual development.Estrogen is responsible for the development of secondary sex characteristics, such as the growth of breasts. And Progesterone prepares the body for conception by causing the buildup of the uterine lining (endometrium) and other changes. The ovaries are the main source of estrogen in sexually mature women. Each month during ovulation, an ovary releases a mature egg. The egg travels down the Fallopian tube to the uterus. If it is fertilized by a sperm, the egg implants into the lining of the uterus and begins to develop into a fetus. If the egg is not fertilized, it is shed from the body along with the lining of the uterus during menstruation. During menopause, the ovaries stop releasing eggs and producing sex hormones. (Martini et.al, 2012)

The uterus varies considerably in size, shape and weight depending on the status of parturition and estrogenic stimulation. The uterus is a fibromuscular organ that can be divided into the upper muscular uterine corpus and the lower fibrous cervix, which extends into the vagina. The upper part of the uterus above the insertion of the fallopian tubes is called the fundus. The narrow portion situated between corpus and cervix is known as the isthmus and lies approximately at the level of

the course of the uterine artery and the internal os of the cervix. The endometrial cavity lies within the uterine corpus and is surrounded by a thick, muscular wall (Snell, 2012)

The musculature of the uterus is in several layers. There is an outer longitudinal layer (stratum supra-vascular) continuing into the fallopian tubes and round ligaments. The vascular layer (stratum vascular) consists of many interlacing spiral groups of smooth muscles and contains many blood vessels. An inner layer consists of muscle fibers arranged both longitudinally and obliquely.The cervix, which protrudes into the vagina, is generally 2–3 cm long. The intravaginal portion of the cervix, known as the portiovaginalis, ordinarily is covered with nonkeritinizing squamous epithelium with a number of mucus-secreting glands.The external os is the opening of the cervix within the vagina. Above the external os lies the fusiform endocervical canal, approximately 2 cm long and lined with columnar epithelium and endocervical glands. The intersection where the squamous epithelium of the exocervix and columnar epithelium of the endocervical canal meet, the squamo-columnar junction, is geographically variable and dependent on hormonal stimulation. It is this dynamic interface, the transformation zone, that is most vulnerable to the development of squamous neoplasia. In early childhood, during pregnancy, or with oral contraceptive use, columnar epithelium may extend from the endocervical canal onto the exocervix, a condition known as eversion or ectopy. After menopause, the transformation zone usually recedes entirely into the endocervical canal.

At the upper end of the endocervical canal at the junction with the uterine cavity is the internal os. The endocervical canal in the nullipara is lined by mucosa arranged in a series of folds. A vertical fold is present on the anterior and posterior cervical walls; from these, oblique folds radiate. These folds have been called the arbor

vitae uteri or plicaepalmatae. It was formerly thought that tubular glands descend vertically from the surface and divide into many branches forming compound racemose glands; however, secondary changes caused by the intense growth activity of the columnar cells result in the formation of tunnels, secondary clefts, and exophytic processes.

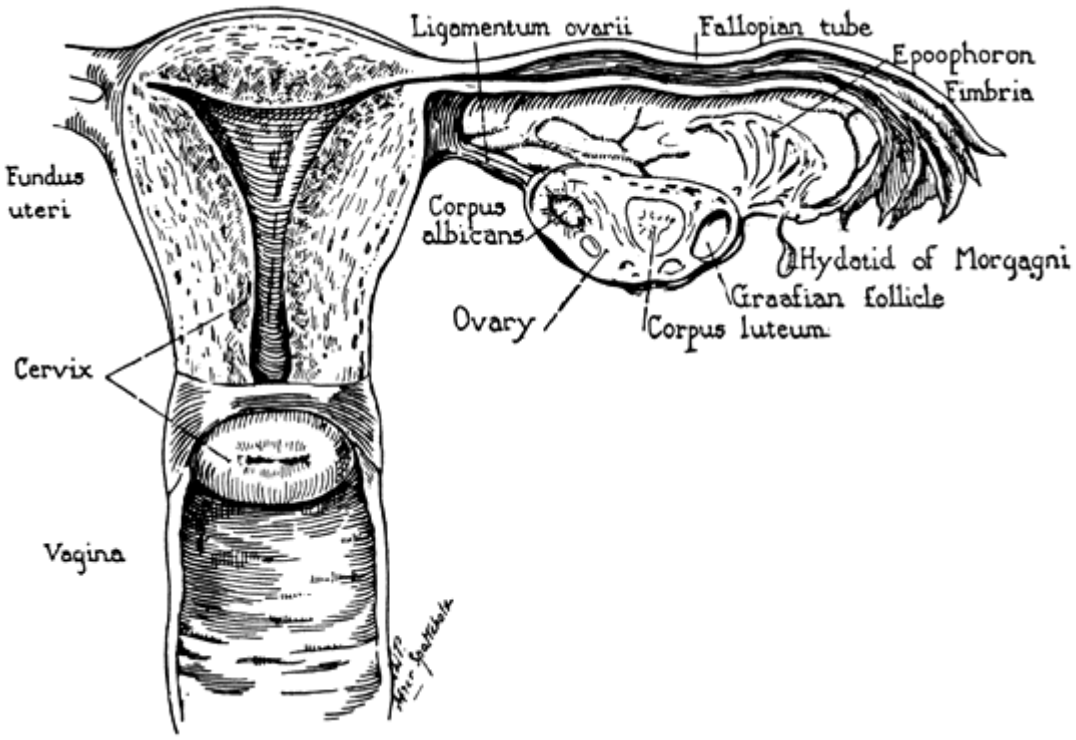

Figure 2.3 Schema of the female reproductive organs.

The endometrial cavity lies above the internal cervical OS. It is roughly triangular in shape and measures approximately 3.5 cm in length. Ordinarily, the anterior and posterior walls of the uterus lie in apposition so that little if any actual cavity is present. At each cornu or horn of the uterus, the cavity of the uterus becomes continuous with the lumen of a fallopian tube. Peritoneum covers most of the corpus of the uterus and the posterior cervix and is known as the serosa. Laterally, the broad ligament, a double layer of peritoneum covering the neurovascular

supply to the uterus, inserts into the cervix and corpus. Anteriorly, the bladder lies over the isthmic and cervical region of the uterus (Snell, 2012).

The “positions” of the uterus are of considerable interest but of much less importance in gynecologic practice than 50 years ago. The most common position of the uterus in a nulligravid female is in moderate anteflexion or bent slightly anteriorly, and the uterus as a whole is inclined toward the symphysis in ante version against the bladder, adapting its position as the latter organ distends or empties (Fig. 3 and Fig. 4). In a variable number of women, the uterus is retroverted or inclined posteriorly or retroflexed toward the sacrum. Quite a few disabilities were attributed to these “malpositions” in the past including dysmenorrhea, functional uterine bleeding, backache, dyspareunia, and leukorrhea. Many normal uteri are in mid position, with the axis of uterus being almost parallel to the spine (Snell, 2012).

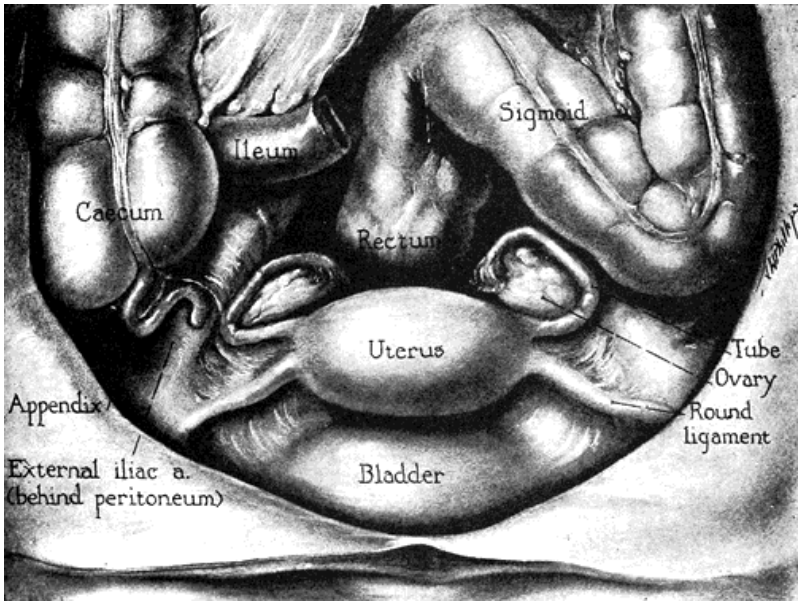

Fig.(2.4) Transverse section of the abdomen above the crests of the ilia. This section is 1 inch above the pubis and extends through the disk between the sacrum and the last lumbar vertebra.

The fallopian tubesare bilateral muscular structures of paramesonephric duct origin. They are from 7 to 12 cm in length and usually less than 1 cm in diameter. The tubes or oviducts have a lumen that varies considerably in diameter. It is extremely narrow, being less than 1 mm at its opening into the uterine cavity. It is wider in the isthmus (Fig. (2-3)) (2.5 mm) and in the ampulla is approximately 6 mm in diameter. The tube begins in the uterine cavity at the cornu and penetrates the myometrium (intramural or interstitial portion). The second portion is the relatively straight and narrow portion of the tube which emerges from the uterus posterior to and a little above the origin of the round ligament. The lumen of the narrow isthmus is relatively simple, with a few longitudinal folds. This portion of its tube is 2 or 3 cm long. There are three layers of musculature: the inner longitudinal, the middle circular layer, and the outer longitudinal layer. There is some evidence that the isthmus may act as a sphincter (Snell, 2012).

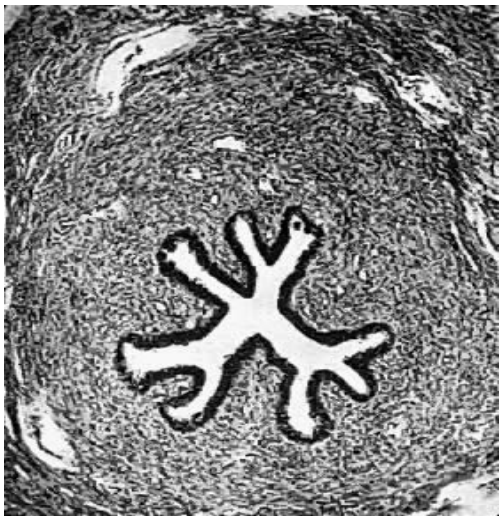

Figure (2-5) Photomicrograph showing the isthmic portion of the fallopian tube; it is in this portion of the tube that spasm may occur and close the lumen. The mucosa is lined by columnar epithelium which surrounds the lumen. The columnar cells have cilia. The circular muscle layer is thickest at the isthmus and thinnest at the infundibulum.To the isthmus and part of the ampulla. Some sympathetic fibers

from T10 and T11 reach the celiac plexus and provide postganglionic fibers to the ovarian plexus, which supplies the distal ampulla and fimbriae. The parasympathetic supply is by vagal fibers from the ovarian plexus supplying the distal portion of the tube. Part of the isthmus receives its parasympathetic supply from S2, S3, and S4 via the pelvic nerve and the pelvic plexuses. The sympathetic innervation of the female pelvis is depicted in Fig. 12(Snell, 2012).

The vagina not only is the female genital canal but also serves as the excretory duct for the menstrual flow from the uterus and forms part of the birth canal. This muscular tube extends upward and backward between the vulva and the uterus. It measures about 3 in. (8 cm) long. The cervix of the uterus pierces its anterior wall. The vaginal orifice in a virgin possesses a thin mucosal fold, called the hymen, which is perforated at its center. The upper half of the vagina lies above the pelvic floor within the pelvis between the bladder anteriorly and the rectum posteriorly; the lower half lies within the perineum between the urethra anteriorly and the anal canal posterior. Supplied by the vaginal artery, a branch of the internal iliac artery, and the vaginal branch of the uterine artery supply the vagina. And Vaginal veins drain into the internal iliac veins(Snell, 2012).

The term vulva is the collective name for the female external genitalia and includes the Mons pubis, labia major and minor, the clitoris, the vestibule of the vagina, the vestibular bulb, and the greater vestibular glands. Supplied by Branches of the external and internal pudendal arteries on each side the skin of the vulva is drained into the medial group of superficial inguinal nodes(Snell, 2012).

Pelvic Cavity:The pelvic cavity, or cavity of the true pelvis, can be defined as the area between the pelvic inlet and the pelvic outlet. It is customary to subdivide it by the pelvic diaphragm into the main pelvic cavity above and the perineum below.

The sigmoid colon is 10 to 15 in. (25 to 38 cm) long and begins as a continuation of the descending colon in front of the pelvic brim. Below, it becomes continuous with the rectum in front of the third sacral vertebra. The sigmoid colon is mobile and hangs down into the pelvic cavity in the form of a loop.The sigmoid colon is attached to the posterior pelvic wall by the fan-shaped sigmoid mesocolon. Supplied by Sigmoid branches of the inferior mesenteric artery.Andthe veins drain into the inferior mesenteric vein, which joins the portal venous system.Anteriorly: in the female, the posterior surface of the uterus and the upper part of the vagina posteriorly: The rectum and the sacrum. The sigmoid colon is also related to the lower coils of the terminal part of the ileum (Snell, 2012).Rectum:The rectum is about 5 in. (13 cm) long and begins in front of the third sacral vertebra as a continuation of the sigmoid colon. It passes downward, following the curve of the sacrum and coccyx, and ends in front of the tip of the coccyx by piercing the pelvic diaphragm and becoming continuous with the anal canal. The lower part of the rectum is dilated to form the rectal ampulla.The rectum deviates to the left, but it quickly returns to the median plane. On lateral view, the rectum follows the anterior concavity of the sacrum before bending downward and backward at its junction with the anal canal. The puborectalis portion of the levatorani muscles forms a sling at the junction of the rectum with the anal canal and pulls this part of the bowel forward, producing the anorectalangle.The peritoneum covers the anterior and lateral surfaces of the first third of the rectum and only the anterior surface of the middle third, leaving the lower third devoid of peritoneum. The muscular coat of the rectum is arranged in the usual outer longitudinal and inner circular layers of smooth muscle. The three teniae coli of the sigmoid colon, however, come together so that the longitudinal fibers form a broad band on the anterior and posterior surfaces of the rectum (Snell, 2012).

The mucous membrane of the rectum, together with the circular muscle layer, forms two or three semicircular permanent folds called the transverse folds of the rectum, they vary in position. Supplied by The superior, middle, and inferior rectal arteries. And the veins of the rectum correspond to the arteries. Relations:Posteriorly: The rectum is in contact with the sacrum and coccyx; the piriformis, coccygeus, and levatoresani muscles; the sacral plexus; and the sympathetic trunks. Anteriorly: In the female, the upper two thirds of the rectum, which is covered by peritoneum, is related to the sigmoid colon and coils of ileum that occupy the rectouterine pouch (pouch of Douglas). The lower third of the rectum, which is devoid of peritoneum, is related to the posterior surface of the vagina.Anus:The anus is the lower opening of the anal canal and lies in the midline. In the living the anal margin is reddish brown and is puckered by the contraction of the external anal sphincter. Around the anal margin are coarse hairs.Pelvic Viscera in the Female:The rectum, sigmoid colon, and terminal coils of ileum occupy the posterior part of the pelvic cavity, as described previously. The contents of the anterior part of the pelvic cavity in the female are described in the following sections (Snell, 2012).

The ureter crosses over the pelvic inlet in front of the bifurcation of the common iliac artery. It runs downward and backward in front of the internal iliac artery and behind the ovary until it reaches the region of the ischial spine. It then turns forward and medially beneath the base of the broad ligament, where it is crossed by the uterine artery. The ureter then runs forward, lateral to the lateral fornix of the vagina, to enter the bladder (Snell, 2012).

The urinary bladder is situated immediately behind the pubic bones. Because of the absence of the prostate, the bladder lies at a lower level than in the male pelvis, and the neck rests directly on the upper surface of the urogenital diaphragm. The close

relation of the bladder to the uterus and the vagina is of considerable clinical importance.The apex of the bladder lies behind the symphysispubis. The base, or posterior surface, is separated by the vagina from the rectum. The superior surface is related to the uterovesical pouch of peritoneum and to the body of the uterus. The inferolateral surfaces are related in front to the retropubic pad of fat and the pubic bones. More posteriorly, they lie in contact with the obturator interns muscle above and the levatorani muscle below. The neck of the bladder rests on the upper surface of the urogenital diaphragm.The general shape and structure of the bladder; its blood supply, lymph drainage, and nerve supply; and the process of maturation are identical to those in the male(Snell, 2012).

2.2. Physiologic Anatomy of the Female:

Female reproductive functions can be divided into two major phases:(1) Preparation of the female body for conception and pregnancy, and (2) The period of pregnancy itself.The principal organs of the human female reproductive tract, the most important of which are the ovaries, fallopian tubes, uterus,and vagina.

Reproduction begins with the development of ova in the ovaries. In the middle of each monthly sexual cycle, a single ovum is expelled from an ovarian follicle into the abdominal cavity near the open fimbriated ends of the two fallopian tubes. This ovum then passes through one of the fallopian tubes into the uterus; if it has been fertilized by a sperm, It implants in the uterus, where it develops into a fetus, a placenta, and fetal membranes—and eventually into a baby.During fetal life, the outer surface of the ovary is covered by a germinal epithelium, which embryological is derived from the epithelium of the germinal ridges.As the female fetus develops, primordial ova differentiate from this germinal epithelium and migrate into the substance of the ovarian cortex. Each ovum then collects around it

a layer of spindle cells from the ovarian stroma(the supporting tissue of the ovary) and causes them to take on epithelioid characteristics; they are then called granulosa cells .The ovum surrounded by a single layer of granulosacells is called a primordial follicle .The ovum itself at this stage is still immature, requiring two more cell divisions before it can be fertilized by a sperm. At this time, the ovum is called a primary oocyte. During all the reproductive years of adult life, between about 13 and 46 years of age, 400 to 500 of the primordial follicles develop enough to expel their ova—one each month; the remainder degenerate (become atretic). At the end of reproductive capability (at menopause), only a few primordial follicles remain in the ovaries, and even these degenerate soon thereafter (Guyton and hall, 2006).

2.3. Pathology:

Cancer is the second leading cause of death in the United States; only cardiovascular diseases exact a higher toll.Even more agonizing than the mortality rate is the emotional and physical suffering inflicted by neoplasm.Cancer is not one disease but many disorders that share a profound growth dysregulation. Some cancers, such as Hodgkin lymphomas, are curable, whereas others, such as cancer of the pancreas, have ahigh mortality. The only hope for controlling cancer lies in learning more about its pathogenesis, and great stride have been made in understanding the molecular basis of cancer and basic biology of neoplasia the nature of benign and malignant neoplasms and the molecular basis of neoplastic transformation (Robbins and Cotran, 2010).

Nomenclature:Neoplasialiterally means “new growth.” A neoplasm, as defined by Willis, is “an abnormal mass of tissue the growth of which exceeds and is uncoordinated with that of the normal tissues and persists in the same excessive

manner after the cessation of the stimuli which evoked the change." Fundamental to the origin of all neoplasms are heritable (genetic) changes that allow excessive and unregulated proliferation that is independent of physiologic growth-regulatory stimuli. Neoplastic cells are said to be transformed because they continue to replicate, apparently oblivious to the regulatory influences that control normal cell growth. Neoplasms therefore enjoy a certain degree of autonomy and more or less steadily increase in size regardless of their local environment and the nutritional status of the host. Their autonomy is by no means complete, however. Some neoplasms require endocrine support, and such dependencies sometimes can be exploited to the disadvantage of the neoplasm. All neoplasms depend on the host for their nutrition and blood supply. In common medical usage, a neoplasm is often referred to as a tumor, and the study of tumors is called oncology (from oncos,"tumor," and logos, "study of"). In oncology, the division of neoplasms into benign and malignant categories is important. This categorization is based on a judgment of a neoplasm's potential clinical behavior. A tumor is said to be benign when its microscopic and gross characteristics are considered to be relatively innocent, implying that it will remain localized, it cannot spread to other sites, and is amenable to local surgical removal; the patient generally survives. It should be noted, however, that benign tumors can produce more than localized lumps, and sometimes they are responsible for serious disease, as pointed out later (Robbins and Cotran, 2010).

Malignant tumors are collectively referred to ascancers, derived from the Latin word for crab—that is, they adhere to any part that they seize in an obstinate manner, similar to a crab's behavior. Malignant, as applied to a neoplasm, implies that the lesion can invade and destroy adjacent structures and spread to distant sites (metastasize) to cause death. Not all cancers pursue so deadly a course. Some are

less aggressive and are treated successfully, but the designation malignant constitutes a red flag. All tumors, benign and malignant, have two basic components :(1) The parenchyma, made up of transformed or neoplastic cells, and(2) The supporting, host derived, non-neoplastic stroma, made up of connectivetissue, blood vessels, and host-derived inflammatory cells. The parenchyma of the neoplasm largely determines its biologic behavior, and it is this component from which the tumor derives its name. The stroma is crucial to the growth of the neoplasm, since it carries the blood supply and provides support for the growth of parenchymal cells. As will be discussed later, stromal cells and neoplastic cells carry on a two-way conversation that influences the growth of the tumor. Benign Tumors .In general, benign tumors are designated by attaching the suffix -oma to the cell type from which the tumor arises. A benign tumor arising in fibrous tissue is a fibroma; a benign cartilaginous tumor is a chordoma.The nomenclature of benign epithelial tumors is more complex. They are classified sometimes on the basis of their microscopic pattern and sometimes on the basis of their macroscopic pattern. Others are classified by their cells of origin. Nomenclature of malignant tumors essentially follows that of benign tumors, with certain additions and exceptions (Robbins and Cotran, 2010).

Malignant neoplasms arising in mesenchymal tissue or its derivatives are called sarcomas. A cancer of fibrous tissue origin is a fibro sarcoma. Sarcomas are designated by their histogenesis (i.e., the cell type of which they are composed). Malignant neoplasms of epithelial cell origin are called carcinomas. It is evident that mesoderm may give rise to carcinomas (epithelial) and sarcomas (mesenchymal). Carcinomas may be qualified further. Carcinomas that grow in a glandular pattern are called adenocarcinomas, and those that produce squamous cells are called squamous cell carcinomas. Sometimes the tissue or organ of origin

can be identified, as in the designation of renal cell adenocarcinoma or Cholangiocarcinoma, which implies an origin from bile ducts. Sometimes the tumor shows little or no differentiation and must be called poorly differentiated or undifferentiated carcinoma (Robbins and Cotran, 2010).

Squamous Carcinoma of the Vulva: As many as 90% of vulvar squamous cell carcinomas are HPV related, usually presenting as poorly differentiated lesions, sometimes multifocal. They often evolve from vulvar intraepithelial neoplasia.Non-HPV-related vulvar squamous cell carcinoma occurs in older individuals, is usually well differentiated and unifocal, and is associated with lichen sclerosus or other inflammatory conditions. Paget Disease of the VulvaRed, scaly plaque, microscopically characterized by the spread of malignant cells within the epithelium, occasionally with invasion of underlying dermis. In a minority of cases there is an underlying carcinoma of a vulvar or perineal gland (Robbins and Cotran, 2010).

2.3.1. Vagina intraepithelial neoplasia and squamous cell carcinoma:

Extremely uncommon, these lesions usually occur in women older than age 60 years, with risk factors similar to those for carcinoma of the cervix, discussed below. A preexisting or concurrent cervical intraepithelial neoplasia or carcinoma of the cervix is frequently present.Vaginal intraepithelial neoplasia is a precursor lesion associated with HPV infection in nearly all cases. Invasive squamous cell carcinoma of the vagina is associated with the presence of HPV DNA in more than half of cases. Of particular interest is vaginal clear cell adenocarcinoma, usually encountered in young women in their late teens to early 20s whose mothers took diethylstilbestrol during pregnancy. Sometimes these cancers do not appear until the third or fourth decade of life. The overall risk is less than 1 per 1000 of those

exposed in utero. In about one-third of instances these cancers arise in the cervix.

Much more frequently, perhaps in one-third of the population at risk, small glandular or microcystic inclusions appear in the vaginal mucosa. These benign lesions, called vaginal adenosis,appear as red granular foci and are lined by mucus-secreting or ciliated columnar cells. It is from such inclusions that the rare clear cell adenocarcinoma arises.

Sarcoma botryoides: (embryonalrhabdomyosarcoma), producing soft polypoid masses, is another, fortunately rare, form of primary vaginal cancer. It is usually encountered in infants and children younger than the age of 5 years. It may occur in other sites, such as the urinary bladder (Robbins and Cotran, 2010).

Cervical Neoplasia: Risk factors for cervical carcinoma include early age at first intercourse, multiple sexual partners, cigarette smoking, immunodeficiency, and infection by “high-risk” papillomaviruses.Nearly all cervical carcinoma is HPV related, particularly certain HPV subtypes (16, 18, 45, 31, and others). HPV vaccine can prevent the occurrence of cervical cancer. HPV virus E6 and E7 proteins cause inactivation of p53 and RBgenes, respectively, resulting in increased cell proliferation and suppression of apoptosis. High-grade cervical dysplasias (CIN II and III) contain HPV incorporated into the cell genome, and cytologically have increased chromatin abnormality and an increased nuclear-to-cytoplasmic ratio.Not all HPV infections progress to CIN III or invasive carcinoma. The time course from infection to invasive disease may be 10 years or more. The Pap smear is a highly effective screening tool in the detection of cervical dysplasia and carcinoma, and has reduced the incidence of cervical carcinoma (Robbins and Cotran, 2010).

2.3.2. Uterine masses:

Uterine Smooth Muscle Neoplasms:Benign smooth muscle tumors, called leiomyomas, are common and frequently multiple; they may present as menorrhagia, as a pelvic mass, or as a cause of infertility.Malignant smooth muscle tumors, called leiomyosarcomas, seem to arise de novo; multiple benign smooth muscle tumors do not increase the risk of malignancy.Criteria of malignancy include necrosis, cytologicatypia, and mitotic activity (Robbins and Cotran, 2010).

Endometriosis refers to location of endometrial glands and stroma outside the uterus and may involve the pelvic or abdominal peritoneum, and sometimes distant sites like lymph nodes and lungs. The ectopic endometrium in endometriosis undergoes cyclincal bleeding and is a common cause of dysmenorrhea and pelvic pain.Adenomyosis refers to growth of endometrium into the myometrium with uterine enlargement. Unlike endometriosis there is no cyclical bleeding. Endometrial hyperplasia results from an excess of estrogen, whether endogenous or exogenous. Risk factors for developing hyperplasia includeanovulatory cycles, polycystic ovary syndrome, estrogen-producing ovarian tumor, obesity, and hormone intake.The severity of hyperplasia is graded by architectural and cytologic criteria. Complex architecture associated with cytologicatypia has a 20% risk of developing carcinoma (Robbins and Cotran, 2010).

2.3.3. Endometrial Carcinoma:

Clinically and molecularly there are two major types of endometrial carcinoma.Endometrioidcarcinomais associated with estrogen excess and endometrial hyperplasia. Early molecular changes include inactivation of DNA mismatch repair genes and the PTENgene.

•Serous carcinomaof the endometrium arises in older women, usually associated

with endometrial atrophy. Mutations in the p53gene are an early event.

• Stage is the major determinant of survival. Serous tumors tend to present more frequently with extrauterine extension and are therefore frequently of more advanced stage (Robbins and Cotran, 2010).

2.3.4. Ovarian Tumors:

Tumors may arise from any of the major components of the ovary: surface epithelium, ovarian stromal and follicle lining granulosa cells, or germ cells.Epithelial tumors are the most common malignant ovarian tumors and are more common in women older than 40 years of age. The major types of epithelial tumors are serous, endometrioid, and mucinous. Each has a benign, malignant, and a low malignant potential (borderline) counterpart.Germ-cell tumors (mostly cystic teratomas) are the most common ovarian tumor in young women; the majority are benign.Germ-cell tumors may differentiate toward oogonia (dysgerminoma), primitive embryonal tissue (embryonal), yolk sac (endodermal sinus. tumor), placental tissue (choriocarcinoma), or multiple fetal tissues (teratoma). Sex cord stromal tumors may display differentiation toward granulosa, Sertoli, Leydig, or ovarianmay produce estrogens or androgens. Stromal cell Depending on differentiation, they may produce estrogens or androgens.Fallopian tube carcinomas usually present at an advanced stage, with involvement of the peritoneal cavity (Robbins and Cotran, 2010).

2.3.5. Cancer of the Sigmoid Colon:

The sigmoid colon is a common site for cancer of the large bowel. Because the lymphatic vessels of this segment of the colon drain ultimately into the inferior mesenteric nodes, it follows that an extensive resection of the gut and its associated lymphatic field is necessary to extirpate the growth and its local lymphatic

metastases. The colon is removed from the left colic flexure to the distal end of the sigmoid colon, and the transverse colon is anastomosed to the rectum (Snell, 2012)

2.3.6. Cancer of the Rectum:

Cancer (carcinoma) of the rectum is a common clinical finding that remains localized to the rectal wall for a considerable time. At first, it tends to spread locally in the lymphatics around the circumference of the bowel. Later, it spreads upward and laterally along the lymph vessels, following the superior rectal and middle rectal arteries. Venous spread occurs late, and because the superior rectal vein is a tributary of the portal vein, the liver is a common site for secondary deposits.Once the malignant tumor has extended beyond the confines of the rectal wall, knowledge of the anatomic relations of the rectum will enable a physician to assess the structures and organs likely to be involved. In both sexes, a posterior penetration involves the sacral plexus and can cause severe intractable pain down the leg in the distribution of the sciatic nerve. A lateral It is clear from the anatomic features of the rectum and its lymph drainage that a wide resection of the rectum with its lymphatic field offers the best chance of cure. When the tumor has spread to contiguous organs and is of a low grade of malignancy, some form of pelvic evisceration may be justifiable (Snell, 2012).

2.4. Modalities used to diagnosis pelvic masses:

2.4.1. Ultrasonography:

Ultrasonography (US) is primary modality useto image the female pelvis, particularly when evaluation of the uterus and cervix is desired. Trans abdominal and transvaginal probes are available are and typically complementary. When imaging transabdominally .it is the best to scan through a full urinary bladder as this serves as an acoustic window in the majority of cases, the endometrium can be

seen discrete hyperechoic structure deep to the myometrium. When the fluid is present in the endometrial canal, the endometrium on each side of the fluid should be measured individually and summed, excluding the fluid from the overall endometrial thickness. A small amount of fluid in the endometrial canal is usual a normal finding. In addition, US can occasionally resolve the junctional zone or inner myometrium, from the outer myometrium aszone of hypoechogenicity interposed between the hyperechoic endometrium and intermediately echoic outer myometrium, for the most part; however, the maymotrialechotexture is uniform.

The serosal layer is not typically identified as discrete layer. Prominentserosal veins are commonly seen. Although the cervix also has azonal anatomy comprising the endocervix and ectocervix, these are not easily discernible sonagraphically (Rockall et.al, 2009)

2.4.2. Hysterosalpingography:

Hysterosalpingography (HSG), remains important in the investigation of infertility .it is and accurate means of assessing the uterine cavity and tubal patency but has a low sensitivity for the diagnosis of pelvic adhesions so cannot replace laparoscopy. The main current indications for HSG are infertility and recurrent miscarriage. Rare indications include checking efficacy of tubal sterilization and assessment of the tube prior to attempted reversal of sterilization (Rockall et.al, 2009)

2.4.3. Magnetic Resonance Imaging:

Magnetic Resonance Imaging (MRI) is an important technique in the evaluation of pelvic pathology due to its ability to obtain images with a high soft-tissue contrast resolution and discrimination in multiple planes. It is now the primary technique of choice in the staging of pelvic malignancy. With the exception of staging ovarian

malignancy. Where CT is the preferred technique. (Rockall et.al, 2009).

2.4.4. Computed Tomography:

The role of Computed Tomography (CT) in the evaluation of gynaecological disease in the pelvis has declined since the advent of endovaginal scanning and MRI.As general rule, benign disease should be investigated initially by US and then MRI, rather than CT, which is used to solve specific problems. Staging of malignant disease requires CT or MRI, depending on the site of the primary tumor. MRI is the superior to CT for staging cervical and uterine carcinoma, particularly with respect to local disease, but CT still has a role in ovarian carcinoma because of its ability to detect peritoneal deposits. CurrentlyCT and MRI have similar capabilities for detecting lymphadenopathy, although the use of different imaging planes and development of specific contrast suggest that MRI will eventually prove to be more accurate. However, CT is frequently used as an imaging modality in patients with non-specific lower abdominal symptoms such as pain, or to determine the site of origin of a mass, so it is clearly necessary to be aware of the CT appearances of gynecological conditions (Rockall et.al, 2009).However, a CT examination will provide information unobtainable from an ultrasound scan. CT is not adversely affected by gas in the bowel, and has a larger field of view allowing clearer visualization of structures and organs in relation to one another. In addition, obese patients, who are notoriously difficult to scan satisfactorily with ultrasound, can be visualized very nicely using CT (as long as they fit into the scanner). Surplus fat within the pelvis actually serves to delineate and isolate structures within the pelvis (and abdomen) from each other. The advent of helical CT in recent years has revitalized dynamic contrast enhanced CT imaging, with rapid scanning times providing valuable diagnostic information in such areas as tumor definition and vascular delineation. Likewise, software programs continue to be

developed, which improve the quality of threedimensional (3D) reconstructions of the bony pelvis. Currently these programs require a workstation in addition to the CT scanner, as they are both time consuming and disk space-hungry. However, it is possible to visualize such programs running concurrently, whilst continuing to image patients, in the not too distant future. Inevitably the pelvis will often be examined in conjunction with the abdomen, as pathologies and conditions in one will often affect the other.

2.5. Previous studies:

Togashi (2003) his article presents an overview of ovarian cancer, which addresses the clinical roles of imaging studies, including US, CT, and MR imaging in the course of diagnosis and treatment of this important disease. US is the modality of choice in the evaluation of patients with suspected adnexal masses. Although its accuracy is not sufficient to avert surgery, morphological analysis of adnexal masses with US helps narrow the differential diagnosis, determining the degree of suspicion for malignancy, usually in concert with a serum CA-125 level. Combined morphological and vascular imaging obtained by US appears to further improve the preoperative assessment of adnexal masses. For uncertain or problematic cases, MR imaging helps to distinguish benign from malignant, with an overall accuracy for the diagnosis of malignancy of 93%. The accuracy of MR imaging in the confident diagnosis of mature cystic teratoma, endometrial cysts, and leiomayomas is very high. CT is not indicated for differential diagnosis of adnexal masses because of poor soft tissue discrimination, except for fatty tissue and for calcification, and the disadvantages of irradiation. In the staging of ovarian cancer, CT, U/S, and MR imaging all have a similarly high accuracy. Although it is difficult to suggest a simple algorithm for evaluating the state of women with adnexal masses, the correct preoperative diagnosis and staging of ovarian cancer

with the use of any of these imaging studies will lead to an appropriate referral to a specialist in gynecologic oncology and offer a significant survival advantage for patients with ovarian cancer.

Forstner et.al (1995) stated that among the gynecologic malignancies, ovarian cancer is second most common in incidence. However, unlike the other gynecologic cancers, its mortality has decreased only minimally during the last two decades. Only recently, preliminary studies suggest promising results for ovarian cancer screening using transvaginal ultrasound in combination with serum Ca 125 levels. Exploratory laparotomy has been the mainstay in the management of ovarian cancer, as it offers histopathological evaluation as well as cytoreduction. However, it is limited by its inaccuracy with understaging in 30–40% at initial presentation. Cross-sectional imaging contributes valuable information toward preoperative surgical and management planning. The proper surgical approach can be selected, the need for preoperative chemotherapeutic debulking can be assessed, and the surgeon will be forewarned of the need for assistance from a gynecologic oncologic surgeon or gastrointestinal oncologic surgeon if a complicated surgical procedure or bowel resection is indicated. CT is established as the primary imaging modality for characterization of ovarian tumors and ovarian cancer staging, while MR is emerging as a problem-solving modality. MR seems to be superior to CT in lesion characterization, in evaluation of local extent of tumor, and in tumor implants involving the hemidiaphragm and liver surface. The role of spiral CT has yet to be explored

Kawamoto, et.al (1999) stated that ovarian cancer is the second most common gynecologic malignancy in the United States and causes more deaths than any other cancer of the female reproductive system. Approximately two-thirds of patients have tumors that have spread beyond the pelvis at the time of diagnosis.

Ovarian tumors arise from the surface epithelium or mesothelium, germ cells, or the gonadal stroma. Epithelial ovarian tumors include serous, mucinous, endometrioid, clear cell, and undifferentiated tumors. In general, the likelihood of malignancy increases with increasing solid-tissue elements and thicker septa. Surgery is central to the management of ovarian cancer. At the initial exploratory laparotomy, surgicopathologic staging and debulking of the tumor are undertaken. Patients with advanced cancer frequently undergo second-look surgery after chemotherapy to detect any residual disease. CT can provide staging information for preoperative planning and determination of surgical resectability, demonstrate tumor response to therapy, and allow detection of persistent or recurrent disease. However, a major limitation of CT is the lack of sensitivity for detection of small tumor implants, especially on the small intestine or mesentery. Dedicated CT of the pelvis is best performed with spiral CT. Ovarian carcinoma can spread by means of intraperitoneal implantation, lymphatic invasion, and hematogenous dissemination.

Nanni et.al (2005) Metastatic cancer of unknown primary origin is a syndrome characterized by a poor prognosis, with a typical survival rate from diagnosis of no longer than 1 year. Only 20–27% of primary tumors are identified by conventional radiological imaging. By contrast, it has been reported that 18F-fluorodeoxyglucose positron emission tomography (FDG PET) allows the identification of 24–40% of otherwise unrecognised primary tumors. To our knowledge, the studies on this topic have been conducted using 18F-FDG PET imaging alone. The aim of this study was to evaluate the potential additional diagnostic role of fused 18F-FDG PET-CT imaging for the detection of metastatic occult primary tumours. Methods: The study population consisted of 21 consecutive patients with biopsy-proven metastatic disease and negative

conventional diagnostic procedures. Each patient underwent a PET scan, carried out according to a standard procedure (6 h of fasting, i.v. injection of 370 MBq of 18F-FDG and image acquisition with a dedicated PET-CT scanner for 4 min per bed position). His main results: 18F-FDG PET-CT detected the occult primary tumor in 12 patients (57% of cases), providing a detection rate higher than that reported with any other imaging modality, including conventional 18F-FDG PET. His study conclude that: The favorable results of this study need to be confirmed in larger patient populations with long-term follow-up.

Sala et.al (2010)stated that functional imaging by means of dynamic multiphase contrast-enhanced magnetic resonance imaging (DCE-MRI) and diffusion weighted magnetic resonance imaging (DW-MRI) is now part of the standard imaging protocols for evaluation of the female pelvis. DCE-MRI and DW-MRI are important MR imaging techniques which enable the radiologist to move from morphological to functional assessment of diseases of the female pelvis. This is mainly due to the limitations of morphologic imaging, particularly in lesion characterization, accurate lymph node staging, assessment of tumor response and inability to differentiate post-treatment changes from tumor recurrence.DCE-MRI improves the accuracy of T2WI in staging of endometrial cancer. It also helps differentiate tumor recurrence from radiation fibrosis in patients with cervical cancer. DCE-MRI improves characterization of cystic adnexal lesions and detection of small peritoneal implants in patients with ovarian cancer.DW-MRI is valuable in preoperative staging of patients with endometrial and cervical cancer, especially in detection of extra-uterine disease. It does increase reader's confidence for detection of recurrent disease in gynaecological malignancies and improves detection of small peritoneal implants in patients with ovarian cancer.In this review article we give an overview of both DCE-MRI and DW-MRI techniques, concentrating on their main clinical application in the female pelvis, and present a

practical approach of the added value of these techniques according to the main pathological conditions, highlighting the pearls and pitfalls of each technique.

Chapter Three

Methodology

3.1. Material:

3.1.1 Subjects:

The study sample was consisted of (76) patient with pelvic tumor collected from three different diagnostic centers. All female patients with Allergy to contrast agent, Pregnancy, Renal insufficiency and male patient was excluded from this study and the non-co-operative patient.

3.1.2 Machine used:

The study was executed using multi-detector computed tomography scanner MDCT64-Slice scanner (0.625 mm slices): 64 slice 0.6.25 mm collimation, table feed 10 mm/rotation, effective tube current 685 mAs at 120 kV. Pitch = 10/40 mm collimation = 0.25. Average scan time = 5 s, with 64-slice (all machines), detector array, fan beam shape, CT monitor for controlling scanning and processing.

CT monitor for controlling scanning and processing, Cardiac trigger monitor with electrode leads (3000 TOSHEIBA) to monitor the heart rate,contrast injector (Medrao Toshiba-2ways) for flush contrast media to patient and VITREA SYSTYM (TOSHIBA) for diagnosis images and reconstruction and volume rendered purposes.

3.2 Method:

In 76 patients (76 female; mean age, 54.47 years, range (21-100 yrs.)) were included. MDCTA was performed. Patients with contraindications to iodinated contrast agent, and unstable clinical presentation were excluded. The Research

Counsel Board -College of Medical Radiological Science approved the research protocols. All patients underwent CT of the Abdomen and pelvis by using a 64-32-8-4 and 2 row MDCT Toshiba and other system. Patients were placed in the supine position; Patients. Contrast medium was injected using power injector.

3.2.1 Technique used:

Patient was scanned using standerad abdominal protocol as scout, plan cuts without contrast but an oral contrast used to differentiate the vessels and GIT region as Isopaque 100 ^{TM}(100 mg/ml): 10 ml into 0.5 liters of water.Omnipaque (IV contrast) 350^{TM}: 60–80ml/s diluted with 10–15 ml saline or sterile water solution was introduced for tri-phasic scan, scanning started after 30-35 second for contrast in arterial phase in order to enhance the soft tissue of the mass, then the proto-venous phase done after 50 second in order to exclude the lymphatic spread of tumors, and then delayed phase for renal function was executed to evaluate the KUB function and normal excretion of contrast. CT technical parameters included: matrix 512 X 512, field of view (FOV) 20 cm; tube current 685 mAs at 120kV; table feed 10mm/rotation, pitch 10/40mm. Axial images were analyzed. Contrast injector (Medrao Toshiba) for flush contrast media to the patient and VITREA SYSTEM for diagnosis images and reconstruction and volume rendered purposes were used.

3.2.2 Scan protocol:

**Protocol is the same for routine abdomen (no pelvis) except that the scan ends at the iliac crests (or lower, if necessary to include the entire liver)*		
Examples of clinical indications: Suspected abdominal mass, tumor staging, abscess		
Scouts: AP and lateral		
Scan type: Helical		
Start location: Just above diaphragm **End location:** Just below symphysis pubis		
Breath-hold: Inspiration		
IV contrast: 125 mL at 3.0 mL/s; 50 mL saline flush. Scan delay = 65 seconds **Oral contrast:** 675 mL barium sulfate suspension (1.5 bottles Readi-Cat 2). An additional 225 mL (the remainder of the second bottle) given just before scanning.		
DFOV: ~38 cm (optimize for individual)		
SFOV: Large body		
Algorithm: Standard		
Window settings: 400 ww/50 wl (soft tissue)l; 150 ww/70 wl (liver—for slices that contain liver); 1500 ww/–700 wl (lung—for slices that contain lung)		
	16-Detector Protocol	64-Detector Protocol
Gantry rotation time	0.8 s	0.8 s
Acquisition (detector width × number of detector rows = detector coverage)	16 × 1.25 = 20 mm	64 × 0.625 = 40 mm
Reconstruction (slice thickness/interval)	5 mm/5 mm	5 mm/5 mm
Pitch	1.375	1.375
kVp	120	120
mA	≥230	≥230

Table(3-1) Showed the routine abdominal protocols

3.2.3 Image interpretation:

CT anatomy of the pelvis: the vagina is identified as a thin rectangular structure with brightly enhancing mucosa. The cervix and uterus appear as soft tissue masses. Only distinguishable from each other by their shape, i.e the cervix is round and the uterus oval or triangular in cross-section. The endometrium is not easily distinguished from the myometrium but distension of the cavity by fluid is discernible, particularly following enhancement with intravenouscontrast.

The ovaries can usually be seen in adult premenopausal patients as soft tissue masses posterolateral to the uterus; however,their position is variable and their precise appearance depends on whether or not there are cysts/follicles present. The atrophic ovaries of postmenopausal patients are frequently indistinguishable from surrounding structures.

Chapter Four

Result Presentation

Table 4.1. Showed the statistical analysis values of the patient related variables

	Mini	Max	Mean	Std. D
Age	21	100	54.47	16.616
Height	110	185	158.00	13.764
Weight	38	160	67.04	15.142
Duration of Marriage	13	35	17.16	3.323
Mass Size	1.4	720.0	63.572	115.9641

Table (4-2) frequency distribution of marital status

Marital status	Frequency	Percent
Single	9	11.8
Married	67	88.2
Total	76	100.0

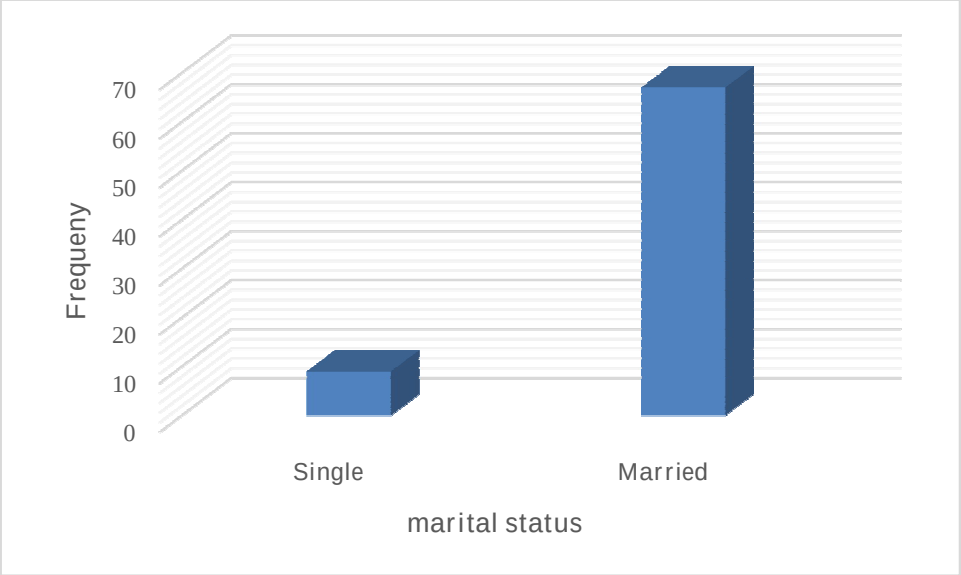

Figure (4-1) demonstrated the distribution of marital frequency

Table (4-3) demonstrated frequency of masses location

Location	Frequency	Percent
Cervix	14	18.4
Uterus	25	32.9
Ovary	25	32.9
Colon	12	15.8
Total	76	100.0

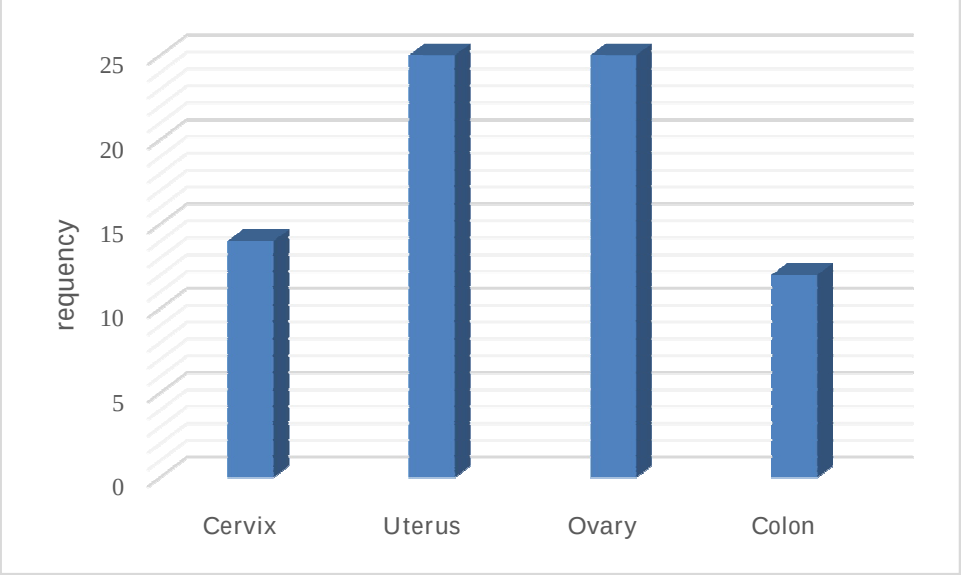

Figure 4.2 demonstrate the frequency distribution of mass location in CT finding

Table (4-4)demonstrated the appearances of masses

Appearances	Frequency	Percent
Well Defined	26	34.2
ill Defined	50	65.8
Total	76	100.0

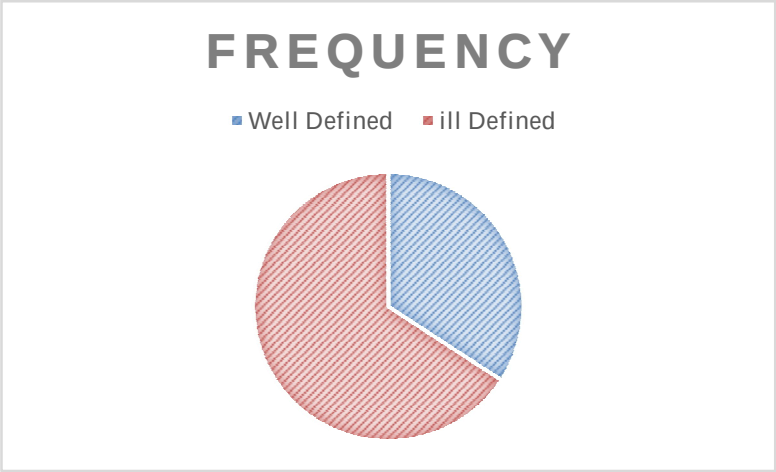

Figure (4.3) shows frequency of masses appearance

Table (4-5) shows regularity of masses

Regularity	Frequency	Percent
Regular	11	14.5
Irregular	65	85.5
Total	76	100.0

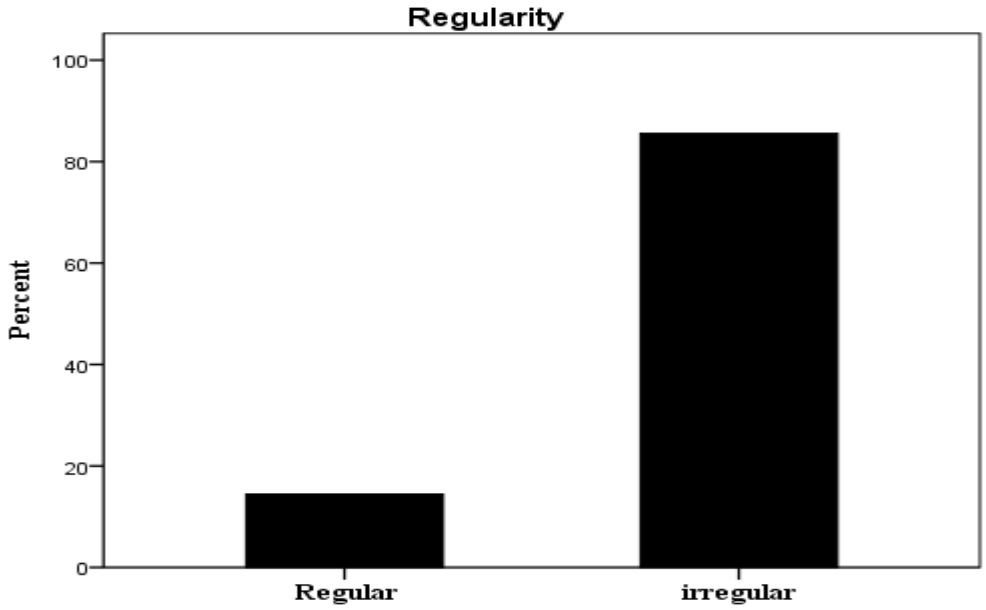

Figure (4-4)show regularity of mass

Table (4-6) demonstrated the homogeneity of masses

Homogeneity	Frequency	Percent
Homogenous	15	19.7
Heterogeneous	61	80.3
Total	76	100.0

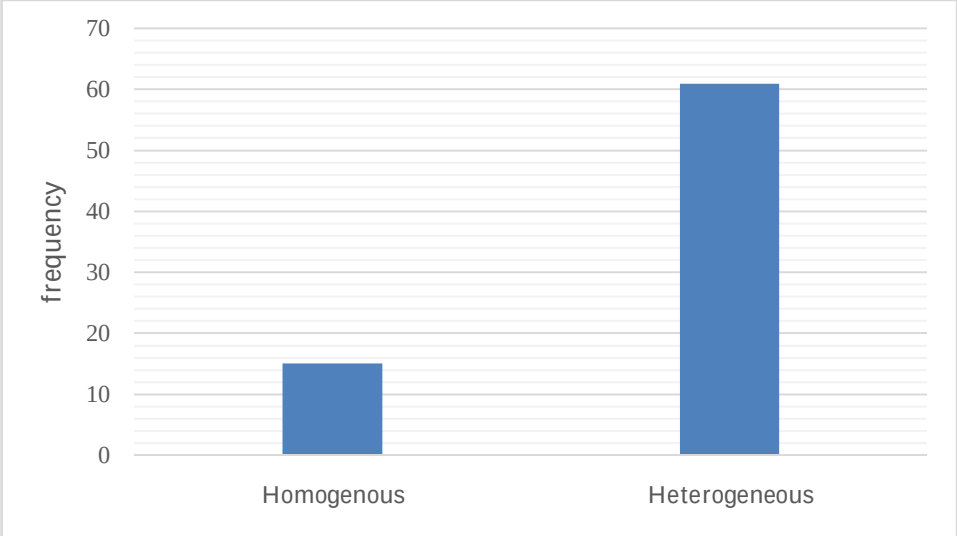

Figure (4.5) show the frequency of masses homogeneity

Table (4-7) show the frequency of density masses

Density	Frequency	Percent
Hyper dense	26	34.2
hypo dense	50	65.8
Total	76	100.0

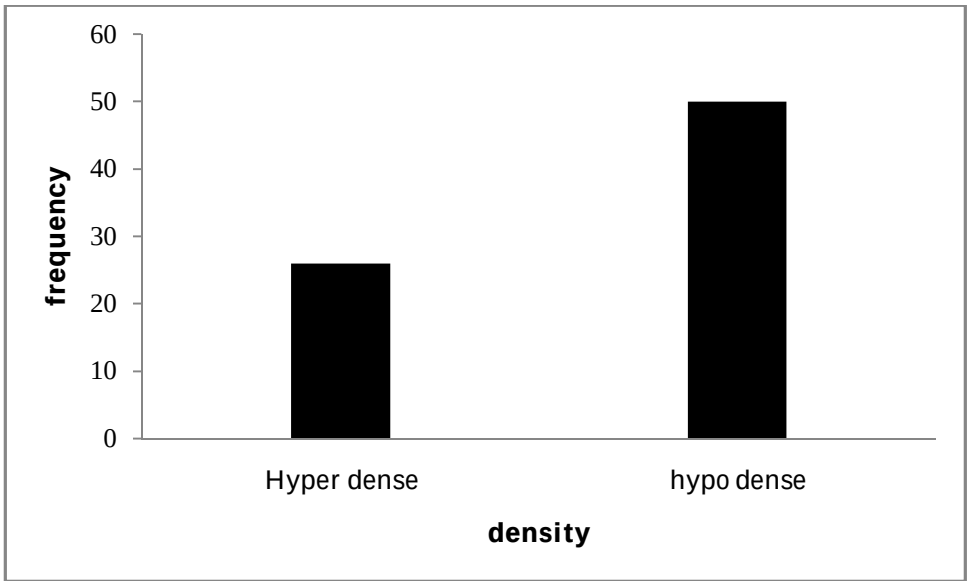

Figure 4.6 show the frequency of masses density

Table (4-8) demonstrated the frequency of masses enhancement

C. uptake	Frequency	Percent
Non-enhanced	17	22.4
Enhanced	59	77.6
Total	76	100.0

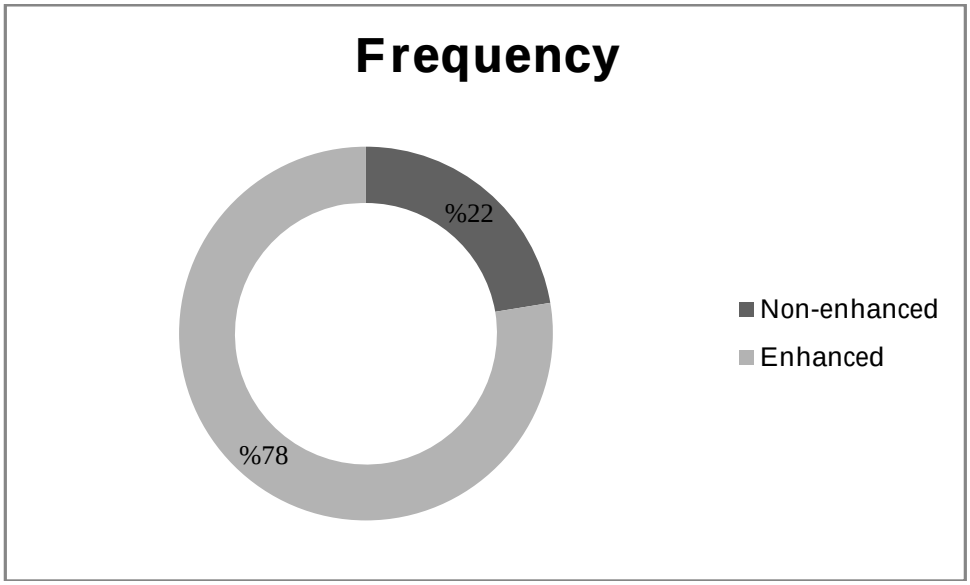

Figure (4.7) show the frequency of masses enhancement

Table (4-9) show the ability of CT to determine the kind of masses

CT Result	Frequency	Percent
Not Determined	13	17.1
Determined	63	82.9
Total	76	100.0

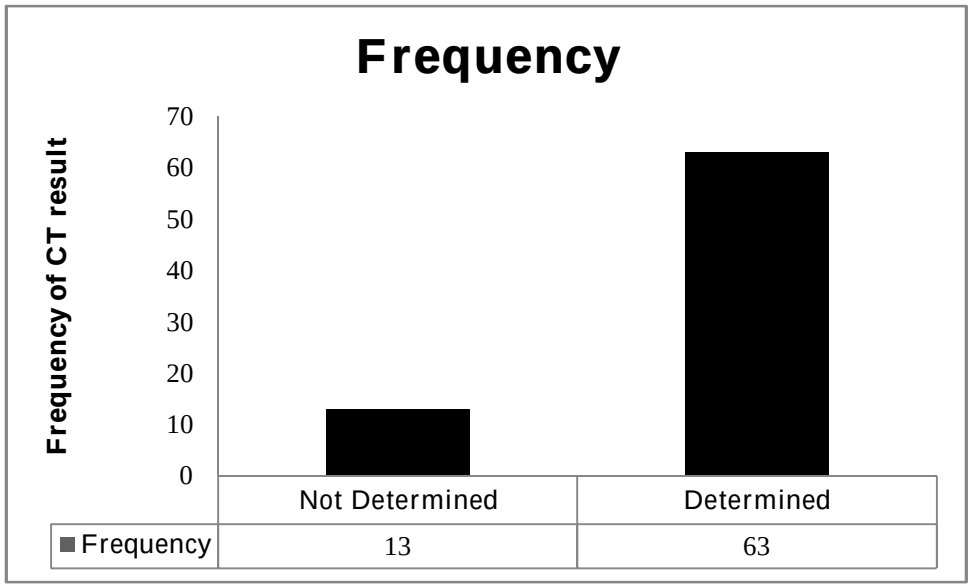

Figure (4-8) show the frequency of CT result

Table (4-10) demonstrated the frequency of type of masses

Variables	Frequency	Percent
Benign Tumor	17	22.4
Adenocarcinoma	22	28.9
Adenosquamous Carcinoma	11	14.5
Squamous Carcinoma	24	31.6
Choriocarcinoma	2	2.6
Total	76	100.0

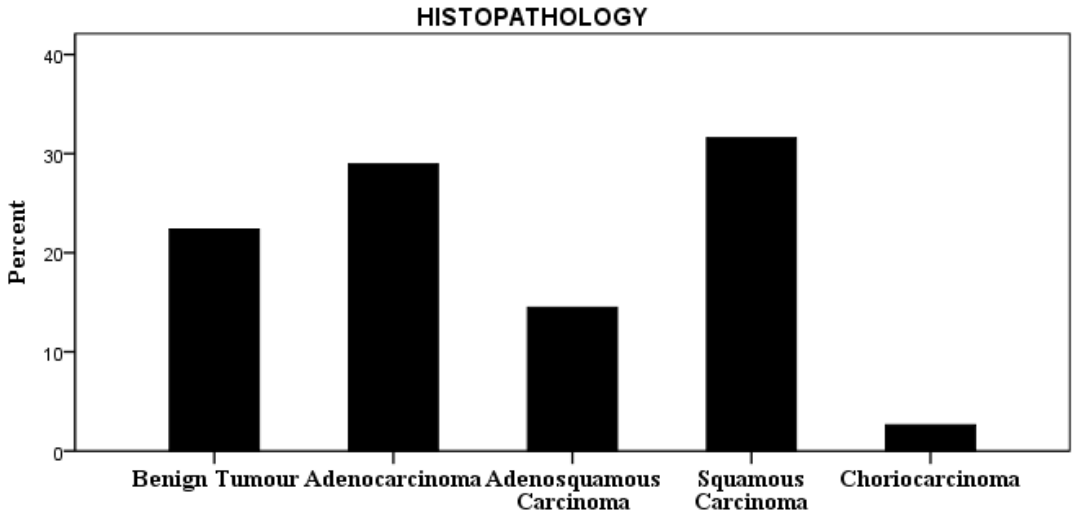

Figure (4-9) showed the distribution of the histopathological type of CT finding

Table(4-11)demonstrated the relation between the result of histopathology and result of CT

			CT Result		
			Not Determined	Determined	Total
HISTOOATHOLOGY	Benign Tumor	Count	5	12	17
		% within HISTOOATHOLOGY	29.4%	70.6%	100.0 %
	Adenocarcinoma	Count	2	20	22
		% within HISTOOATHOLOGY	9.1%	90.9%	100.0 %
	Adenosquamous Carcinoma	Count	4	7	11
		% within HISTOOATHOLOGY	36.4%	63.6%	100.0 %
	Squamous Carcinoma	Count	2	22	24
		% within HISTOOATHOLOGY	8.3%	91.7%	100.0 %
	Choriocarcinoma	Count	0	2	2
		% within HISTOOATHOLOGY	.0%	100.0%	100.0 %
Total		Count	13	63	76
		% within HISTOOATHOLOGY	17.1%	82.9%	100.0 %

Table (4-12)demonstrated the relation between AGE * HISTOOATHOLOGY

Age Period		HISTOOATHOLOGY					Total
		Benign Tumors	Adenocarcinoma	Adenosquamous	Squamous Carcinoma	Chorico Carcinoma	
AGE	20-35	4	4	0	1	0	9
	36-50	9	8	4	1	1	23
	51-75	3	9	7	18	1	38
	>76	1	1	0	4	0	6
Total		17	22	11	24	2	76

Table(4-13)show mass site * HISTOOATHOLOGY Crosstabulation

mass site	HISTOOATHOLOGY					Total
	Benign Tumors	Adenocarcinoma	Adeno squomas	Squomas Carcinoma	Chorico Carcinoma	
Cervix	0	1	2	11	0	14
Utrine	11	5	4	3	2	25
Ovary	6	7	4	8	0	25
Rectum, Anal, Segmoid	0	9	1	2	0	12
Total	17	22	11	24	2	76

Table (4-14) show status * HISTOOATHOLOGY Crosstabulation

status	HISTOOATHOLOGY					Total
	Benign Tumors	Adenocarcinoma	Adeno squomos	Squomas Carcinoma	Chorico Carcinoma	
Single	6	2	0	1	0	9
Marrid	11	20	11	23	2	67
Total	17	22	11	24	2	76

Table (4-15)parity * HISTOOATHOLOGY Crosstabulation

Parity	HISTOOATHOLOGY					Total
	Benign Tumors	Adenocarsinoma	Adenosquomas	Squomas Carcinoma	Chorico Carcinoma	
0	2	4	1	1	0	8
1	0	3	2	0	0	5
2	1	2	1	3	2	9
3	2	4	1	4	0	11
4	4	1	1	2	0	8
5	0	2	1	4	0	7
6	0	1	2	2	0	5
7	2	1	1	1	0	5
8	0	0	0	3	0	3
9	0	1	1	1	0	3
10	0	1	0	1	0	2
11	0	0	0	1	0	1
Total	11	20	11	23	2	67

Chapter Five

Discussion, Conclusion and Recommendation

5.1 Discussion:

This study aimed to evaluate the accuracy of computed tomography of female pelvic tumor. The study included76 females of different ages as demonstrated in table (4-1) the minimum age mass (21) years old while the maximum was (100) years old with mean (54) years old.

The result of the study showed that the uterus and ovary have the highest percentage which was (32.9 %), the other location of the masses were detected in the cervix and colon. This result was in line with the previous studies which showed that the common site of female pelvic masses was seen in the uterus and ovary (Kawamoto et.al, 1999).

Regarding the characterization of pelvic masses, the study result revealed that the majority of the sample was ill-defined, irregular and heterogeneous mass. These features were the common feature of malignant tumors.

Several studies have suggested that contrastenhanced MDCT can be highly accurate in the detection and characterization of adnexal mass, and can have an important role in the diagnosis of malignant ovariantumor(Togashi, 2003). In this study (77.6%) of pelvic masses were enhanced after injection of contrast media.

Table (4-9)Describe the ability of CT to determine the type of mass, the resultsshowed that (82.9%) of cases, CT able to determine the type of mass. While (17.1%) couldn’t determine.

Table(4-10) Describe frequency of tumor types, it was found that the benign tumour frequency was 22.4%, adenocarcinoma was 28.9%, adeno-squmous carcinoma was 14.5%, squamous carcinoma was 31.6%, and Choriocarcinoma 2 was 2.6%.

CT has high accuracy which was (82.9%) in diagnosing pelvic masses. In addition, when Parity less than 6,cervix recorded (5),uterine (13),ovary (15) and rectum +anal+ sigmoid (7). When parity is 6 and above,the cervix recorded (9),uterine (4), ovary (3) and rectum +anal+ sigmoid(3).From this observed result, the cervix have direct relation with number of parity it increase related to increase number of parity its converse to uterine and ovary which decreased when the number of parity increased.

5.2 **Conclusion**:

In final of this research we can recognize clearly that CT has a high accuracy in diagnosis female pelvic mass which is (82.9%).and contrast agent has important role to diagnose and differentiatebetween masses in CT.

Also observed that the married women have a high risk to have pelvic mass more than un married women, also observed the more dominated of mass in cases of married women is uterine masses and the most common is ovary masses. and cervix have direct relation with number of parity it increase related to increase number of parity its converse to uterine and ovary which decreased when the number of parity increased.

5.3 Recommendations:-

- Today the frequency of such malignancy is highly irradiate the diagnostic radiology department so further imaging modalities should be existed to evaluate such masses and its extension in order to enhance the outcome.
- A comparison should be done between CT and other modalities for diagnostic accuracy.
- Research should be conducted to find the relationship between spread tumors with women on Sudan and the surround environment or the geographic area , therefore through collecting Patient's data observed the often patient who's diagnosed their came from the limited geographic area.
- More data should be available in next researches.
- Also a correlation between the location of mass, histopathology type and texture of CT images should be performed based on the laprotary and image diagnostic criteria not a bone HIST only

References:

American cancer society. (2011, december 5). Ovarian cancer. Atlanta, ga: american cancer society.

Delanceyjol: principles of anatomy and perioperative considerations. In: rock ja, thompsonjd, eds. Telinde's operative gynecology, 8th edn. Philadelphia, lippincott-ravens, 1997:77

Evissala, andrearockal,deeparangarajan, and rahel a. Kubik-huch, (2010), the role of dynamic contrast-enhanced and diffusion weighted magnetic resonance imaging in the female pelvis, european journal of radiology, volume 76, issue 3, pages 367–385

Farrer-brown g, beilbyjow, tarbitmh: blood supply of the uterus. J obstetgynaecolbrcommonw 77: 673, 1970

Forstner, r., hricak, h. & white, s. Abdom imaging (1995) 20: 2. Doi:10.1007/bf00199633.

Kleemansd, silvawa: gynecologic anatomy. In: sokolai, sokoler, eds. The requisites in obstetrics and gynecology: general gynecology. Philadelphia, mosby-elsevier, 2007:87

Martini, f. H., timmons, m. J., &tallitsch, r. B. (2012). Human anatomy.7th edition. San francisco: pearsonbenjamincummings.

McGahan, J.P., Corwin, M.T. and Gerscovich, E.O., 2014. Ovarian/adnexal masses in the nonpregnant female patient. Applied Radiology, 43(5), pp.8-20.

Nanni, c., rubello, d., castellucci, p. Et al. Eur j nucl med mol imaging (2005) 32: 589. Doi:10.1007/s00259-004-1734-3.

National cancer institute. (2012, march 2). Ovarian epithelial cancer treatment (pdq®) patient version.Bethesda, md: national cancer institute.

Neilson d, jones gs, woodruffjd, goldberg g: the innervation of the ovary. Obstetgynecolsurv 35: 889, 1970

Ovarian cancer.American society of clinical oncology (asco). (2012, february 9). Cancer.net. Alexandria, va.: american society of clinical oncology (asco).

Pauersteincj: the fallopian tube – a reappraisal. Philadelphia, lea &febiger, 1974

Reynolds srm: physiology of the uterus. New york, hafner, 1965

Satomi kawamoto, md, bruce a. Urban, md, and elliot k. Fishman, md (1999), ct of epithelial ovarian tumors, pelvic imaging - continuing medical education, volume 19, suppl_1doi: http://dx.doi.org/10.1148/radiographics.19.suppl_1.g99oc10s85

Togashi, k. Eurradiol (2003) 13(suppl 6): l87. Doi:10.1007/s00330-003-1964-y