Sudan University of Science and Technology

College of Graduate Studies

Study of Underline Causes of Right Loin Pain Using Ultrasonography

دراسة أسباب ألم الخاصرة بإستخدام الموجات فوق الصوتية

A thesis submitted for the partial fulfillment of the requirement of M.Sc.degree in Medical Diagnostic Ultrasound

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August 2015

بِسْمِ ٱللَّهِ ٱلرَّحْمَٰنِ ٱلرَّحِيمِ

قال تعالي :

(يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ)

سورة المجادلة : الآية(11)

Dedication

I dedicate this humble work to my beloved parents for always supporting me, because they are the driving force in my life and career.Without their love, none of this would matter.

To my husband, Abu Obieda, and my children Lama and Khalid, I give my deepest expression of love and appreciation for the encouragement that you gave and the sacrifices you made during this program.

Acknowledgement

I would like to express my sincere gratitude and deep appreciation to my faithful supervisor Dr. Mohammed Alfadel who dedicated a lot of his precious time to give me invaluable assistance and guidance throughout the study and for sharing his knowledge with me thus promoting my skills and knowledge.

Many thanks and great appreciations extended to Dr. Al Gunaid Awad Yousif who endlessly kept helping and encouraging me. Without his assistance this work would not be accomplished.

Abstract

This study was carried out to investigate the cause of the Rt loin pain using ultrasound in order to relate the pain to the sign and symptoms according to ultrasound finding. The data of this study collected from 50 patients refer to ultrasound department in Military Hospital in Omdurman as having Rt loin pain in the period from Jan 2014 to May 2015. The patient scanned by General electric logia 5 ultrasound machine equipped with TA convex probe 3.5MHz. The result of this study showed that the main known cause of Rt loin pain was gall balder where wall thickness exceeds 5 mm in 14% of the patient some of them associated with gall stone. While 10% of the patient had hydronephrosis, 12% had hyperechoic kidney appearance and 8% with renal stone, only one patient were diagnosed as having appendicitis. In conclusion Rt loin patient mostly showed significant difference in the signs and symptoms groups in respect to gall bladder thickness while liver size, kidney length showed inconclusive results.

المستخلص

لقد تم اعداد هذة الدراسة لتشخيص مسببات الم الخاصرة اليمنى باستخدام الموجات فوق الصوتية بهدف تحديد علاقة الالم بالعلامات و الاعراض طبقا لنتائج الكشف بالموجات فوق الصوتية. معلومات هذة الدراسة قد تم تجميعها من خمسين مريضا يعانون من الم الخاصرة اليمنى تم تحويلهم الى قسم الاشعة فوق الصوتية فى المستشفى العسكرى با م درمان خلال الفترة من يناير 2014 الى مايو 2015 . لقد تم فحص المرضى باستخدام جهار الموجات فوق الصوتية جنرال اليكتريك لوقيا 5 المزود بمسبار محدب 3.5 ميغاهيرتز اظهرت نتيجة هذة الدراسة ان السبب الرئيسى الذى تم التعرف عليه لالم الخاصرة اليمنى هو حويصلة الصفراوية حيث يزيد سمك جدارها عن 5 مليمترات لدى 14% من المرضى بعضهم يعانون من حصوة حويصلة الصفراوية بينما 10% منهم يعانون من مظهر مفرط الصدى للكلية 12% يعانون من موه الكلية و 8% من الحصوةالكلوية ومريض واحد فقط تم تشخيصه بانه يعانى من التهاب الزائدة الدودية. فى الخلاصة اتضح ان المرضى الذين يشكون من الم الخاصرة اليمنى يظهر عليهم فى الغالب اختلاف فى العلامات و الاعراض المتعلقة بسماكة الحويصلة الصفراوية اما فيما يتعلق بحجم الكبد وطول الكلية فلم يتم التوصل الى نتيجة نهائية.

List of tables

List of Figures

List of abbreviations

Rt	Right
GB	Gall Bladder
ALD	Alcoholic Liver Disease
CT	Computed Tomography
US	Ultrasonography
KUB	Kidney,Ureters and Bladder
ER	Emergency Room
ED	Emergency Department
TA	Trans Abdominal
LPO	Left Posterior Oblique
LLD	Left Lateral Decubitus
SPSS	Statically Package of Social Science
Cr	Creatinine
RBCs	Red Blood Cells

List of Contents

Chapter one
Introduction

In human anatomy, the loin refers to an area extending vertically from just below the waist, or more specifically from the bottom of the ribcage, to just below the pelvis. The term is somewhat inexact, and is most often used to describe the sides of the body in the area below the ribs, sometimes also called the flanks, and the parts of the lower back on either side of the spine. Sometimes the term also includes the genitals, the groin, the hips, and the lower abdomen. Lower right abdominal pain is defined as pain in the lower area of the abdomen. There are dozens of causes, some which can be easily treated, while others need the immediate attention of a medical professional.The most common causes of lower abdominal pain are appendicitis, ectopic pregnancy, pelvic inflammatory disease and kidney stones.In appendicitis, Pain usually starts at or around the belly button and moves to the lower right area. Symptoms include a desire to vomit, reduced appetite and fever. Appendicitis can cause a dull to a very sharp pain.Ectopic pregnancy, this condition occurs outside of the uterus, usually in a fallopian tube. It can occur with severe pain usually in the lower right (or lower left) abdomen, sometimes presenting with vomiting. This is considered to be a severe medical emergency, so you should seek medical attention immediately.Pelvic inflammatory disease is an inflammation of the pelvic region. If the uterus is tilted to the right just slightly, then it can cause a dull, sometimes sharp and lower right abdominal pain. The pain may be accompanied by vaginal discharge, pain during intercourse and fever.Kidney stones, or calcium-like deposits in the kidney, usually occur in the kidneys or the ureters. It can be associated with severe pain and can spread to the back. Seek medical attention, as kidney stones could pose a serious problem for some people.

Some lesser common causes include constipation, Crohn's Disease, Diverticulitis, Endometriosis, pyelonephritis, bowel cancer, hernia, colon cancer, gas, Irritable Bowel Syndrome, overeating, fatigue, food poisoning, pancreatitis, lead poisoning, cystitis, ovarian cysts, twisted ovary or ovaries, urinary tract infection.ultrasonography has become the standard imaging modality in the investigation of kidneys because it offers excellent anatomic detail, requires no special preparation of patients is readily available and does not expose the patient to radiation or contrast agents.

1.2 Problem of the study:

The majority of patients who consult a physician about abdominal pain mainly in the Rt side do not have an acute abdomen, although the chief complaint may have a sudden onset.It is often difficult for the physician to elicit an accurate description of the nature of the pain in patients specially the elderly one. They may be unable to distinguish new symptoms from preexisting complaints and concomitant illnesses. Laboratory test most of the time gives result that do not correlated well with signs and symptoms; therefore ultrasound as a non invasive tool of investigation can gives a better results especially in case of pathological condition or at least it can rollout the pathological problems.

1.3 Objectives:

The general objective of this study was to study Rt loin pain using ultrasonography in order to find out the most frequently causes of the pain that associated with the signs and symptoms.

Specific objectives:

- To determine the most frequent pathological conditionthat causesRt loin pain.
- To measure the size of the liver, kidney length and gall bladder thickness.
- To correlate the finding with laboratory investigation.
- To find the significant difference in the liver size, kidney length and gall bladder thickness in respect to signs and symptoms groups.

1-4 Significant of the study

This study is a descriptive one which will give the most causes of the Rt loin pain in the suffering patient as well it will correlate the signs and symptoms with ultrasound finding and it will gives suggestion for the improvement of the investigation for those case with Rt loin pain but with non pathological condition.

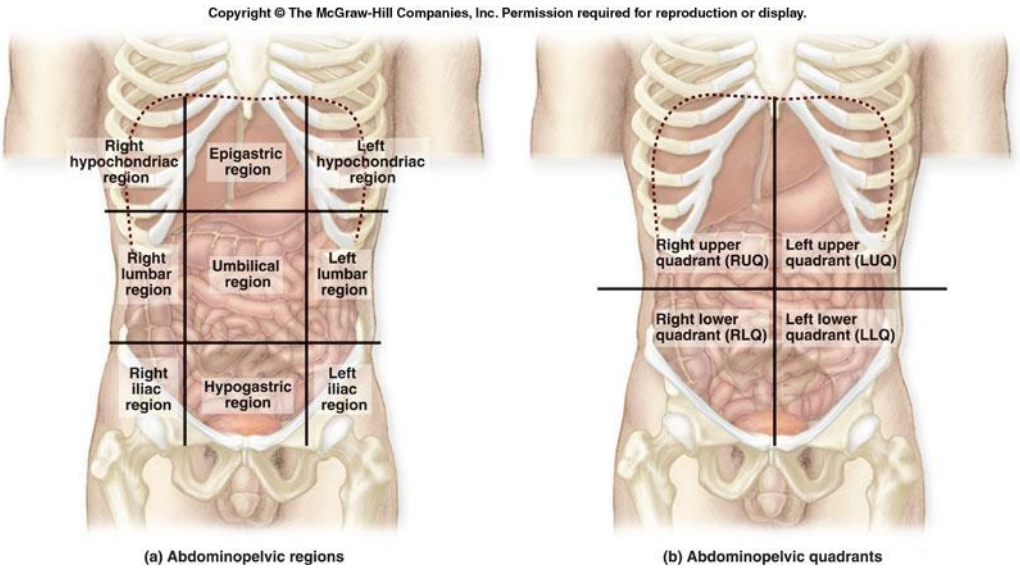
1.5 Overviews of the Study

This study falls into five chapters with chapter one is an introduction which include problem of the study, objectives and overview. Chapter two include literature review while chapter three include material and method used for data collection and analysis. Chapter four presents the result of the study in a line graphs and table and finally chapter five which include the discussion, conclusion, recommendation and references.

Chapter two
Literature review

2-1 Background

Loins are the abdominal area between the ribs and pelvic bone (ilium) on either side of the body. The right flank is essentially the right lumbar region – one of nine abdominal regions. It includes area of the body running around the sides of the abdomen to the back. The lower part of the flank area is where fat tends to accumulate (midsection) and is commonly referred to as “love handles” or “spare tire”. The flanks are also known by several other common terms including the flanks, sides and left and right lumbar regions.(Freeman SJ 2005)



Figure(2-1) abdominal regions and quadrants

2-2 Meaning of right loinpain

Loin pain is in most cases due to a problem in the kidney or ureters, irrespective of whether it occurs on the right or left loin. However, there are various other causes that may also be responsible for loin pain and this can vary from the right side and left side. Right loin pain indicates a problem with one or more of the organs lying in this area. These organs

include:right kidney, right ureter, colon – ascending, hepatic flexure and descending colon and right diaphragm. Organs which are at the border of the right loin or in neighboring regions can also cause loin pain;theseincludes: liver, gallbladder, appendix, right ovary (women), pancreas (head) and urinary bladder..(Freeman SJ 2005)

Figure (2-2) Types of loin pain

2-3 Othersigns and symptoms

The various other symptoms that may be present depend on the cause of the right loin pain. Typically there are urinary disturbances since most causes of right loin pain are associated with the kidney and ureter;these symptoms include:frequent urination, large volume urine (polyuria), small volume (oliguria) or no urine (anuria), burning upon urination and blood in the urine (haematuria). Disease affecting the liver and gallbladder that may cause right flank pain includes:jaundice, weight loss, nausea, fatty stools and diarrhoea. Problems in the colon may present with; diarrhoea or constipation, excessive flatulence, abdominal distension and

mucus or blood in the stool. Often right loin pain arises with no other symptoms at the outset. This may be seen mainly with kidney and liver disorders. However, the other symptom mentioned above develops gradually. Right loin pain with no other symptoms should not be ignored. It needs to be investigated further particularly if the pain is severe or worsening over time despite no other symptoms developing over time..(Freeman SJ 2005)

2-4 Causes of right loinpain

2-4-1 Kidney

Diseases of the right kidney causes upper right loin pain, more towards the back as discussed under kidney.

Pyelonephritis is an infection of the kidney which typically arises as a consequenceof anascendingurinarytractinfection**.** Itismainlybacterialinnature**.** Pyelonephritis is an acute infection that can have serious complications if not treated rapidly.

Kidneystones (renal calculi) are hard sediments that form in the kidney. Smaller stones pass down the ureter and may be expelled with little or no pain. Larger stones may stay lodged in the kidney or ureter and cause severe loin pain known as renal colic.

Hydronephrosis is an accumulation of urine in the kidney leading to kidney swelling. It occurs with any cause of urinary tract obstruction like a kidney stone, enlarged prostate (men), pregnancy (women) or tumor in or around the tract.

Kidney trauma may arise with any injury to the kidney. This can be associated with blunt force or sharp force trauma. It may arise with assault, a fall or car accidents. Bleeding within the kidney may arise (renal haemorrhage).

Polycystic kidney disease is the presence of multiple cysts within the kidney tissue. This may be associated with genetic abnormalities. It can eventually lead to kidney failure.

Renal cell carcinoma is a cancerous growth arising from the kidney cells. It is the most common type of kidney cancer. Sometimes less common types of cancers may arise in the kidney and ureter like transitional cell carcinoma. These are primary cancers meaning it starts in the kidney tissue. Sometimes cancer from elsewhere in the body can spread to the kidney (metastasis).

Renal vascular problems includes renal artery stenosis which is narrowing of the artery that carries blood to the kidney or renal vein thrombosis where a clot forms in the vein carrying blood out of the kidney.(Dhinakar M et al. 2010)

2-3-2 Ureter

Many of the conditions that affect the kidney can extend to the ureter. Ureteral conditions may cause loin pain that runs down the loin towards the central part of the lower abdominal area (suprapubic region) where it joins the bladder.

Ureteral stones which are kidney stones that pass into the ureter and either stay lodged within the ureter or cause significant damage to the inner wall as it passes down the ureter.

Ureteritis is inflammation of the ureter most commonly as a result of an ascending urinary tract infection.

Ureteral cancer is a malignant tumor of the ureter which most often starts in the kidney, like transitional cell carcinoma..(Dhinakar M et al. 2010)

2-3-3 Liver

Liver diseases that are isolated to the outer (lateral) part of the right lobe of the liver may be responsible for right loin pain.

Hepatitis is inflammation of the liver associated with an infection particularly with the hepatitis virus (viral hepatitis) or alcohol abuse (alcoholic hepatitis) which is part of alcoholic liver disease (ALD). There are other causes of hepatitis but these two causes are the most common.

Fattyliverdisease is the accumulation of fat within the liver tissue. It arises with obesity, diabetes mellitus, hypertension and hyperlipidemia (elevated blood lipids).

Pyogenic liver abscess is a collection of pus within the liver tissue. It develops as a complication of infections within the abdomen like appendicitis or if microbes gain entry into the liver tissue following trauma that leads to open wounds. Sometimes it arises after surgery or certain diagnostic investigation.

Gallbladderpain may be due to:cholecystitis, cholangitis, gallstones and gallbladder cancer..(Freeman SJ 2005)

2-3-4 LargeIntestine

Diseases of the large intestine which affects the cecum, ascending colon, hepatic flexure and first portion of the transverse colon may cause right loin pain.

Appendicitis is inflammation of the appendix, the outpouching from the cecum. It arises with an obstruction or infection of the appendix. Appendix pain is located at the right lower quadrant of the abdomen closer to the belly button.

Inflammatoryboweldisease is a chronic inflammatory disorder of the gut that mainly affects the colon and rectum. There are two types – ulcerative colitis and Crohn's disease.

Colonicobstruction is any partial or complete blockage of the colon which may arise with a tumor, twisting of the colon, external compression of the colon and impacted feces.

Ischemic bowel disease is a condition where the blood supply to the bowel wall is interrupted. This leads to damage of the bowel wall and eventually death of the tissue.Other causesinclude; abdominal wall injury, muscle strain, intra-abdominal abscess, peritonitis, adrenal gland tumors, pleuritis, lung infections, pneumonia and referred pain from the back.(Freeman SJ 2005)

2-5 Previous Study

Dhinakar et al (2010) in a case study reported that post-partum ovarian vein thrombosis is an uncommon clinical presentation. 90% of cases present as right loin and right iliac fossa pain, within 10 days of the puerperal period. Two such cases that were referred to the Imaging department as suspected appendicitis/ureteric colic are reported. The findings seen on imaging illustrate the difficulty in the clinical and radiological diagnosis of post-partum ovarian vein thrombosis and highlight the need to include it as a differential diagnosis in cases of post partum acute abdomen. Post-partum ovarian vein thrombosis can be accurately diagnosed by appropriate non-invasive investigations to enable early therapy with anti-coagulants and intravenous antibiotics which are the mainstay of treatment. Surgery can be avoided if diagnosis is made early.

Tripathi et al. (2011) stated that loin pain some time occurs as a result of spontaneous partial rupture of upper renal tract is rare and is usually associated with urolithiasis. Other causes include instrumentations, trauma, pelvic cancer, retroperitoneal fibrosis, fluid overload, and pregnancy. They report two cases (46-year-old and 41-year-old men) of upper renal tract rupture. The first case had rupture of the ureter proximal to stone impaction and the second case had fornicial rupture secondary to stone impaction at the uretero-vesical junction. In contrast to ureteral rupture, fornicial extravasation is more common and the symptoms are always mild. The mechanism of ureteral rupture can be explained as either pressure around the ureteral wall due to stone impaction, or a tear caused by pressure during the passage of the stone. Fornicial rupture occurs when intra-pelvic pressure is greater than 35cm H_2O. It is important to distinguish true rupture of the ureter from fornicial tear with extravasation, because both the outcome and treatment are different.

The Page kidney phenomenon refers to hypertension resulting from any external compression of a kidney by a hematoma, tumor, lymphocele or urinoma. Hypertension develops due to activation of the renin-angiotensin-aldosterone system induced by renal hypoperfusion and microvascular ischemia. As such, Page kidney is a rare cause of high renin hypertension. Subcapsular or perinephric hematoma due to traumatic or iatrogenic hemorrhage accounts for the majority of cases. The interval between injury and the development of hypertension may vary from days to years. Presentation, however, may be acute to the point of a hypertensive emergency. We report a patient who presented with repeated acute episodes of hypertensive urgency/emergency secondary to Page kidney caused by a spontaneously recurring subcapsular renal hematoma. Between episodes, the hematoma was seen to completely resolve. The possible etiology is discussed and a brief overview of Page kidney is given (Kenis et al 2012).

Abdel-Gawad (2014) Said thatdespite the routine use of helical CT in diagnosis of renal colic, there are recent concerns regarding the radiation exposure, overuse and costs. They attempted in their retrospective study to evaluate the accuracy of ultrasound (gray-scale and color Doppler with twinkling), KUB and urinalysis in diagnosis of renal colic due to ureteral calculi presented in Emergency Room. A total of 939 consecutive cases of renal colic presented to ER have been managed and evaluated by ureteral ultrasound, KUB and urinalysis for the presence of ureteral stones. Non-confirmatory cases were subjected to Helical CT examination. Renal and ureteral ultrasound (gray-scale) alone detected ureteral calculi in 615 cases (65.4%) and after utilizing Color Doppler Ultrasound with twinkling the diagnosis was made with confidence in 935 cases (99.6%) but 4 (0.4%). KUB showed radiopaque stones in 503 (53.6%) patients and no stones were detected in 436 (46.4%). Microhematuria presented in 835 (88.9%) cases while absent in 102 (10.9%). There were 190

(20.3%), 77 (8.2%) and 671 (71.5%) patients with upper, middle and lower ureteral stones respectively. The simultaneous positive findings in US and KUB with microhematuria were found only in 453 (48.2%) cases.The use of Color Doppler ultrasound with twinkling increased the detection rate of ureteral stones in acute renal colic patients presented to ER with less radiation exposure. Ultrasound examination as a single modality is superior to KUB and urinalysis in initial diagnosis of renal colic.

Spontaneous rupture of a normal renal collecting system during pregnancy is uncommon and all reported cases have occurred in right kidneys. We report a case of spontaneous rupture of the left renal collecting system during pregnancy. A 33-year-old pregnant woman presented with left loin and lower abdominal pain, and signs of preterm labour, at 32 weeks' gestation. An emergency caesarean section was performed for fetal distress but the left loin pain did not subside after delivery. Ultrasonography and a computed tomogram showed a left perinephric collection and urine extravasation, compatible with rupture of the renal collecting system. A percutaneous nephrostomy was inserted and the symptoms subsided. A summary of the literature discussing management of this clinical situation is provided (KL Lo et al 2007)**.**

Michael et al. (2012) mentioned that focused bedside ultrasound is a screening tool frequently used by emergency physicians to evaluate hepatobiliary and renal pathology in patients presenting with abdominal complaints in the emergency department (ED).Objective: This case report describes a sonographic finding that was interpreted as free fluid in the right upper quadrant. Computed tomography (CT) was used to confirm the diagnosis. Case Report: A 44-year-old man presented to the ED with the sudden onset of right-sided abdominal pain and exhibited right costovertebral angle tenderness on physical examination. Focused bedside ultrasound of the right upper quadrant revealed severe hydronephrosis of the right kidney and

free fluid of either subcapsular, perinephric, or peritoneal location represented by an anechoic stripe in Morison's pouch. On CT evaluation, this patient was found to have perinephric fluid accumulation from a presumed ruptured renal calyx in the setting of chronic ureteropelvic junction obstruction with severe hydronephrosis. Conclusion: The exact location of anechoic fluid in the abdomen is not always apparent on bedside ultrasound. To minimize misinterpreting focused bedside ultrasound examination findings, we recommend a number of Sonographic techniques to identify possible mimics of free fluid. Suspected free fluid findings on bedside ultrasound should always be evaluated within the clinical context of the patient's presentation.

Christopher and Leslie (2012) describeda case of a patient presenting with acute flank pain and a classic clinical picture of a first episode of renal colic. The epidemiologic characteristics, pathophysiologic characteristics, risk factors, and initial assessment of patients with renal colic are briefly discussed. Imaging options are discussed, with emphasis on sonography and computed tomography (CT). Although CT is typically a first-line test in the United States and is very accurate, there is increasing awareness of the radiation risk associated with CT scanning. Sonography may directly visualize kidney stones and/or evidence of ureteral obstruction and may obviate the need for CT scanning. Sonography is typically the first-line test in Europe, even in a first episode of kidney stones. They submit that sonography as an initial imaging modality in suspected kidney stones should be considered more often, particularly in younger and female patients with classic symptoms on first presentation and in patients with symptoms consistent with their prior episodes of renal colic, reserving CT for patients in whom symptoms do not resolve or there is a suspicion of alternative diagnoses. Decisions about imaging may offer an opportunity for shared decision making about what initial imaging modality to use.

Chapter three
Material and method

3-1 Material

The data of this study collected by using General electric logia 5 ultrasound machine equipped with TA convex probe 3.5MHz and thermal paper printer was used to have hard copy images.

3-2 Design of the study

This is a descriptive cross-sectional study intended to characterize and describe the causes of the Rt Loin pain by having abdominal scanning

3-3 Study population:

The population of this study consisted of adult patients(18-60 years old) from both gender suffer or complaining from an acute Loin pain in the right side vested the ultrasound department for investigation

3-4 Sample size and type

The data of this study collected from 50 patients suffering from Rt loin pain selected conveniently from those visited the ultrasound clinic during the study period.

3-5 Area and duration of study:

This study carried out in the period from Jan 2014 to May 2015 in the Military Head Quarter hospital in Omdurman district.

3-6 Datacollection:

The data of this study were collected using abdominal scanning for the patient specially the Rt side as follows:

Liver Scanning Technique

The patient is placed in the supine, left posterior oblique (LPD) or left lateral decubitus (LLD) position. Scans are usually done in longitudinal and transverse or transverse-oblique planes. The transducer is placed in a subcostal location and scanning is usually performed with the patient in deep suspended inspiration in order to lower the liver. The best images of the diaphragmatic portion of the liver are usually obtained with steep cephalad angulation of the transducer. Intercostal scanning may be necessary if the patient is too full of gas or if the liver is small and too high for adequate subcostal scanning. Moving the patient from the supine into the LPO or LLD positions may cause the liver to fall to a lower position and it often rearranges the gas thereby enhancing the scanning procedure. Intercostal scanning provides scans in the coronal plane. A real time transducer with a small foot print and a wide field of view is generally the preferred equipment. This enables easy subcostal and intercostal scanning. As the liver is a large organ, the optimal transducer should provide focusing from near to far field.

Kidneys Scanning Technique

The examination begins with the patient in the supine position. Scans are performed in the sagittal and transverse planes from the anterior approach using the liver and spleen as acoustic windows. Various maneuvers may enhance demonstration of the kidneys: left lateral decubitus or lateral oblique positions for the right kidney and right lateral decubitus or lateral oblique positions for the left kidney. Coronal longitudinal and transverse scans may also be obtained and are recommended for evaluating the renal pelvis and proximal ureter on hydronephrotic patients.

3-7 Studyvariables:

Age, gender,hight,weight, signs, symptoms, measurements, U/S findings.

3-8 Dataanalysis:

It will carried out by statically package for social sciences SPSS.

3-9 Ethical approval

Permission from the hospital Military hospital and the ultrasound was granted where no patient identifications data will be disclosed and the data will be used for study purpose only as well as consent from the patient were taken .

Chapter four
Results

Table 4-1 frequency distribution table of gender

Gender	Frequency
Male	29
Female	21
Total	50

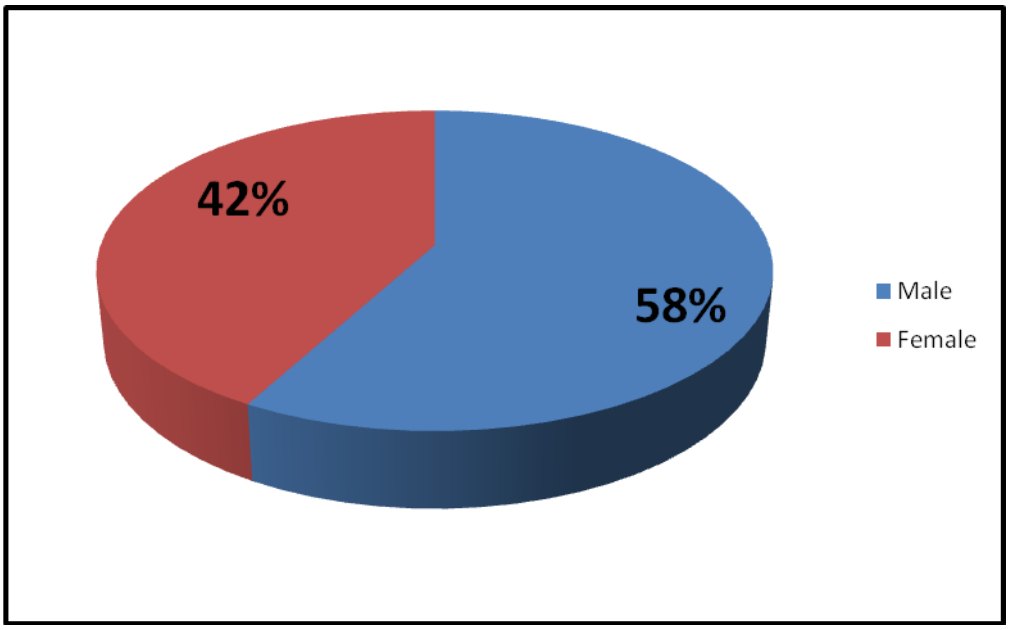


Figure 4-1 a pie graph of gender percentage distribution

Table 4-2 frequency distribution table of signs and symptoms for Rt loin patient

Sign Symptoms	**Frequency**
Rt loin pain	29
with jaundice	3
with nausea & vomiting	6
with burning micturition	4
with heamaturea	3
pain radiating to shoulder	2
pain radiating to leg	3
Total	50

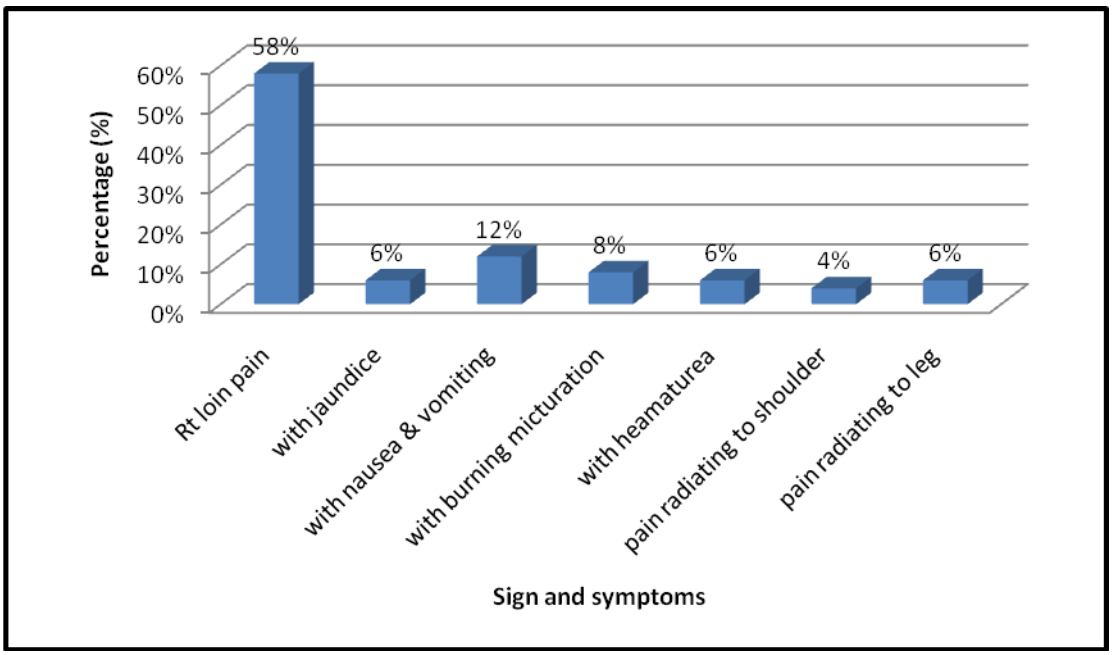


Figure 4-2a bar graphs of percentage distribution for signs and symptoms for Rt loin patient

Table 4-3 frequency distribution table of gall bladder appearance in ultrasound scan

GB appearance	**Frequency**
Normal	43
thick-walled	3
Stone	4
Total	50

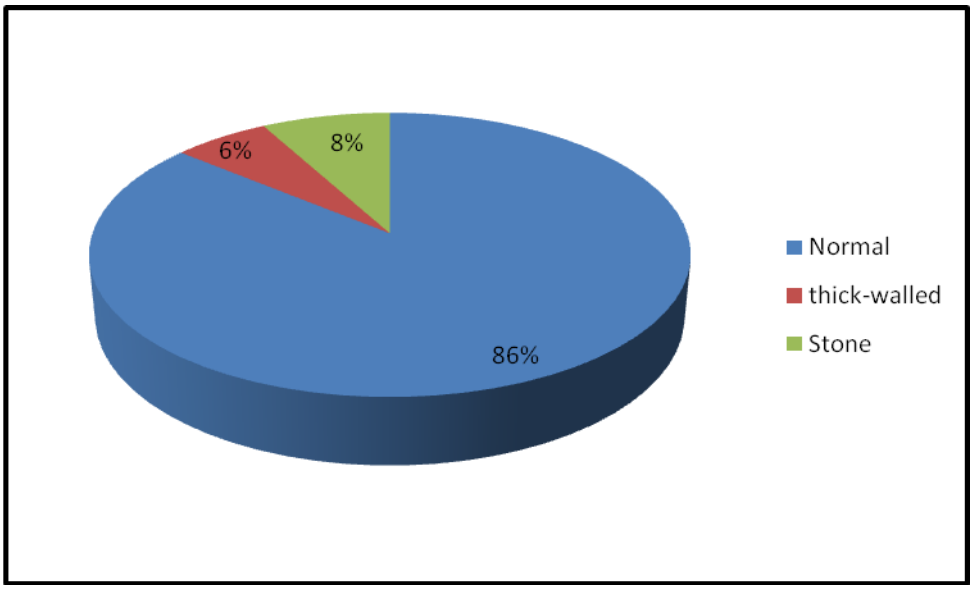


Figure 4-3 a pie graph of percentages distribution for gall bladder appearance in ultrasound scan

Table 4-4 frequency distribution table of kidney appearance in ultrasound scan

Kidney appearance	Frequency
Normal	31
Hydronephrosis	5
Hyperechoic	6
Stone	4
Cyst	3
Mass	1
Total	50

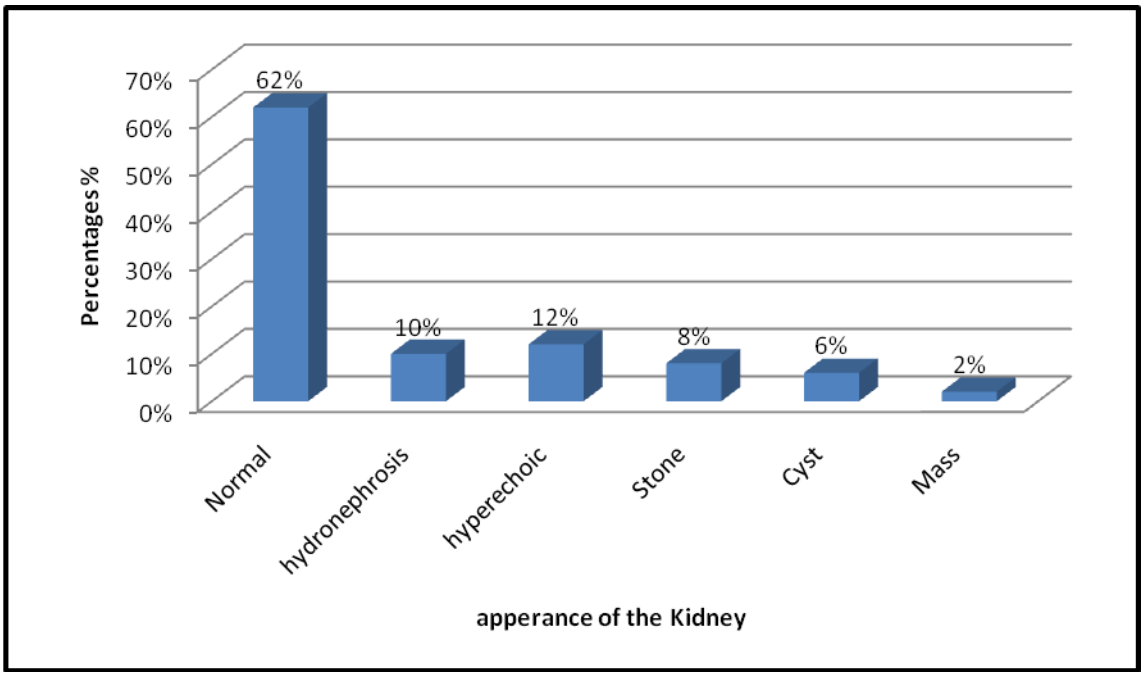


Figure 4-4a bar graph of percentages distribution for kidney appearance in ultrasound scan

Table 4-5 frequency distribution table of appendix appearance in ultrasound scan

Appendix	**Frequency**
Normal	49
Appendicitis	1
Total	50

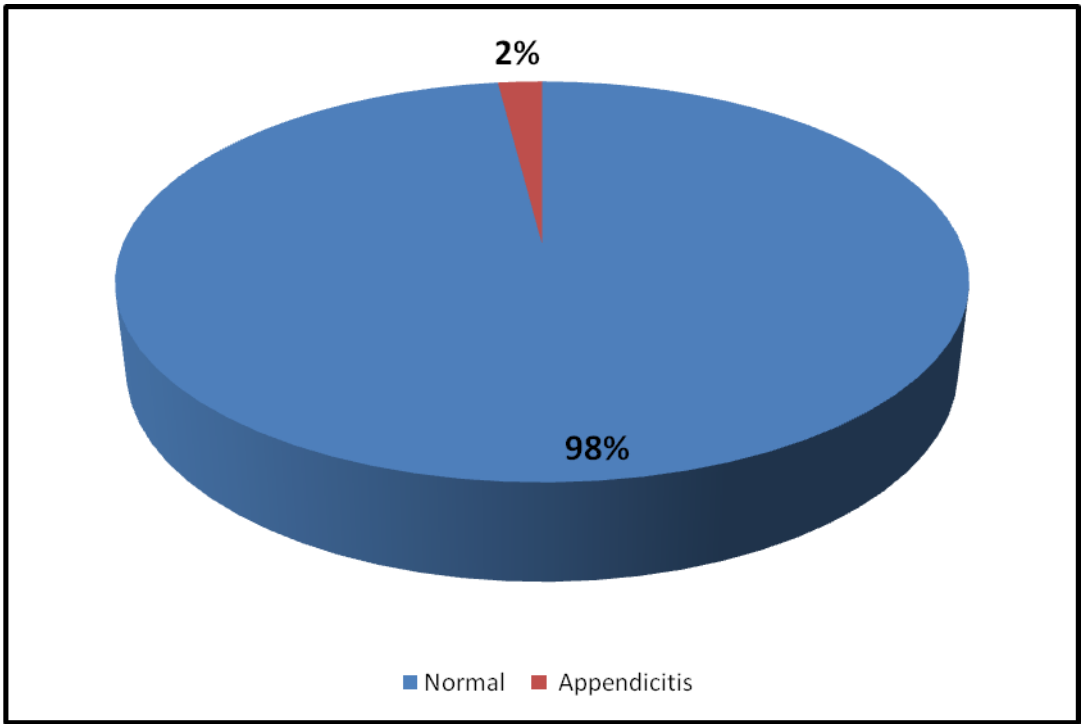


Figure 4-5 pie graph of percentages distribution for appendix appearance in ultrasound scan

Table 4-6 frequency distribution table of laboratory test results for Rt loin pain patients

Laboratory Test	Frequency
Normal	37
HBV+	2
high Cr. &B.urea	4
high pus cells	3
high RBCs	3
high Ca –oxalate	1
Total	50

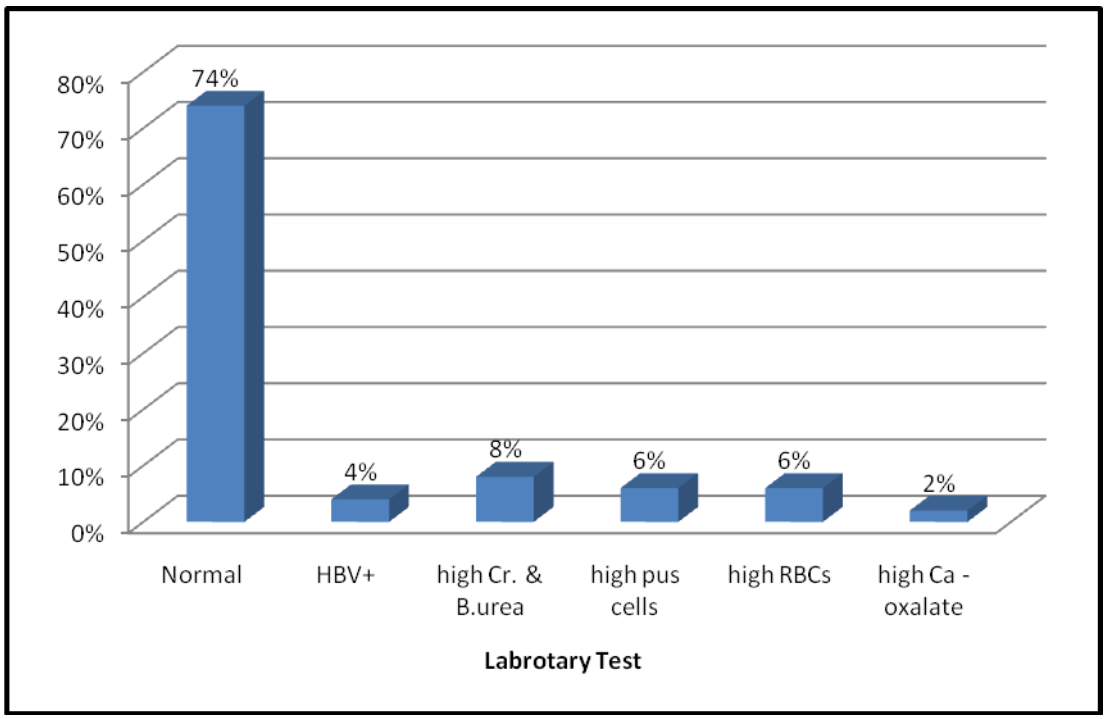


Figure 4-6 a bar graph of laboratory test results percentage distribution for Rt loin pain patients

Table 4-7 cross-tabulation table of signs & symptoms versus gall bladder appearance in ultrasound

SignSymptoms * GBappearance Crosstabulation

SignSymptoms	GBappearance			Total
	Normal	Thickwalled	Stone	
Rt loin pain	28	0	1	29
with jaundice	3	0	0	3
with nausea & vomiting	2	1	3	6
with burning micturation	4	0	0	4
with heamaturea	3	0	0	3
pain radiating to shoulder	0	2	0	2
pain radiating to leg	3	0	0	3
Total	43	3	4	50

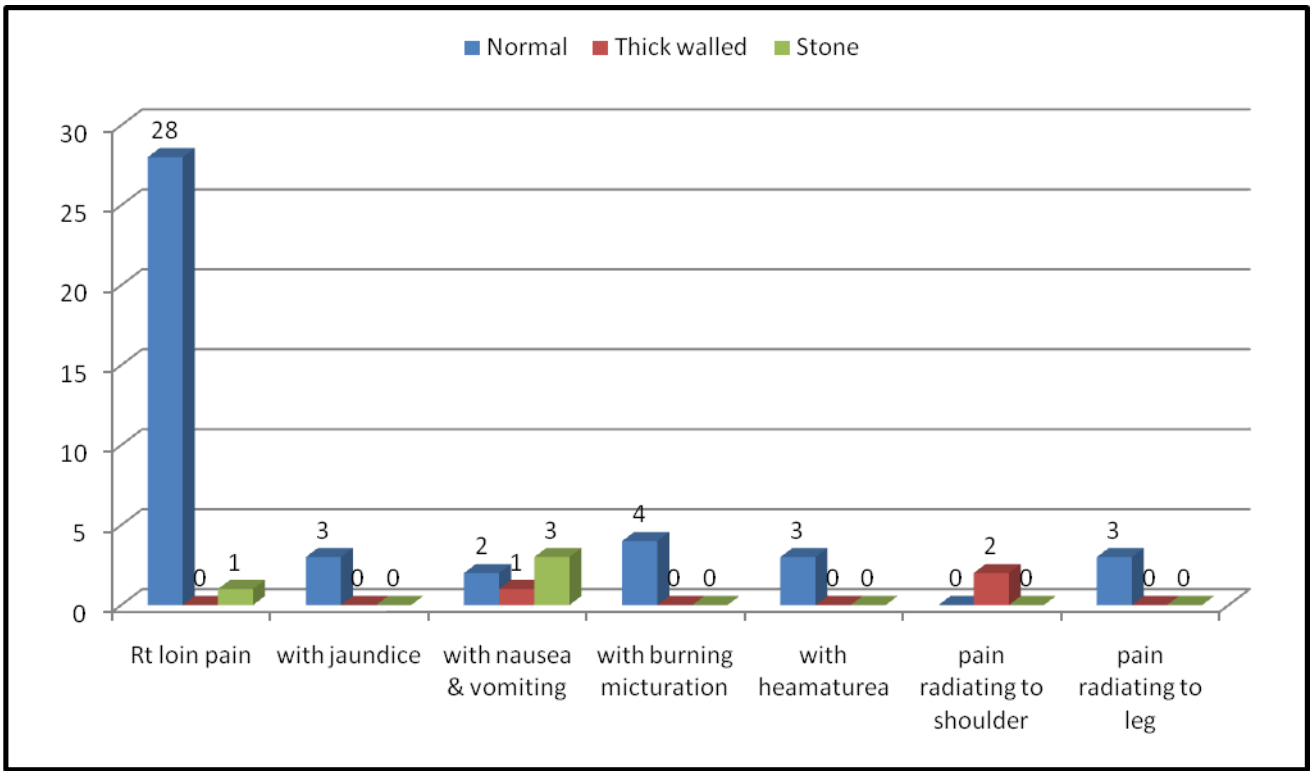


Figure 4-7 bar graph for the frequency of signs & symptoms for gall bladder appearance in ultrasound

Table 4-8 cross-tabulation table of signs & symptoms versus kidney appearance in ultrasound

Sign Symptoms * Kidneyappearance Crosstabulation

Sign Symptoms	Kidneyappearance						Total
	Normal	hydronephrosis	hyperechoic	Stone	Cyst	Mass	
Rt loin pain	18	3	2	3	3	0	29
with jaundice	3	0	0	0	0	0	3
with nausea & vomiting	3	1	2	0	0	0	6
with burning micturation	1	1	1	0	0	1	4
with heamaturea	2	0	1	0	0	0	3
pain radiating to shoulder	2	0	0	0	0	0	2
pain radiating to leg	2	0	0	1	0	0	3
Total	31	5	6	4	3	1	50

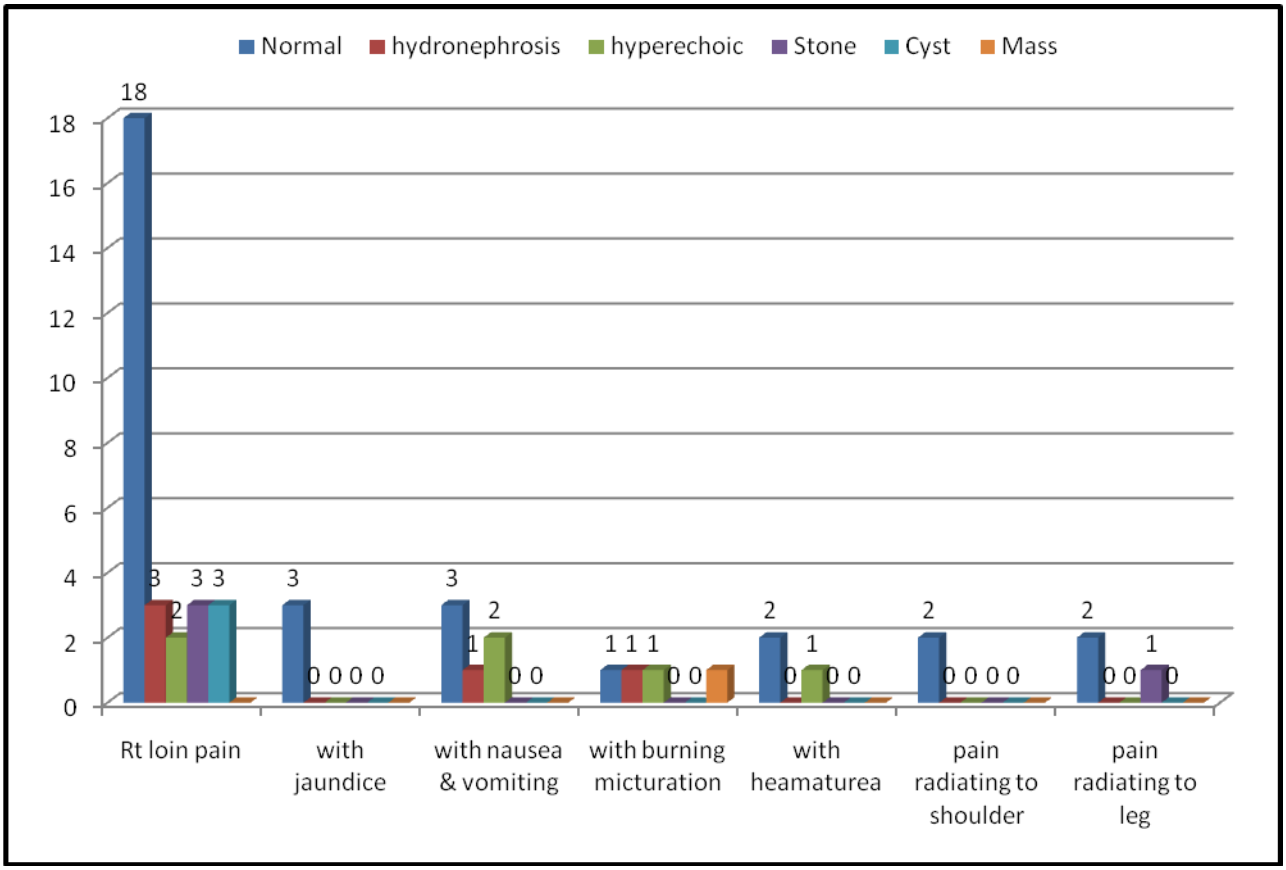


Figure 4-8 bar graph for the frequency of signs & symptoms for kidney appearance in ultrasound

Table 4-9 cross-tabulation table of signs & symptoms versus appendix appearance in ultrasound

Sign Symptoms * Appendix Crosstabulation

Sign Symptoms	Appendix		Total
	Normal	Appendicitis	
Rt loin pain	28	1	29
with jaundice	3	0	3
with nausea & vomiting	6	0	6
with burning micturition	4	0	4
with heamaturea	3	0	3
pain radiating to shoulder	2	0	2
pain radiating to leg	3	0	3
Total	49	1	50

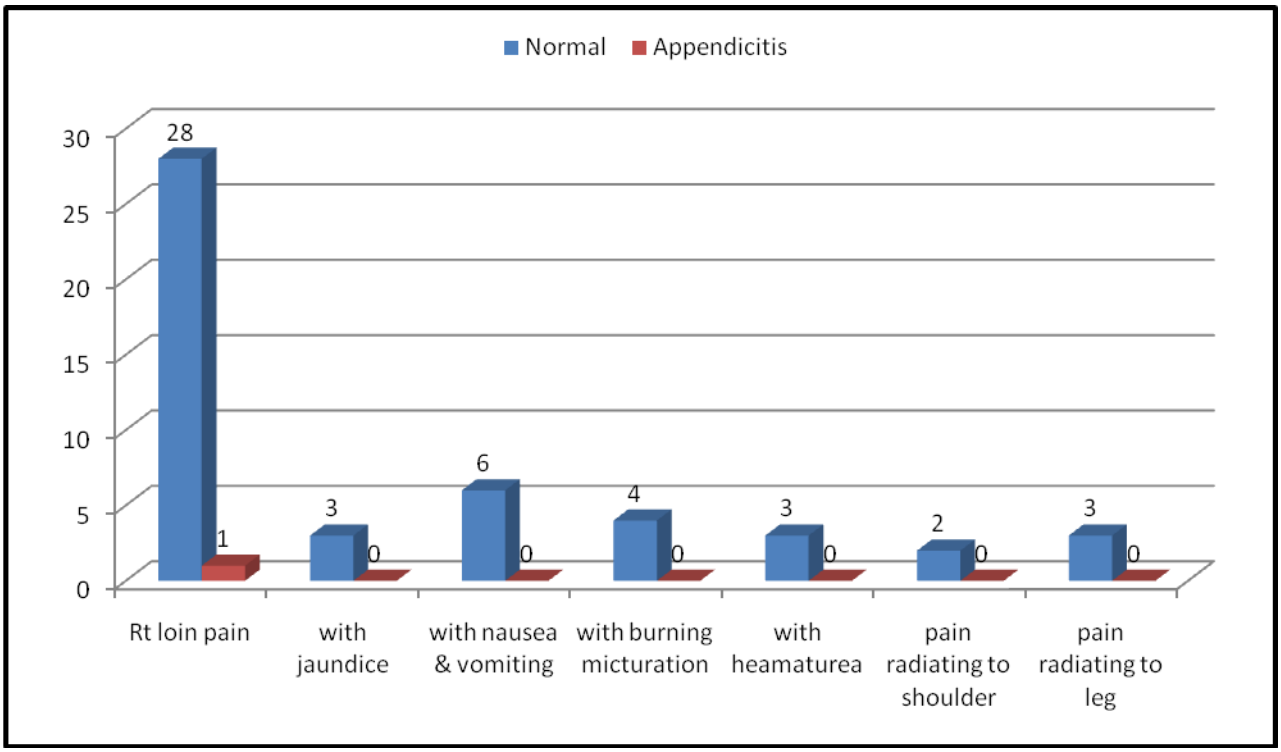


Figure 4-9 bar graph for the frequency of signs & symptoms for appendix appearance in ultrasound

Table 4-10 cross-tabulation table of signs & symptoms versus levorotary test results

Sign Symptoms * LaboratoryTest Crosstabulation							
	LaboratoryTest						
Sign Symptoms	Normal	HBV+	high Cr. &B.urea	high pus cells	high RBCs	high Ca - oxalate	Total
Rt loin pain	22	0	1	3	3	0	29
with jaundice	2	1	0	0	0	0	3
with nausea & vomiting	4	1	1	0	0	0	6
with burning micturation	3	0	1	0	0	0	4
with heamaturea	1	0	1	0	0	1	3
pain radiating to shoulder	2	0	0	0	0	0	2
pain radiating to leg	3	0	0	0	0	0	3
Total	37	2	4	3	3	1	50

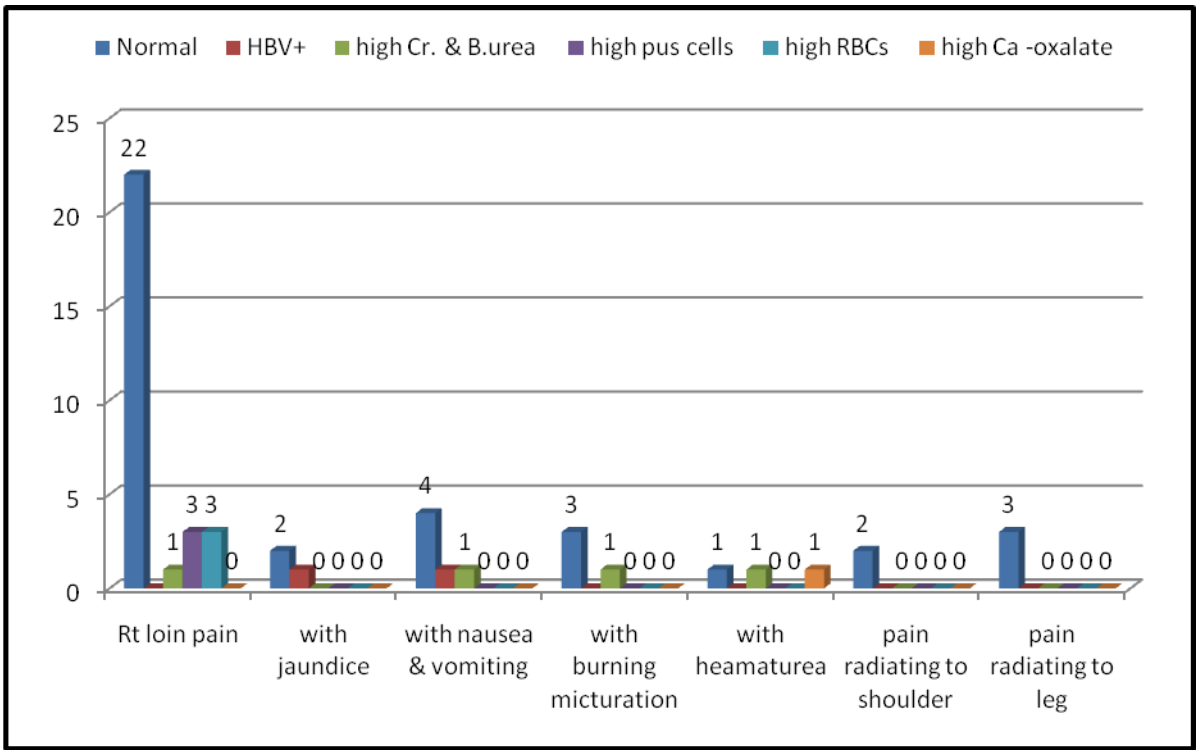


Figure 4-10 bar graph for the frequency of signs & symptoms for laboratory test results

Table 4-11table of mean size of liver, kidney length and gall bladder thickness for the signs and symptoms group

Sign and symptoms	Mean Liver size	Mean GB thickness	Mean Kidney length
Rt loin pain	12.9	2.1	10.7
with jaundice	12.7	2.0	10.7
with nausea & vomiting	12.3	4.3	10.3
with burning micturation	12.3	1.8	11.3
with heamaturea	12.7	2.0	10.7
pain radiating to shoulder	11.5	5.0	10.0
pain radiating to leg	12.3	2.0	10.3

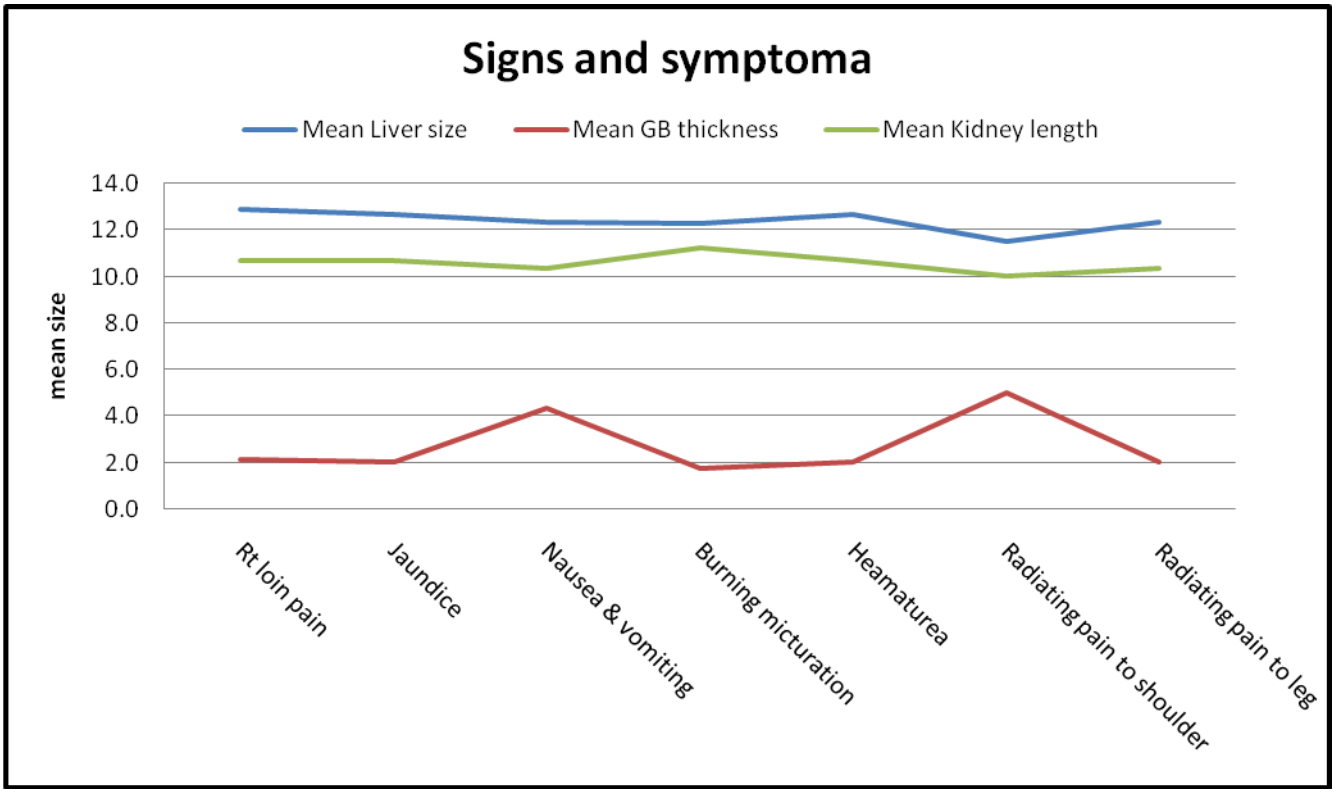


Figure 4-11 line graph for the mean of liver size, gall bladder thickness and kidney length versus signs & symptoms

Table 4-12 analysis of variance table test the significant difference of the liver size, gall bladder thickness and kidney length for the signs and symptoms groups

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Liver_size	Between Groups	5.488	6	.915	.578	.746
	Within Groups	68.032	43	1.582		
	Total	73.520	49			
GB_wall_thicness	Between Groups	40.888	6	6.815	8.739	.000
	Within Groups	33.532	43	.780		
	Total	74.420	49			
Kidney_lenth	Between Groups	3.230	6	.538	.268	.949
	Within Groups	86.290	43	2.007		
	Total	89.520	49			

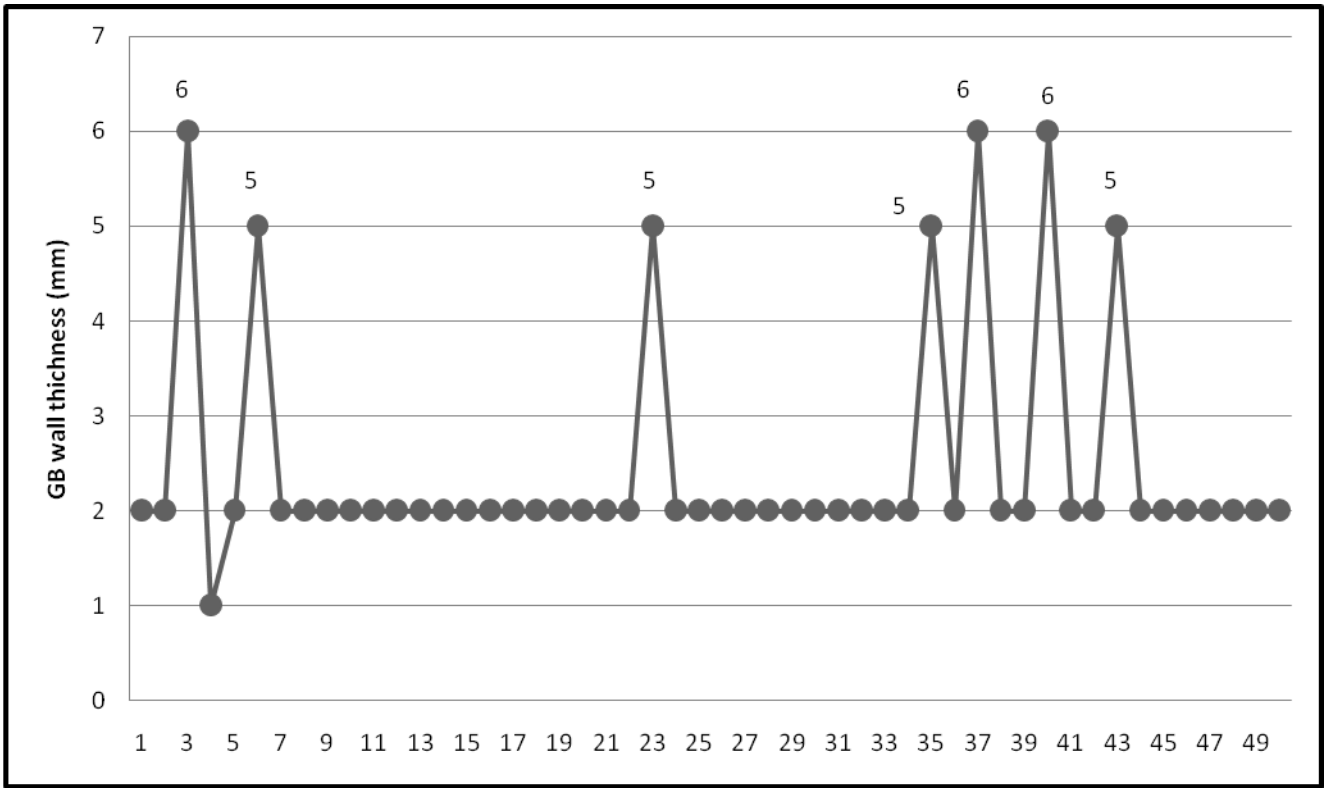


Figure 4-12 line graph of gall bladder wall thickness, normal size <=3mm

Chapter Five
Discussion, Conclusion and Recommendations

5-1 Discussion

This study has been conducted in Military hospital on 50 patients presented with Rt loin pain; 29 of them were males(58%) and 21 are female (42%).The frequency of male to female in this study denote that men weregenerally slightly more affected with Rt loin pain than female;this result was in aagreement with Naveen et al 2014.(Table and figure 4-1).This study found that 29 patients (58%) come with Rt loin pain only, 6 patients (12%)had nausea and vomiting, 8% come with burning micturition, 6% come with jaundice, 6% come with heamaturea, 4% come with pain radiating to the shoulder,and 6% come with pain radiating to the leg(Table and Figure 4-2). Which means more than 50% of the patient refer to ultrasound examination for Rt loin pain only the rest of the patient with this pain but associated with a variable symptoms mostly nausea and vomiting.Concerning gall bladder appearance 43 patients (86%) showed normal gall bladder appearance, the rest of the patient patients (14%)showed thick-walled gall bladder, 4 of them had gall bladder stone these result was agreed with Prasad (2006) as shown in Figure and Table (4-3).The renal system especially the kidneys showed normal appearance in 31 patients (62%), while 38% of the patient showed variables diseases most of them had hydronephrosis or had hyperechoic kidney, and only one patient had kidney mass(Figure and

Table (4-4). Although all the patient came to ultrasound examination had Rt loin pain either alone or associated with other symptoms like nausea, vomiting and radiating pain; which mostly make them perfect candidate for appendicitis only one patient was diagnosed as having appendicitis (Table and Figure 4-5). Moreover the entire patient with normal appendix they are suffering from nausea & vomiting, burning micturation, pain radiating to shoulder and pain radiating to leg; all of these symptoms associated with Rt loin pain (Table and Figure 4-9).Laboratory test reveals that 74% of the patient had normal results the rest of the patient which is is 26% showed abnormal result regarding high Cr. And blood urea mostly and sometime high bus cells or RBCs as shown in (Table and Figure 4-6). This is mostly explaining the reason for refereeing them ultrasound examination to rollout the cause of Rt loin pain. The results of cross-tabulation showed a diversity of adjoining results; concerning gall bladder appearance and sign & symptoms 3 patients out of 4 with gall bladder stone had nausea and vomiting and 2 of them had pain radiating to shoulder while those with normal gall bladder had variables irrelevant signs and symptoms (Table and Figure 4-7).The ultrasound appearances of kidneys in respect to sign and symptoms showed that hydronephrosis and hyperechoic had similar relation to that of gall bladder with sign & symptoms where the patient suffers manly from nausea and vomiting in addition to burning micturation which associated with Rt loin pain (Table and Figure 4-8). The 37 normal patients with Rt loin pain in

respect to laboratory test only 15 showed a different types of sign and symptoms as shown in Table and Figure (4-10). Similarly the cross-relationship between the signs and symptoms with the mean size of the liver, kidney length showed minor differences between the different groups (Table and Figure 4-11). While gall bladder thickness showed a considerable differences when comparing the thickness of each group of signs and symptoms. Using ANOV test it showed that there is a significant differences concerning the thickness of the gall bladder while the size of the liver and the length of the kidneys had inconclusive result. This result indicate that gall bladder appearance and thickness associated significantly with the Rt loin pain rather than the renal system as shown in the scholar literature; where it is usually associated with renal stone or other renal pathology

5-2 Conclusion

The main objective of this study was to study the Rt loin pain using ultrasonography in order to find the most frequently cause the pain. Generally a number of patients have been sent to ultrasound clinic to rollout the cause of the Rt loin pain. In previous study mostly the Rt loin pain found to be associated with a verity of pathological condition; such as kidney stones, gall bladder problem and sometimes Rt ovarian problem or appendicitis. This descriptive cross-sectional study was carried out in 50 patients referred to Military Head Quarter Hospital in Omdurman district in the period from Jan 2014 to May 2015. The data was collected using General electric logia 5 ultrasound machine equipped with TA convex probe 3.5MHz.The results of this study showed that 58% of the patients were males and 58% had only Rt loin pain and the rest of the patients suffer from other signs and symptoms, which is goes from nausea & vomiting to radiating pain either to shoulder or lower limp. Gall bladder thickness showed normal appearance in 86% of the cases the rest (14%) showed thickness of the wall 8% associated with gall bladder stones. One patient had reported with appendicitis, while the liver size and kidneys length does not show any significant change as gall bladder wall thickness does. In conclusion laboratory test does not gives conclusive results as well the signs and symptoms could barely related to the Rt loin pain except for gall bladder wall thickness; which gives a significant results in respect to the associated symptoms. The Rt

loin pain it may arise from a lot of reasons like bowel problem, muscle ache or gases.

5-3 Recommendations

- Application of Doppler in the investigation my reveal increase of blood flow to organs in the Rt side which indicate inflammatory process or pathological condition.
- Preparation of patient to avoid gases can reveals problems in appendix or Rt ovary more clearly.
- More dedicated laboratory tests associated with the signs and symptoms could limit the area of scan to get more precise results.
- Further study can be done with more data to relate the Rt loin pain to gender an hence find the association of the pain in respect to gender.

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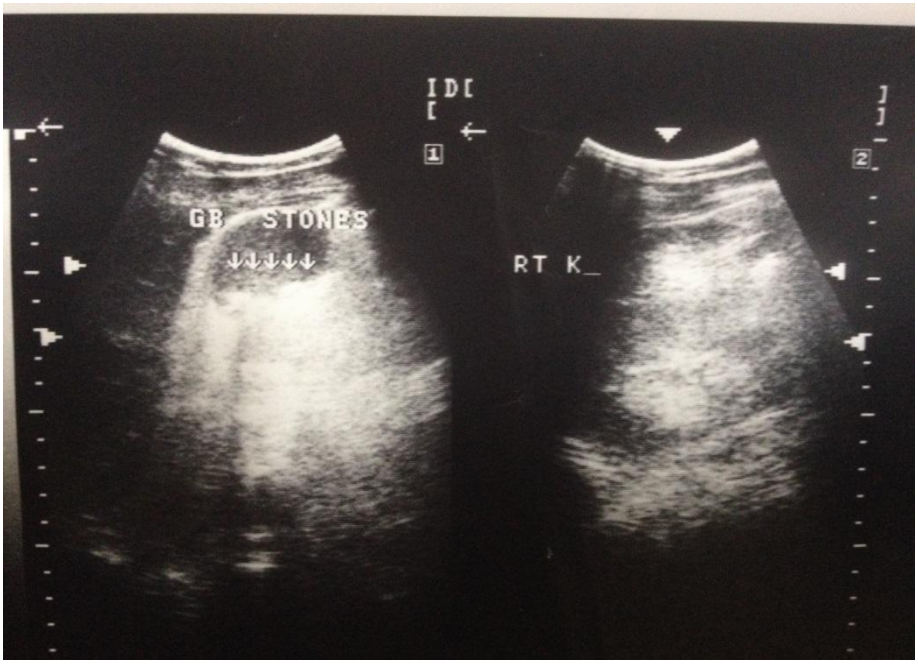
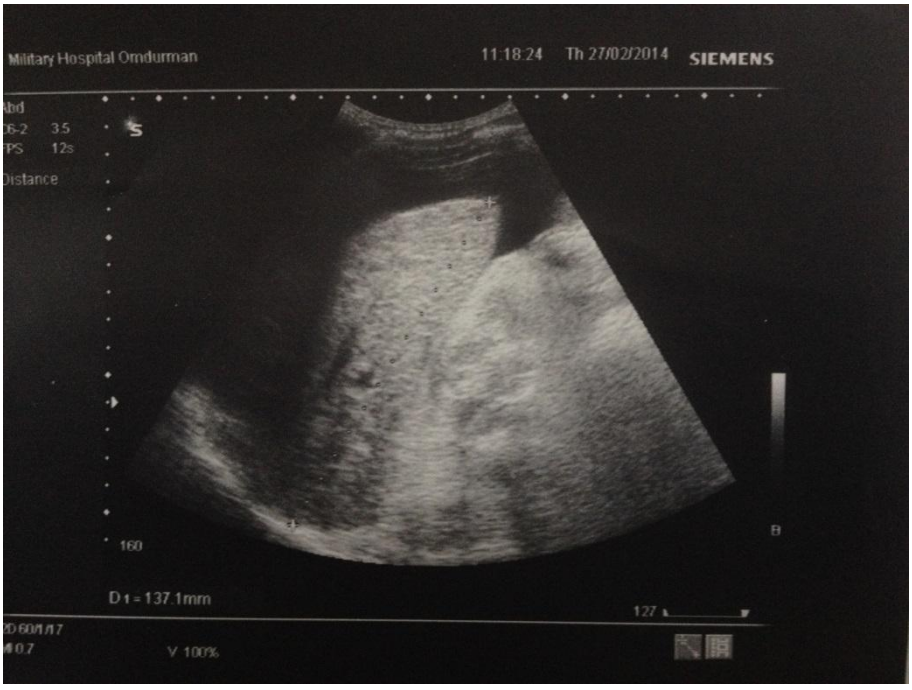
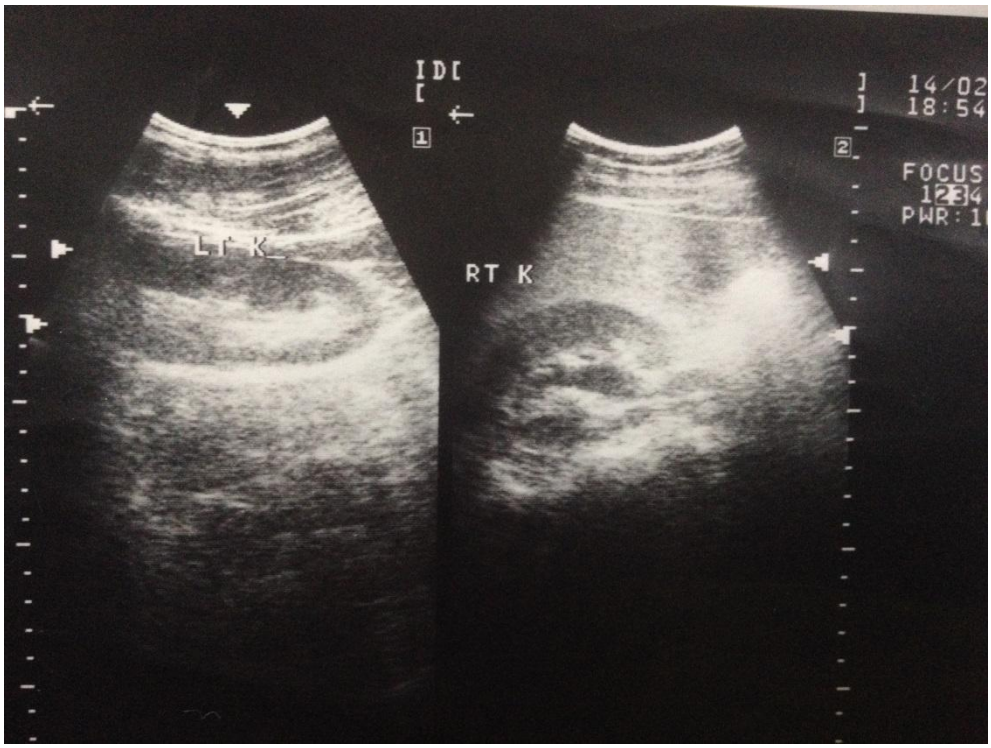
Appendices:



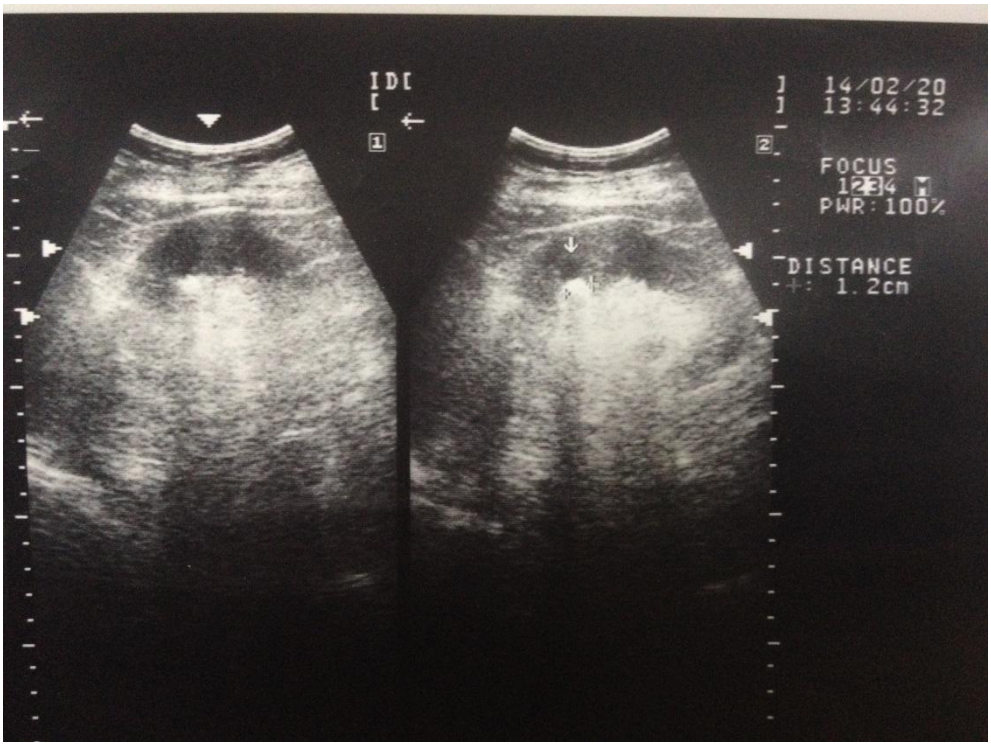
Sonogram (1) of 40 years male shows multiple small stones



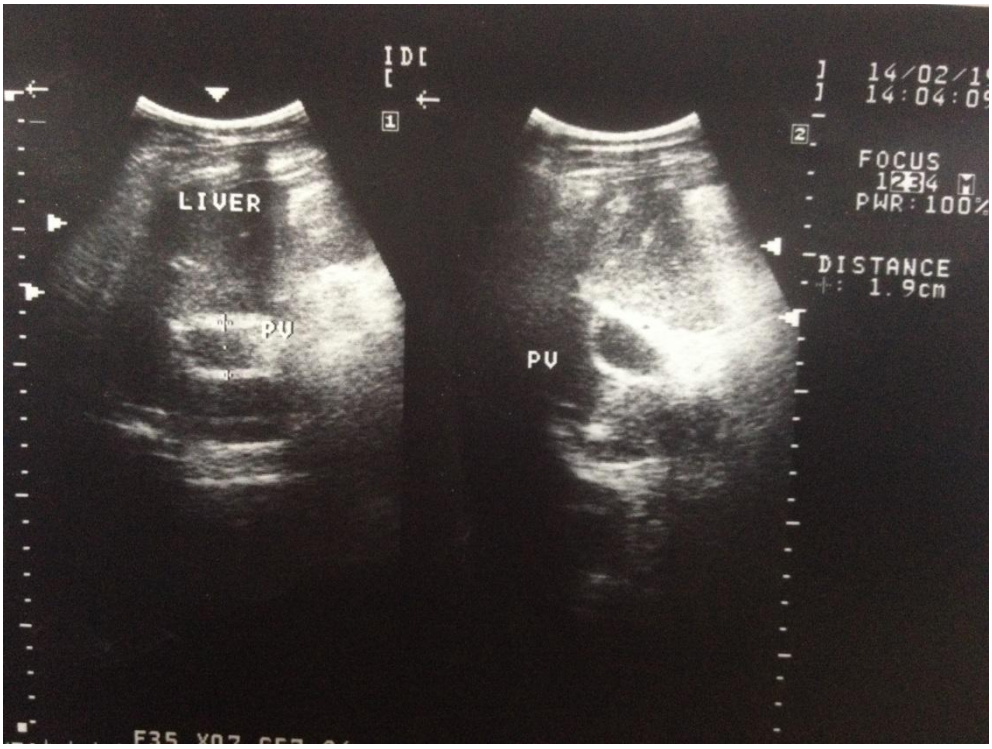
Sonogram(2) of 59 years male showsshrunken,cirrhotic liver with ascites



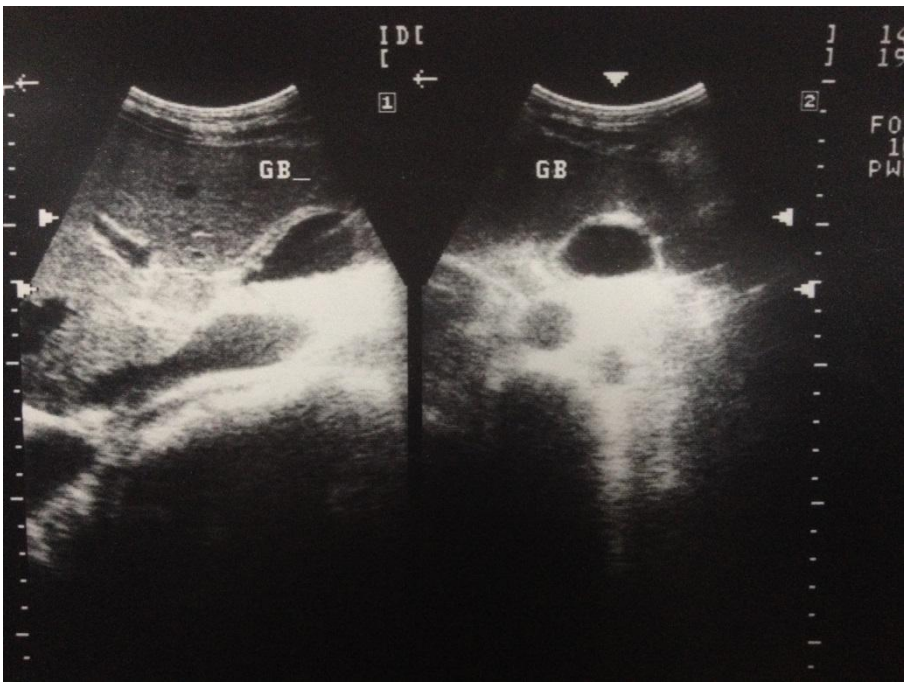
Sonogram (3) of 22 years female shows hydronephrosis in Rt kidney



Sonogram(4) of 47 years male shows Rt renal stone



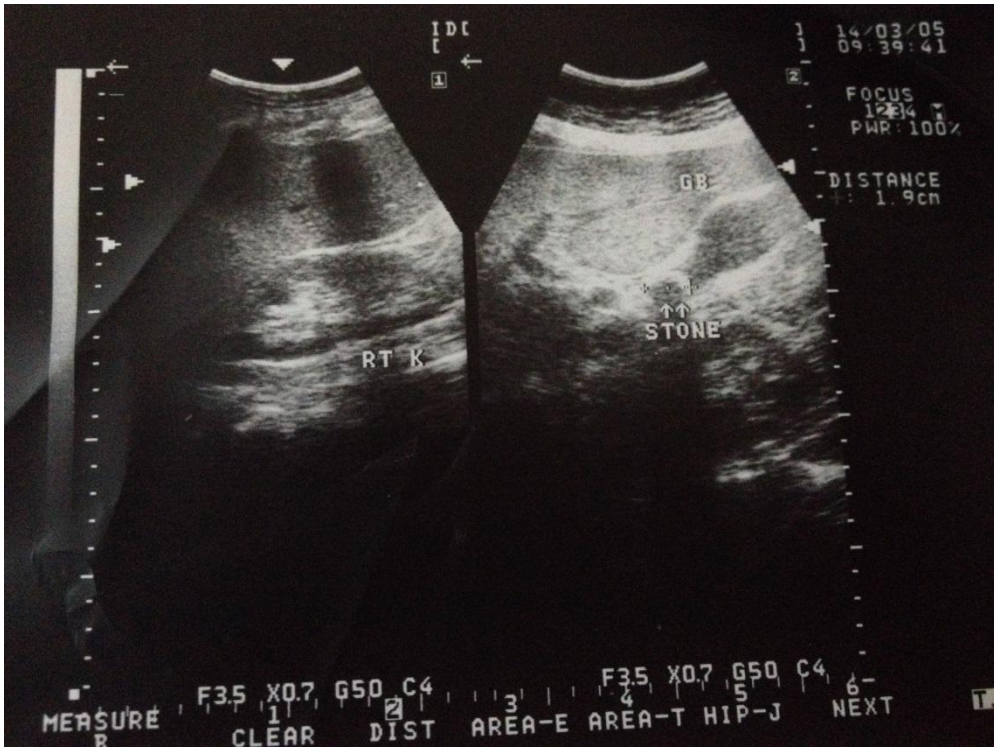
Sonogram (5) of 40 years male shows dilated portal vein and preportal fibrosis due to bilharsiasis



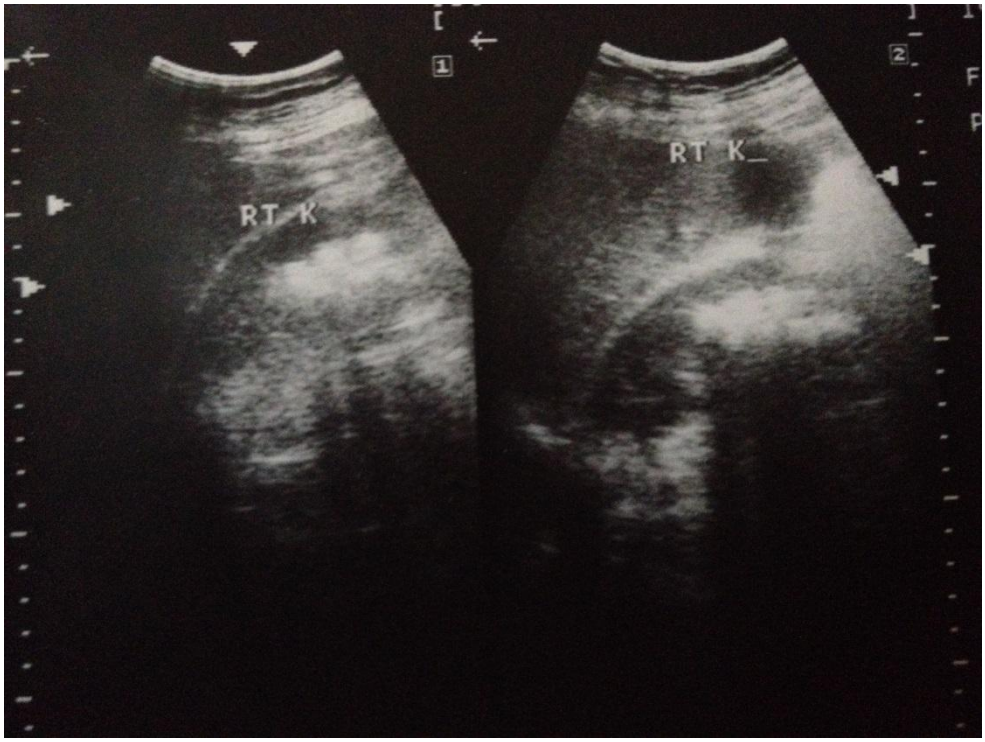
Sonogram (6) of 34 years male shows thickwalledgall bladder (cholecystitis)

Sonogram(7) of 54 years male shows hydronephrosis in the Rt kidney due to renal pelvis stone.

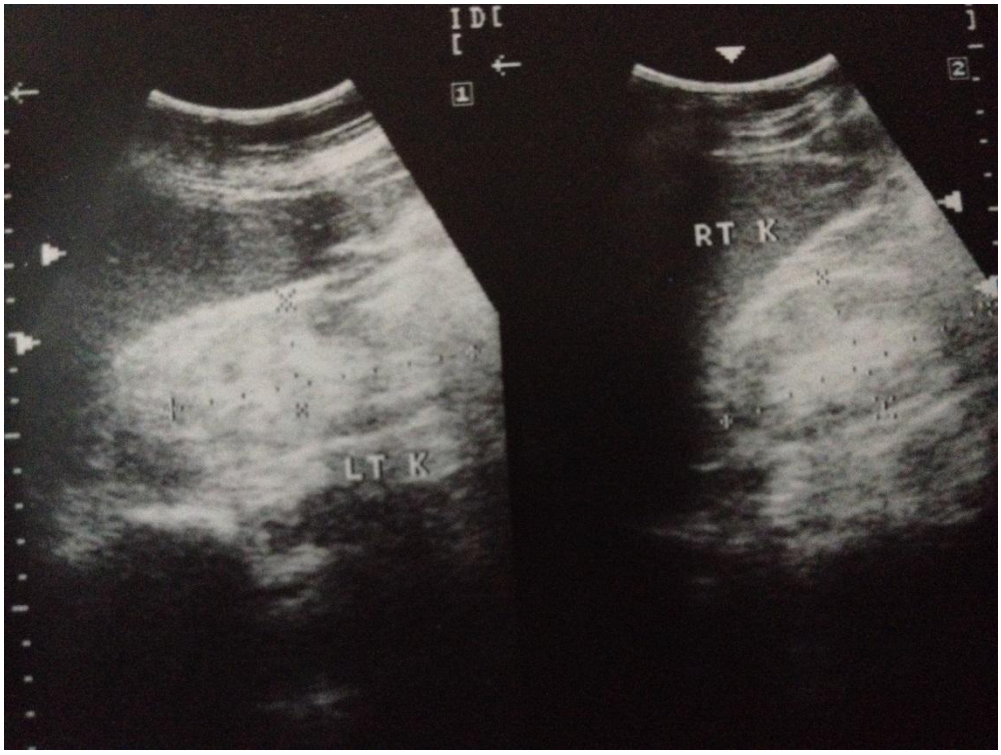
Sonogram (8) of 50 years male shows Rt lower pole renal mass



Sonogram(9) of 70 years male shows impacted gallstone



Sonogram (10) of 47 years male shows multiple Rt renal stones casting large denceshadow .



Sonogram (11) of 63 years female shows small, hyperechoic kidneys with poor corticomedullory differentiation (chronic renal failure)

Data Sheet

1-age	2-gender	3-hight	4-weight	5-signs and symptoms

6-Ultrasound Findings						7-Labrotary Test
Liver	GB	Kidney	ovary	uterus	Appendix	