Sudan University of science and Technology

College of Graduate Studies and scientific

Study Of Finding CT Abdomen Post Contrast

دراسة نتائج فحص البطن باستخدام الاشعة المقطعية بعد حقن وسيط التباين

A Thesis Submitted in Partial Fulfillment of the Requirement of M.Sc Degree in Diagnostic Radiologic Technology

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٢٠١٦

الآيـة

بِسۡمِ ٱللَّهِ ٱلرَّحۡمَٰنِ ٱلرَّحِيمِ

قال تعالى:

(قل ربي زدني علما)

صدق الله العظيم

سورة طه الاية(١٤٤)

DEDICATION

To my mother (EhssanMostfa Barak)

To my father (BakheetAisa Mohammed)

To my husband (Qusai Mobarak)

To my daughter (MayarQusai)

To my sisters

To my brothers

ACKNOWLEDGEMENT

First of all I would like to thank Allah who's without his mercy, blessing and his kind to me I was never be able to finish this work.

Then I would like to express my sincere gratitude to my supervisor **Dr.Crolin Edward ayad** for his suggestion, gudidance, encouragement, cooperation and supervision of this work.

I am also so grateful to every person helped me in gathering information, collecting data and guiding me from time to time in making this project

Abstract

-the objects of this study to known the finding CT abdomen post contrast.

The Data was conducted by radiology department in Gazira traumatology center in wadmadani,

-A sample of ٥٠ patients of both gender, female(٣٠) and male (٢٠)their ages range from ١-٨٠ years old ,they have abdominal diseases , CT scan was done to the explain this diseases.

-From the result of study was showed more frequent age affected between ٣٤-٥٠ years old, which represent ١٢٪ from the sample.

The study result showed the most affected gender was female.

-The common finding were in the study was cases of bowel and pelvic diseases that percent (٤٦٪), the urinary tract diseases that percent (٤٥٪), liver diseases that percent (٣٩٪), spleen disease (٨٪), and vessels diseases (٦٪), and other diseases of abdomen (٤٪).

It can be said that the CT image modality was performed and used as essential technique of evaluation abdominal diseases, which help to obtain early diagnosis.

ملخص االبحث

تهدف هزه الدراسه لمعرفة ملخص فحوصات البطن بواسطة استخدام جهز الاشعه المقطعيه بعد حقن صبغة وسيط التباين, في مركز الجزيره للاصابات في الفترة من سبتمبر ٢٠١٦وحتي نوفنمبر٢٠١٦, حيث شملت هزه الدراسه عينات عشوائية من خمسين مريضا يعانون من امراض في البطن وكانت اعمارهم تتراوح بين ١-٨٠ سنة.٦٠% اناث و٤٠% زكور.

وتم التصويرالمقطعي لتوضيح اسباب الام البطن واوضحت النتائج ان الفئه العمريه الاكثر اصابه من العمر ٣٤-٥٠ سنه يمثلون ١٢% .

وبينت الدراسه ان نتائج الصور المقطعيه كانت كالاتي:امراض الامعاء والحوض بنسبة٤٦%, امراض المسالك البولية بنسبة ٤٥% ، وأمراض الكبد بنسبة ٣٩% ، وامراض الطحال بنسبة ٨%,الأوردة الدموية ٦%, وأمراض أخرى بنسبة ٤%

ويمكن القول ان استخدام الاشعه المقطعيه تقنيه ضرورية للكشف عن امراض البطن مما يساعد علي التشخيص المبكر والمساعده في العلاج.

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List of Abbreviations

CCK	Cholecystocinin
CT	Computer tomography
HCC	Hepatocellulrcarcinoma
IV	Inter-veins
KVP	Kilo voltage
MA	Malliamperge
RCC	Renal cells carcinoma
٢ D	Two dimensions

Chapter one

Introduction

Chapter one

Introduction

١-١ Introduction:

Computed tomography CT is noninvasive diagnostic imaging procedure that uses a combination of x-ray and computer technology to produce horizontal, or axial image of the body. A CT scan show detailed images of any part of the body, including the bone, muscles, fat, organs, and blood vessels.(radiographics-rsna.org .٢٠٠٧)

In computed tomography the x-ray beam moves in a circle around the body .This allows many different views of the same organ or structure. The x-ray information is sent to a computer that interprets the x-ray data and display it in a two-dimensional (٢D) form on monitor.

CT scans may be done with or without contrast "contrast" contrast refers to a substance taken by mouth injection into an intravenous(IV)line that causes the particular organ or tissue under study to be seen more clearly, contrast examination may require patient to fast for a certain period time before the procedure.(radiographics-rsna.org .٢٠٠٧)

The abdomen is contain organs of the gastrointestinal, urinary, endocrine, and reproductive systems. A CT scan of the abdomen may by performed to assess the abdomen and its organs for tumors and other lesions, injuries, intra-abdominal bleeding, infection, unexplained abdominal pain, obstruction.(radiographics-rsna.org .٢٠٠٧)

A CT scanof the abdomen may also be used to evaluate the effects of treatment on abdominal tumor. Another use of abdominal CT is to provide guidance for biopsies and-or aspiration of tissue from the abdomen.(radiographics-rsna.org .٢٠٠٧).

This is study aimed to evaluated the finding of patients' examination

١-٢Problem of study:

The problem of the study, CT scan can detected the different pathology of the abdomen**.**

١-٣Objective:

١-٣-١General objectives:

To evaluate the finding CT scan of abdomen

١-٣-٢Specific objectives:

-To evaluated most common finding in abdomen Ct examination.--To study the most affected age and gender .

-to calcified the finding according to the organ or system and to find the % of affection.

١-٤Overview of the study;

Chapter one: will consist introduction, objective, methodology of the research the scope of the study.

Chapter two: will consist: literature review, anatomy, physiology, pathology, computed tomography.

Chapter three: it deal with the material and methods

Chapter four: it includes result presentation.

Chapter five: it will deal with the discussion, conclusion and recommendation.

Chapter two

Anatomy - pathology

Chapter two

Anatomy

٢-١Abdominal cavity:

The abdominal cavity is region located between the diaphragm and sacral promontory. The abdominal and pelvic cavities are commonly divided into four quadrants or nine distinct regions. Contents of the abdominal cavity include the liver, gallbladder and biliary system, pancreases, spleen, adrenal gland, kidneys, ureters, stomach, intestines, and vascular structures.(Khathryn E ,١٩٥٧)

٢-١-١The liver:

The liver is quite large and fills most of the upper right abdominal quadrant. Part of its function is to store vitamins and iron. It is reddish-brown in color and is enclosed by tough capsule. This capsule divided the liver into a large right lobe and a small left lobe. Each lobe is separated into smaller divisions called hepatic lobules. Branches of the hepatic portal vein carry blood from digestive organs to hepatic lobules. The hepatic lobules contain macrophages that destroy bacteria and viruses in the blood. Each lobule containsmany cell called hepatocytes. Hepatocytes process the nutrients in blood and make bile, Which is used in the digestion of fat. Bile leaves the liver through the hepatic duct. Hepatic duct merges with the cystic duct (the duct from the gallbladder) to form the common bile duct. This duct delivers bile to the duodenum.(KhathrynE,١٩٥٧)

٢-١-٢The gallbladder:

The gallbladder is a small, sac-like structure located beneath tle liver. Its only function is to store bile. Bile leave the gallbladder through the cystic duct. The hormone cholecystokinin causes the gallbladder to release bile. The salts in bile break large fat globules into smaller ones so that they can be more quickly digested by the digestive enzymes. Bile salts also

increase theabsorption of fatty acids, cholesterol, and fat-soluble vitamins into the bloodstream**.**

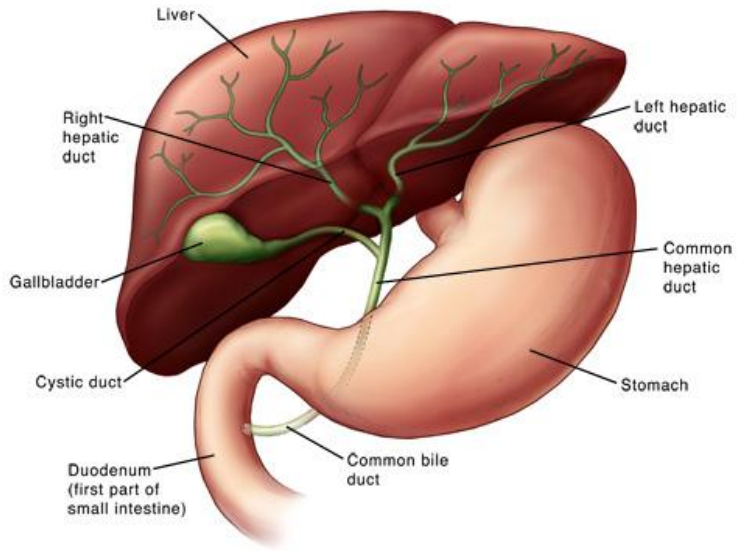


Figure (١-١) anatomy of liver and stomach and gallbladder

(www.hopkinsmedicine.org ٢٠٠٧)

٢-١-٣The pancreas:

The pancreas is located behind the stomach. Pancreatic acinar cells produce pancreatic juice, which ultimately flows through the pancreatic duct to the duodenum. Pancreatic juice contains the following enzymes:

- Pancreatic amylase. This enzyme digests carbohydrates.
- Nucleases. These enzymes digest nucleic acids.
- Pancreatic lipase. This enzyme digests lipids.
- Trypsin, chymotrypsin, and carboxypeptidase. These enzymes digest proteins.

The pancreas also secretes bicarbonate ions into the duodenum. These ions neutralize the acidic chime arriving from the stomach. The parasympathetic nervous system stimulates the pancreas to release its enzyme. The hormones secretin and cholecystokinin also stimulate the

pancreas to release digestive enzyme. Secretin and cholecystokinin come from the small intestine.(Khathryn, ١٩٥٧).

٢-١-٤The spleen:

The spleen is largest lymph organ in the body. It is located posterior to the stomach in the left upper quadrant of the abdomen. It is protected by the ninth through eleventh ribs.

The spleen is in contact with the stomach, left kidney, and diaphragm. The splenic artery and vein enter anf exit the spleen at the hilum between the gastric and renal depressions. The tail of the pancreas is also located at the hilum. The spleen is a highly vascular organ that functions to filter abnormal blood cells from the blood, store iron from red blood cells, and initiate the immune response.(Khathryn ,١٩٥٧)

٢-١-٥The kidneys:

The kidneys are bean-shaped organs that are reddish brown in color. Tough, fibrous capsules cover them. The kidneys are retroperitoneal in position, which means that they lie behind the peritoneal cavity. They lie on either side of the vertebral column at about the level of the lumber vertebrae.

The medial depression of a kidney is called a renal sinus. The entrance of the sinus is called the hilum and contain the renal artery, renal vein, and ureter. Inside the kidney, the ureter expands as the renal pelvis. The renal pelvis divides into small tube inside the kidney called calyces.

The outermost layer of the kidney is called the renal cortex, and the middle portion is called the renal medulla. The renal medulla is divided into triangular shape areas called renal pyramids. The renal cortex covers the pyramids and also dips down between the pyramids. The portion of the cortex between pyramids is called a renal column.

The kidneys are responsible for removing metabolic waste products from the blood. These metabolic waste are combined with water and ions to

form urine, which is excreted from the body. The kidneys also secrete the hormone erythropoietin, which helps to regulate red blood cell production, and the hormone rennin, which helps to regulate blood pressure. .(Khathryn E ١٩٥٧)

٢-١-٦The ureters:

The ureters are long,muscular tubes that carry urinefrom the kidneys to urinary bladder. They propel urine toward the bladder through peristlasis.

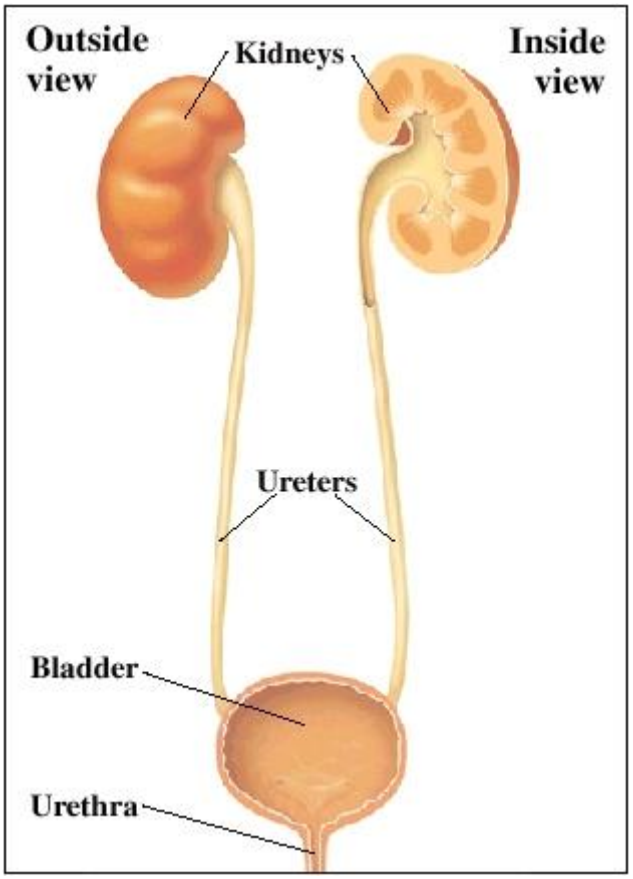


Figure (١-٢) anatomy of urinary tract (www.hopkinsmedicine.org ٢٠٠٧)

٢-١-٧The stomach:

The stomach lies below the diaphragm in the upper left region of the abdominal cavity. It functions to receive foot from the esophagus, mix foot with juice(secretions of the stomach lining), start protein digestion, and move food into the small intestine.

The beginning portion of the stomach that is attached to the esophagus is called the cardiac region. The portion of the stomach that balloons over

the cardiac portion is called the fundic region, or fundus. The main part of the stomach is called the body, the narrow portion that is connected to the small intestine is called pyloric region or pylorus. A sphincter called the pyloric sphincter controls the movement of substances from the pyloric region of the stomach into the small intestine.

The lining of the stomach contains gastric glands. These glands are made of the following cell types:

Mucous cells. These cells secrete mucus to protect the lining of the stomach.

Chief cells: These secrete pepsinogen, which becomes pepsin in the presence of acid. Pepsin digests proteins.

Parietal cells: These cells secrete hydrochloric acid, which is necessary to convert pepsinogen to pepsin. They also secrete intrinsic factor, which is necessary for vitamin B١٢ absorption.

When aperson smell, testes, or sees appetizing food, the parasympathetic nervous system stimulates the gastric glands to secretes their products. A hormone called gastrin, made by stomach, also stimulates the gastric gland to become active. A hormone called cholecystokinin (CCK) made by the small intestine inhibits gastric gland. The stomach doses not absorb many substances but it can absorb alcohol, water, and some fat-soluble drugs. The mixture of food and of food and gastric juice is called chyme. Once chyme is well mixed, stomach contractions push it into the small intestine a little at a time. It takes ٤ to ٨ hours for stomach to empty following a meal.(Khathryn, ١٩٥٧)

٢-١-٨The small intestine:

The small intestine is a tubular organ that extends from the stomach to the large intestine. It fills most of abdominal cavity and is coiled. The small intestine carries out most of the digestion in the body and is responsible for absorbing most of the nutrients into the bloodstream.

The ٢-١-beginning of the small intestine is called the duodenum. It is C-shaped and relatively short. The middle portion of the small intestine is called the jejunum. It is coiled and forms the majority of the small intestine. The last portion of the small intestine is called ileum, and it is directly attached to the large intestine.

The lining of the small intestine contains cell that have microvilli. Microvilli greatly increase the surface area of the small intestine so that it can absorb many nutrients. The lining of the small intestine also contains intestinal gland that secrete various substances. The secretions of the small intestine include mucus and water. Water aid in digestionbut some toxins cause the secretion of too much water, and this lead to diarrhea—*which* in turn aids the body in eliminating the toxins. Mucus protects the lining of the small intestine. The following are the major enzymes secreted by the small intestine:

Peptidases: These enzymes digest proteins.

Sucrase, maltase and lactase: These enzymes digest sugars. A person who cannot produce lactase will not beable to digest lactose, which is the sugar in dairy products. This causes a condition called lactose intolerance.

Intestinal lipase. This enzyme digests fats.

The parasympathetic nervous system and the stretching of the small intestine to secrete wall are the primary factors that trigger the small intestine to secrete its products. Almost all nutrients (water, glucose, amino acid, fatty acid, glycerol, and electrolytes) are absorbed by the small intestine.

The wall of small intestine contracts to mix chime and to propel it toward the large intestine. If chime move too quickly through the small intestine, nutrients are not absorbed and diarrhea results. The ileocecal sphincter

controls the movement of chime from the ileum to cecum, which is the beginning of the large intestine.(Khathryn E, ١٩٥٧)

٢-١-٩The large intestine:

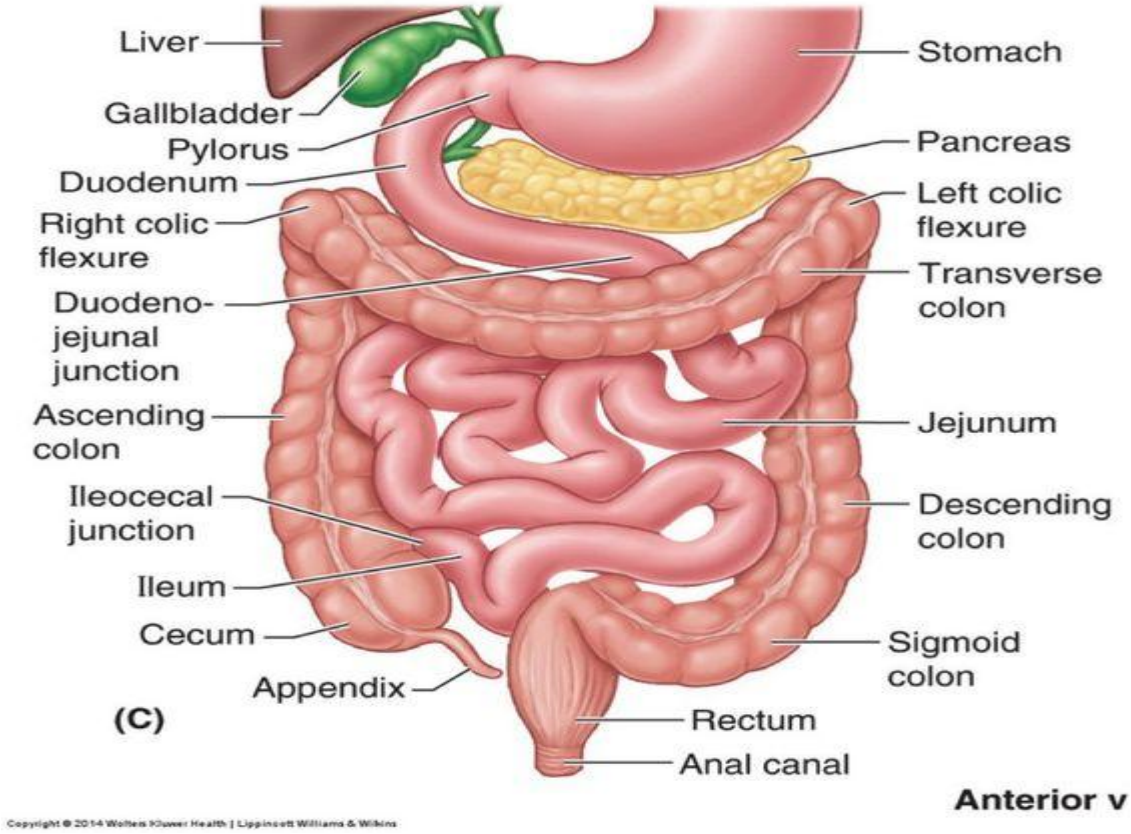
The large intestine extends from the ileum of the small intestine to where it opens to the outside world as the anus. The beginning of the vermiform appendix. The appendix is mostly made of lymphoid tissue and has no significant function in humans. The cecum eventually gives rise to the ascending colon, which is the portion of the large intestine that runs up the right side of the abdominal cavity. The ascending colon becomes the transverse colon as it crosses the abdominal cavity; from there it becomes the descending colon as it descends the left side of the abdominal cavity. In the pelvic cavity, the descending colon then forms an S-shaped tube called the sigmoid colon.(Khathryn E,١٩٥٧)

٢-١-١٠The Rectum and Anal canal:

Eventually the sigmoid colon straightens out to become the rectum. The last few centimeters of the rectum is called the anal canal, and the opening of the anal canal to the outside world is called the anus.

The lining of the large intestine only secretes mucus to aid in the movement of the substances. As chyme leaves the small intestine and enters the large intestine, the proximal portion of the large intestine absorbs water and a few electrolytes from it. The leftover chime is then called feces. Feces are made of undigested solid materials, a little water, ion, mucus, cells of the intestinal lining, and bacteria.

The contractions of the large intestine propel feces forward but these contractions normally occur periodically and as mass movements. Mass movement trigger the defecation reflex, which allows anal sphincters to relax and feces to move through the anus in the process of elimination. The squeezing action of the abdominal wall muscles also aid the emptying of the large intestine.(Khathryn E, ١٩٥٧)



Figure(١-٣) anatomy of stomach and intestine(www.hopkinsmedicine.org ٢٠٠٧)

٢-١-١١Urinary bladder:

The urinary bladder is a distensible organ that is located in the pelvic cavity. Its function to store urine until it is eliminated from the body. Internal floor of the bladder contains three openings- one for urethra and two for ureters. These three openings form a triangle called the trigone of the bladder. The wall of the bladder contain smooth muscle, called the detrusor muscle. This muscles contracts to push the urine from the bladder into the urethra. This process of urination called micturition.(Khathryn, ١٩٥٧)

٢-١-١٢The uterus:

The uterus is hallow, muscular organ that functions to receive an embryo and sustain its development. The upper two-thirds of the uterus is called

the body of the uterus. And the narrow, lower portion of the uterus that extends into the vagina is called the cervix. The openingof the cervix is called cervical orifice.

The wall of the uterus has three layers - endometrium, myometrium and perimetrium.(Khathryn,١٩٥٧)

٢-١-١٣Fallopian tube:

The fallopian tube are slender, muscular tube extending laterally from the body of the uterus to the peritoneum near the ovaries. They are supported by the broad ligament, and at their distal end expand to form a funnel-shaped infundibulum. The infudibulum has numerous fingerlike projections called fimbriae.(Khathryn E ,١٩٥٧)

٢-١-١٤Ovaries:

The paired ovariesare small, almond-shaped organs located on either side of the uterus. They lie in a depression on the lateral walls of the pelvis and are held in place by the ovarian and suspensory ligaments.(Khathryn E ١٩٥٧)

٢-١-١٥The urethra:

The urethra is a tube that moves the urine from the bladder to external world. In females, the urethra is much shorter than in males. For this reason, the females are much more susceptible to urinary tract infection.(Khathryn E, ١٩٥٧)

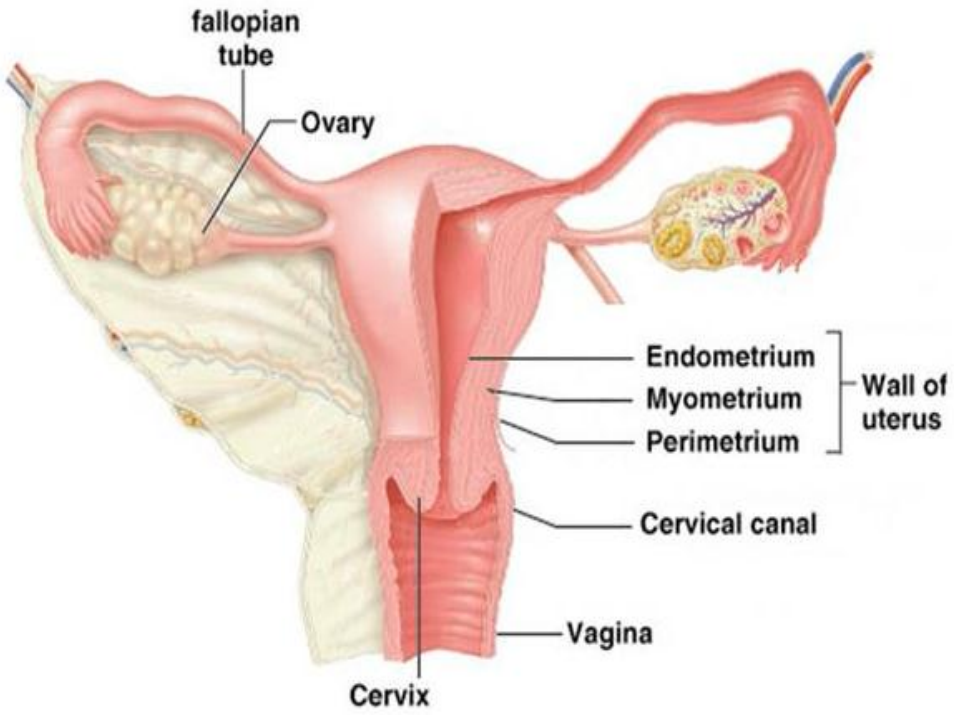


Figure (١-٤) anatomy of uterus(www.hopkinsmedicine.org ٢٠٠٧)

٢-١-١٦Abdominal aorta and branches:

The abdominal aorta is a retroperitoneal structure beginning at the aortic hiatus of the diaphragm. Typically, it is located just left of midline as it descends the abdominal cavity. At approximately the level of L٤, the aorta bifurcates into the right and left common iliac arteries. The major branches of the aorta can be divided into paired and unpaired branches.(Khathryn ,١٩٥٧)

٢-١-١٦-١Unpaired branches:

- Celiac trunk.
- Superior mesenteric artery.
- Inferior mesenteric artery.

٢-١-١٦-٢Paired branches:

- Supernal artery.
- Renal artery.
- Gonadal artery.

٢-١-١٦-٣Inferior vena cava and tributaries:

The inferior vena cava(IVC) is the largest vein of thebody and is formed by the union of the common iliac veins at approximately the level of the L٥. The IVC courses superiorly through the retroperitoneum along the anterior aspect of the vertebral column and to the right of the aorta. Asit ascends the abdominal cavity, the IVC passes the posterior surface of the liver and pierces the diaphragm at the caval hiatus to enter the right atrium of the heart. The IVC receives many tributaries throughout its course in the abdomen, which include the lumber, right gonadal, renal and hepatic veins.(Khathryn E, ١٩٥٧)

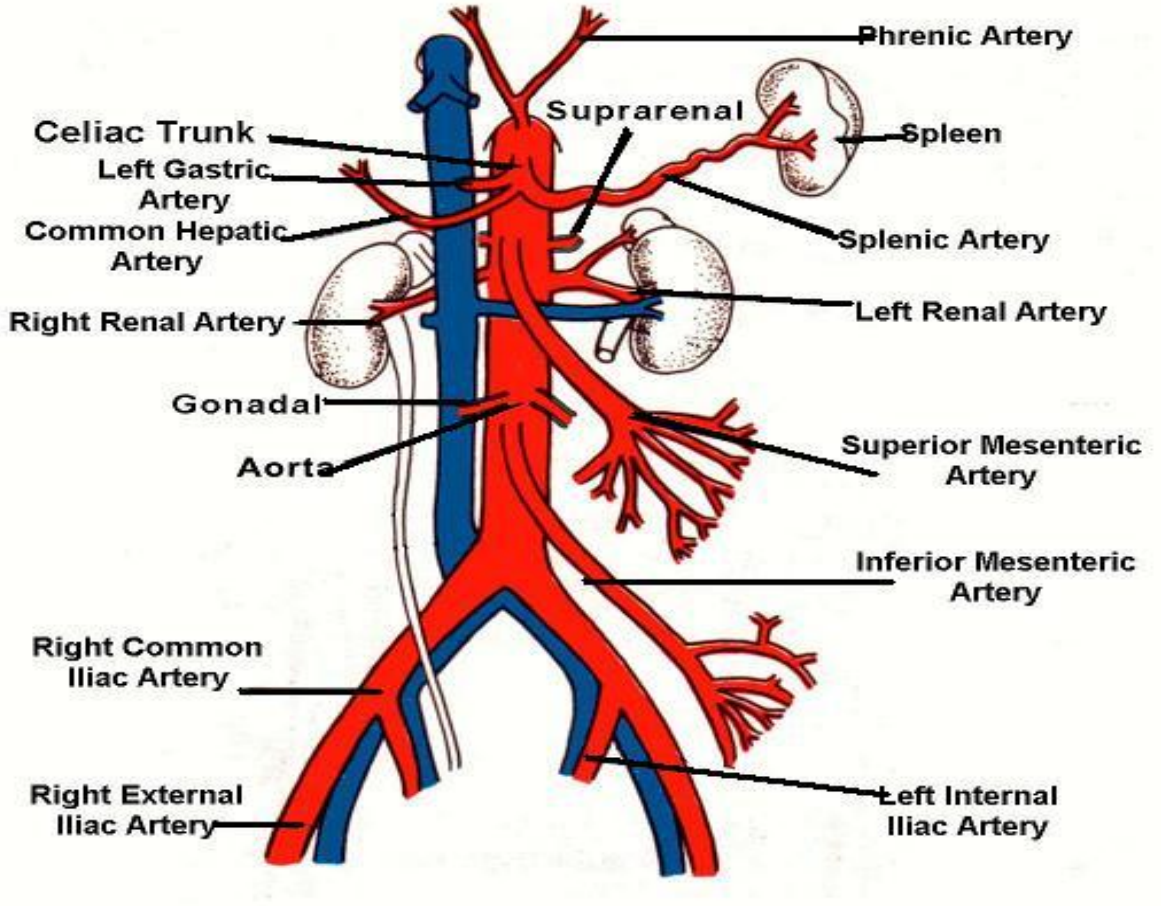


Figure (١-٥) anatomy of abdominal vessels(www.hopkinsmedicine.org ٢٠٠٧)

٢-١-١٧Abdominal muscles:

Rectus abdominis muscle is originated from the pubic bone near symphysis and insertion in the costal cartilage of fifth, sixth, seventh ribs and xiphoid process of sternum.

External oplique muscle is originated from lower ribs and insertion in the lineaalba and iliac crest.

Internal oblique muscles is originated from iliac crest and lumbodorsal fascia and insertion in lower three ribs.

Transverses abdominis muscles is origination from lower sis ribs, iliac crest and lumbodorsal fascia .and insertion in pubic bone and lineaalba.

Quadrates muscles is originated from iliac crest. And insertion in twelfth rib and transverse processes of lumber vertebra.

Psoas muscles is originated from anterior surfaces and transverse processes of T١٢-L٥.(Khathryn,١٩٥٧)

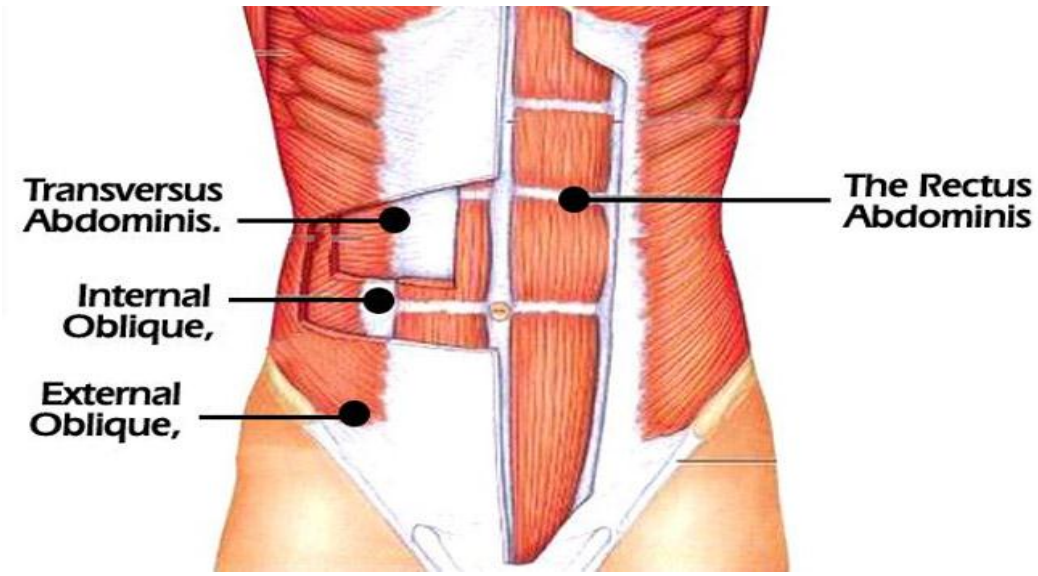


Figure (١-٦) anatomy of abdominal muscles (www.hopkinsmedicine.org ٢٠٠٧)

٢-٢Pathology of the abdomen:

٢-٢-١Appendicitisis an inflammation of the appendix. If not treated promptly, it can be life-threatening.

Causes: This disorder is caused by blockage of the appendix with feces or a tumor.(Khathryn,١٩٥٧)

٢-٢-٢**Cirrhosis** is a long-lasting liver disease in which normal liver tissue is replaced with nonfunctional scar tissue.

Causes: The disease is often an autoimmune disease. It may be caused by some medications and alcohol consumption. Hepatitis B and C infections can also contribute to the development of cirrhosis.(Khathryn E ١٩٥٧)

٢-٢-٣**Colitis** is defined as inflammation of large intestine. This condition can be chronic or short-lived, depending on the cause.

Causes: Colitiscan be caused by a viral or bacterial infectionorthe use of antibiotics. Ulcer in the large intestine, crohn's disease, various other disease, and stress may also contribute to the development of this disorder.(Khathryn E, ١٩٥٧)

٢-٢-٤**Colorectal cancer** usually comes from the lining of the rectum or colon. This type of the cancer is curable if treated early.

Causes. The causes are mostly unknown. Polyps in the colon or rectum can become cancerous, leading to this disease. Colorectal cancer may be prevented through regular screenings for polyps.(Khathryn E ١٩٥٧)

٢-٢-٥**Constipation** isthe condition of difficult defecation, which is the elimination of feces.

Causes. The primary causes are a lack of physical activity, a lack of fiber in the diet, the use of certain medication, and thyroid and colon disorders.(Khathryn E ١٩٥٧)

٢-٢-٦**Crohn's disease** is a common type of disorder called inflammatory bowel disease**.**

Causes**:**This disease is an autoimmune disorder.(Khathryn E ١٩٥٧)

٢-٢-٧ **Diverticulitis** is inflammation of diverticuliin the intestine**.**

Diverticuli are abnormal dilation in the intestinal wall.

Causes. The causes are mostly unknown .lack of fiber in the diet and a-bacterial infection of the diverticuli can cause this disorder.(Khathryn E, ١٩٥٧)

٢-٢-٨**Gastritis** is an inflammation of the stomach lining .it is often referred to as an "upset stomach."

Causes. Gastritis can be caused by bacteria or viruses, some medication, the use of alcohol, spicy food, excessive eating, poisons, and stress. Cooking food properly to kill harmful bacteria and viruses can help to prevent this condition.(Khathryn, ١٩٥٧)

٢-٢-٩**Hemorrhoids** are varicose vein of the rectum or anus.

Causes. Hemorrhoids are caused by constipation, excessive straining during bowel movements, liver disease, pregnancy, and obesity.(Khathryn, ١٩٥٧)

٢-٢-١٠**Hepatitis** is defined as inflammation of the liver. There are many different types of hepatitis.

Causes: Causes include bacteria, viruses, parasites, immune disorders, the use of alcohol and drugs, and an overdose of acetaminophen. Preventive measures include getting vaccination, practicing safe sex, avoiding undercooking food(especially seafood), and using prescription or over-the-counter drugs at their recommended dosages.(Khathryn ١٩٥٧)

٢-٢-١١**Pancreatic** cancer is the fourth leading cause of cancer death in the United States.

Causes: Causes are mostly unknown, although smoking is considered a risk factor.

Stomach cancer most commonly occurs in the uppermost portion of the stomach, which is called the cardiac portion.(Khathryn,١٩٥٧)

٢-٢-١٢**Hepatocellular carcinoma (HCC**) is a primary malignancy of the liver and occurs predominantly in patient with underlying chronic liver disease and cirrhosis. .(Khathryn, ١٩٥٧)

٢-٢-١٣**Ascities** describes the condition of pathologic fluid collection within the abdominal cavity.(Khathryn, ١٩٥٧)

٢-٣Previous study:

Gamerddin et al(٢٠١٤):diagnosis of urinary bladderabnormalities.the study reveal that acute and chronic cystitis were the most common vesicle diseases and represent approximately ٢٨٪of the cases. It was observed that schistosomiasis affect the male only because their work related to the water (farmers) which is the source of the parasite. In this study, the incidence of polyps is rare and there was only three cases ٢,٧٪ .the ultrasound finding of vesicle blood clot was the second common finding after acute and chronic cholecystitis representing ٩,٩%. This is due to that many pathological change and diseases cause vesicle blood clots such as: inflammation of the prostate, tuberculosis and early malignantchange.(http// www.sudanmedical.org.Decmber٠٢,٢٠١٤,ip:٤١,٢٣٤,٣٥,١٢٧)

Nisreen M et al(٢٠٠٨) this study was said: the predominant abdominal cancer incidence was among arabalgazeeramadani(٢٣٪)(arab descendant), foor(١١٪)(Africa descendant), baniamir(٨٪), bagara(٧٪), hadandwa(٥٪) and danagla(٤٪).

While the common susceptible abdominal organ for cancer is esophagus with (٣٦٪), the liver (١٨٪), the pancreas (١٠٪), the large bowel (١٠٪), the stomach (٧٪) and gallbladder (٦٪).

(Evaluation of the incidence for abdominal cancer patients ant is follow up by CT) (http//www.sudanjp.com)

Chales O.C et al (٢٠١٢) sought to Hepatocelullar carcinoma in south sudan. In this study, ٨٠٪ -٩٠٪ of HCC present in the background of cirrhosis. Some causes of cirrhosis which is lead to HCC include:

- Chronic hepatitis B and C vairuses.
- Aflatoxin.
- Alcohol consumption.

(https://en.m mikipedia.org/wiki/hepatocellularcarcinoma?-e p I =٧٪٢CPAGE ٢٣٣)

Ahmed E et al (٢٠١٥) sought to application of MRI in diagnosis of gastrointestinal tract diseases. This study is we observed, the male is about ٥٣٪ and female is about ٤٦,٧٪ from the study, all patients is ٣٠ persons.

The researcher found, the active crohn's disease in ٦ patients (٢٠٪), ulcerative colitis in ٥ patients (١٦,٧٪), fistula in ٤ patients (١٣,٣٪), bowel mass in ٣ patients (١٠٪), bowel abscess in ٢ patients (٦,٧٪), bowel obstruction in٣ patients (١٠٪),adrenal gland mass in ٢ patients (٦,٧٪), aortic aneurysm in ٣ patients (١٠٪) unrelated to bowel diseases, lymph nodes diseases in ٢ patients (٦,٧٪) from total ٣٠ patients.

The researcher found that MRI enterology superior than CT in diagnose the GIT diseases specially the inflammatory bowel diseases and other diseases (crohn's disease, ulcerative colitis, bowel obstruction and aortic aneurysm) and confirms result of CT, also MR enteroloy confirms result of CT in other diseases (fistula,bowel mass, bowel abscess, adrenal gland mass and lymph nodes disease).

Knowlton el al(٢٠٠٨) according to the mago clinic, anyone can get an enlarged spleen, but children suffering from mononucleosis, adult with certain inherited metabolic disorder including gaucher's and people who live or travel to malaria endemic areas are more at risk.

Knowlton listed infection, liver disease, cancer and blood disease as typical causes for enlarged spleen according to mayo clinic, specific infection and disease. (http://www.livescience.com/٤٤٧٢٥-spleen.html).

- Abboud et al (٢٠١٦)sougt to the etiology of chronic renal failure in adult Sudanese patients. in this study, one hundred adult Sudanese patients who presented to soba university hospital with established chronic renal failure were studied to determine the etiology. ٣٨ patients had chronic glomerulonephritis, ١٢ patients had renal calculi, ٩ patients had diabetic renal disease, ٧ patients chronic

pyelonepheritis, ٥ patients had sequelae of acute renal failure, ٤ patients had renal vascular disease, ٣ patients had polycystic disease of the kidney, and ٢ patients had obstructive uropathy. In ٢٠ patients the etiology was not determined because of late presentation to hospital. The results were compared with those of the developed countries, which differ greatly from sudan in climate, diet, race, culture and social habits. The main difference were in the prevalence of renal calculi which, although being the second commonest cause of chronic renal failure in the sudan, were rare in European countries. (http//group.bmj.com)

Chapter Three

Material and methods

Chapter Three

Material and methods

٣-١Materials:

٣-١-١Patient:

٥٠ Sudaneses patients (male and female) at different ages. Had CT examination for abdomen post contrast.

٣-١-٢Machine Used:

Ct ١٦ slice scanners (Toshiba) at wadmadani hospital(KV١٢٠-MAS١٦٠)

٣-١-٣Data sheet which was including:

Name of patient, age, gender and finding of CT abdomen image.

٣-٢Place of the study:

Gazeera Traumatology Center-in Wadmadani City

٣-٣Duration of the study:

From September ٢٠١٦ to november٢٠١٦

٣-٤ CT protocol :

All patients underwent ct scan for abdomen with patient supine-feet first, the arm are a raised and placed behind the patient head (out of the scan plane); positioning is add by alignment light "the median sagittal plane is perpendicular and the cronall plane is parallel to the scanner table top" the scanner table light is adjusted to ensure that's the cronal plan alignment is at the level of axillary line. The patient was moved in to the scanner until the scan reference point is at the level of the xiphoid process. The scout view was obtained to include the diaphragm and pubis "with slice thickness ٥-٨ mm".

Contrast scans can be classified as single-phase, multiphase, or special.

Single-phase scans are typically used to evaluate acute abdomen or suspected abdominal infections, with imaging usually in the portal venous phase. It is usually combined with administration of oral

contrast. Oral or intraluminal contrast enhances the evaluation of the bowel.

Multiphase scans consist of precontrast and combinations of arterial phase, portal venous phase, and delayed imaging, depending on the organ of interest.

٣-٥Method of interpretation:

The study data was collected in trumatolog center under supervising the radiology. and were classified according to size finding including urinary tract, bowel, pelvic, liver, spleen,vessels.

The finding of each system or organ would evaluated and presenting were table.

Chapter Four

Results

Chapter Four

Results

٤-١ Results:

Table (٤،١)age distribution

Age	Frequency	Percentage
١-١٦	٥	١٠٪
١٧-٣٣	٦	١٢٪
٣٤-٥٠	١٦	٣٢٪
٥١-٦٧	١٢	٢٤٪
> ٦٧	١١	٢٢٪

Table (٤،٢) gender distribution

Gender	Frequency	Percentage
Male	٢٠	٤٠٪
Female	٣٠	٦٠٪

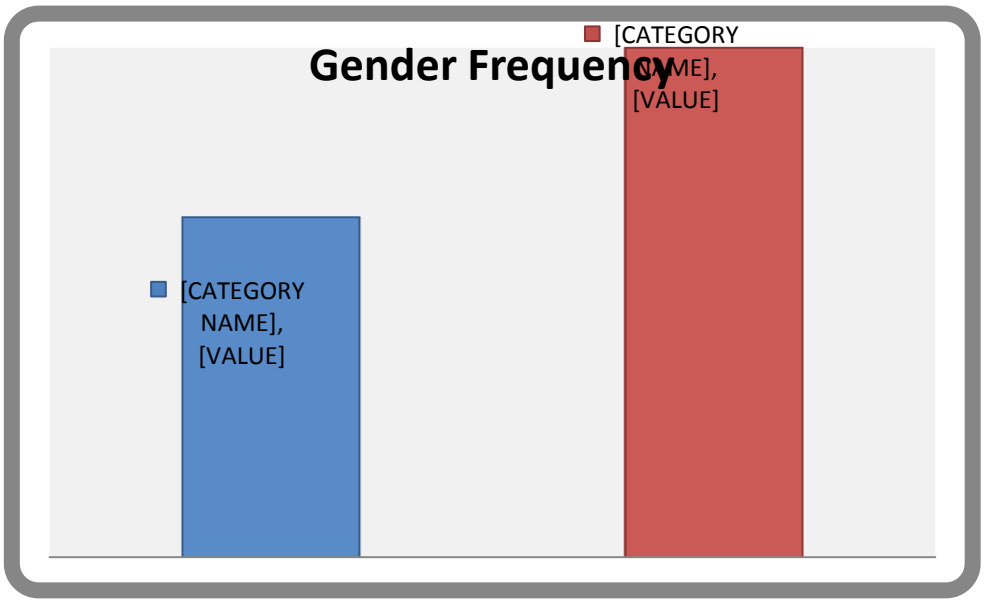


Figure (٤-١) shows distribution of gender

Table (٤,٣) shows finding of CT urinary tract

Organs	Finding Of CT Abdomen	Frequency	Percentages	
Urinary Tract	Obstructive Uropathy	١	١٪	٤٥٪
	Stone	١	٢٪	
	RCC	٤	٨٪	
	Cystitis	٢	٢٪	
	Hydronephrosis	٣	٦٪	
	Hydroureter	٢	٤٪	
	Distended UB	١	٢٪	
	Atrophied Kidney	٣	٦٪	
	CA UB	٥	١٠٪	
	Renal Metes	١	٢٪	

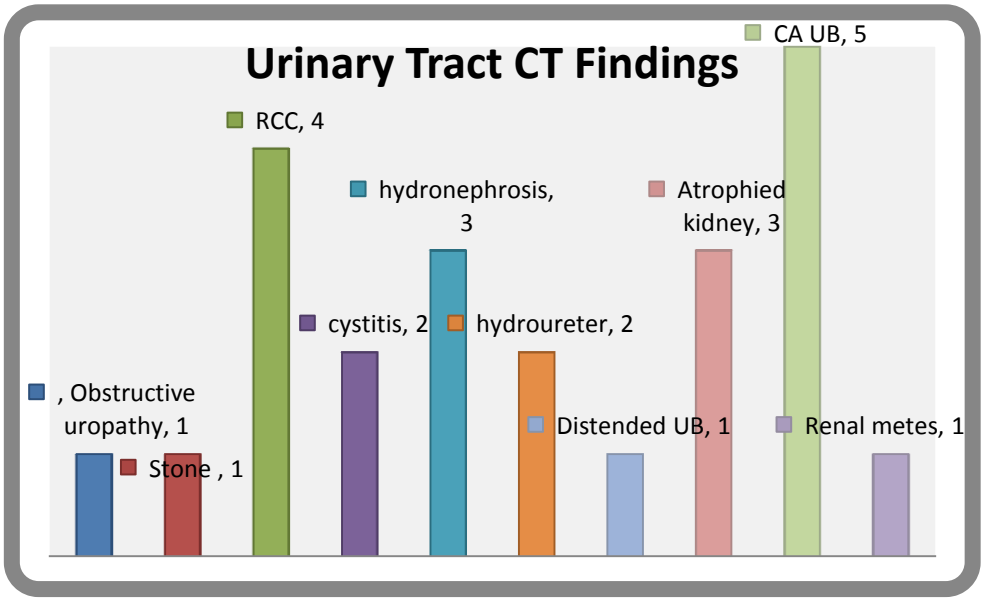


Figure (٤-٢) urinary tract CT finding

Table (٤ -٤) Shows finding of liver

Organs	Finding Of CT Abdomen	Frequency	Percentages	
Liver	Cyst Of Liver	٤	٨٪	٣٩٪
	HCC	٦	١٢٪	
	Liver Adenoma	١	١٪	
	Hepatomegaly	٤	٨٪	

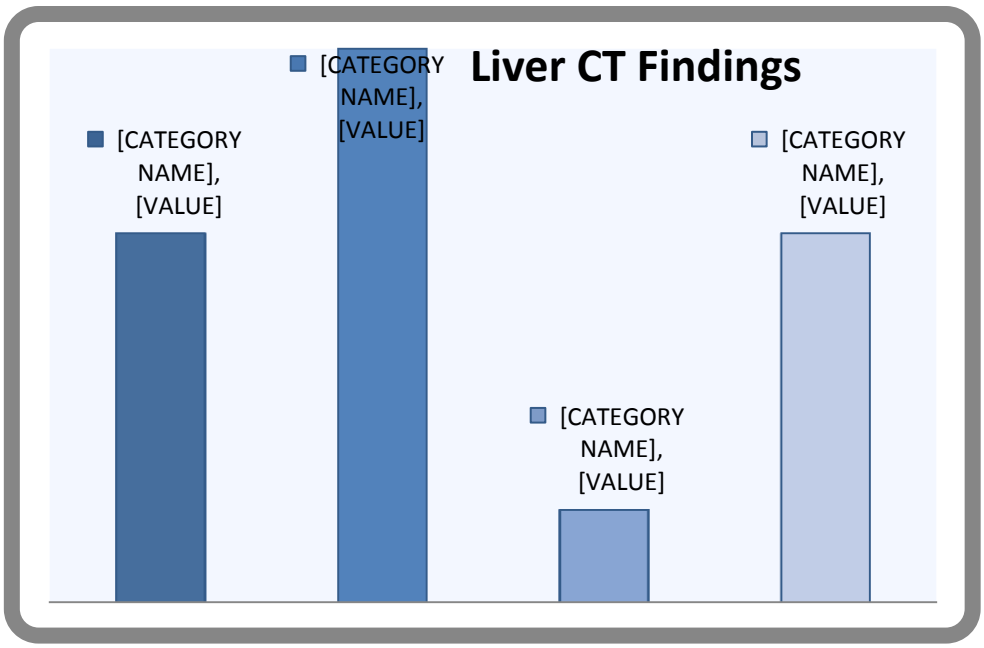


Figure (٤-٣) liver CT finding

Table (٤ - ٥) Shows finding of Bowell and pelvic

Organs	Finding Of CT Abdomen	Frequency	Percentages	
Bowell And Pelvic	Pelvic Cyst	١	٢٪	٤٦٪
	Ascetic	٨	١٦%	
	Sigmoid Colon Diverticulum	١	٢٪	
	Pelvic Mass	٣	٦٪	
	Appendicular Mass	٢	٤٪	
	Inflammation Of Bowell	٢	٤٪	
	CA Endomedrium	١	٢٪	
	CA Rectum	٣	٦٪	
	CA Anal Canal	١	٢٪	
	CA Ovary	١	٢٪	

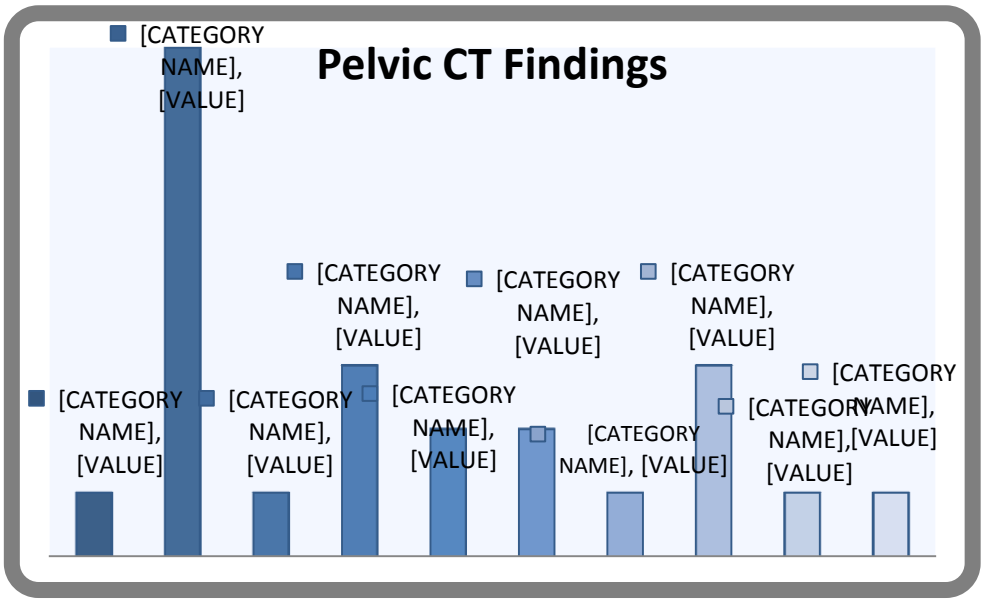


Figure (٤-٤) Pelvic CT Findings

Table (٤ - ٦) shows finding of vessels

Organs	Finding Of CT Abdomen	Frequency	Percentages	
Vessels	Aortic Aneurysm	٢	٤٪	٦٪
	Portal Hypertension	١	٢٪	

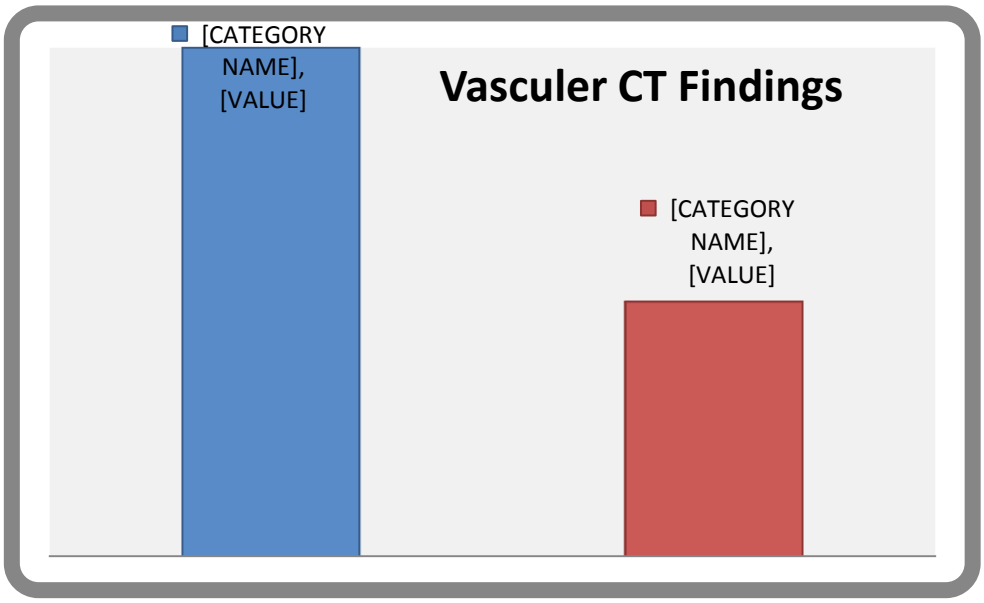


Figure (٤-٥) vascular CT finding

Table (٤ - ٧) Shows finding of spleen

Organs	Finding Of CT Abdomen	Frequency	Percentages	
Spleen	Spleenomegaly	٣	٦٪	٨٪
	Infarction	١	٢٪	

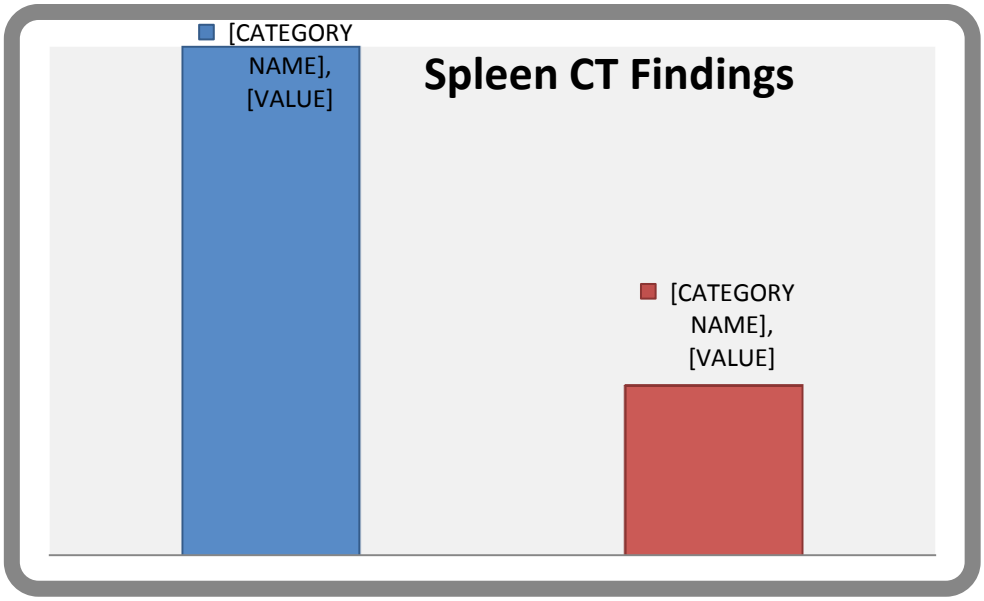


Figure (٤-٦) spleen ct finding

Table (٤ - ٨) Showsother diseases of abdomen

Organs	Finding Of CT Abdomen	Frequency	Percentages	
Normal	-	٣	٦٪	٦٪
Other	Enlargement Of Para Aortic LNS	٢	٤٪	٨٪
	Hiatus Hernia	٢	٤٪	

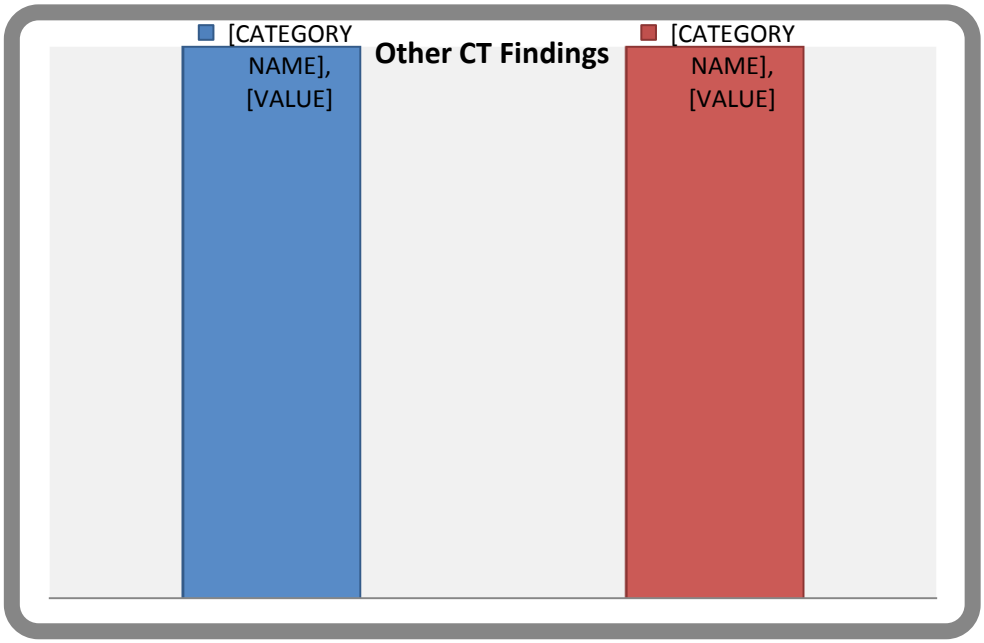


Figure (٤-٧) other CT finding

Chapter Five

Discussion, Conclusion &Recommendation

Chapter Five
Discussion, Conclusion & Recommendation

٥-١ Discussion

In the present study, data showed that table (٤-١) shows the correlation between age groups and the finding of CT abdomen post contrast. The data reveal that common involved age were the age groups ٣٤-٥٠ years (٣٢٪).

Table (٤-٢) show the distribution the finding based on gender, which showed that common involved gender is the female groups with specific percent of ٦٠٪ relative to male with ٤٠٪.

Table (٤ - ٣) show CT finding – which is determent percent of disease in urinary tract which had high percent compared with other area (٤٥٪) after Bowell and pelvic which is green with the finding of the study by abboud et al (٢٠١٦).

The renal failure is ٣ patients from ٥٠ patient is not little that result from social habit and culture of Sudanese in country is hot.

And agree with the study of gamerddin et al(٢٠١٤)has cases of cystitis which result from exposure to schistosomiasis affected on farmers, And agree with study of Nassrin metal(٢٠٠٨) which is say predominant abdominal cancer incidence was among arab algazeira madani.

Table (٤ - ٤) demonstrate the finding in liver by percent (٢٩٪). The H CC is the percent of highest proportion (١٢٪). Which result from several causes such as aflatoxin. Alcohol on consumption and chronic hepatitis Band C which is now distribution between Sudaneses that is agree with study by Chalos O.C et al (٢٠١٢).

Table (٤ - ٥) and table (٤ - ٦) is demonstrated of disease in area of bowel and pelvic, ascites is more fanding (١٦٪) in there because to it is associated to the inflammation and cancer which is present in this cases.

Also is seen pelvic mass (٦٪), appendicular mass (٤٪). CA rectum (٤٪), CA endometrium (٢٪), CA anal (٢٪), and inflammation of Bowell (٤٪)

agree with the study Mohammed E et al (٢٠١٥), the CT scam better for observe the mass and CA but in the inflammation of Bowell better MRI.

Table (٤ - ٧): demonstrated finding in spleen. Which is splenomegaly (٦٪), that more percent. It result from endemic area by malaria and mononucleosis that is agree with study by knowlton et al (٢٠٠٨).

٥-٢Conclusion

-The most affected gender were the female

- The most affected age group were the group from ٣٤ to ٥٠ years old

- The common finding in the study was cases of bowel and pelvic diseases that percent (٤٦٪), the urinary tract diseases that percent (٤٥٪), liver diseases that percent (٣٩٪), spleen disease (٨٪), and vessels diseases (٦٪), and other diseases of abdomen (٤٪).It can be said that the CT image modality was performed and used as essential technique of evaluation abdominal diseases, which help to obtain early diagnosis.

٥-٣Recommendation

Change some social habits, culture, diet and race to reduce problem or disease of kidney. Sudan country is very hot need drinking more water.

We are given the more formation about the risk factor carcinogenesis to the community to reduce cancer.

Increase the sample size of study in gazira state.

Repeated the study in different area in sudan.

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Appendixs

Appendixs(I)

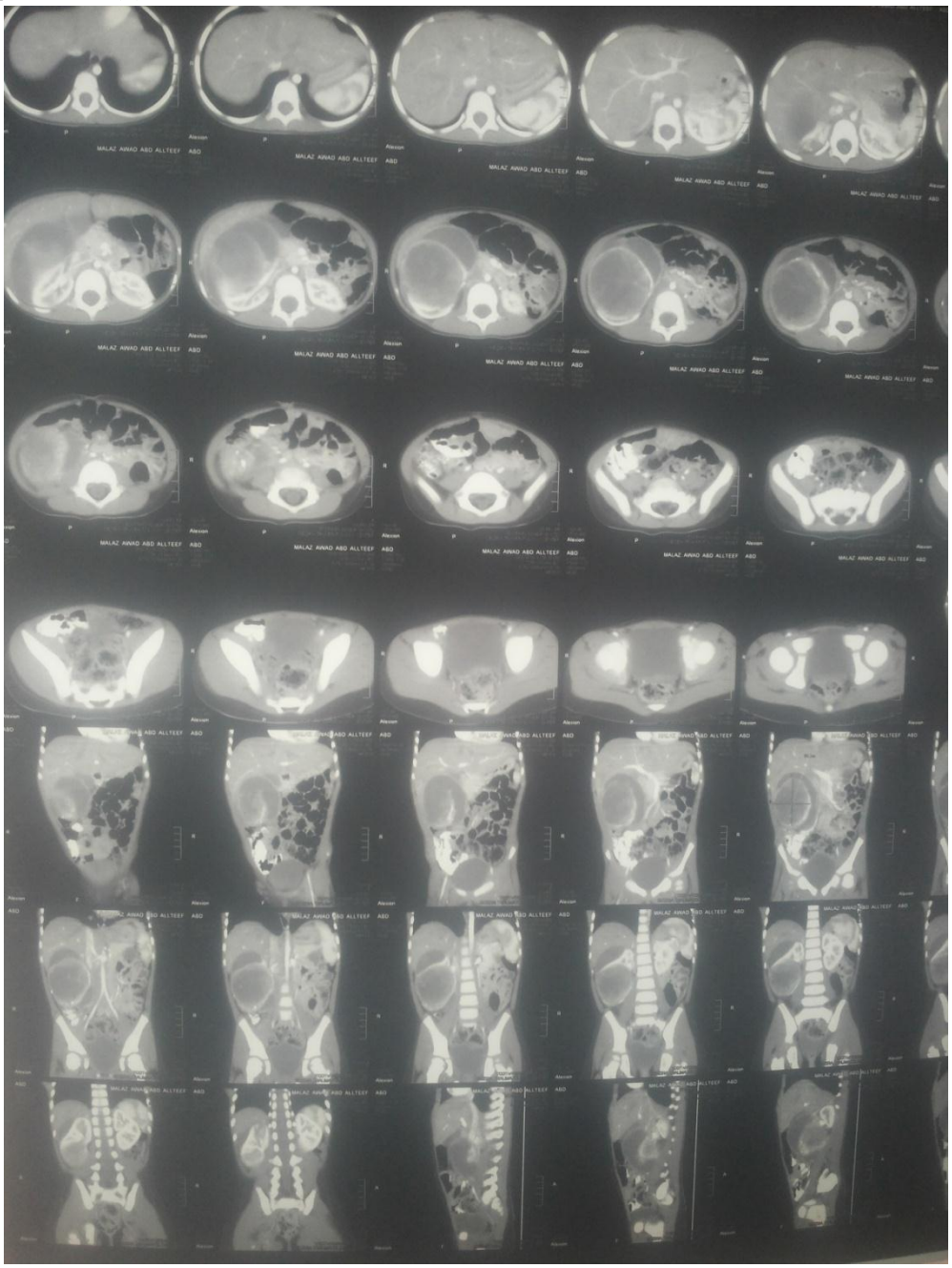

Figure (٥-١).axial and Coronal view of CT abdomen for patient has HCC(venous view)

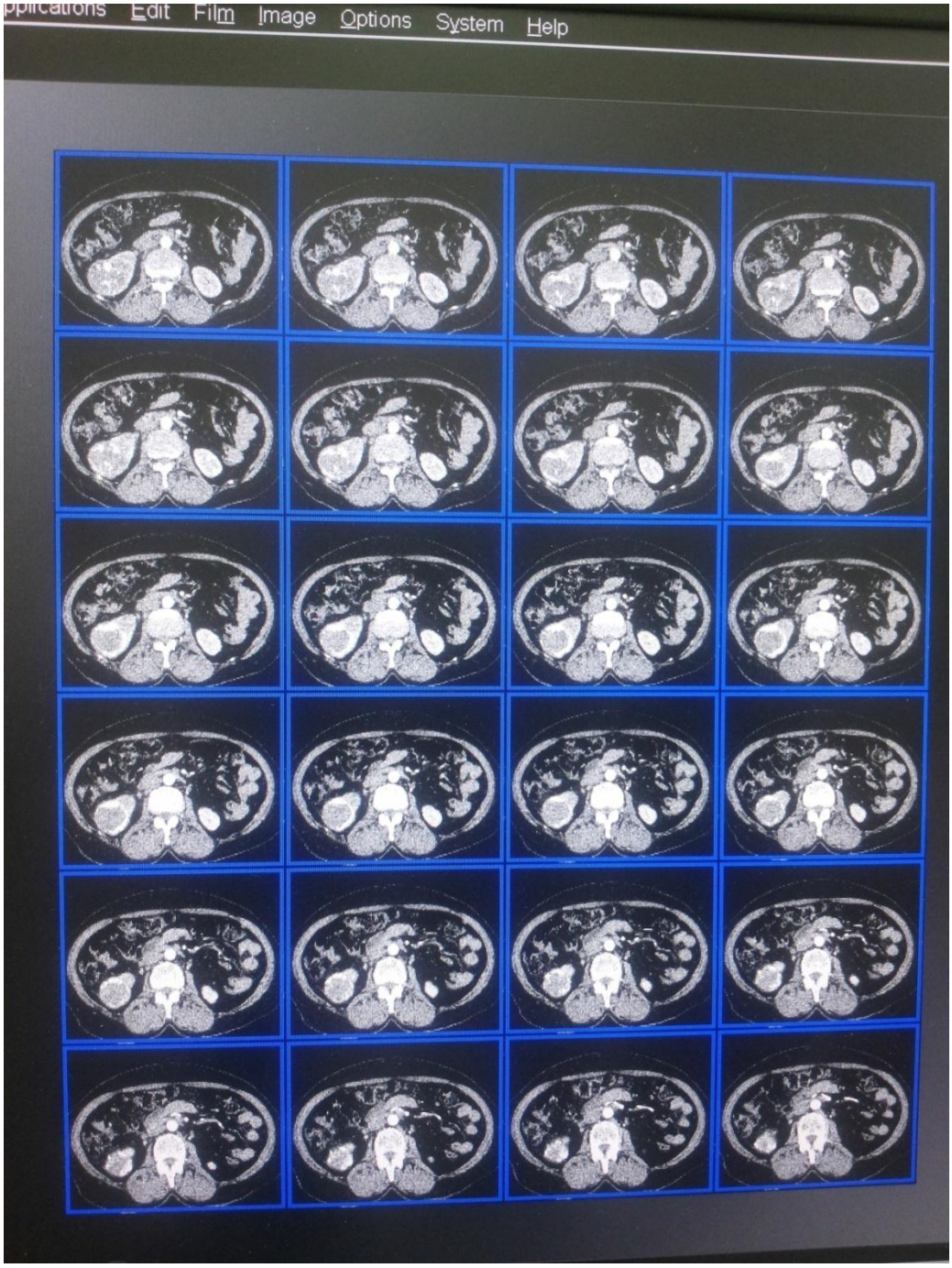

Figure (٥-٢). Axial view of ct abdomen for patient has RCC (arterial phase

Appendixs(II)

The data collected from center A

No	Age	Gander	Finding CTscan of abdomen