"ULTRASOUND AND COMPUTERISED TOMOGRAPHY GUIDED THERAPEUTIC DRAINAGE OF INTRA ABDOMINAL ABSCESS, A CROSS SECTIONAL OBESERVATIONAL STUDY FOR A PERIOD OF ONE YEAR AT KAHER, DR.PRABAKAR KORE HOSPITAL AND RESEARCH CENTER, BELAGAVI-590010"

BY
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Dissertation

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Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"ULTRASOUND AND COMPUTERIZED TOMOGRAPHY GUIDED THERAPEUTIC DRAINAGE OF INTRA ABDOMINAL ABSCESS, A CROSS SECTIONAL OBSERVATION STUDY FOR A PERIOD OF ONE YEAR AT KAHER, DR. PRABHAKAR KORE HOSPITAL AND RESEARCH CENTRE, BELAGAVI-590010"**, is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

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ABBREVIATIONS

ALD	-	Alcoholic Liver Disease
CBD	-	Common Bile Duct
CT	-	Computed Tomography
GIT	-	Gastro Intestinal Tract
HTN	-	Hypertension
IV	-	Intra Venous
IL-1	-	Inter leukin-1
PCD	-	Percutaneous Drainage
PID	-	Pelvic Inflammatory Disease
T2DM	-	Type 2 Diabetes Mellitus
TNF	-	Tumour Necrosis factor
USG	-	Ultra Sonography
UTI	-	Urinary Tract Infection

ABSTRACT

Aim: To assess the efficacy of percutaneous drainage of intra-abdominal abscesses treatment using ultrasound and CT guided tube drainage

Methods and Material: The present study was conducted in KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum attached to Jawaharlal Nehru Medical College, Belgaum. It is a cross sectional study done during period of January 2021 - December 2021.

Results: It was found from the current study that, there were 83.3% males and 16.7% females. 37 out of 60 patients had co-morbidities, 51.7% had diabetes mellitus, 25% had hypertension, 8.3% were with ischemic heart diseases and 1.7% each had COPD and HIV. Hepatic abscess was the most common site of abscess (31.7%), followed by pancreatic abscess (21.7%) and appendicular abscess (11.7%) as the 3rd most common site of abscesses. Majority of the patients stayed in the hospital upto 7 days (50.0%).there was success rate at 91.7% with 41.7% as nil in drain collection of intra-abdominal abscesses. 50% cases showed improvement in the collection of drain wherein there was reduction in the collection.8.3% was the failure rate that was observed in the current study.

Conclusions: To drain intra-abdominal abscesses and fluid collections, the Usg/ct guided percutaneous procedure is a straightforward, cost-effective, and less traumatic method. Others are reduced risk of complications and a shorter length of hospital stay. It's the sole option for terminally ill individuals because it doesn't involve the dangers of general anaesthesia. Ultrasound guidance is commonly used since it is accessible, inexpensive, and poses no radiation risk during procedures. In light of these benefits, ultrasonography is an excellent method for post-drainage monitoring. Patients can be

sent home immediately after surgery, with a draining catheter still in place, reducing their chance of contracting an infection and the overall cost of care.

Key-words: Ultrasonography, percutaneous, abscess, antibiotics.

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INTRODUCTION

Surgeons frequently face the issue of an intraabdominal abscess. Drainage, both surgical and USG/CT guided, is a mainstay of treatment. Harmful accumulations of bacteria or other pathogens in the abdominal cavity can cause serious illness or even death. These disorders remain difficult to diagnose and treat despite significant progress.

Significant progress has been made thanks to the introduction of new catheters and enhanced CT scanners. As a result, therapeutic drainage guided by images has gained in popularity. In recent years, image-guided percutaneous drainage has replaced open surgery as the treatment of choice for intraabdominal abscess, all thanks to the remarkable developments in diagnostic imaging. The majority of patients, regardless of origin, are now treated with ausg and ct guided drainaege of abdominal collections and abscesses. Most patients now opt for PCD instead of the old procedure of draining abdominal collections, and PCD is frequently utilised as a stopgap in really unwell patients..[3] The procedure is technically easy, reproducible, cost effective and can also be done in patients who are unfit for general anesthesia.[4] Hence the present study was undertaken to determine the safety and efficacy of both USG/CT guided as a primary method to treat the intraabdominal abscess.

AIMS & OBJECTIVES

Aim

To assess the efficacy of percutaneous drainage of intra-abdominal abscesses treatment using ultrasound and CT guided tube drainage.

Objective

- Primary objective: to evaluate the efficacy of percutaneous drainage to treat intra abdominal abscess through CT/USG guided tube drainage.

- Secondary objective was to demonstrate that it is done under patients, who are unfit for general anaesthesia.

REVIEW OF LITERATURE

Epidemiology[5]

Abscesses inside the abdomen are commonly the result of surgery and are typically caused by an organ located within the abdomen. Seventy percent are attributed to the time after surgery, and about 6 percent of people who have had colorectal surgery develop an abscess in the surgical site. Hepatic abscesses account for 13% of all abdominal abscesses. Hepatic abscesses tend to occur in the right lobe because of its greater size and superior blood supply.

Abdominal Structure and function[6]

The spine and the lower ribs provide the only skeletal support for the abdomen, making it far more vulnerable than the athorax and pelvis. The abdominal wall attaches to the skeleton at the thoracic cage in the upper section and at the pelvic bones in the lower part. As a result of the relatively low bone density in the trunk, it can expand and contract on the fly to accommodate variations in the volume of the abdominal contents. When creating incisions in the abdominal wall, it is important to have a firm grasp on the many layers that make up the tissue. These layers range from the very thin to the very thick.

- Skin
- Subcutaneous tissue has the following subcategories:
- Camper's fascia, an outer layer of fatty tissue
- Scarper's fascia, a thick layer of membranous tissue
- abdominal muscles, aponeuroses, and their enclosing fascia
- Anterior transversalis fascia
- Parietal peritoneum

The abdominal wall is responsible for a wide range of important activities. It houses and sustains the abdominal viscera, which are essential to life. All layers contribute to the physical protection of the organs. The abdominal muscles can be broken down into two categories: the anterior and the lateral. The five pairs of anterolateral muscles are the transversus abdominis, arectus abdominis, external oblique, and pyramidalis. 7 The psoas major and quadratus lumborum are examples of posterior muscles on both sides. The abdominal muscles help facilitate a wide range of trunk motions, including flexion, extension, lateral flexion, and rotation. Sneezing, coughing, vomiting, and defecating all require the simultaneous contraction of abdominal muscles to generate the intraabdominal and intrathoracic pressure required. It is possible that this motion also aids in stabilising the trunk when lifting big objects. As soon as additional physiological.[6]

Surface anatomy[6]

The external abdominal wall can be broken down into zones to better describe exam results. Drawing vertical lines from the midclavicular point to the mid inguinal point creates the midclavicular plane. In the anterior thorax, the most inferior region, the subcostal plane and the intertubercular plane can be separated into horizontal lines (in line with the iliac tubercles). The abdominal cavity is divided into nine equal parts by two sets of parallel plane lines, one vertical and one horizontal. Alternatively, the abdomen can be segmented into four quadrants using the transumbilical plane and the vertical median line..

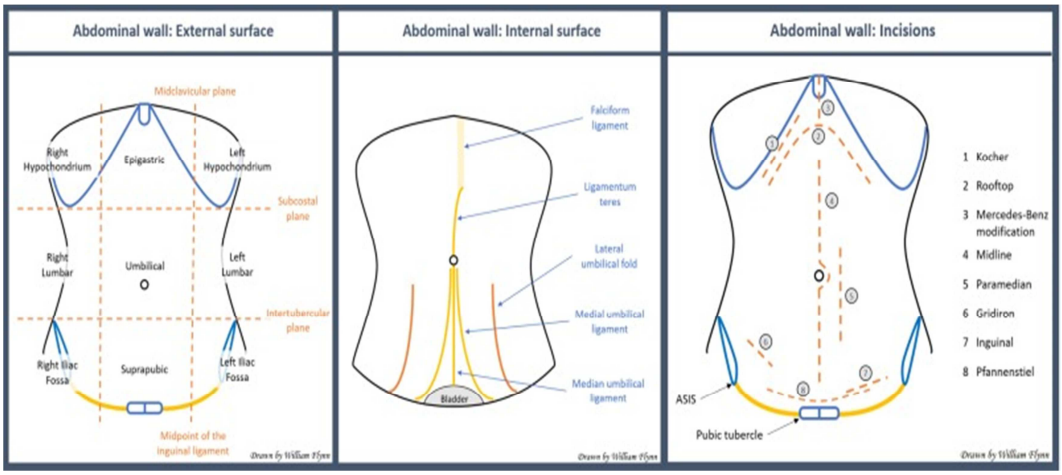


Figure 1: Surface anatomy and abdominal wall incisions[6]

When the peritoneal cavity is entered and filled during laparoscopic surgery, the inner surface of the front abdominal wall is exposed for inspection. Many creases and ligamentous scars are plain to see. The falciform ligament's free edge is followed by the ligamentum teres, a remnant of the umbilical vein. Before continuing along the inner surface of the anterior abdominal wall to the umbilicus, it separates the liver into the right and left anatomical lobes. There are five visible folds or ligaments below the umbilicus. The median umbilical ligament, which extends from the umbilical cord to the bladder, still contains remnants of the foetal urachus. The remains of the umbilical arteries form the medial umbilical ligaments, which are apparent on both sides of the injury..[6]

Embryology:

The embryo develops from a disc to a foetus within the first three to four weeks of pregnancy. The intestinal tube and lateral body wall are formed by the endodermal and mesodermal disc layers wrapping inward in the opposite direction, whereas the neural tube is formed by the ectodermal disc layer folding inward in a pleated fashion. Mesoderm is responsible for the development of the abdominal wall's

muscles and fascia. Rank below the umbilicus in importance. The median umbilical ligament, which extends from the umbilical cord to the bladder, still contains remnants of the foetal urachus. Umbilical artery remnants form the medial umbilical ligaments on both sides of the median ligament. The femoral ring and the arcuate line are connected by the inferior epigastric arteries, which go through the lateral umbilical folds..[8]

Anatomy of abdominal cavity: [9]

The xiphi's abdominal chamber extends far into the pelvis, starting just below the sternum. There are both hollow and solid organs within its body. Muscles encompass the whole abdomen, front to back, except for the pelvic and under-rib areas. The iliac muscles form the inferior boundary, the vertebral columns and the psoas major, minor, and quadrates lumborum constitute the posterior, and the rectus abdominis forms the anterior border of the abdominal cavity. Two arbitrary horizontal and vertical lines are used to partition the abdominal cavity into nine parts for descriptive purposes. Lines that are either at the level of the pylorus in the stomach or at the tip of the ninth costal cartilage are called transpyloric.

Peritoneal cavity: [10]

The peritoneum is a membrane that lines the inside of the abdominal cavity. This lining is a serous membrane. The abdominal and pelvic viscera transport the peritoneum into the abdominal cavity during embryonic development. There are two opposing layers of peritoneum lining the visceral ligaments between internal organs and the abdominal wall. The absence, fusion, shifting, and reduction of such peritoneal folds during development define the greater and lesser sacs as two discrete

regions of the peritoneal cavity. The lesser omentum, stomach, and gastrocolic ligament form a wall in front of the smaller sac. By way of the Winslow foramen, it communicates with the bigger sac on the right.. Retroperitoneal structures are those found inside the abdominal cavity that are not connected to the body wall by ligaments or mesentery

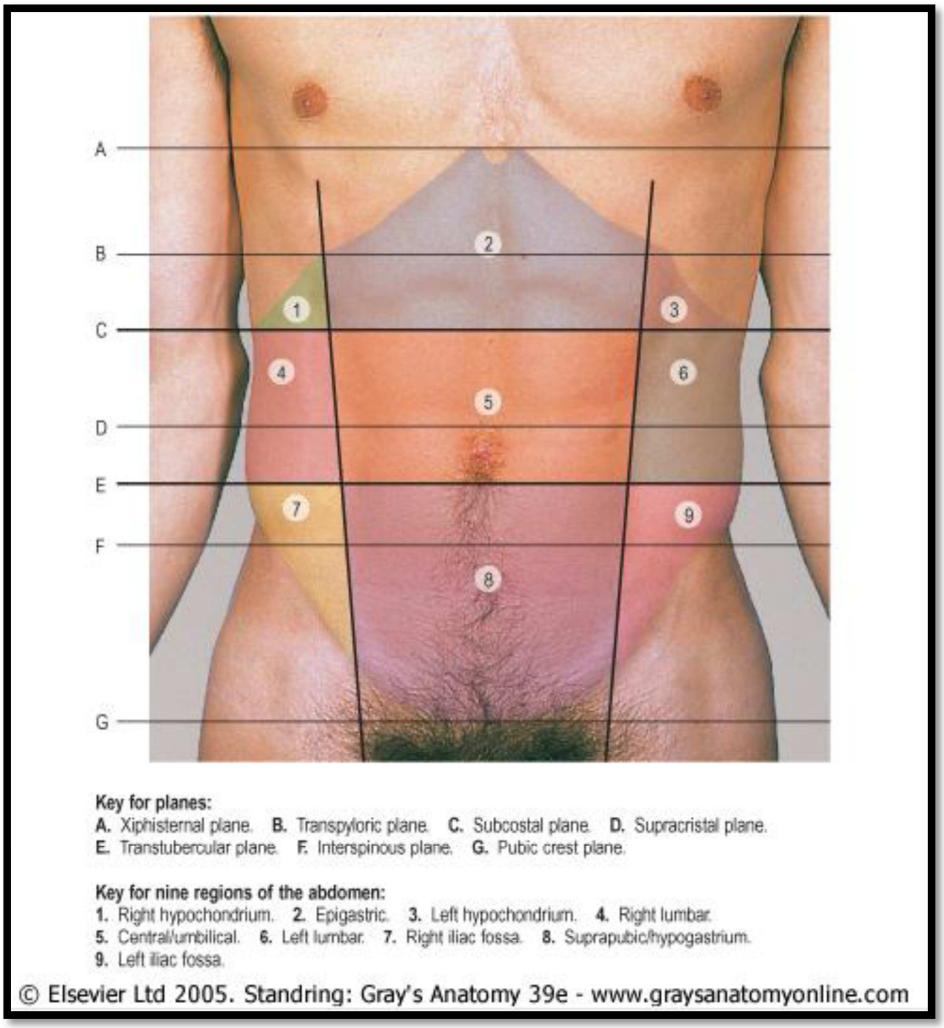


Figure 2: Different Quadrants of abdomen

Blood supply and lymphatics

The subclavian arteries carry blood to the abdominal wall, which then transports it to the tributaries.

The internal thoracic artery develops from the anterior section of the subclavian artery.

The rectus abdominis, together with the upper abdomen and umbilical regions, are fed by the superior epigastric, which lies behind the rectus sheath.

The venous drainage is very similar to the arterial supply, except for the internal thoracic veins which drain superiorly into the brachiocephalic veins.

The thoracic aorta supplies blood to the lateral abdominal wall, subcostal arteries, tenth and eleventh posterior intercostal arteries, and the rest of the body.

The anterior abdominal wall receives both superficial and deep feeding from branches of the femoral artery and the external iliac artery, respectively..

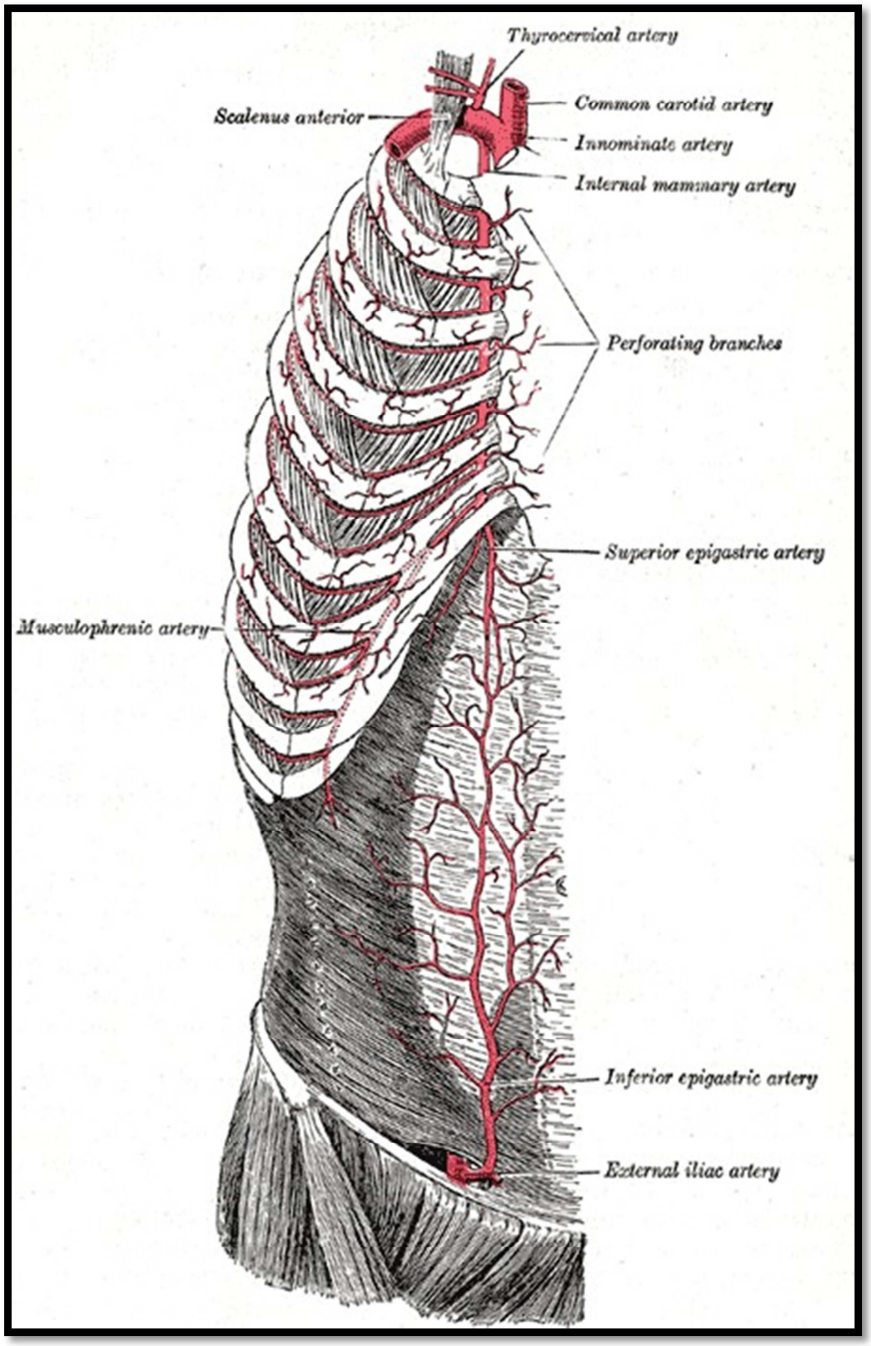


Figure 3: Superficial Arteries of the Chest and Abdomen[6]

The back of the abdomen receives blood from the abdominal aorta's branches. The adrenals and diaphragm receive nourishment via the inferior phrenic arteries, which travel superiorly and laterally to the diaphragmatic crus.

Lymph vessels in the skin and subcutaneous tissue of the anterior abdominal wall are divided in the transumbilical plane. Superior lymph flow is ensured by the pectoral axillary nodes. The lower end of these lymph vessels feed into the superficial inguinal lymph nodes. "The lymphatic system in the muscles of the anterior and posterior abdominal walls drains deep like the veins and arteries. The parasternal lymph nodes receive drainage from higher up thanks to the superior epigastric arteries. The lymph nodes in the external iliac lobe get drainage from the inferior epigastric arteries. Both the intercostal and subcostal veins drained laterally from the chest wall. This lymphatic flow from the back wall is carried through the lumbar vessels to the lateral and retro-aortic nodes.

The muscles of the anterior and lateral abdominal wall are supplied with nerve endings by the intercostal nerves that run from the ribs (C7-C12). They follow the rest of the neurovascular bundle as it travels anteriorly along a circular path between the internal oblique and transversus abdominis muscles. lymph nodes located in the back of the chest. Transmission of lymph through the back of the abdominal wall. These nclude tmediastinum.

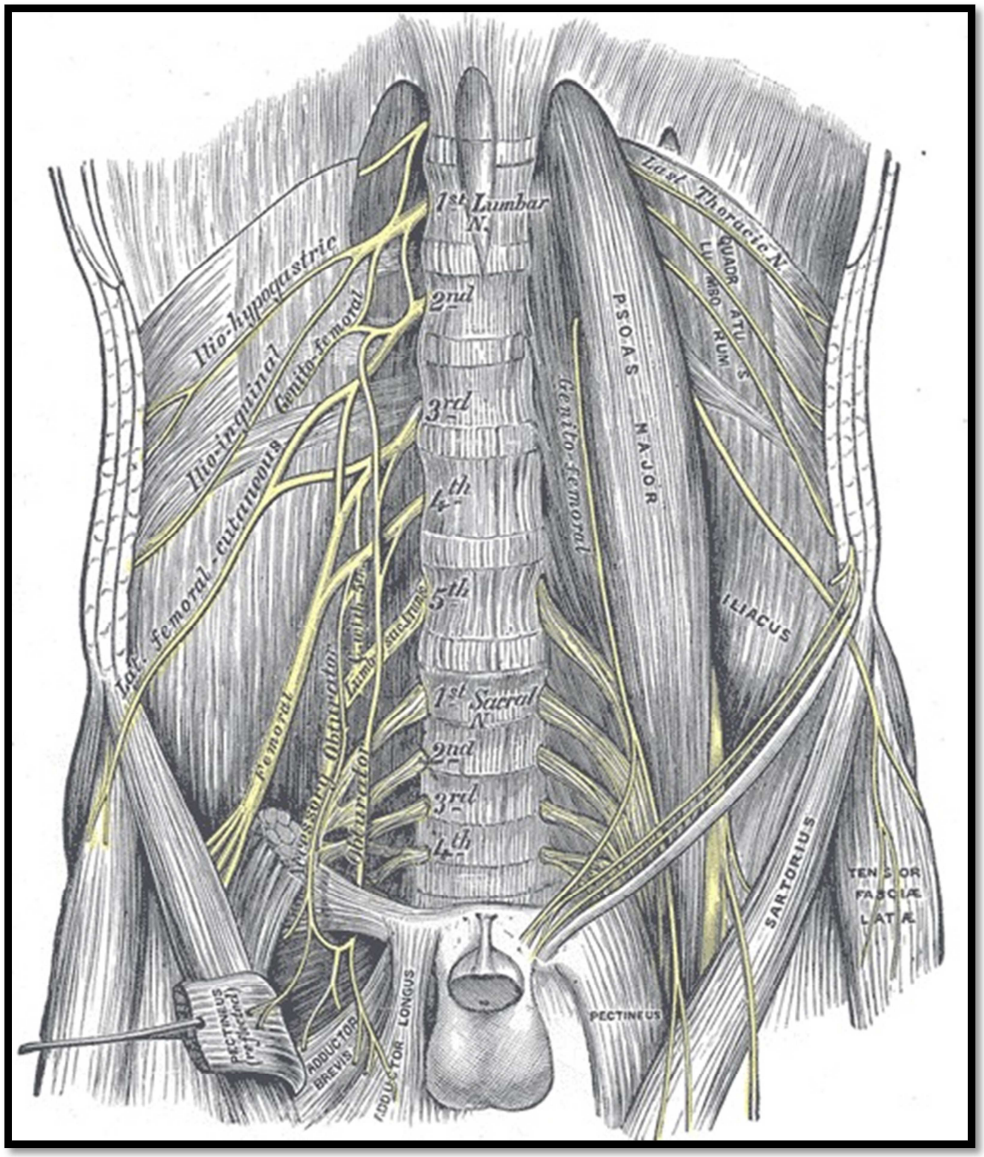


Figure 4: Lumbosacral nerves[6]

Muscles

- AAnterolateral abdominal wall muscles
- AExternal oblique
- AInternal oblique
- Tasversus abdominis
- ARectus abdominis
- APyramidalis

Posterior abdominal wall muscles

- AQuadrates lumborum
- APsoas major

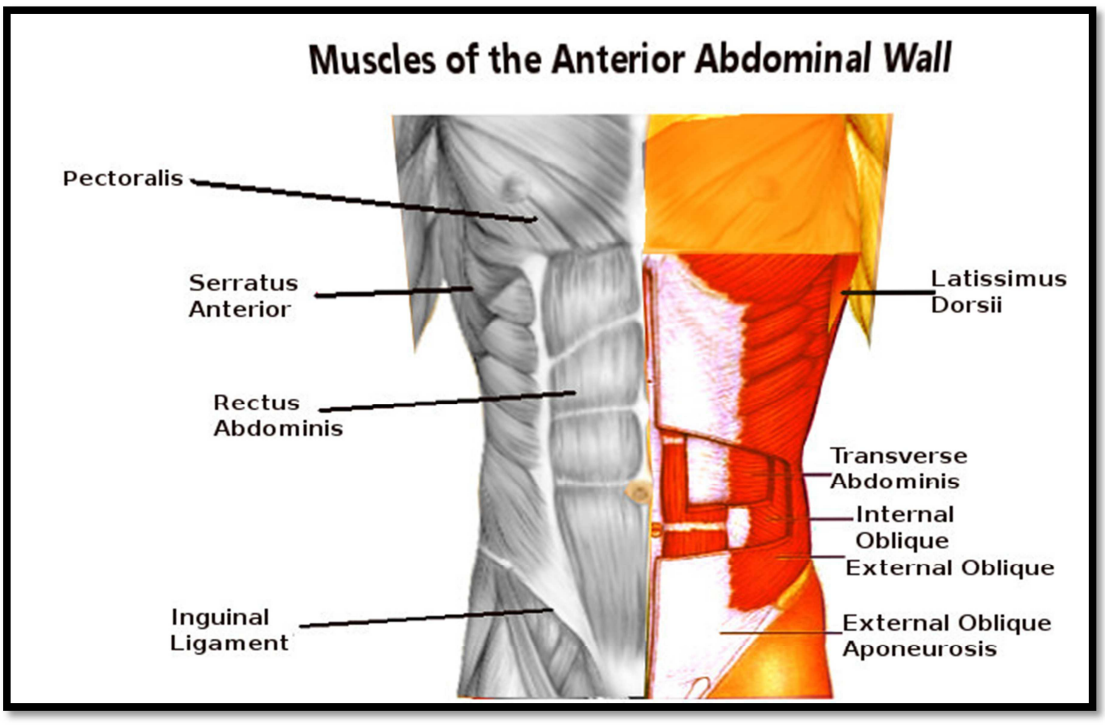


Figure 5: Muscles of Abdominal Wall.[6]

No modern surgeon would have been able to complete all of the necessary procedures without these needles and sutures.

Surgical skin incision tissue repair aims for quick strength gain, little tissue injury, minimal inflammation, and a nice scar. These goals are affected by a number of variables, including as the suture material and location..[12,13]

Abdominal Abscess[5]

An abdominal abscess can form from cellular debris, enzymes, and liquid waste products of infected or noninfectious origin. When a patient has an abscess inside their abdomen, it's usually a symptom that they're quite ill. An abscess can appear in the peritoneal cavity, but it can spread to other areas of the abdomen. An intraabdominal abscess may be obstructed by the omentum, viscera, or mesentery. Abdominal abscesses are a frequent and potentially fatal medical disease. In order to lessen the severity of the illness' morbidity and death rate, prompt diagnosis and treatment are essential. The mortality and morbidity rates associated with sepsis caused by an upper gastrointestinal perforation or leak are often lower than those seen in cases of sepsis caused by a rupture..14–16

Etiology[5]

The gastrointestinal system is a common source of the aerobic and anaerobic bacteria most often associated with abdominal abscesses. A ruptured gastric ulcer, a perforated appendix, diverticulitis, ischemic bowel disease, pancreatic necrosis, or gangrenous cholecystitis are all potential causes of an intraabdominal abscess. Surgical trauma, anastomotic leakage, volvulus, intussusception, and missing

gallstones are some other potential negative outcomes of a cholecystectomy. Sterile abscesses are a rare but possible side effect of injecting drugs.17

An abdominal abscess's causing organisms include;

aCandida

The organism involved in an abdominal abscess include;

- ACandida
- AEscherichia coli
- ANeisseria
- ABacteroides
- AChlamydia

Pathophysiology[5]

An abscess within the abdomen may be confined to one area or it may involve the entire peritoneal cavity. Adhesions, omentum, or other viscera in the area may act as a barrier for localised pus collections. Polymicrobial communities, including both aerobic and anaerobic GI tract species, are characteristic in abdominal abscesses. Inflammation caused by the bacteria typically leads to a hypertonic environment that continues to grow as an abscess cavity. In the event that an abdominal abscess is left untreated, septic shock could develop.

Table 1: Classification of abdominal abscesses

Classification	Examples
A Visceral vs. non-visceral	A Hepatic vs. subphrenic
A Primary vs. secondary	A Splenic vs. appendiceal
A Spontaneous vs. postoperative	A Diverticular vs. peri-anastomotic
An Intra-peritoneal vs. retroperitoneal	A Tubo-ovarian vs. psoas
A Simple vs. [a] complex	[A a]Complex:
	- multiple (liver)
	- multiloculated
	- communication with bowel (leaking anastomosis)
	- associated with necrotic tissue (pancreatic)
	- associated with cancer
Anatomical	Subphrenic, subhepatic , lesser sca, paracolic, pelvic, interloop, perinephric, psoas

Physical examination[5]

Symptoms of an intra-abdominal abscess include a lack of appetite, high body temperature, rapid heart rate, and a lengthy ileus. A perceptible thickness might or might not be there. Some persons may go into septic shock if the presentation is postponed.

If the abscess is retroperitoneal or very deep in the pelvis, there may be no outward symptoms. In such cases, a fever, mild liver dysfunction, or prolonged ileus can be the only symptoms that raise suspicion.

Analgesia and other postoperative drugs might mask the symptoms of infection, making it difficult to diagnose an abdominal abscess in a surgical patient.

A subphrenic abscess may result in shoulder pain, tummy trouble, or difficulty breathing. Abdominal abscess symptoms include dehydration, oliguria, tachycardia, tachypnea, and respiratory alkalosis..

Evaluation[5]

The presence of leukocytosis, poor liver function, anaemia, or thrombocytopenia in a blood test is not diagnostic of intra-abdominal abscesses, although it may be indicative of other conditions. These symptoms suggest that an infection is present. Positive blood culture results are uncommon, but when they do occur, they often reveal anaerobic organisms, the most common of which being Bacteroides fragilis.

Therefore, a CT scan is required since an intraabdominal abscess cannot be detected on a plain abdominal x-ray. This is the gold standard for ruling out the possibility of an intraabdominal abscess. Thickened intestines, thumbprinting, and ileus can all be detected, localised, and measured with CT. Antibiotics administered intravenously (IV) are the treatment of choice for intra-abdominal abscess. In cases where the abscess can be pinpointed using CT, aspiration under imaging guidance can drain the infection. A CT scan has the benefit of eliminating the need for general anaesthesia and the associated wound care issues that often accompany it. Another

benefit is that it prevents disease-causing organisms from spreading to other parts of the abdomen..[18–20] In some patients, ultrasound may help identify abdominal abscess.

Nuclear scans are rarely used today to detect abscesses because the technique is time-consuming and has a high rate of false positives.

Management[5]

Antibiotics with a broad range of action and enough hydration are required. Once cultures are obtained, certain antibiotics can be used based on their sensitivity. Hydration via intravenous infusion is essential. A nasogastric tube can assist decompress the gut and reduce emesis.[21–23]

Commonly, percutaneous CT-guided drainage is used to treat abdominal abscesses. With the use of a local anaesthetic, the time spent in the hospital for the procedure can be drastically cut down. After 48 hours of drainage, most patients are able to make a full recovery. More than 90% of isolated abscesses can be drained successfully with CT guidance. Patients needing surgical consultation if they don't improve within 24 to 48 hours. A laparoscopic, IR, or open procedure can drain the abscess from the abdomen. The necrotic tissue will be excised, and any adhesions will be broken down, if surgery is required. A lot of these people need to be watched closely in an ICU and have a lot of fluids pumped into them. If the abscess can be contained, and the infection can be treated quickly, the prognosis is good.

Excellent results are achieved when pelvic abscesses are drained transrectally or transvaginally.

Adhesions and a lack of appropriate anatomical pathways to divide the intestines make open surgery for an abdominal abscess a challenging treatment..

Differential diagnosis

- Ulcerative colitis
- Prolonged ileus
- Crohn disease
- Fever of unknown origin

Complications

- An abdominal abscess can lead to the complications, like;
- Formation of fistula
- Multiorgan failure
- Death
- Both CT guided drainage and surgery can lead to bowel perforation
- Malnutrition
- Deep vein thrombosis

Studies evaluating the efficacy of percutaneous catheter drainage of abdominal abscesses guided by ultrasonography and computed tomography have been conducted since 1979. One such study was conducted by Gerzof SG et al. In 22 of 24 cases, percutaneous catheter drainage proved curative and no surgery was required. Over the course of the follow-up periods, which spanned from one week to three years on average, there were no fatalities or recurrences. Percutaneous aspiration and drainage should be considered as an alternative to surgery for the treatment of intraabdominal or retroperitoneal abscess.. [24]

Mark et al. (1990) examined 48 consecutive patients with 68 intra abdominal abscess who had surgery or radiological attempts at drainage. Numerous individuals with simple abscesses have benefited from surgical drainage and/or radiological drainage. Patients with more complicated forms of abscess had a greater mortality rate and typically needed surgical intervention to resolve the infection. In the end, 79% of patients had their abscesses cleared up.

Civardi G et al. (1998) conducted research on the efficacy of US-guided percutaneous drainage of abdominal abscesses. Overall, 90.4% of patients were cured. Results were best for amoebic and pyogenic hepatic abscesses (98.7 and 94.3% cure rates, respectively). The rates of recovery were somewhat lower in patients with significant immunosuppression, postoperative collections, or abdominal or splenic abscesses. Catheter drainage was responsible for the majority of the complications that occurred (6.6%). There were no fatalities due to drainage issues. The study shows that ultrasound guided percutaneous drainage is both clinically effective and safe even when performed directly by the clinician. Sonographic guidance is preferable to other imaging modalities because it is more cost-effective, easier to implement, and safer for patients. For hepatic abscesses, ultrasonography guided needle aspiration outperformed catheter drainage with fewer complications.. [25]

To evaluate USG-guided percutaneous drainage of an abdominal abscess, Saleem M. et al., (2000) conducted a prospective case-controlled study. Overall, the success rate was 96.2%, with only 3.8% of patients losing their lives due to complications. There was a 0% mortality rate among the 20 patients who had multiple abscesses, and an 83.4% mortality rate among the 6 patients who had complicated abscesses. The median length of stay was 10.7 days in the hospital (range 3-25).

Abdominal abscesses can be safely and effectively drained by percutaneous ultrasound guidance if the abscess is small.. [26]

Betsch A, et al., (2002) evaluated CT-guided percutaneous drainage for intraabdominal abscess. The abscess was successfully drained in 62 of 75 patients (83%), without the need for surgery. Abscesses that were less than 200 cm3 in volume and had a simple structure had a higher chance of being successfully treated clinically. Patients with APACHE III levels below 30 were significantly more likely to get only percutaneous abscess drainages (PAD) for their abscesses. When abscesses are single, modest (200 cm3), and located in conveniently accessible regions, and when APACHE scores are low (30), percutaneous draining of intra-abdominal abscesses has favourable long-term consequences.. [27]

Out of 114 patients with intraabdominal abscess due to appendicitis, diverticulitis, postoperative, undetermined, 67 did not respond to conservative management and required emergency surgery, according to a study by Kumar RR et al., (2006) titled Factors effecting the successful management of Intra abdominal abscess with antibiotics and need for percutaneous drainage. Sixty-one patients, with an average abscess width of roughly 4cms, showed improvement after receiving only antibiotic treatment. After 48 to 72 hours of antibiotic treatment, 50 patients underwent image guided drainage. However, PCD was necessary for individuals whose abscess diameter was >6.5 cm and whose temperature was >101.2 degrees F. The study found that antibiotic treatment alone was effective for the vast majority of individuals..[28]

The effectiveness of US-guided percutaneous treatment of abdominal collections was evaluated in a 2009 study by Azzarello G et al. Four hundred thirty-one patients had ultrasound-guided percutaneous drainages of intra-abdominal abscesses. Successful abscess drainage occurred in 12/12 (100%) of pyelonephritis patients, 10/12 (85%) of acute cholecystitis cases, 3/6 (50%), and 322/403 (80%) of postoperative abscesses. Currently, US-guided drainage is the recommended treatment for simple abdominal abscesses.. [29]

Percutaneous drainage is unsuccessful in around 9 of 107 cases, according to research by Lagana D et al., (2008). Twelve patients experienced catheter displacement, while six patients experienced catheter blockage. There were no major problems. Clinical success was observed in 98 of 107 abscesses due to progressive collection shrinkage (>50%). The accumulation of fluid was not reduced by percutaneous drainage in 9 of 107 cases. As many as 12 occurrences of catheter dislodging and 6 instances of catheter obstruction were reported. Abdominal and pelvic abscesses can be successfully treated with percutaneous drainage. It can be thought of as either a preparatory measure for surgery or an effective alternative to open incisions. However, if the operation does not succeed, more surgical intervention may be attempted at a later date. Obstruction and catheter displacement are observed in all cases since procedures were performed using 10 -14 Fr pigtail catheters. Multiple-holed catheters ranging in size from 10 to 16 Fr are used in my research. In my research, I use the tandem procedure, which entails inserting a pair of needles (18G and 22G) and then passing a guide wire through the space created, before passing a series of dilators and catheters..[30]

A study was conducted to evaluate the treatment of liver abscess by Singh S et al., (2013). A statistically significant improvement in success was seen in the catheter drainage group (P=0.006). Patients in the pigtail catheter drainage group showed faster clinical recovery (P=0.039) and a 50% decrease in abscess cavity volume (P=0.000) compared to those in the percutaneous needle aspiration group. For larger abscesses that have either partially liquefied or thick pus, percutaneous catheter drainage is preferable to percutaneous needle aspiration..[31]

Anbumani S. et al. (2018) evaluated the efficacy of US and CT guided drainage of intra abdominal collections and abscesses. Seventy of the 102 drainages were supervised by CT, while the remaining 32 were overseen by US. To avoid invasive surgery, abscesses were drained in their entirety in 91 patients (89.2%). Intra-abdominal infective collections can be safely drained using image-guided catheter drainage as an alternative to open surgical drainage in both healthy and medically compromised patients. Both in terms of achieving complete drainage and preventing complications, CT guidance was found to be preferable.[2]

The effectiveness of ultrasound-guided needle aspiration in the treatment of liver abscesses was evaluated in a study by Surya M et al., (2020). Despite a statistically negligible difference between the PNA and PCD groups' success rates of 88% and 92%, respectively, both treatments should be considered equally beneficial. Overall hospital stays were significantly shorter in the PNA group (mean 6.8 days [PNA] vs 10.5 days [PCD]; p = 0.011) as were the times between intervention and discharge (mean 5.9 days [PNA] vs 10.2 days [PCD]; p = 0.026). One very serious effect was seen in our study, and that was peritonitis caused by peri-catheter leak in the PCD group. Needle aspiration is preferable to drainage for the treatment of hepatic

abscesses for a number of reasons, including reduced hospital time, improved patient safety and comfort, reduced complexity of the procedure, and reduced expense (even in abscesses more than 5 cm). If a second attempt at aspiration is unsuccessful, only then should a catheter drain be inserted.[32]

When evaluating the efficacy of image-guided percutaneous drainage of abdominal fluid accumulation, Wani RA et al. (2020) conducted a study. Almost 90% of the intra-abdominal collections we studied were either liver abscesses, postoperative collections, or peripancreatic collections caused by severe pancreatitis. The bulk of postoperative collections occurred as a result of care given in emergency departments. The majority of PCD patients are very ill, but the treatment is effective in curing them in about 85% of cases and providing relief for the remaining 8%. There is a good success rate with image-guided percutaneous drainage for the drainage of intra-abdominal collections and abscesses, and it requires the least amount of surgical intervention. PCD along with targeted antibiotic treatment can often replace open or laparoscopic surgery in these cases. In critically ill patients with many medical conditions who are deemed unsuitable for general anaesthesia, PCD can be utilised as a temporary alternative.[3]

In order to evaluate the efficacy of endoscopic US-guided drainage of intra-abdominal abscess, Donatelli G et al., (2021) conducted a case series. In all, 10 patients (6F) with an average age of 59.6 years were enrolled after ten LAMS were deployed. One patient was ruled out after an EUS screening, while another underwent two LAMS procedures for separate abscesses. 88% of cases were resolved successfully from a technical and clinical standpoint. Intestinal rest, broad-spectrum intravenous antibiotics, and interventional approaches to drain abscesses are the new

mainstays in diverticulitis care, replacing the invasive procedures of yesteryear. It suggests that EUS-guided drainage with LAMS is a successful treatment approach for encapsulated abscesses larger than 4 cm in size and near to the colonic wall. Many patients can avoid radiological or surgical intervention in specialised facilities..[33]

MATERIAL & METHODS

Source of Data: The present study was conducted in KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum attached to Jawaharlal Nehru Medical College, Belgaum.

Study Design: Observational study-Cross sectional study

Study Period: January 2021 - December 2021

Sample Size: 49

Formula used for sample size calculation is

$$n = \frac{p(100-p)Z^2}{E^2}$$

n is the sample size required, **p** is the percentage occurrence of a state or condition (proportion or prevalence), **E** is the percentage maximum error required, **Z** is the value corresponding to level of confidence required.

1. Prevalence of complete cure observed as 85%[1], with 95% confidence and 10% error,

$$n = \frac{85 \times (100-85) \times (1.96)^2}{10^2}$$

$$n = 48.98 \approx \mathbf{49}$$

2. Prevalence of complete cure assumed as 90%, with 95% confidence and 10% error,

$$n = \frac{90 \times (100-90) \times (1.96)^2}{10^2}$$

$$n = 34.57 \approx \mathbf{35}$$

Larger the sample size, better the precision

Inclusion Criteria

- Diagnosed cases of intra-abdominal abscess due to primary disease of any viscera in the abdomen.
- Sick patients, post-operative patients and patients who were deemed unfit for general anesthesia were also included in the study.

Exclusion Criteria

- Phlegmons with unclear borders were not included in the analysis since they might spread the infection.
- * Patients with multiple abscesses were not included in the analysis.
- Because it may necessitate many approaches and catheters, multiple loculations within the abscess were regarded a relative contraindication.
- There is an extremely significant risk of anaphylaxis, making hydatid cysts a definite contraindication.
- It is not recommended to use a percutaneous approach to access a pelvic abscess; rather, a transvaginal or transrectal approach is preferred.
- A relative contraindication to percutaneous catheter drainage is an abnormal prothrombin time and international normalised ratio..

Method:

- After admission, a complete history and physical examination were performed on each patient, and the results were documented on a standardised form.
- Patients should have tests such prothrombin time, international normalised ratio, clotting time, bleeding time, and total blood count performed based on their symptoms (CBC). Additionally, these patients underwent specialised

diagnostic procedures, including ultrasonography (USG) and computed tomography (CT), to identify the precise location of any abscesses developing within the abdominal cavity.

Diagnostic aspiration and percutaneous drainage pathways were planned using these pictures. Part is painted and draped, and local anaesthetic is administered once the patient is brought to the operation room (CT scan room) / bedside. Depending on the severity of the abscess, indwelling catheters (10G to 22G trocars) were placed via the incisions to perform prompt decompression, evacuation, and continuous draining of the abscess chamber.

The first consequence that was taken into consideration was whether or not the abscess cavity could be drained. Mezol wash was administered twice day till the bleeding ceased. Imaging experiments completed by respondents revealed either complete resolution (no residual collection) or partial resolution (residual collection) (any collection on next follow up even if small). An antibiotic culture and sensitivity test was performed on the pus sample. It was decided that there would be a need for repeated drainage. Information about the patient's hospital stay, drainage, and outcome were documented.

Do any human or nonhuman animal subjects need to undergo examinations or treatments as part of the study? Please give a brief explanation if so.:

YES

Clinical symptoms determine which tests, including prothrombin time, international normalised ratio, clotting time, bleeding time, and total blood count, a patient must undergo (CBC). In addition, these patients need to undergo specialised

tests like USG or CT to look for and pinpoint the location of any abscesses that may have formed inside their abdominal cavity..

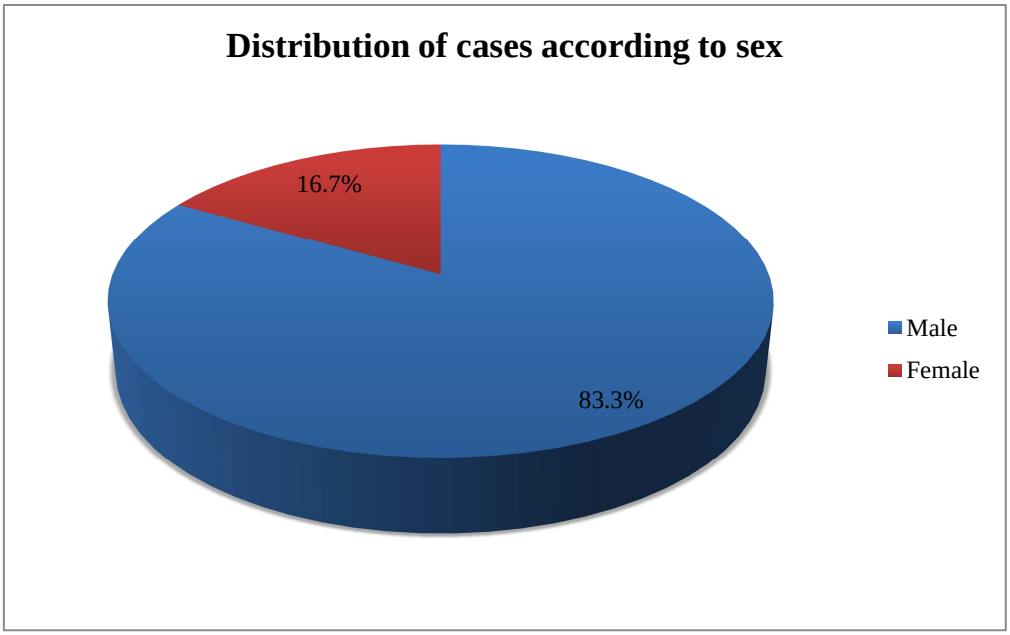
STATISTICAL ANALYSIS

Microsoft Excel was used for data collection and storage. Excel and R, two statistical packages, were used to examine the data. Data for continuous variables were presented as meanss.d./medians (range). The frequency distribution was used to depict categorical variables. A chi-square test was utilised to examine the significance of associations between discrete categories. Mean/Distribution Comparison Across Groups Statistical analysis included the t-test, one-way analysis of variance, Mann-Whitney test, and Kruskal-Wallis test. Statistics including the paired t-test, Wilcoxon's test, repeated measures of ANOVA, and Friedman's test were employed to examine changes in mean and variance over time. Verifying that data are normally distributed We utilised the Quantile-Quantile (QQ) plot and the Shapiro-test. Wilk's The significance level is defined as a p-value less than 0.05.

RESULTS

Table 1: Sex wise distribution of the cases

Sex	Number (N = 60)	Percentage (%)
Male	50	83.3
Female	10	16.7



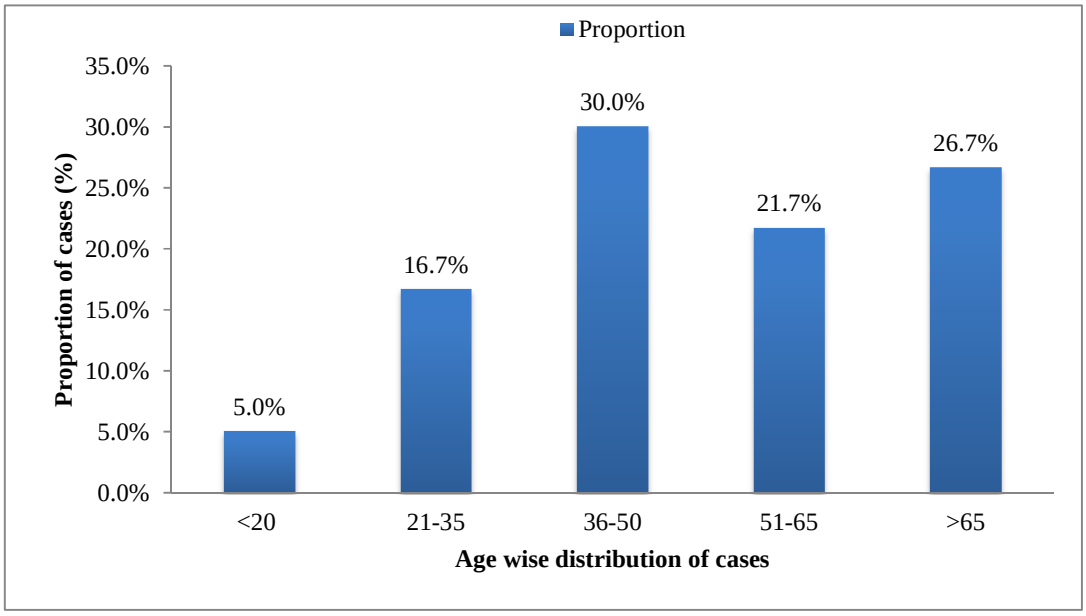
Graph 1: Graph showing the distribution of cases according to sex

It was found from the current study that, there were 83.3% males and 16.7% females.

Table 2: Age wise distribution of the cases

Age (years)	Number (N = 60)	Percentage (%)
<20	03	05.0
21-35	10	16.7
36-50	18	30.0
51-65	13	21.7
>65	16	26.7

Mean Age: 51.8±18.6 years

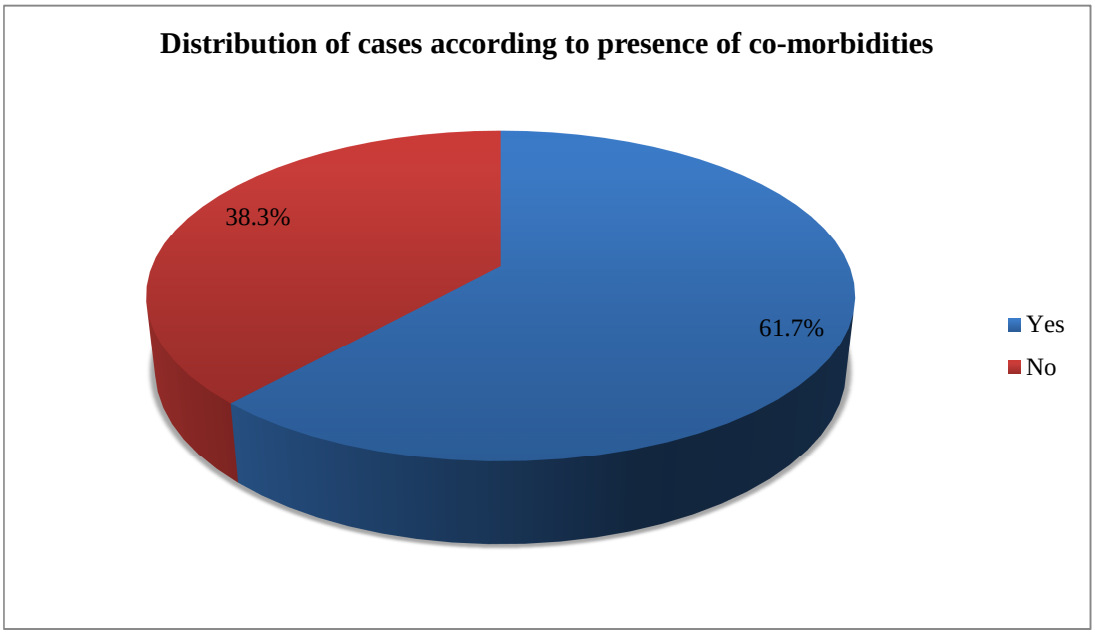


Graph 2: Graph showing age wise distribution of the cases

It was noted from the current study that, majority of the study population was form 36-50 years age group (30.0%), followed by elderly age group more than 65 years age as 26.7%. Within 20 years age group cases was 5.0%.

Table 3: History of Co-morbidities

Co-morbidities	Number (N = 60)	Percentage (%)
Yes	37	61.7
No	23	38.3



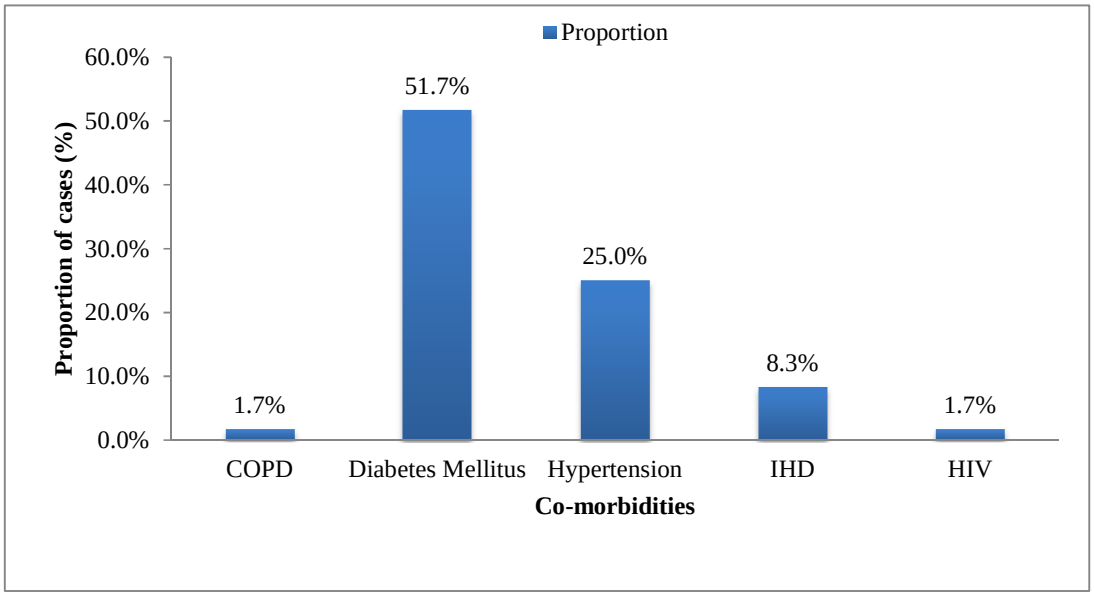
Graph 3: Graph showing the distribution of cases according to the presence of co-morbidities

It was observed from the study that, 61.7% of the population had co-morbidities and 38.3% did not had any other associated conditions.

Table 4: Distribution of cases according to Co-morbidities

Co-morbidities*	Number (N = 37)	Percentage (%)
COPD	01	01.7
Diabetes Mellitus	31	51.7
Hypertension	15	25.0
Ischemic Heart Disease	05	08.3
HIV	01	01.7

*Multiple co-morbidities

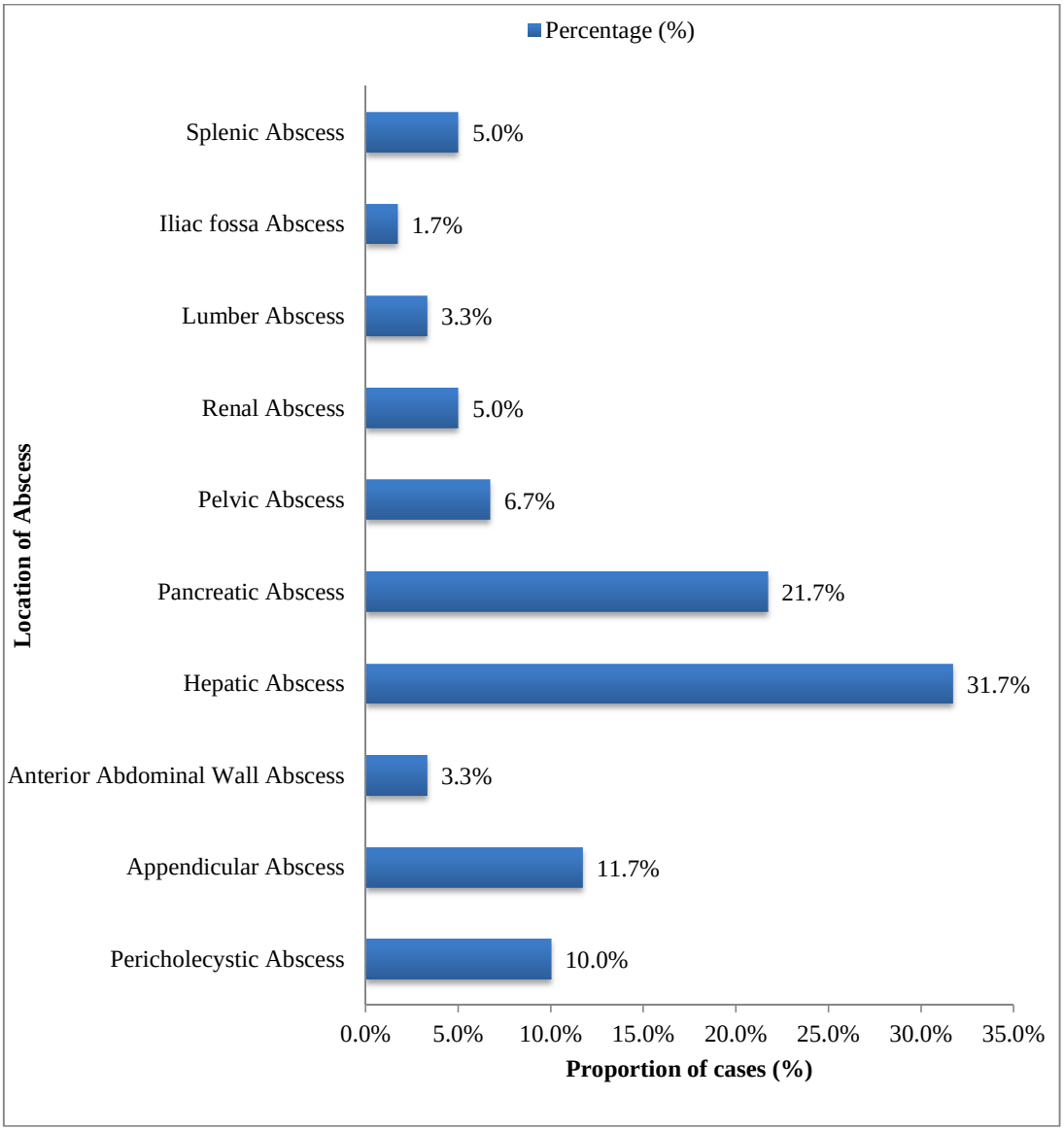


Graph 4: Graph showing the presence of different co-morbidities in cases

The current study showed that, 37 out of 60 patients had co-morbidities. Among them, 51.7% had diabetes mellitus, 25% had hypertension, 8.3% were with ischemic heart diseases and 1.7% each had COPD and HIV. Patients had multiple co-morbidities. Most of them had diabetes with hypertension.

Table 5: Distribution of cases according to the location of intra-abdominal abscesses

Location of Abscess	Number (N = 60)	Percentage (%)
Pericholecystic Abscess	06	10.0
Appendicular Abscess	07	11.7
Anterior Abdominal Wall Abscess	02	03.3
Hepatic Abscess	19	31.7
Pancreatic Abscess	13	21.7
Pelvic Abscess	04	06.7
Renal Abscess	03	05.0
Lumber Abscess	02	03.3
Iliac fossa Abscess	01	01.7
Splenic Abscess	03	05.0



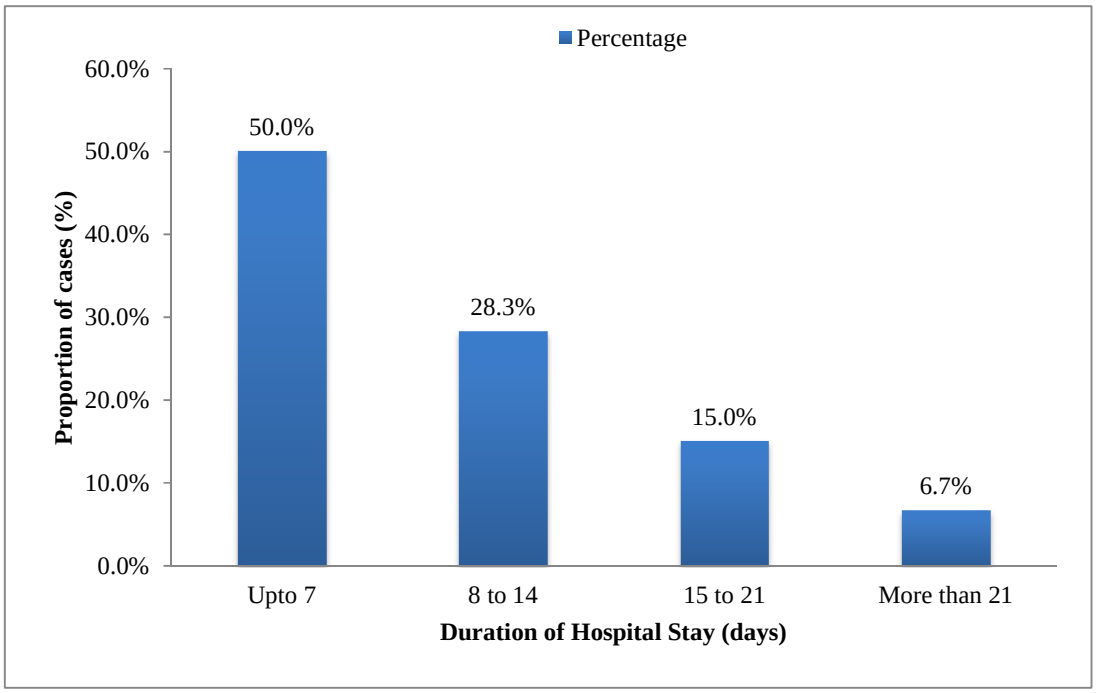
Graph 5: Graph showing the different location of intra-abdominal abscesses

It was noted from the current study that the abscess located in various parts of the body. Hepatic abscess was the most common site of abscess (31.7%), followed by pancreatic abscess (21.7%) and appendicular abscess (11.7%) as the 3rd most common site of abscesses. Least common was iliac fossa abscess (1.7%) and splenic abscess and renal abscess (5.0% each).

Table 6: Duration of Stay in Hospital

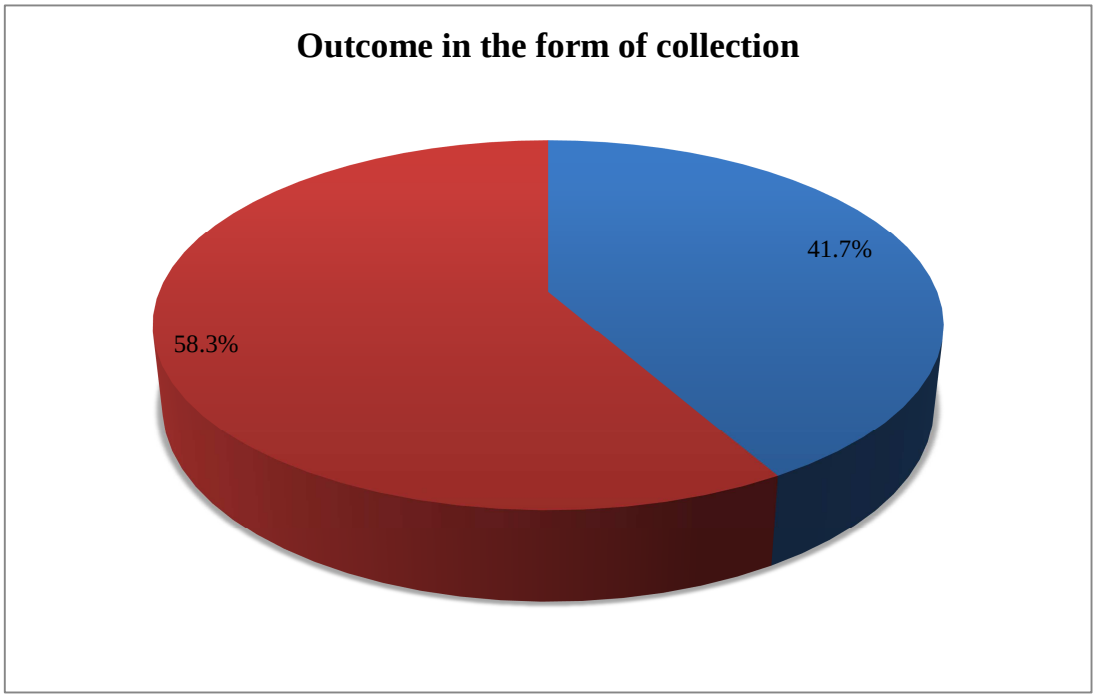
Duration of Hospital Stay (days)	Number (N = 60)	Percentage (%)
Up to 7	30	50.0
8-14	17	28.3
15-21	09	15.0
More than 21	04	06.7

Mean duration: 10.0±7.8 days



Graph 6: Graph showing the duration of patient stay in hospital

Majority of the patients stayed in the hospital upto 7 days (50.0%). Mean duration of hospital stay was found to be 10.0±7.8 days. 28.3% of cases were found to have stayed in the hospital between 8 and 14 days. Only 6.7% cases were found to have stayed more than 21 days i.e, over 30 days and upto nearly 40 days.

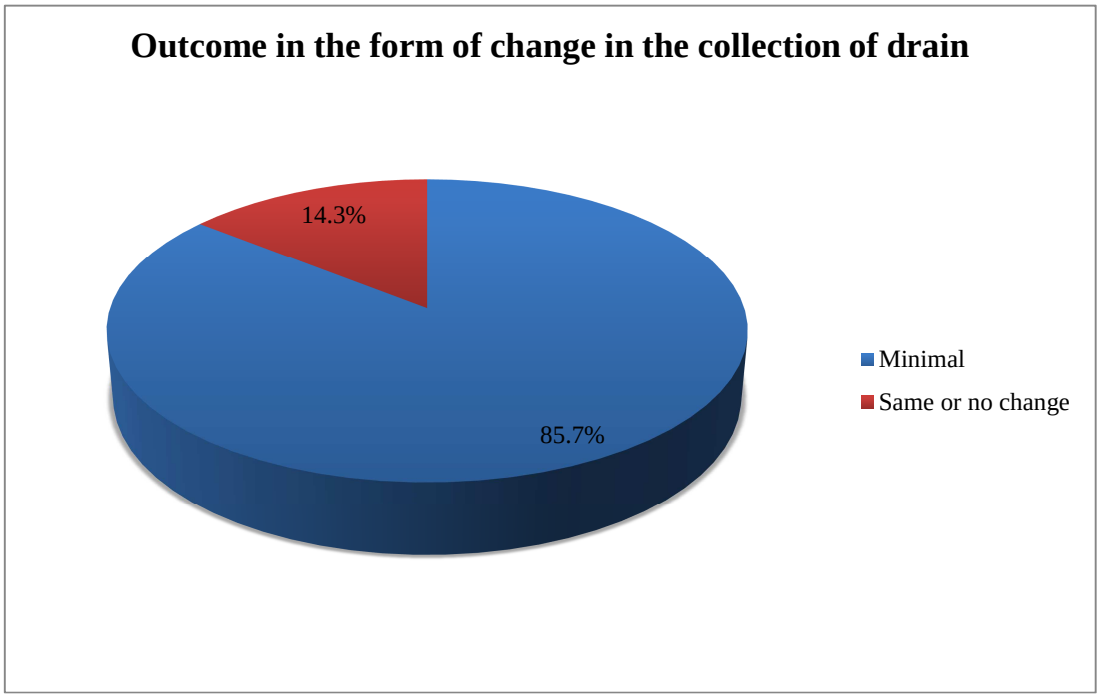


Graph 7: Graph showing the presence of collection in the drain on PCD

The current study showed the outcome of the cases in the form of collections which was found from USG. 58.3% cases showed that there was collection and 41.7% did not had any collection. It was assumed to have good outcome among those cases.

Table 7: Outcome in the form of collection post USG (1 month)

Collection in drain	Number (N = 35)	Percentage (%)
Minimal Collection	30	85.7
Same or no change	05	14.3

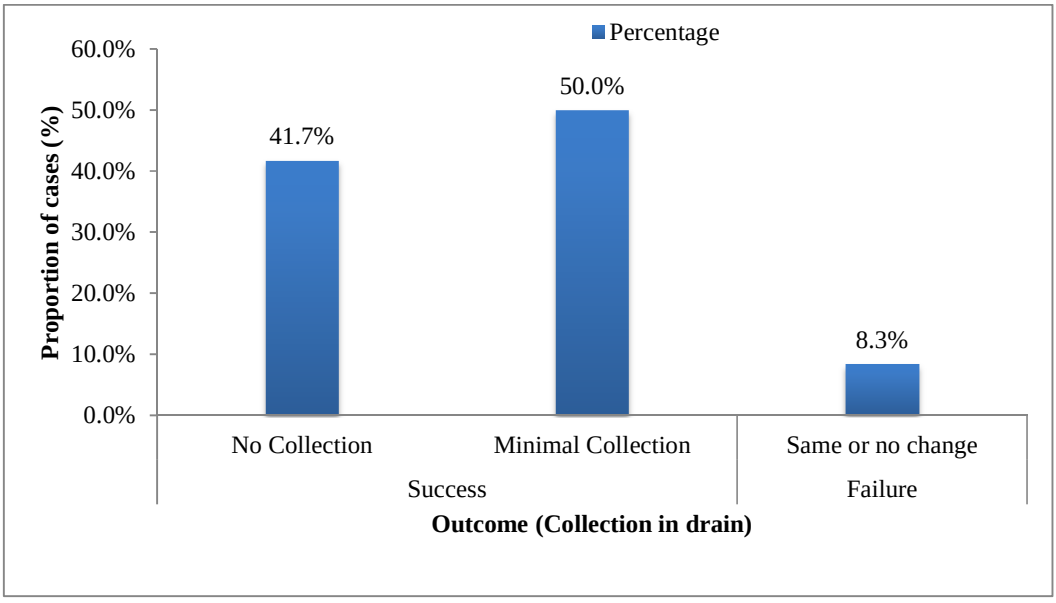


Graph 8: Graph showing the outcome in the form of improvement in the collection.

As there was collection in the drain among 58.3% cases (36 of 60 cases), it was noted that majority was having minimal collection (85.7%) and only 14.3% cases had no change in the quantity of the collection rather it was considered to be no improvement in those cases.

Table 8: Success rate of PCD

Collection in drain	Number (N = 60)	Percentage (%)	Outcome (%)
No Collection	25	41.7	Success (91.7)
Minimal Collection	30	50.0	
Same or no change	05	08.3	Failure (08.3)

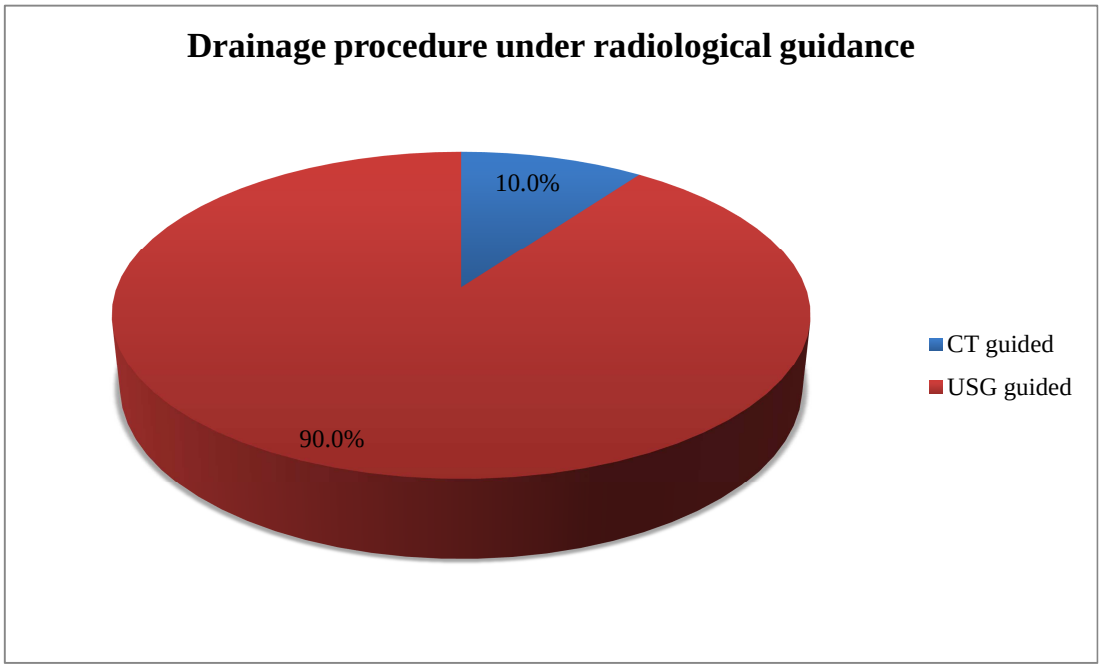


Graph 9: Graph showing the outcome in the PCD in the form of collection.

It was observed in the current study that, there was success rate at 91.7% with 41.7% as nil in drain collection of intra-abdominal abscesses. 50% cases showed improvement in the collection of drain wherein there was reduction in the collection. Thus, there was success rate of 91.7% in the current study. 8.3% was the failure rate that was observed in the current study, showing that 2 cases underwent VARD procedure and 1 patient died.

Table 9: Selection of drainage procedure in collection of intra-abdominal abscess

Procedure	Number (N = 60)	Percentage (%)
CT guided	06	10.0
USG guided	54	90.0

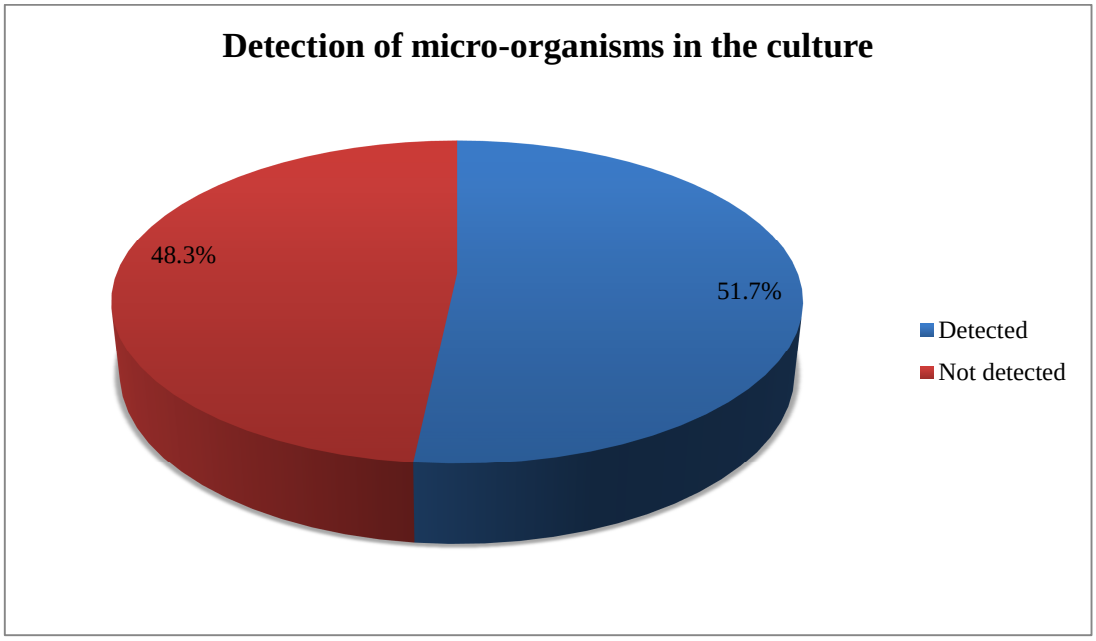


Graph 10: Graph showing the selection of radiological guide for draining the abscess

It was found from the current study that, drainage was done most commonly (90.0%) through ultrasonography and only 10.0% cases underwent computed tomography guided procedures.

Table 10: Culture detected in the sample

Culture Micro-organisms	Number (N = 60)	Percentage (%)
Detected	31	51.7
Not detected	29	48.3

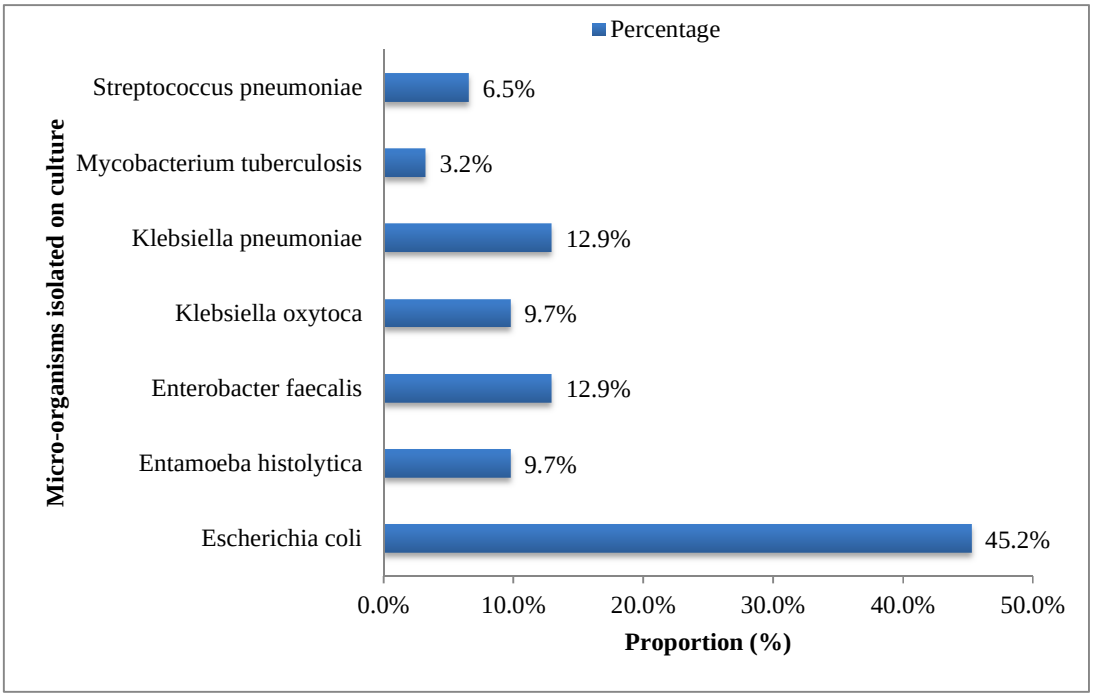


Graph 11: Graph showing the detection of micro-organisms on culture

Among the cases under the current study, samples were collected for detection of microorganisms. Thus, it was known that 51.7% cases shown the presence of micro organisms in the culture rather 48.3% cases did not show any development of micro organisms. It was known to be a sterile culture plate.

Table 11: Micro-organisms detected in the culture

Culture Micro-organisms	Number (N = 31)	Percentage (%)
Eischerichia coli	14	45.2
Entameoba histolytica	03	09.7
Enterobacter faecalis	04	12.9
Klebssiella oxytoca	03	09.7
Klebsiella pneumonia	04	12.9
Mycobacterium tuberculosis	01	03.2
Streptococcus pneumoniae	02	06.5



Graph 12: Graph showing the micro-organisms isolated from culture

As 31 of 60 cases (51.7%) cases shown that there was micro organisms on culture, it was studied and found that there were different micro organisms. Majority (45.2%) cases had got identified with *Eischerichia coli*. 12.9% cases each were detected with *Enterobacter faecalis* and *Klebsiella pneumoniae*. Other common micro-organisms were found to be 9.7% each of *Entamoeba histolytica* and *Klebsiella oxytoca*. Least was found to be with *Mycobacterium tuberculosis* (3.2%) and *Streptococcus pneumonia*e (6.5%).

Table 12: Investigations

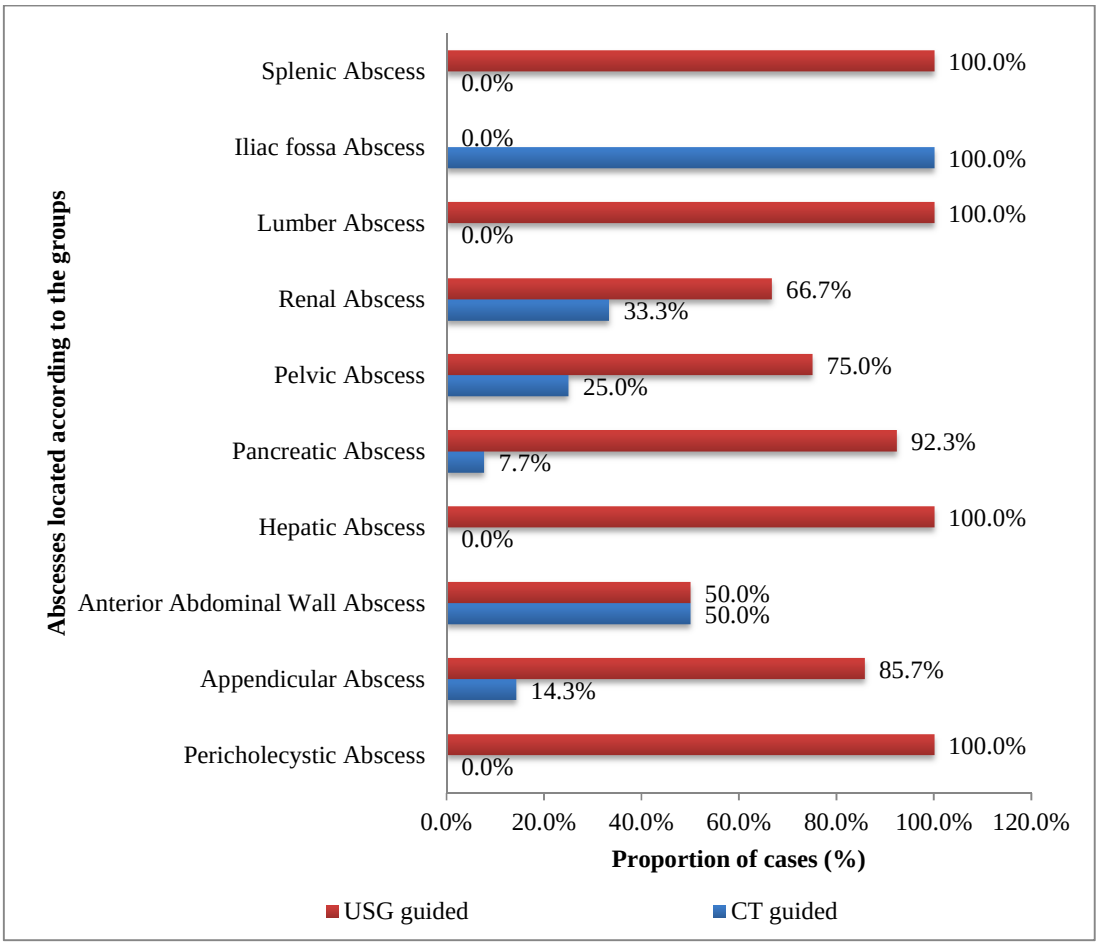
Investigations	Mean	SD
TLC (cells/mm^3)	15961.7	17074.8
Sr. Creatinine (mg%)	1.3	0.5

In the current study, laboratory investigations like TLC and Serum creatinine were done. It was noted that average TLC count was found to be 15961.7±17074.8 cells/mm^3. Mean serum creatinine level was found to be 1.3±0.5 mg%.

Table 13: Association between technique of identification of collection and its drainage

Location of Abscess	CT guided 06 (10.0%)	USG guided 54 (90.0%)	Total N = 60	p value
Pericholecystic Abscess	00 (00.0)	06 (100.0)	06 (10.0)	**0.023**
Appendicular Abscess	01 (14.3)	06 (85.7)	07 (11.7)	
Anterior Abdominal Wall Abscess	01 (50.0)	01 (50.0)	02 (03.3)	
Hepatic Abscess	00 (00.0)	19 (100.0)	19 (31.7)	
Pancreatic Abscess	01 (07.7)	12 (92.3)	13 (21.7)	
Pelvic Abscess	01 (25.0)	03 (75.0)	04 (06.7)	
Renal Abscess	01 (33.3)	02 (66.7)	03 (05.0)	
Lumbar Abscess	00 (00.0)	02 (100.0)	02 (03.3)	
Iliac fossa Abscess	01 (100.0)	00 (00.0)	01 (01.7)	
Splenic Abscess	00 (00.0)	03 (100.0)	03 (05.0)	

It is found from the study that, there is significant change in the difference between identification of abscess based on ultrasonography as well as computed tomography. The current study showed, majority of the intra-abdominal abscesses were identified by ultrasonography than computed tomography. Among them hepatic abscesses were identified more among all the abscesses and it was known to be statistically significant ($p<0.05$).

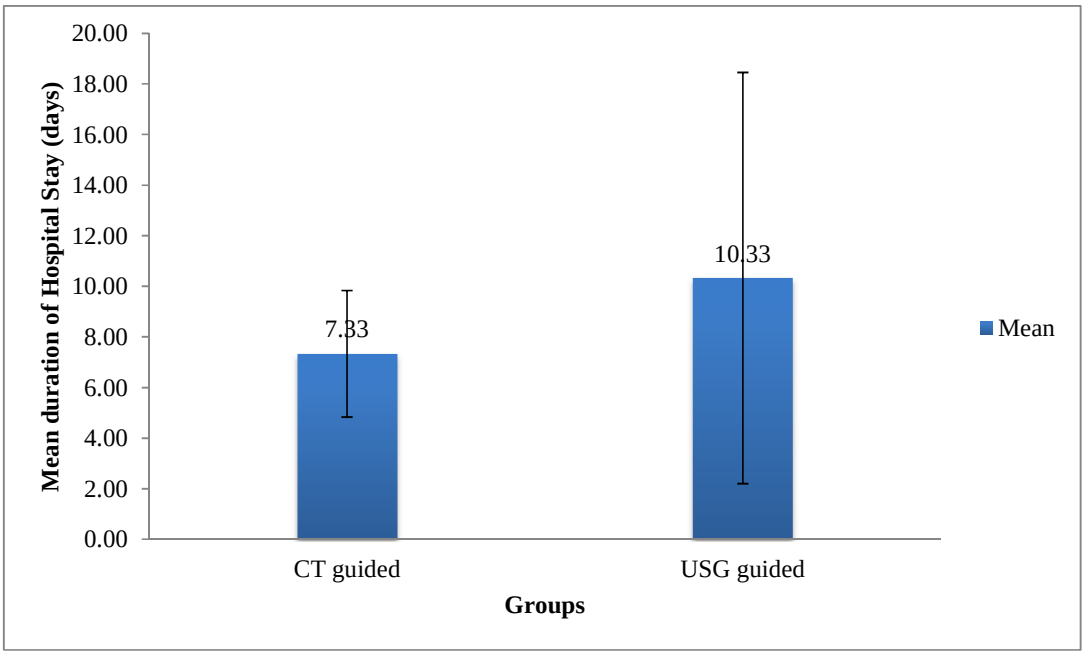


Graph 13: Graph showing the association between the two groups on location of abscesses

Table 14: Mean duration of hospital stay and drain removal in two groups

Parameters	CT guided 06 (10.0%) Mean±SD	USG guided 54 (90.0%) Mean±SD	Total (N = 60) Mean±SD	p value
Hospital Stay	7.33±2.50	10.33±8.12	10.03±7.78	0.059
Drain removal	7.67±2.07	12.44±8.31	11.97±8.03	**0.002**

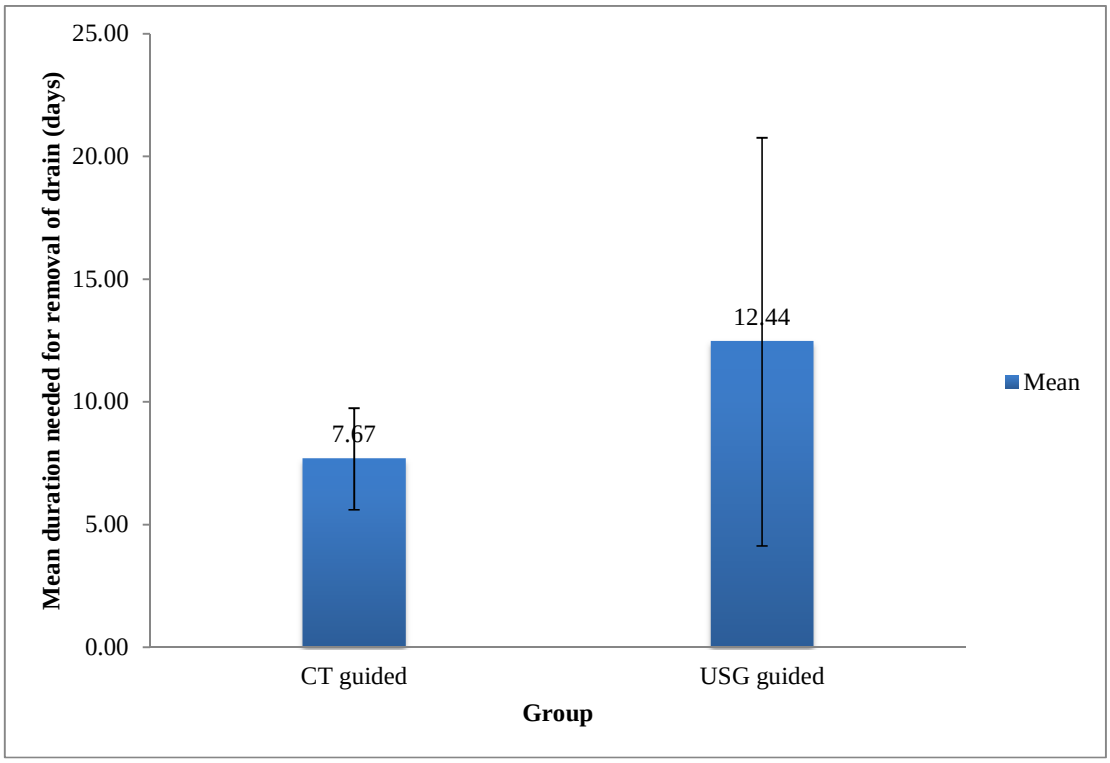
It was found from the current study that, the duration of hospital stay on average was 10.03±7.78 days. Mean duration of stay in the hospital was relatively longer in the USG guided group than CT guided group. It was known that CT guided intra-abdominal abscesses had better success rate than USG guided from the study.



Graph 14: Graph showing the mean duration of hospital stay between the two groups

Similarly it was noted from the current study that, CT guided group had early drain removal at mean duration of 7.67±2.07 days than USG guided group which had mean duration of 12.44±8.31 days and it was found to be statistically significant. Thus, it was understood that, CT guided group has better clearance of the abscess and thereby collection were drained appropriately rather than in USG guided group.

It was also noted that 02 patients under USG guided underwent VARD procedures and no patients were found to be undergoing the same procedure ensuring higher success rate in CT guided group than USG guided group.



Graph 15: Graph showing the mean duration needed for removal of drain between two groups

DISCUSSION

Intra-abdominal abscess stands as one of the important cause of morbidity and mortality among the patients.

Although many distinctive advances were made in treating them, it appears difficult to diagnose and treat.

Anbumani S, Soundarapandian A. A study of ultrasound and CT guided therapeutic drainage of intra-abdominal collections and abscesses. Int J Contemp Med Surg Radiol. 2018;3:3.

Incision and drainage has long been the gold standard for treating abdominal abscesses. Traditional abscess locations have informed clear protocols for surgical excision and drainage. Prior to the development of ultrasonography and computed tomography, abscess drainage through percutaneous method was not very effective (CT). The percutaneous needle drainage of abscesses using ultrasonography and CT has been a major advancement in the treatment of abscesses.

Gerzof SG, Robbins AH, Birkett DH, Johnson WC, Pugatch RD, Vincent ME. Percutaneous catheter drainage of abdominal abscesses guided by ultrasound and computed tomography. American Journal of Roentgenology. 1979 Jul 1;133(1):1-8.

A highly variable presentation of intra-abdominal abscesses makes diagnosis of the same as difficult in the postoperative period. Computed tomography (CT) scanning stands at 95% accuracy and is considered as the best diagnostic imaging method for abdominal abscess. Factors such as the development of ileus, presence of dressings, drains, or any inserted stomas does not interfere with reliability. In patients who are critically ill, initial percutaneous drainage can control sepsis and improve

hemodynamics before definitive surgical treatment (if this becomes necessary). A visualized collection may be sterile (bile, hematoma) or infected, and CT-guided aspiration is most helpful in distinguishing between these states.[45]

Malangoni MA, Shumate CR, Thomas HA, Richardson JD. Factors influencing the treatment of intra-abdominal abscesses. Am J Surg. Jan 1990;159(1):167-71.

By using CT images, abscess cavities can be accurately identified and delineated, allowing for secure percutaneous drainage. The criteria for removal of percutaneous drainage are improvement in sepsis symptoms, little drainage from the catheter, and clearance of the abscess cavity as shown by ultrasonography or CT scan. Patients who have had many operations, are above the age of 60, have co-morbidities such as hypertension, diabetes mellitus, malnutrition, multiple organ failure, or have complex, recurring, or chronic abscesses are at a higher risk for complications and death..[1,46]

Eberhardt JM, Kiran RP, Lavery IC. The impact of anastomotic leak and intra-abdominal abscess on cancer-related outcomes after resection for colorectal cancer: a case control study. Dis Colon Rectum 2009; 52(3):380-6

Lo RH, Yu SC, Kan PS. Percutaneous needle aspiration in the treatment of hepatic abscess: factors influencing patient's outcome. Ann Acad Med Singapore.1998;27(2):173-7.

This research was conducted to see how well ultrasonography and CT guided tube drainage worked for draining intra-abdominal abscesses. The goal was to learn what bacteria were responsible for the abdominal abscesses.

The research took place at Dr. Prabhakar Kore Hospital and Medical Research Centre (KAHER), Belagavi, and lasted for a full calendar year..

Demographic characteristics:

Age:

The average age in this analysis was 51.8 18.6 years. The oldest participants in the study, at 26.7%, were those older than 65, while the youngest participants were between the ages of 36 and 50 (30.0%). About 5.0% of cases occurred in the under-20 group. subjects' ages ranged from 19 to 88 in this analysis.

Five hundred and twenty-nine patients were studied over the course of three years by Cinat ME, Wilson SE, and Din AM at the Department of Surgery, University of California, Irvine Medical Centre, Orange. Of these, 96 received percutaneous drainage (PCD). The average participant age was 48.17 years old..

Cinat ME, Wilson SE, Din AM. Determinants for successful percutaneous image-guided drainage of intra-abdominal abscess. Archives of Surgery. 2002 Jul 1;137(7):845-9.

The years 2015 and 2016 saw a similar study conducted at India's Saveetha Medical College and Hospital in Chennai. An observed total of 102 patients was recorded. The age range was fairly comparable to that of the current study, spanning from 16 to 72 years.

Anbumani S, Soundarapandian A. A study of ultrasound and CT guided therapeutic drainage of intra-abdominal collections and abscesses. Int J Contemp Med Surg Radiol. 2018;3:3.

Sex:

The research revealed a total of 60 occurrences. There were a total of 60 people, 50 (or 83.3% men) and 10 (or 16.7% females).

There were 90 patients included in the 2013-2014 prospective study by Wani RA, Digra NC, and Gupta K at the Department of General Surgery, Government Medical College, Jammu, India (75 male and 15 female).

Wani RA, Digra NC, Gupta K. Image-guided percutaneous drainage of intra abdominal fluid collections and abscesses: a hospital based prospective study. World J Surg Surgical Res.2020;3:1219.

Gerzof SG et al. also conducted a study along these lines, and they found that 23 patients participated. There were a total of 25 people, 18 males and 5 females.

Gerzof SG, Robbins AH, Birkett DH, Johnson WC, Pugatch RD, Vincent ME. Percutaneous catheter drainage of abdominal abscesses guided by ultrasound and computed tomography. American Journal of Roentgenology. 1979 Jul 1;133(1):1-8.

Factors influencing the abscesses:

Location of Abscesses:

The latest research confirmed that abscesses can develop everywhere in the human body. The most prevalent location for an abscess was the liver (31.7%), followed by the pancreas (21.7%), and finally the appendix (11.7%). Abscesses on the spleen (5.0%), kidney (5.0%), and iliac fossa (1.7%) were the least prevalent.

Wani RA, Digra NC, and Gupta K observed that hepatic abscesses accounted for 64% of all intra-abdominal abscesses, followed by post-operative collections

(17%), pancreatic pseudocyst/collections (8%), gall bladder perforation with localised collections (3%), Appendicular abscess (3%), and others (5%). The results were very comparable to those of the present investigation..

Wani RA, Digra NC, Gupta K. Image-guided percutaneous drainage of intra abdominal fluid collections and abscesses: a hospital based prospective study. World J Surg Surgical Res.2020;3:1219.

Four subphrenic, four pancreatic, five intrarenal, three retroperitoneal, two intrahepatic, one subhepatic, two mid-abdominal, two perirenal transplant, and one interloop abscesses were found in the study by Gerzof SG et al. Sixteen (67%) of these abscesses developed after surgery..

Gerzof SG, Robbins AH, Birkett DH, Johnson WC, Pugatch RD, Vincent ME. Percutaneous catheter drainage of abdominal abscesses guided by ultrasound and computed tomography. American Journal of Roentgenology. 1979 Jul 1;133(1):1-8.

Abcesses were most commonly identified in the colon and rectum (28%), the liver and biliary tree (21%), and the appendix (20%), according to a multi-center study conducted at the University of California, Irvine Medical Centre in Orange by Cinat ME, Wilson SE, and Din AM. Similar to the current study, it was found that renal (1%), stomach, and duodenal (6%).

Cinat ME, Wilson SE, Din AM. Determinants for successful percutaneous image-guided drainage of intra-abdominal abscess. Archives of Surgery. 2002 Jul 1;137(7):845-9.

Similarly, a study by Anbumani S. and Soundarapandian Completed between 2015 and 2016, an at Saveetha Medical College and Hospital in Chennai, India. The

majority of abscesses are found in the liver (intrahepatic), as has been reported (32 of 102). Similarly, renal abscess was found to be uncommon in this study's comparable instances (4 of 60).

Anbumani S, Soundarapandian A. A study of ultrasound and CT guided therapeutic drainage of intra-abdominal collections and abscesses. Int J Contemp Med Surg Radiol. 2018;3:3.

Hospital Stay:

The mean length of hospitalisation in this analysis was 10.07.8 days. The minimum stay was two days, and the maximum was forty. Fifty percent of the patients stayed in the hospital for up to seven days. The median length of hospital stay was determined to be 8 days, with 28.3% of patients spending between 8 and 14 days there. Of those who stayed longer than 21 days, just 6.7% stayed for more than 30 days, with some cases even reaching over 40 days. The average length of hospitalisation for patients with hepatic abscess was found to be 7.9 5.2 days". The average length of hospitalisation for patients who underwent pancreatic collection was reported to be 16.610.8 days.

The average length of hospitalisation in this study was 8.6 days, which is consistent with the findings of a study by Wani RA, Digra NC, and Gupta K. The average length of hospitalisation for hepatic abscess was 7.5 days, and for postoperative collection it was 8.5 days. Pancreatic collection was associated with a lengthier hospital stay (12 days average stay).

Wani RA, Digra NC, Gupta K. Image-guided percutaneous drainage of intra abdominal fluid collections and abscesses: a hospital based prospective study. World J Surg Surgical Res.2020;3:1219.

The average period of follow-up in a multi-center study conducted by Cinat ME, Wilson SE, and Din AM of the Department of Surgery at the University of California, Irvine Medical Center, Orange, was 40.320.0 days. The survey indicated that the average length of a hospital admission was 8.3 days, with a maximum of 130.6 days.

Cinat ME, Wilson SE, Din AM. Determinants for successful percutaneous image-guided drainage of intra-abdominal abscess. Archives of Surgery. 2002 Jul 1;137(7):845-9.

Culture detected in the sample:

Approximately half (51.7%) of the samples tested positive for microbial growth in culture, while nearly half (48.3%) did not. Microorganisms were cultured from 51.7% of the cases, and they were found to be diverse. As a result, it was discovered that Escherichia coli accounted for 45.2% of the confirmed cases. Enterobacter faecalis and Klebsiella pneumoniae were each found in 12.9% of the patients. The percentages for the other common microorganisms, Entamoeba histolytica and Klebsiella oxytoca, were 9.7 and 9.7 percent, respectively. Streptococcus pneumoniae (6.5%) and Mycobacterium tuberculosis (3.2%).

The researchers Wani RA, Digra NC, and Gupta K found that only 18 out of 90 cases (20%) had microbial isolates. Escherichia coli was determined to be the most common (18/18), followed by Klebsiella spp.

Wani RA, Digra NC, Gupta K. Image-guided percutaneous drainage of intra abdominal fluid collections and abscesses: a hospital based prospective study. World J Surg Surgical Res.2020;3:1219.

The current study is different from a multi-center study conducted by Cinat ME, Wilson SE, and Din AM from the Department of Surgery at the University of California, Irvine Medical Center in Orange. Whereas, Streptococcus spp. (14%) came in third, behind Escherichia coli (17%) and Bacteroides spp. Although Escherichia coli was discovered to be in the majority, other micro-organisms isolated were not identical to those in the current investigation. The least common isolates were Enterobacoter spp (4%) and Klebsiella spp (6%).

Cinat ME, Wilson SE, Din AM. Determinants for successful percutaneous image-guided drainage of intra-abdominal abscess. Archives of Surgery. 2002 Jul 1;137(7):845-9.

Outcome:

The current study found that, overall, 58.3% of instances showed collection and 41.7% did not have any collection at all on the initial try. In those instances, it was considered to have a positive outcome. After a month of monitoring the 58.3% of cases when in-collections were made, researchers found that 85.7% of those cases had improved, whereas 14.3% had failed and 1 death had occurred. With 55 out of 60 cases improving, this study has a 91.7% success rate. Additionally, it was revealed that 19 out of 60 cases of hepatic abscess were drained successfully. An abscess can be drained with a 61.53% success rate using a pancreatic collection.

Wani RA, Digra NC, and Gupta K discovered a success rate of 76% in their research population. Fifty-five out of 58 cases of hepatic abscess were reportedly drained satisfactorily. After 15 collections, 13 were considered successful.

Wani RA, Digra NC, Gupta K. Image-guided percutaneous drainage of intra abdominal fluid collections and abscesses: a hospital based prospective study. World J Surg Surgical Res.2020;3:1219.

Success rates for percutaneous draining ranged from 70% after one effort to 82% after two attempts and 84% after three attempts, according to a multi-center study conducted by Cinat ME, Wilson SE, and Din AM at the Department of Surgery, University of California, Irvine Medical Centre, Orange. It was shown that drainage was successful in 90% of post-operative abscesses. Ninety-five percent of appendicular abscesses were drained successfully, while 85% of those in the liver or biliary tract were. Similar to another study, this one found that 15% of PCD cases were unsuccessful.

Cinat ME, Wilson SE, Din AM. Determinants for successful percutaneous image-guided drainage of intra-abdominal abscess. Archives of Surgery. 2002 Jul 1;137(7):845-9.

In 2015 and 2016, researchers at Saveetha Medical College and Hospital in Chennai, India, found that draining of abscesses had an 84.3% success rate. The study found a failure rate of 11.7 percent, while the present study found a rate of 8.3 percent. Similar to the current study, which also showed a 100% success rate in the drainage of the abscess collection in the liver, spleen, and kidney, it was noticed that there was 100% successful drainage of hepatic abscess, splenic abscess, and renal abscess.

Anbumani S, Soundarapandian A. A study of ultrasound and CT guided therapeutic drainage of intra-abdominal collections and abscesses. Int J Contemp Med Surg Radiol. 2018;3:3.

Duration of drainage:

Based on the results of the current investigation, it was determined that the median time for catheter drainage was 11.37.3 days. Only 2% (or 2 of 60) of patients were treated with VARD. The study indicated that drainage should last at least 4 days and could last as long as 30 days. When draining a hepatic abscess, patients typically waited 10.3 6.3 days.

Mean catheter days were 18.9 days, which is consistent with a study by Wani RA, Digra NC, and Gupta K. Catheterization for hepatic abscess typically lasted for 15.5 days. Peri-pancreatic collection required a longer time period of catheterization, specifically 26 days. In the current investigation, draining the peri-pancreatic collection took 16.58.2 days.

Wani RA, Digra NC, Gupta K. Image-guided percutaneous drainage of intra abdominal fluid collections and abscesses: a hospital based prospective study. World J Surg Surgical Res.2020;3:1219.

Similar results were found in a study by Willard CJ et al. from the Department of Surgery and Radiology at the Boston Veterans Administration Medical Centre and Tufts University School of Medicine in Boston, Massachusetts, who reported a mean duration of catheter drainage of 17 days in PCD. Similar to the current study, previous research found that the average time it took to drain an abscess with PCD was 20 days

for post-operative abscess, 17 days for peritransplants, 6 days for psoas abscess, and 28 days for splenic abscess.

Johnson WC, Gerzof SG, Robbins AH, Nabseth DC. Treatment of abdominal abscesses: comparative evaluation of operative drainage versus percutaneous catheter drainage guided by computed tomography or ultrasound. Annals of Surgery. 1981 Oct;194(4):510.

It was discovered that the average time for catheter implantation in draining abscesses was 14 days, which is consistent with a previous study by Gerzof SG et al. This study confirmed the previously cited study's findings on the range required for abscess drainage. Subphrenic abscesses heal in 5–17 days, hepatic abscesses heal in 12–14 days, renal abscesses heal in 9–12 days, pancreatic pseudocysts heal in 5–19 days, and retroperitoneal abscesses heal in 6–28 days. The results of the present investigation were found to be very comparable in the situations that were taken into account.

Gerzof SG, Robbins AH, Birkett DH, Johnson WC, Pugatch RD, Vincent ME. Percutaneous catheter drainage of abdominal abscesses guided by ultrasound and computed tomography. American Journal of Roentgenology. 1979 Jul 1;133(1):1-8.

CONCLUSION

To drain intra-abdominal abscesses and fluid collections, the Usg/ct guided percutaneous procedure is a straightforward, cost-effective, and less traumatic method. One more benefit is a reduced risk of complications and a shorter length of hospital stay. It's the sole option for terminally ill individuals because it doesn't involve the dangers of general anaesthesia. Liver abscesses are typically cured by PCD in addition to appropriate antibiotic treatment. It is exceedingly unfavourable to submit patients with post-operative abdominal collection due to index surgery to yet another operation to remove the collection. Present-day draining (PCD) has become the standard technique for emptying such repositories. Additionally, it is becoming clear that PCD can assist stabilise individuals with symptomatic large pancreatic pseudocysts and acute fluid collections due to acute pancreatitis. The same holds true for appendicular abscess and a ruptured gall bladder with localised collection. Eventually, definitive care may be provided under these conditions. Ultrasound guidance is commonly used since it is accessible, inexpensive, and poses no radiation risk during procedures. In light of these benefits, ultrasonography is an excellent method for post-drainage monitoring. Patients can be sent home immediately after surgery, with a draining catheter still in place, reducing their chance of contracting an infection and the overall cost of care..

SUMMARY

Surgeons frequently face the issue of an intraabdominal abscess. Drainage, both surgical and USG/CT guided, is a mainstay of treatment. Harmful accumulations of bacteria or other pathogens in the abdominal cavity can cause serious illness or even death. These disorders remain difficult to diagnose and treat despite significant progress. The present study was conducted in KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum attached to Jawaharlal Nehru Medical College, Belgaum. It is a cross sectional study done during period of January 2021 - December 2021.The aim is to assess the efficacy of percutaneous drainage of intra-abdominal abscesses treatment using ultrasound and CT guided tube drainage. It was found from the current study that, there were 83.3% males and 16.7% females. 37 out of 60 patients had co-morbidities, 51.7% had diabetes mellitus, 25% had hypertension, 8.3% were with ischemic heart diseases and 1.7% each had COPD and HIV. Hepatic abscess was the most common site of abscess (31.7%), followed by pancreatic abscess (21.7%) and appendicular abscess (11.7%) as the 3rd most common site of abscesses. Majority of the patients stayed in the hospital upto 7 days (50.0%).there was success rate at 91.7% with 41.7% as nil in drain collection of intra-abdominal abscesses. 50% cases showed improvement in the collection of drain wherein there was reduction in the collection.8.3% was the failure rate that was observed in the current study.

To drain intra-abdominal abscesses and fluid collections, the Usg/ct guided percutaneous procedure is a straightforward, cost-effective, and less traumatic method. Others are reduced risk of complications and a shorter length of hospital stay. It's the sole option for terminally ill individuals because it doesn't involve the dangers of general anaesthesia. Ultrasound guidance is commonly used since it is accessible,

inexpensive, and poses no radiation risk during procedures. In light of these benefits, ultrasonography is an excellent method for post-drainage monitoring. Patients can be sent home immediately after surgery, with a draining catheter still in place, reducing their chance of contracting an infection and the overall cost of care.

BIBLIOGRAPHY

1. Altemeier WA, Culbertson WR, Fullen WD, Shook CD. Intra-abdominal abscesses. Am J Surg. 1973 Jan;125(1):70–9.

2. Anbumani S, Soundarapandian A. A study of ultrasound and CT guided therapeutic drainage of intra-abdominal collections and abscesses. Int J Contemp Med Surg Radiol. 2018;3(3):126–30.

3. Wani R, Digra N, Gupta K. Image-Guided Percutaneous Drainage of Intra Abdominal Fluid Collections and Abscesses: A Hospital Based Prospective Study. World J Surg Surg Res. 2020;3:1219–22.

4. Sartelli M, Chichom-Mefire A, Labricciosa FM, Hardcastle T, Abu-Zidan FM, Adesunkanmi AK, et al. The management of intra-abdominal infections from a global perspective: 2017 WSES guidelines for management of intra-abdominal infections. World J Emerg Surg. 2017;12:29.

5. Mehta NY, Copelin II EL. Abdominal abscess. StatPearls Publishing. StatPearls Publishing; 2021. p. 1–16.

6. Flynn W, Vickerton P. Anatomy, Abdomen and Pelvis, Abdominal Wall. 2019;

7. Seeras K, Qasawa RN, Ju R, Prakash S. Anatomy, Abdomen and Pelvis, Anterolateral Abdominal Wall. In Treasure Island (FL); 2022.

8. Sadler TW, Feldkamp ML. The embryology of body wall closure: relevance to gastroschisis and other ventral body wall defects. Am J Med Genet C Semin Med Genet. 2008;148C(3):180–5.

9. Chaudhry S, Luskin V, Panuganti K. Anatomy, Abdomen and pelvis, spleen. Treasure Island: StatPearls Publishing; 2020.

10. Tirkes T, Sandrasegaran K, Patel AA, Hollar MA, Tejada JG, Tann M, et al. Peritoneal and Retroperitoneal Anatomy and Its Relevance for Cross-Sectional Imaging. RadioGraphics. 2012;32(2):437–51.

11. Tsai H-C, Yoshida T, Chuang T-Y, Yang S-F, Chang C-C, Yao H-Y, et al. Transversus Abdominis Plane Block: An Updated Review of Anatomy and Techniques. Biomed Res Int. 2017;2017:8284363.

12. Tuuli MG, Rampersad RM, Carbone JF, Stamilio D, Macones GA, Odibo AO. Staples compared with subcuticular suture for skin closure after cesarean delivery: a systematic review and meta-analysis. Obstet Gynecol. 2011;117(3):682–90.

13. Nuthalapaty FS, Kuper SG, Higdon III HL. Staples compared with subcuticular suture for skin closure after cesarean delivery: a systematic review and meta-analysis. Obstet Gynecol. 2011;118(1):166–7.

14. Serraino C, Elia C, Bracco C, Rinaldi G, Pomero F, Silvestri A, et al. Characteristics and management of pyogenic liver abscess: A European experience. Medicine (Baltimore). 2018 May;97(19):e0628.

15. Sarychev LP, Sarychev Y V, Pustovoyt HL, Sukhomlin SA, Suprunenko SM. Management of the patients with blunt renal trauma: 20 years of clinical experience. Wiad Lek. 2018;71(3 pt 2):719–22.

16. Son D-J, Hong J-Y, Kim K-H, Jeong Y-H, Myung D-S, Cho S-B, et al. Liver abscess caused by Clostridium haemolyticum infection after transarterial chemoembolization for hepatocellular carcinoma: A case report. Medicine (Baltimore). 2018 May;97(19):e0688.

17. Cirocchi R, Afshar S, Shaban F, Nascimbeni R, Vettoretto N, Di Saverio S, et al. Perforated sigmoid diverticulitis: Hartmann's procedure or resection with primary anastomosis-a systematic review and meta-analysis of randomised control trials. Tech Coloproctol. 2018 Oct;22(10):743–53.

18. Guizzetti L, Zou G, Khanna R, Dulai PS, Sandborn WJ, Jairath V, et al. Development of Clinical Prediction Models for Surgery and Complications in Crohn's Disease. J Crohns Colitis. 2018 Jan;12(2):167–77.

19. Zens TJ, Rogers AP, Riedesel EL, Leys CM, Ostlie DJ, Woods MA, et al. The cost effectiveness and utility of a "quick MRI" for the evaluation of intra-abdominal abscess after acute appendicitis in the pediatric patient population. J Pediatr Surg. 2018 Jun;53(6):1168–74.

20. Li P-H, Tee Y-S, Fu C-Y, Liao C-H, Wang S-Y, Hsu Y-P, et al. The Role of Noncontrast CT in the Evaluation of Surgical Abdomen Patients. Am Surg. 2018 Jun;84(6):1015–21.

21. Bakopoulos A, Tsilimigras DI, Syriga M, Koliakos N, Ntomi V, Moris D, et al. Diverticulitis of the transverse colon manifesting as colocutaneous fistula. Ann R Coll Surg Engl. 2018 Aug;100(8):e1–3.

22. Yoshioka T, Kondo Y, Fujiwara T. Successful wound treatment using negative pressure wound therapy without primary closure in a patient undergoing highly contaminated abdominal surgery. Surg case reports. 2018 Aug;4(1):85.

23. Chen C-Y, Lin M-J, Yang W-C, Chang Y-J, Gao F-X, Wu H-P. Clinical spectrum of intra-abdominal abscesses in children admitted to the pediatric emergency department. J Microbiol Immunol Infect. 2020 Apr;53(2):283–91.

24. Gerzof SG, Robbins AH, Birkett DH, Johnson WC, Pugatch RD, Vincent ME. Percutaneous catheter drainage of abdominal abscesses guided by ultrasound and computed tomography. Am J Roentgenol. 1979;133(1):1–8.

25. Civardi G, Di Candio G, Giorgio A, Goletti O, Ceragioli T, Filice C, et al. Ultrasound guided percutaneous drainage of abdominal abscesses in the hands of the clinician: a multicenter Italian study. Eur J ultrasound. 1998;8(2):91–9.

26. Saleem M, Ahmad N, Ahsan I. Ultrasound guided percutaneous drainage of abdominal abscesses. JOURNAL-PAKISTAN Med Assoc. 2000;50(2):50–3.

27. Betsch A, Wiskirchen J, Trübenbach J, Manncke KH, Belka C, Claussen CD, et al. CT-guided percutaneous drainage of intra-abdominal abscesses: APACHE III score stratification of 1-year results. Eur Radiol. 2002;12(12):2883–9.

28. Kumar RR, Kim JT, Haukoos JS, Macias LH, Dixon MR, Stamos MJ, et al. Factors affecting the successful management of intra-abdominal abscesses with antibiotics and the need for percutaneous drainage. Dis colon rectum. 2006;49(2):183–9.

29. Azzarello G, Lanteri R, Rapisarda C, Santangelo M, Racalbuto A, Minutolo V, et al. Ultrasound-guided percutaneous treatment of abdominal collections. Chir Ital. 2009;61(3):337–40.

30. Laganà D, Carrafiello G, Mangini M, Ianniello A, Giorgianni A, Nicotera P, et al. Image-guided percutaneous treatment of abdominal-pelvic abscesses: a 5-year experience. Radiol Med. 2008;113(7):999–1007.

31. Singh S, Chaudhary P, Saxena N, Khandelwal S, Poddar DD, Biswal UC. Treatment of liver abscess: prospective randomized comparison of catheter drainage and needle aspiration. Ann Gastroenterol Q Publ Hell Soc Gastroenterol. 2013;26(4):332–4.

32. Surya M, Bhoil R, Sharma YP. Study of ultrasound-guided needle aspiration and catheter drainage in the management of liver abscesses. J Ultrasound. 2020;23(4):553–62.

33. Donatelli G, Cereatti F, Fazi M, Ceci V, Dhumane P. Endoscopic ultrasound-guided drainage of intra-abdominal diverticular abscess. A case series. J Minim Access Surg. 2021;17(4):513–7.

ANNEXURE – I - CONSENT STATEMENT

I, Mr/Ms/Mrs. _____ voluntarily agree for the participation as a subject of study. By signing this consent form, I am not giving up any of my legal rights. I may withdraw from the study anytime. I am signing the consent form after having read or been read for me in my vernacular language, including the risks and the benefits and having all my questions answered.

Participant Name : _____

Signature or Left Thumb Print of Participant : _____

Name of legally authorized person: : _____

Signature or Left thumb print of legally authorized person:_____

Witness Name: _____ Signature: _____

Investigators Name: _____ Signature: _____

Date: _____ Place: _____

ANNEXURE – II - PROFORMA / QUESTIONNAIRE TO BE USED FOR DATA COLLECTION:

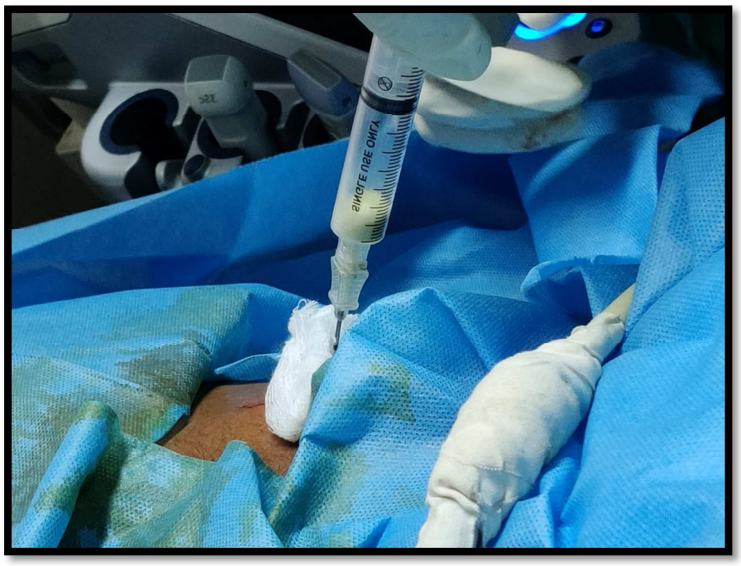
CASE NO:	
NAME:	
AGE:	
SEX:	
ADDRESS:	
IP NO:	
UNIT/WARD:	
DATE OF ADMISSION:	
DATE OF DISCHARGE:	
CHIEF COMPLAINTS:	
PAST HISTORY:	
PERSONAL HISTORY:	
TREATMENT HISTORY:	
ABDOMINAL EXAMINATION: • INSPECTION • PALPATION • PERCUSSION • AUSCULTATION	
PER RECTAL EXAMINATION:	
CLINICAL DIAGNOSIS:	
INVESTIGATIONS: 1. CBC	

2. RBS 3. MR 4. LFT 5. PT-INR/aPTT 6. Chest X-ray (SOS) 7. ERECT ABDOMEN X-RAY (SOS) 8. USG ABDOMEN 9. CT Abdomen & Pelvis • Location of the abscess and extension • Size of abscess • Single/Multiple • Contents 10. Pus Culture and Sensitivity 11. Others	
ADMISSION TO DISCHARGE TIME:	
FOLLOW UP: CT/USG (POST PROCEDURE) Size of the abscess :	

ANNEXURE – III - PHOTOGRAPHS

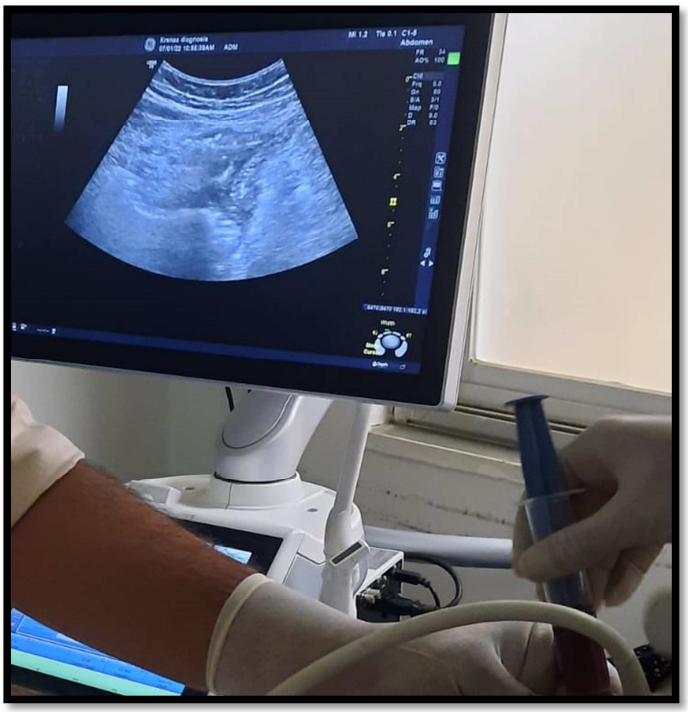
Photograph 1: Percutaneous drainage trocar with catheter

Photograph 2: Right lumbar abscess



Photograph 3: usg guided aspiration of postop biliary collection in right hypopchondrium.

Photograph 4: Postop biliary collection.



Photograph 5: Appendicular abscess.

ANNEXURE – IV - MASTER CHART

Case no.	sex	age	Age Coded	Comorbidities	Co-morbidities	COPD	DM2	HTN	IHD	HIV	Abscess site	Location of Abscess	Sr.creat	TLC	SBP	DBP	Hospital stay	Hospital Stay Coded	Place of procedure	Post USG drainage Coded	usg/ct guided	Culture Coded	Drug Sensitivity	D1 Drain	D2 Drain	D3 Drain	M1 Drain	Drain removal groups	Drain removal
1	1	65	4	DM type2	1	0	1	0	0	0	left lobe of liver	4	1.90	25000.00	90.00	60.00	4	1	2	0	2	2	1	28	16	7	0	1	7
2	1	62	4	NO	0	0	0	0	0	0	pelvic	6	1.50	13000.00	120.00	80.00	4	1	2	1	2	0	1	27	16	9	0	1	7
3	1	65	4	HTN	1	0	0	1	0	0	gall bladder perforation	4	1.00	11000.00	130.00	80.00	5	1	2	0	2	0	2	27	15	5	0	1	5
4	1	39	3	no	0	0	0	0	0	0	right lobe of liver	4	0.80	140000.00	100.00	60.00	4	1	2	0	2	0	3	30	17	6	0	1	4
5	1	54	4	DM type2,IHD	1	0	1	0	1	0	right iliac fossa collection	9	1.30	15000.00	80.00	60.00	10	2	1	0	1	1	1	33	15	9.8	0	2	10
6	1	26	2	NO	0	0	0	0	0	0	gall bladder perforation	4	1.20	10000.00	120.00	80.00	4	1	2	1	2	5	1	31	18	7	0.5	1	6
7	1	62	4	DM type2	1	0	1	0	0	0	perinephric abscess	7	1.20	11000.00	140.00	90.00	7	1	1	1	1	1	6	34	15	9	0	1	7
8	1	28	2	nil	0	0	0	0	0	0	right lobe of liver	4	1.60	15000.00	100.00	60.00	3	1	2	0	2	1	8	31	13	9	0	2	10
9	1	86	5	DM type2,HTN	1	0	1	1	0	0	gall bladder perforation	4	1.70	16000.00	100.00	60.00	5	1	2	0	2	5	8	30	14.9	6	0	2	10
10	1	77	5	DM type2	1	0	1	0	0	0	gall bladder perforation	4	0.90	23000.00	80.00	60.00	5	1	2	0	2	1	5	32	14.2	9	0	2	10
11	1	72	5	COPD	1	1	0	0	0	0	duodenal perforation	3	0.80	18000.00	90.00	60.00	30	4	2	1	2	5	3	36.2	18.7	10	2	4	30
12	1	19	1	nil	0	0	0	0	0	0	pancreatic psuedocyst	5	0.80	18000.00	100.00	60.00	10	2	2	1	2	0	8	29	17.4	5.2	0	3	20
13	1	42	3	DM type2,HTN	1	0	1	1	0	0	acalculus cholecystitis	1	0.79	11300.00	100.00	60.00	5	1	2	1	2	4	5	37	14	8	0	1	5
14	1	46	3	DM type2	1	0	1	0	0	0	perpancreatic collection	5	1.27	12000.00	160.00	100.00	6	1	2	1	2	0	2	24	16	10	0	3	15
15	1	49	3	no	0	0	0	0	0	0	appendicular abscess	2	1.08	12600.00	100.00	60.00	5	1	1	1	2	1	1	34	10.9	6	0	2	10
16	1	40	3	NO	0	0	0	0	0	0	left lobe of liver	4	0.90	7300.00	120.00	80.00	2	1	2	0	2	1	7	30	15	6	0	1	7
17	2	34	2	no	0	0	0	0	0	0	post cholecystectomy with hepaticojejunostomy	4	0.60	10500.00	140.00	80.00	20	3	2	1	2	0	9	39.8	13.8	12	1	4	30
18	1	19	1	no	0	0	0	0	0	0	right lobe of liver	4	0.80	27000.00	100.00	60.00	4	1	2	1	2	0	6	29	12	7	0	1	7
19	1	48	3	no	0	0	0	0	0	0	post surgery lap cholecystectomy	3	1.20	8800.00	130.00	80.00	4	1	1	0	1	0	9	27	10	9	1	1	6
20	1	49	3	no	0	0	0	0	0	0	appendicular abscess	2	1.80	12600.00	130.00	80.00	5	1	2	0	2	0	9	30	14	5	0	1	5
21	1	66	5	NO	0	0	0	0	0	0	gall bladder perforation	4	2.00	15000.00	90.00	60.00	15	3	2	1	2	1	8	36	29	17	0.5	3	20
22	2	45	3	DM type2	1	0	1	0	0	0	left lobe of liver	4	1.80	17200.00	80.00	60.00	10	2	2	1	2	1	6	29	18	7.2	0	2	10
23	1	28	2	no	0	0	0	0	0	0	right lobe of liver	4	0.72	15600.00	120.00	80.00	5	1	2	1	2	0	3	29	14	6	0	1	5
24	1	87	5	DM type2	1	0	1	0	0	0	perpancreatic collection	5	1.20	6500.00	130.00	80.00	8	2	1	0	1	0	8	29	8	5.4	0	2	8
25	1	29	2	NO	0	0	0	0	0	0	acute necrotising pancreatitis	5	1.34	4600.00	90.00	60.00	20	3	2	2	2	4	8	29	20	10	0	3	21
26	1	19	1	NO	0	0	0	0	0	0	appendicular abscess	2	0.48	20400.00	90.00	60.00	7	1	1	1	2	1	8	32	18	7	0	1	7
27	1	36	3	HIV POSITIVE	1	0	0	0	0	1	pelvic	6	1.10	12000.00	130.00	80.00	2	1	2	1	2	6	6	20	12	10	0	3	15
28	1	77	5	DM type2	1	0	1	0	0	0	acalculus cholecystitis	1	0.90	23000.00	100.00	60.00	5	1	2	0	2	0	9	29	12	5	0	1	5
29	1	69	5	DM type2	1	0	1	0	0	0	postanastamotic leak right lumbar	8	0.80	18000.00	100.00	60.00	20	3	2	1	2	1	1	38.2	24	12	0	3	20
30	1	28	2	DM type2	1	0	1	0	0	0	acute necrotising pancreatitis	5	1.80	18000.00	120.00	80.00	30	4	2	2	2	1	5	36.9	25.5	20.2	10.4	0	underwent VARD
31	1	27	2	no	0	0	0	0	0	0	perpancreatic collection	5	0.90	9000.00	120.00	80.00	15	3	2	0	2	7	4	32	22	10	1	3	15
32	1	29	2	NO	0	0	0	0	0	0	perpancreatic collection	5	0.80	11000.00	110.00	70.00	30	4	2	2	2	0	5	35.9	12.7	10	1	4	30
33	2	60	4	DM type2	1	0	1	0	0	0	Calculous cholecystitis	1	2.00	15000.00	70.00	90.00	10	2	2	1	2	1	1	32.4	10.8	15	0	4	30
34	2	42	3	DM type2	1	0	1	0	0	0	appendicular abscess	2	1.20	11000.00	120.00	80.00	5	1	2	1	2	7	4	34	17	9	0	1	6
35	1	50	3	DM type2,HTN	1	0	1	1	0	0	acute necrotising pancreatitis	5	1.40	12000.00	110.00	80.00	20	3	2	2	2	3	1	37.9	18.7	10	1	4	30
36	1	45	3	NO	0	0	0	0	0	0	perpancreatic collection	5	1.20	11000.00	130.00	80.00	10	2	2	1	2	0	9	28	19.2	3.1	0	3	15
37	1	60	4	DM type2,IHD	1	0	1	0	1	0	gall bladder perforation	4	1.80	15000.00	90.00	60.00	15	3	1	1	2	1	6	29	18	12	0.5	3	15
38	2	55	4	DM type2	1	0	1	0	0	0	appendicular abscess	2	1.20	13000.00	130.00	80.00	5	1	1	0	1	3	5	33	19	9	1	1	5
39	1	48	3	HTN	1	0	0	1	0	0	postanastamotic leak pelvic collection	6	1.60	10000.00	130.00	80.00	10	2	1	1	1	4	6	32	13.6	6.7	1	2	10
40	1	47	3	DM type2	1	0	1	0	0	0	right lobe of liver	4	1.80	12000.00	110.00	80.00	10	2	2	1	2	2	5	25	18	9.7	0	2	10
41	1	41	3	DM type2,HTN	1	0	1	1	0	0	appendicular abscess	2	1.90	20000.00	80.00	60.00	20	3	2	1	2	0	6	31	24	9.7	0	3	20
42	2	52	4	DM type2,HTN	1	0	1	1	0	0	gall bladder perforation	4	0.80	14000.00	100.00	60.00	15	3	2	0	2	0	8	36	20	11.4	1	3	15
43	1	62	4	DM type2	1	0	1	0	0	0	splenic abscess	10	1.20	17000.00	120.00	80.00	10	2	2	0	2	5	2	31	12	7.7	0	2	10
44	1	66	5	DM type2,HTN,IHD	1	0	1	1	1	0	perpancreatic collection	5	1.70	21000.00	90.00	60.00	12	2	2	1	2	0	1	32	9	5	0	2	12
45	1	68	5	DM type2,HTN	1	0	1	1	0	0	left lobe of liver	4	1.60	18000.00	80.00	60.00	6	1	2	0	2	0	2	30	17	7	0	1	6
46	1	70	5	DM type2,HTN,IHD	1	0	1	1	1	0	perinephric abscess	7	1.40	15000.00	90.00	60.00	8	2	2	0	2	1	1	30	8	4.9	0	2	8
47	2	65	4	DM type2	1	0	1	0	0	0	right lobe of liver	4	1.80	16000.00	110.00	70.00	7	1	2	1	2	2	5	29	19	6	0	1	7
48	1	46	3	NO	0	0	0	0	0	0	acute necrotising pancreatitis	5	0.60	7000.00	140.00	80.00	40	4	2	2	2	3	7	38.7	29.2	19.9	11.9	0	underwent VARD
59	1	38	3	NO	0	0	0	0	0	0	perpancreatic collection	5	0.40	6000.00	130.00	80.00	10	2	2	0	2	0	9	30	12	8.2	0	2	10
50	1	29	2	NO	0	0	0	0	0	0	left lobe of liver	4	0.60	5500.00	120.00	80.00	12	2	2	0	2	0	8	30	16	7.7	0.5	2	12
51	1	30	2	NO	0	0	0	0	0	0	splenic abscess	10	0.80	9300.00	110.00	80.00	6	1	2	1	2	0	9	29	10	6	0	1	6
52	2	72	5	DM type2,HTN	1	0	1	1	0	0	Calculous cholecystitis	1	1.60	11500.00	120.00	80.00	10	2	2	0	2	0	9	26	14.7	9.2	1	2	10
53	1	77	5	DM type2	1	0	1	0	0	0	perpancreatic collection	5	2.00	16000.00	90.00	60.00	5	1	2	1	2	0	6	32	10	5	0	1	5
54	1	80	5	HTN	1	0	0	1	0	0	acalculus cholecystitis	1	1.80	12000.00	120.00	80.00	5	1	2	0	2	0	9	34	12	9	1	1	5
55	1	88	5	DM type2,HTN,IHD	1	0	1	1	1	0	Splenic abscess	10	2.30	17000.00	130.00	80.00	9	2	2	0	2	0	3	32	10.2	6.7	0	2	9
56	1	71	5	HTN	1	0	0	1	0	0	postanastamotic leak right lumbar	8	1.00	23000.00	100.00	60.00	9	2	2	0	2	0	8	30	9.7	6	0	2	9
57	2	52	4	DM type2	1	0	1	0	0	0	acalculus cholecystitis	1	1.50	20000.00	90.00	60.00	4	1	2	1	2	0	9	29	14	6	0	1	4
58	1	38	3	NO	0	0	0	0	0	0	appendicular abscess	2	0.30	11000.00	130.00	80.00	4	1	1	1	2	0	2	31	10	5	0	1	4
59	1	63	4	DM type2,HTN	1	0	1	1	0	0	perinephric abscess	7	1.60	3000.00	100.00	60.00	10	2	2	0	2	0	3	34	9.2	7.9	0	2	10
60	2	70	5	DM type2	1	0	1	0	0	0	pelvic	6	1.80	9000.00	100.00	60.00	6	1	2	1	2	3	5	30	14	9	0.5	1	6