"PROSPECTIVE EVALUATION OF PLATELET PARAMETERS IN DIAGNOSIS OF ACUTE APPENDICITIS- ONE YEAR OBSERVATIONAL STUDY at KAHER'S DR. PRABHAKAR KORE CHARITABLE HOSPITAL AND MEDICAL RESEARCH CENTRE, BELAGAVI."

BY

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Smetgud 18/1/23

Dr. S.C. METGUD MS
Professor and Head
Department of General Surgery,
J. N. Medical College,
Belagavi

Date:
Place: Belagavi

Dr. N. S. MAHANTSHETTI, MD
Principal,
J. N. Medical College,
Belagavi

Date:
Place: Belagavi

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Reg. No. BH0120004,
Postgraduate Student,
2020-21 Batch,
Department of General Surgery,
J. N. Medical College, Belagavi.

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JAWAHARLAL NEHRU MEDICAL COLLEGE,
NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)
Website: http//www.jnmc.edu
E-Mail : dome@jnmc.edu
Phone: (+ 91-(0)831 Office : 2472550
Principal: 2471701
Fax No. +91 (0)831 – 2470759

Ref: MDC/DOME/ 105 **Date: 25/01/2021**

REG NO: BH0120004

PG student in Surgery,
J.N.Medical College,
BELAGAVI.

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(Dr. Smita Sonoli)
Member Secretary
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

(Dr. Harsha Hegde)
Chairman,
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

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LIST OF ABBREVIATIONS

AA- Acute Appendicitis

AGA- Acute Gangrenous Appendicitis

HBsAg – Hepatitis B Surface Antigen

HIV – Human Immunodeficiency Virus

H/O – History of

JNMC - Jawaharlal Nehru Medical College

KAHER – KLE Academy of Higher Education and Research

KLES – Karnataka Lingayat Education Society

MIS – Minimally Invasive Surgery

MPV- Mean Platelet Volume

mm – millimetre

PDW- Platelet Distribution Width

PR – Pulse Rate

PT – Prothrombin Time

RR – Respiratory Rate

SSI – Surgical Site Infection

Temp. – Temperature

TLC- Total Leukocyte Count

USG – Ultrasonography

CT- Computed tomography

CBC- Complete Blood Count

ABSTRACT

Background- Acute Appendicitis is on the commonest surgical conditions that present to the emergency department. Earlier the intervention, better is the outcome. 8% of those in western countries have appendicitis at a point of time during their lifetime, 10-30 years of age being the peak incidence. Various quick, low cost and easy laboratory parameters are being studied to identify complications of the appendicitis, such as C- reactive protein level, sr. bilirubin, pulse rate and period of symptoms and onset.

Aim- To evaluate the predictive value of mean platelet volume and platelet distribution width in determining the diagnosis/ complications/ severity of Acute Appendicitis.

Methodology- this study was conducted in department of general surgery, in KLE's Prabhakar kore's hospital and medical research centre. In this study 70 patients were included who presented with Acute Appendicitis and underwent Appendectomy for the period – January 2021 to December 2021. Routine MPV and PDW results of these patients were compared with normal laboratory reference values.

Results- around 34 out 59 patients with acute appendicitis had MPV values greater than 8.1 and 36 out of 59 patients with acute appendicitis has PDW value less than 12.2%, but these results were not statistically significant. When the values of MPV and PDW were compared between Acute appendicitis and complicated appendicitis, MPV and PDW were significantly higher in complicated appendicitis group

Conclusion- Although MPV and PDW values are not help in diagnosing Acute appendicitis when compared to imaging and total count values. But they can be used as a cheaper alternative to determine the severity of the Acute Appendicitis in early stages of presentation to hospital.

Keywords: - MPV, PDW, Acute appendicitis, platelet Parameters.

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INTRODUCTION

Acute Appendicitis is on the commonest surgical conditions that present to the emergency department. Appendicectomy is the most commonly performed emergency surgery either with laparoscopic or open methods. Earlier the intervention, better is the outcome. Around 8% of those in western countries have appendicitis at a point of time during their lifetime, 10-30 years of age being the peak incidence. [(1)]

Appendicitis usually presents with right lower quadrant pain which sometime is associated with fever, nausea, vomiting, McBurney point tenderness, rebound tenderness.[(2)] The major pathophysiology is obstruction of the lumen of the appendix either due to hyperplasia of submucosal lymphoid follicles or fecolith,

other causes being parasitic infections, foreign body, malignancy.[(3–5)] There is a rapid progression from acute appendicitis to perforation which occurs within days.[(6)] Therefore, early diagnosis is warranted to prevent such complications. The mortality rate of acute appendicitis is about 3% and for perforated appendix it reaches to 6%.[(7)] Certain imaging techniques for the diagnosis of appendicitis and its complications are ultrasonography, computed tomography. Though these investigations are highly sensitive and specific, there are certain limitation like cost, not readily available and radiation exposure.[(8)] These are also limited in certain scenarios like contrast nephropathy and allergy. Various quick, low cost and easy laboratory parameters are being studied to identify complications of the appendicitis, such as C- reactive protein level, sr. bilirubin, pulse rate and period of symptoms and onset.[(9)]

Platelets are cytoplasmic fragments of the megakaryocytes, with a diameter of 3-5 um and a volume of 4.5-11fl. A single megakaryocyte releases 1500-2000 platelets into blood stream.[(10)] Normal range of platelets in adults range from 150 to 450 x 10^9/l. (11)(12)Platelets play an important role in haemostasis and thrombosis,

recent evidences demonstrate that, it has a vital role in inflammatory process, host defence and wound healing.[13] A variable platelet pattern was found in malignant disease, renal failure and infection.[12] Mean platelet volume (MPV) and platelet distribution width (PDW) are the parameters of platelet in routine complete blood count test. MPV and PDW are being studied as inflammatory markers in gastrointestinal inflammatory diseases. MPV is an indicator of platelet activity and PDW is an indicator for variation in platelet size. MPV is reduced in acute gastro-intestinal inflammatory conditions due to sequestration of platelets by inflamed vascular segment of bowel.[14]

Studies have demonstrated alterations in MPV and PDW as an inflammatory marker in conditions like, sepsis, myeloproliferative diseases, massive haemorrhage, leukaemia, vasculitis and post splenectomy. Lalahruaitharanga and chawngtha vanlahula, concluded that MPV did not have higher sensitivity with TLC but PDW has higher sensitivity than MPV and also PDW level was found to be higher in complicated appendicitis[11], whereas studies by hossien najd et_al and akin aydogan et_al showed that MPV and PDW may be valuable marker to detect the risk of perforation and diagnosis of Acute Appendicitis.[15,16]

In our study, we have compared diagnostic value of TLC and all the platelet parameters wiz, MPV, PDW and platelet count. We also compared the sensitivity and specificity of imaging methods like USG and CT with that of platelet parameters. We have also studied the negative appendicectomy rates with use of MPV and PDW as diagnostic tool for appendicitis.

OBJECTIVES

To evaluate the predictive value of mean platelet volume and platelet distribution width in determining the diagnosis or complications or severity of Acute Appendicitis.

REVIEW OF LITERATURE

HISTORICAL BACKGROUND OF APPENDICITIS

The Appendix was first showed by Leonardo da Vinci in 1492, in his drawings and called it 'Orecchio'. The Appendix was never mentioned in any anatomical studies; as earlier anatomical studies were conducted in animal which did not have such organ within them. Giovanni Morgagni was the first person to described detailed anatomy of Appendix. Claudiaus Amyand, a French surgeon, who performed the first appendicectomy for the presence of a perforated appendix within the hernia sac. In 19th century Goldbeck described Suppurative Appendicitis as 'Perityphilitis'. In 1886, Reginald Fitz first used the term "APPENDICITIS" and described his findings in the meeting of Association of American Physician. He has described that the abscess formation in right iliac fossa was the sequel to appendicular perforation.[17,18]

In the year 1887, Thomos G Morton has performed the first successful removal of vermiform appendix in perforated appendix. Charles McBurney, described medial two-thirds and later one-thirds of spino-umbilical line as McBurney's point and also presented Gridiron incision to Chicago medical Society.[19]

DEVELOPMENT OF APPENDIX

Appendix is the terminal part of the embryonic caecum; it can be identified by the fact that it doesn't grow as quickly as the proximal caecum. Appendix appears at the 8th week of gestation, impelling forward from the apex of the caecum. As Caecum grows origin of the Appendix moves medially. After 12th week appears lobed, at 4th or 5th month villi are found, which disappears at birth.[18,20]

Abnormalities in Development

1. **Absence of the appendix-** it is because of sloughing of the appendix. Any diagnosis of agenesis needs visualization of bowel and abdominal cavity for mummified appendix.
2. **Ectopic appendix-** if the appendix is present in thorax, it is associated with malrotation and diaphragmatic defect. Appendix can also be found in posterior sacral wall and lumbar area.
3. **Left sided Appendix-** four conditions which results in left sided position of Appendix- 1. Situs inversus viscerum, 2. Non rotation of the intestine, 3. Ambulating caecum with long mesentery, 4. Lengthy Appendix
4. **Duplication of the appendix-** three types of the duplication has been described – 1. Double-barreled appendix, 2. Bird-type paired appendix, 3. Taenia coli type duplication
5. **Congenital Appendiceal diverticula-** Ravara discovered a link between congenital diverticula and genetic disorders.[18]

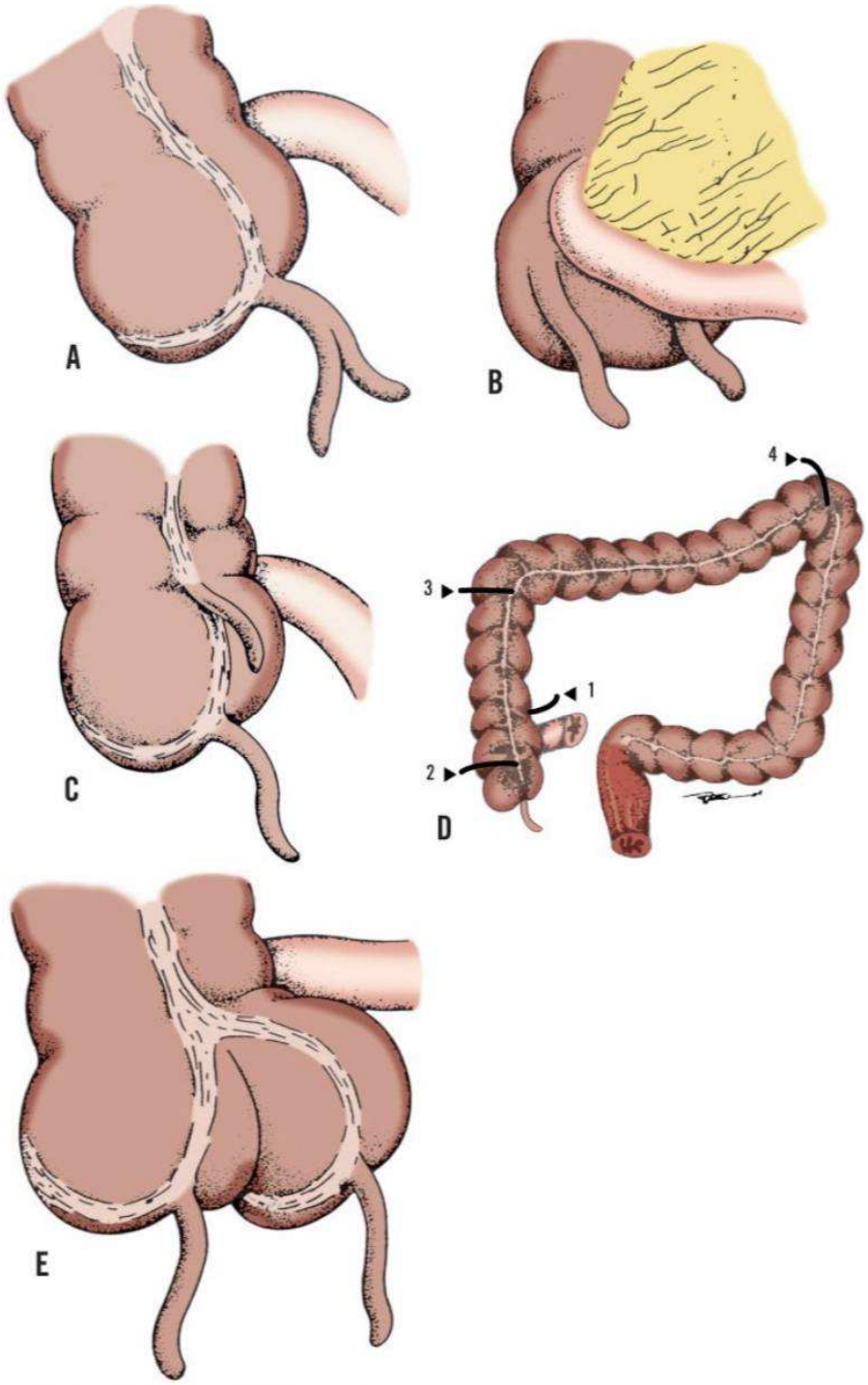


Fig. 1- Developmental 'abnormalities of Appendix'[18]

ANATOMY OF THE VERMIFORM APPENDIX

The Appendix comes from the caecum. Posteriorly, It is related to iliopsoas muscle and lumbar plexus of nerves and anteriorly, its closely associated with Abdominal wall. It's a muscular tube, which measures around 6 to 10 cm long. The 'luminal orifice' is sometimes partially covered by a fold of mucosa, which forms a valve, which is asymmetrical. Lumen of the Appendix may be present in childhood but gets partially or completely occluded in the elderly.

Microscopy

The Appendix is formed by four layers the serosa, muscular layer, the submucosa and mucosal layer. The submucosa usually contains large lymphoid follicles that may protrude into the mucosa and disrupt the integrity of the muscularis mucosa. The mucosa is covered by a columnar epithelium, which contains large lymphoid tissue. The submucosal lymphoid tissue frequently has germinal centres inside follicles, suggestive of B-cell activation. The appendix has an irregular lumen being encroached upon by multiple longitudinal folds of mucous membrane lined by columnar cell intestinal mucosa of the colonic type. It has few crypts, which contains kulchitsky cells which lie in the base of the crypts, which may give rise to carcinoid tumors.

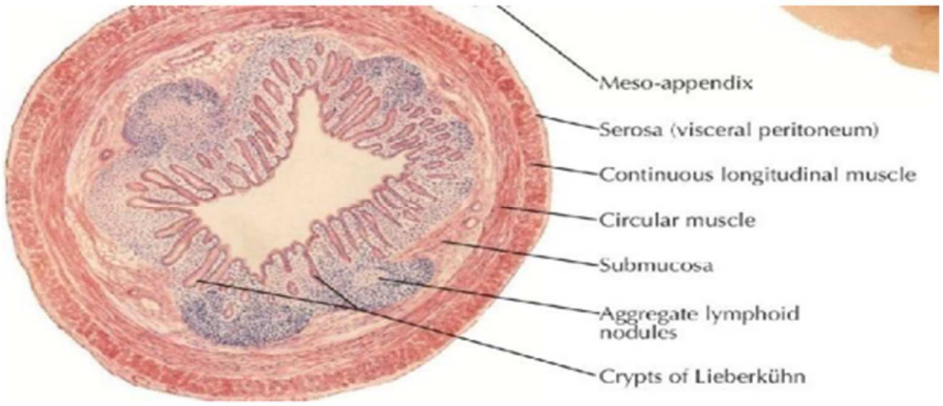


Fig. 2- Microscopic picture of Appendix

The mesoappendix

The mesoappendix is a triangular mesentery which lies in between the terminal ileum and appendix, contains fat and ends short of the blind end of the appendix. Bloodless fold of Treves which is a peritoneal fold running between terminal ileum and the anterior layer of the mesoappendix.

The appendicular artery reaches the appendix along this mesentery. When the mesentery is incomplete artery stays on the wall of the appendix in its distal part, in suppurative appendicitis vessel wall may be eroded or it may lead to thrombosis of the appendicular blood vessel.

The layers of the mesoappendix enclose the blood vessels, nerves, lymph vessels and lymph node of the appendix

POSITION OF THE APPENDIX

The vermiform appendix is a narrow tubular structure arising from the posterior medial wall of caecum. Though the base of the vermiform appendix is fixed, its tip can point in any direction and it may occupy any of the following positions-

1. Retrocaecal Appendix (74%): behind the caecum and distal part of the ascending colon
2. Pelvic appendix (21%): it may descend along the brim of the lesser pelvis in which case it lies in close relation to the right ureter in males and ovary and right uterine tube in females.
3. Paracaecal appendix (2%): on the lateral aspect of the caecum
4. Subcaecal appendix (1.5%): inferior to caecum
5. Preileal appendix (1%): lies anterior to terminal part of ileum and may lie in contact with anterior abdominal wall.
6. Postileal Appendix (0.5%): posterior to terminal part of ileum. [21–23]

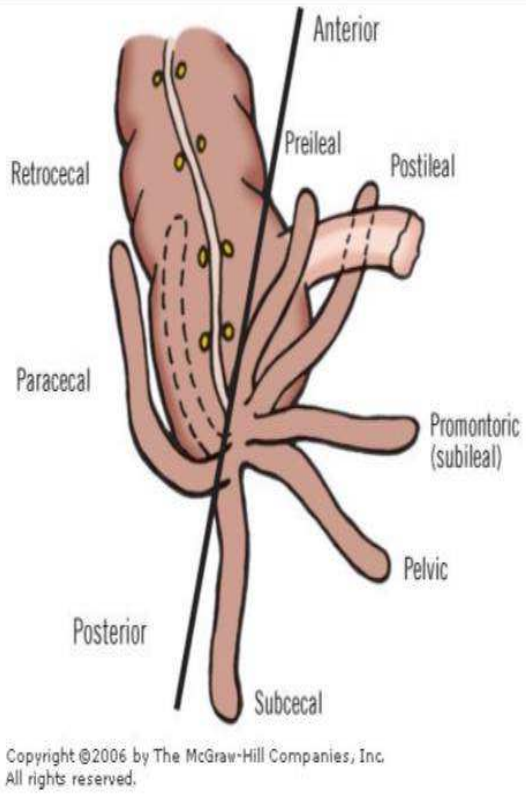


Fig. 3- Positions of Appendix

BLOOD SUPPLY AND THE LYMPHATIC DRAINAGE OF THE APPENDIX

BLOOD SUPPLY

The appendicular artery arises from the ileocolic artery. It passes behind the terminal ileum to enter the mesoappendix a short distance from base of the appendix, where it gives a reccurent branch which anastomoses with a branch of the posterior cecal artery at its base. Seshachalam described an accessory appendicular artery, which supplies the base of the appendix.[22]

The appendicular vein drains into cecal veins and becomes the ileocolic vein, which is a tributary of the right colic vein.

Lymphatics

Appendix has numerous lymphatic vessels. From the tip and the body of the appendix around 8-15 lymphatics vessels reach the mesoappendix, one or the two of which are interrupted by nodes lying I peritoneal fold. They unite to from 3 to 4 lymphatics which terminate in the superior and inferior nodes of the ileocolic chain.

INNERVATION-

Celiac and superior mesenteric ganglia are the source of the appendix's sympathetic innervation.

The vagus nerve is the source of parasympathetic innervation.

The spinal nerve or potentially the 10th -11th thoracic nerves carry sensory pathway

SURFACE MARKING –

The surface marking for the base of the appendix is at the junction of the lateral and middle one thirds of the line joining right anterior superior iliac spine to umbilicus (McBurney's point).

PHYSIOLOGY-

The appendix performs immune functions due to the presence of numerous lymphatic- follicles, it is generally accepted. This doesn't mean a normal appendix should not be removed in an exploratory laparotomy because of a possibility of future acute appendicitis. Some say it to be a microbial reservoir.[18,22]

AETIO-PATHOGENESIS OF ACUTE APPENDICITIS-

Acute appendicitis is becoming increasingly common in developing nations that are incorporating more sophisticated western diets. Contrary to what has been observed over the last 30 years in western countries, the incidence of acute appendicitis has dramatically decreased. There are no known causes for this paradoxical shift, but improved hygiene and a shift in the pattern of paediatric gastroenteritis associated with greater antibiotic use may be to blame. Pathophysiology of acute appendicitis is said to follow, the below mentioned sequel, which is:

1. Closed-loop obstruction due to fecolith or stone or tumor, leading to swelling of mucosa and sub-mucosal lymphoid tissue at the base of the appendix,

2. The fluid secreted by mucosa of appendix increases, intra-luminal pressure.

3. Appendiceal pressure increases and exceeds capillary pressure, causing mucosal ischemia, and

4. Over growth of the bacteria with in the lumen and translocation through the appendiceal wall leads to inflammation-> edema-> ischemia and finally necrosis.[21,22,24]

Although there is considerable variability, perforation usually after at least 48 hours from the onset of symptoms. Rarely free perforation of the appendix occurring into peritoneal cavity leads to peritonitis and septic shock and can be complicated by the subsequent formation of multiple intra-peritoneal formation of multiple intra-peritoneal abscesses.

In contrast, the larger omentum and small bowel loops might attach to an inflamed appendix and wall off the spread of contamination in the peritoneum, leading to a phlegmonous mass or paracaecal abscess. Rarely does appendiceal

inflammation go away, leaving a mucocele of the appendix, a swollen mucus-filled organ.

Subacute appendicitis

Sub-acute appendicitis is the term for occurrences of acute appendicitis that appear to spontaneously resolve before progressing to the acute stage. It is a less severe kind of acute appendicitis. But this condition can come back again. It is conceivable that natural lumen blockage reduction would diminish appendicular inflammation and its accompanying symptoms.[17]

'Chronic appendicitis'

Even though it is uncommon, chronic appendicitis can occasionally cause ongoing stomach pain in some patients. The typical signs and symptoms of acute appendicitis are not present in the patients. Instead, individuals experience right bottom quadrant pain for weeks to years, and they could have undergone several medical exams. Initial symptoms may match the classic signs of acute appendicitis for which no treatment was administered when questioned. At time of surgical exploration clinical and pathological changes of chronic inflammation are identified in the region of appendix.[25,26]

Recurrent appendicitis

There are occasional patients who have one or more attacks of what appears to be acute appendicitis. Between attacks these patients are free of symptoms and the physical examination is normal. Repeated attacks of obstructive appendicitis produce adhesions and fibrosis causing recurrent appendicitis. If repeated examination during an acute attack provides evidence of recurrent appendicitis, elective appendicectomy should be undertaken.[27]

Bacteria commonly isolated in Perforated Appendix[26]

Type of bacteria	Patients (%)
Anaerobic	
Bacteroides fragilis	80
Bacteroides thetaiotaomicron	61
Bilophilia wadsworthia	55
Peptostreptococcus spp.	46
Aerobic	77
Escherichia coli	
Viridans streptococcus	43
Group D streptococcus	27
Pseudomonas aeruginosa	18

Table-1 bacteriology of Appendix

Clinical features

Symptoms

Pain- As stretch of the viscera simulates the nociceptors, the typical presentation of “Acute Appendicitis” starts with cramping, intermittent abdominal pain that is assumed to be caused by occlusion of the lumen of Appendix. The right iliac fossa is where the discomfort shifts after 12 to 24 hours. Sharp and persistent pain replaces the formerly mild and colicky nature of the discomfort. Some people complain of pain with each bump in a car or ambulance, which is known as the "speed-braker’s sign". Anorexia- almost always complained of with acute appendicitis. It is one of the constant clinical features and diagnosis may be questionable if patient is not anorectic Nausea or vomiting- nausea is present in at least 9 of 10 patients with acute Appendicitis. Usually vomiting appears after onset of pain. If vomiting precedes pain the diagnosis should be questioned. Central abdominal pain is associated with fever and vomiting is diagnostic of acute appendicitis, which is termed as murphy’s triad

Signs

1) Pyrexia: Appendicitis, may cause raised temperature, although pyrexia is uncommon with non-complicated appendicitis. Rise in temperature is frequently restricted to 90 or 100F (39C). Even patients with complicated appendicitis often presents with normal temperature.

2) On systemic gentle palpation of abdomen the site of maximum tenderness will correlate to the location of appendix and is usually situated in right lower quadrant or near ‘Mc Burney’s point’.[21]

3) Muscle guarding or resistance to the palpation usually parallels the degree of the inflammation. Early in the course of disease, guarding if present is usually due to

voluntary guarding. As peritoneal irritation worsens, reflex involuntary rigidity eventually takes its place. One should be able to distinguish voluntarily guarding from involuntarily rigidity. While guarding is reduced after expiration, involuntary rigidity doesn't

4) Cutaneous hyperesthesia can be appreciated by minimal scratching of the skin both sides of the abdomen. In 'Acute Appendicitis' hyperesthesia is noticed at the Sherren's triangle which is formed by the ASIS, the symphisis pubis and the umbilicus.

5) 'Pointing test' - When the patient is asked to point the site of their discomfort, it usually resembles the Mc Burney's point, which is situated at the junction of the lateral third and medial two thirds of the spino-umbilical line.[22]

6) Rovsing's sign: On palpation, discomfort is felt in the right bottom quadrant when pressure is applied to the left lower quadrant. The term "referred rebound tenderness" is another name for it. The retrograde displacement of the intestinal gas that strikes the base of the inflamed appendix is a likely reason for this.[24]

7) Psoas sign: It is assessed by making the patient lie on his left side. Then slowly extends the patients right thigh, thus stretching the iliopsoas muscle which produces pain. This test indicates the presence of 'Inflammed Appendix' lies over the psoas muscle. This is positive in the 'Retrocaecal Appendicitis'.

8) Rebound tenderness: This is a classical sign of peritoneal inflammation. A sudden pressure is exerted over the inflamed area and immediate release of hand produces extreme pain.

9) Cope's obturator test: A patient with "Pelvic Appendicitis" has pain when their hip flexes and rotates internally since the hip sits on top of the obturator internus muscle.[23]

Complications of Acute Appendicitis-

The complications of appendicitis are as follows-

1. Appendicular mass
2. Appendicular abscess
3. Appendicular perforation

The disease may be that, it will be advanced to perforation of appendicitis and progresses to generalised peritonitis. However, an alternative course of progression is when the appendix is walled off by omentum and adjacent coils of small bowel. Initially, mass contains confused mixture of structures and granulation tissue. Provided the appendicular inflammation doesn't overcome the barriers so that the patient goes on to general peritonitis, the mass comes to contain pus, first in small quantities, but soon as a well-defined abscess.[(29)]

Pre-operative investigations in appendicitis-

- Routine

  Full blood count

  Urinalysis

- Selective

  Pregnancy

  Urea and electrolytes

  Supine abdominal radiograph

  Ultrasound of the abdominal/pelvis

  Contrast-enhanced abdomen and pelvic computed tomography scan

  Consider low-dose protocol in young adults[(21)]

The most helpful laboratory test is a white blood cell count. When there is no perforation, it is only slightly elevated; when there is, it is extremely elevated. Urinalysis is carried out to examine various possible causes of stomach pain, particularly ureterolithiasis and urinary tract infection.[26]

Diagnostic scores

Alvarado score-To aid in the diagnosis of appendicitis, a number of clinical and laboratory-based scoring systems have been developed. The Alvarado score is the most frequently utilised. Scores of seven or higher are very indicative of acute appendicitis.[26]

Diagnostic criteria	**Point**
symptom	
Migration of pain	1
Anorexia	1
Nausea/emesis	1
Sign	
Right lower quadrant tenderness to palpation	2
Rebound tenderness	1
Pyrexia	1
Laboratory values	
Leukocytosis	2
Shift to left	1

Table. 2- Alavarado score

IMAGING STUDIES

The ideal study for the diagnosis of appendicitis should be relatively non-invasive, quick and should be accurate in those patients with high risk of complications.

It should be easily obtained at any hour, easily reproducible and should be free of inter-observer variability. Ideally, imaging should reveal inflammation of appendix when it is located at a site that is anatomically troublesome to evaluate.

The potential imaging modalities for diagnosis of acute appendicitis include abdominal ultrasonography and Computed tomography.[26]

Abdominal ultrasonography (USG)

The diameter of an appendix can distinguish the normal appendix from the acute, inflammed appendix. The hallmark of appendicitis on USG is direct visualization of inflammed appendix. The characteristics of Acute Appendicitis are concentrically layered, incompressible, sausage like structure seen at the site of maximum tenderness.[30]

The ideal findings of appendicitis on USG are:

- Envision of non-compressible appendix as aperistaltic, blind ending cylindrical structure.
- The appearance of more than/equal to 6 mm in total diameter on cross section or maximum mural wall thickness of more than/equal to 2 mm.
- The lumen of appendix may be distended with anechoic or hyperechoic material.
- Diffuse hypoechogenicity corresponds with higher incidence of perforation.
- Envision of appendicular lith.
- Prominent hyperechoic mesoappendix / paracaecal fat.
- Localized periappendicular fluid collections.

A diagnosis of spontaneously resolving appendicitis should be considered if the inflamed appendix stops being painful to pressure. Ultrasound is a reliable tool for differentiating a number of clinically similar cases of appendicitis. Bacterial ileocaecitis caused by Yersinia, Salmonella, or Campylobacter is the most common type. Secondly important conditions are gynaecological conditions such as ovarian cyst, ectopic pregnancy, tubo-ovarian abscess and adnexal torsion. Some other ultrasonographically identifiable conditions are sigmoid and caecal, cholecystitis, crohn's disease, urological disease and small bowel obstruction.

The appendix may be relatively thickened in patients with perforated peptic ulcer, crohn's disease or sigmoid diverticulitis due to adjacent extrinsic inflammatory disease, which can lead to a false positive diagnosis of appendicitis. In an experienced hand the inflammed.[31]

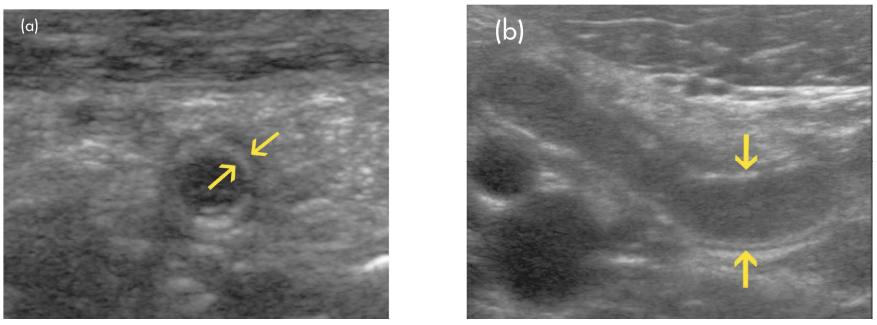


Fig. 4 - Ultrasonography of an acutely inflamed appendix (arrows): (a) transverse, and (b) longitudinal.

Computed tomography (CT)

CT has high diagnostic accuracy for appendicitis and can also diagnose many of other causes of pain in abdomen that can be confused with appendicitis. The radiographic findings of appendicitis on CT include thick walled, dilated (>6 mm) appendix that does not fill with enteric contrast or air, and also the surrounding fat stranding to suggest inflammation.[32]

Given that CT has a high negative predictive value and a sensitivity of 0.94 and specificity of 0.95, it can be used to rule out appendicitis in patients for whom the diagnosis is uncertain.[33]

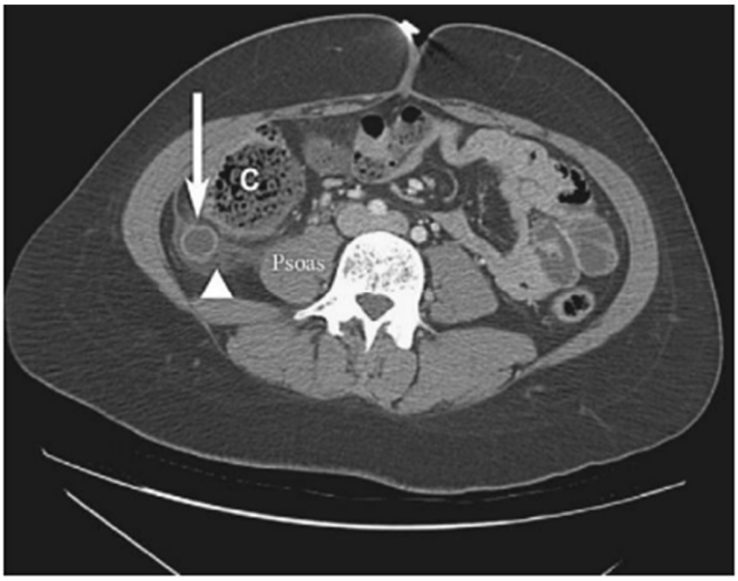


Figure. 5 – Computed tomography showing Acute Appendicitis[24]

DIFFERENTIAL DIAGNOSIS-

Almost any pain brought upon by the afflicted organs on the right side of the abdomen can resemble acute appendicitis features. For the majority of patients, a thorough medical history, a thorough physical examination, and close observation are all that are required to diagnose an uncomplicated appendicitis. Most of the time, computed tomography is needless and comes with radiation exposure and dangers from giving intravenous contrast. The information provided might be useful:

• Abdominal pain lasting more than 36 hours is a marker of an appendiceal perforation, and it is also linked to peritoneal irritation symptoms that are obviously present and almost always to leukocytosis.

• It would be risky for the patient and shaming for the surgeon to provide a general anaesthetic to someone who genuinely had pleuritic pain brought on by right lower lobe pneumonia or empyema.

• The presence of nausea and vomiting prior to the beginning of stomach discomfort helps to identify gastroenteritis. More diffuse abdominal pain and a typical absence of leukocytosis are present. It is rare for appendicitis to cause diarrhoea.

Young children who have streptococcal pharyngitis may vomit and experience abdominal pain. The diagnosis is typically confirmed by mucosa inflammation of pharynx, cervical lymphadenopathy, and a rapid antigen test of the throat for group A Streptococcus.

• Children are typically affected by mesenteric adenitis, which typically develops after a viral illness. Upper respiratory and gastrointestinal symptoms may be associated to inflammation and hypertrophy of the mesenteric lymph nodes to sizes > 1 cm on USG. The abdomen is still soft, and the discomfort is concentrated closer to the umbilicus along the protrusion of the root of the mesentery.[26]

Gastrointestinal Causes	Genitourinary Causes
Cecal diverticulitis	Pyelonephritis / perinephric abscess
Sigmoid diverticulitis	Nephrolithiasis
Meckel's diverticulitis	Hydronephrosis
Epiploica appendicitis	Urinary tract infection
Mesenteric adenitis	**Nonabdominal Causes**
Omental torsion	Rectus muscle hematoma
Crohn's disease	Lower lobe pneumonia
Cecal carcinoma	Streptococcal pharyngitis
Appendiceal neoplasm	**In Women**
Lymphoma	Ovarian cyst
Typhlitis	Corpus luteal cyst
Small bowel obstruction	Ovarian torsion
Perforated duodenal ulcer	Pelvic inflammatory disease
Intussusception	Endometriosis
Acute cholecystitis	Tubo-ovarian abscess
Hepatitis	**In Pregnancy**
Pancreatitis	Ectopic pregnancy
Infectious Causes	Round ligament pain
Infectious terminal ileitis	Chorioamnionitis
Gastroenteritis	Placental abruption
Cytomegalovirus colitis	Preterm labor

Table no. 3 - Differential diagnosis for acute appendicitis [23]

SURGERY FOR APPENDICITIS

Thomas G Morton in 1887, performed first removal of perforated appendix, successfully. Charles McBurney had described the 'McBurney's point' and demonstrated 'Gridiron incision' to Chicago medical society. A.E Rockey advocated transverse skin incision for appendicectomy. First laparoscopic appendicectomy was performed by semm in 1983.[18]

OPEN VS LAPAROSCOPIC APPENDICECTOMY

Several prospective randomized studies have compared laparoscopic and open appendicectomy, and overall differences in outcome remains the same. The percentage of appendicectomy performed laparoscopically continues to increase. When in doubt laparoscopic appendicectomy is advisable. Laparoscopy can be both diagnostic and therapeutic.[23,32]

Table 4: Laparoscopic VS Open Appendicectomy[26]

Laparoscopic appendicectomy	Open Appendicectomy
Diagnosis of other conditions	Shorter operating room time
Decreased pain after surgery	Low cost
Reduced length of stay	Lower hospital costs
Lesser wound infections	Minimal intra-abdominal abscesses
Faster Recovery	
Lower societal cost	

Table no. 4 – open vs laparoscopic appendectomy

LAPAROSCOPIC APPENDICECTOMY

Before the surgery begins all the equipment's must be checked for the proper working capacity. All the methods of laparoscopic appendicectomy require standard laparoscopic equipment's which are as follow:

- Trocars
- Blunt graspers
- Electro cautery
- Laparoscope, 30^0, 10 mm
- Veress needle
- Co_2 insufflator
- Light source

Positioning

The patient is put in supine position. A monitor is placed at the right side of the patient, upon abdominal insufflation and laparoscope insertion, steep Trendelenburg position facilitates the proper placement of the last two trocars. After placing all trocars, placing the patient left side down aids gravity in relocating the small bowel away from the appendiceal field of vision.

Technique

• After the patient is in the previously mentioned position, the parts are painted and draped sterilely.

• Inserting a Foley catheter aids in bladder decompression, which increases the viewing area and enhances the workspace.

• Underneath the umbilicus, a 2-cm sub-umbilical curvilinear incision is created.

• The fascia should be skeletonized by performing a thorough dissection into the SC tissue past the “scarpa fascia” and till “the linea alba”.

•Continue the blunt dissection until the peritoneum can be seen.

Grab the peritoneum horizontally with 2 straight clamps placed side-by-side. With your fingertips, feel the peritoneum you've just grabbed for any intra-abdominal fluids.

•Use “Metzenbaum scissors” to make a 2 cm longitudinal incision to access the peritoneal cavity. Currently, gently insert the hasson trocar

• For the following 2- ‘5 mm’ trocars, move the patient into a steep ‘Trendelenburg position’.

• A 1 cm incision is made, and the first trocar is positioned 1 cm above the pubic ramus, to the left of the midline. When the port penetrates the peritoneal cavity, be cautious to remain cephalad to the bladder dome.

• Position the 2nd 5 mm port, 2 cm medial and above the left ASIS. With the aid of a laparoscope, the vessels across the front abdominal wall can be highlighted to serve as a useful guide for entering the abdominal cavity.

• To acquire the best view of the planned target, the patient can be rotated left side down after all the trocars have been inserted while still in the steep Trendelenburg posture. Through the use of gravity, the small bowel can now retract away from the surgical area.

• Insert 2 atraumatic graspers through the 5 mm ports, trace the taenia coli to its confluence at the base of the caecum to visualise the appendix.

• Through the suprapubic port, grab the appendix's tip and retract it upward and outward toward the left upper quadrant. This should allow clear visibility of the mesoappendix and the appendiceal base.

• Transect the entire mesoappendix and coagulate it to skeletonize the appendix.

The appendix can be removed through the infra umbilical 10 mm port using a grasper and reducer while utilising the 30-degree 5 mm scope inserted into the left iliac port.

• Tie a rodder's knot over the appendicular base.

• An examination of the removed appendix's histopathology is advised.

• Change the scopes once more, switching the 5 mm for the 10 mm, and check the appendiceal stump once more for any anomalies.

• If necessary, irrigate and suction the pelvis and this area. After irrigating and suctioning is done, remove all of the instruments off the peritoneal cavity.

• Disconnect all ports that extend beyond the fascia visible with direct vision, stop abdominal insufflation, and switch the light source. The hasson trocar should be released and taken out of the abdominal cavity.[26]

Complications of appendicectomy

The several complications which can occur following appendicectomy are mentioned as below

A. Surgical site infection
B. Appendix stump complications
C. Bowel obstruction
D. Post operative bleeding
E. Fecal fistula
F. Incisional hernias[34]

Platelets

The healthy platelet pool serves to maintain endothelial homeostasis and seals up leaks in the capillary beds. Platelets are also the nidus of coagulation and the surface on which the reaction is coordinated and propagates. Platelets assist in wound healing through delivery and concentration of phospholipids and coagulation factors, growth factors, and cytokines and are capable of adapting their response through residual RNA, depending on systemic conditions such as acute or chronic inflammation.

Wright-stained smears examined under a light microscope reveal platelets as tiny, anucleate (that is, devoid of a nucleus) fragments with sporadic reddish granules, measuring about 2 m in diameter with a volume of around 8 fL and demonstrating significant variation in size and shape.

Resting and active platelets have different morphologic and biochemical properties, with the former being characterised by resting metabolic activity and the latter by agonist stimulation.

Transmission electron microscopy investigations provided the first descriptions of platelet anatomy. Platelet structure- divided into four categories: surface of platelet, membranous elements, granules and cytoskeleton.[35]

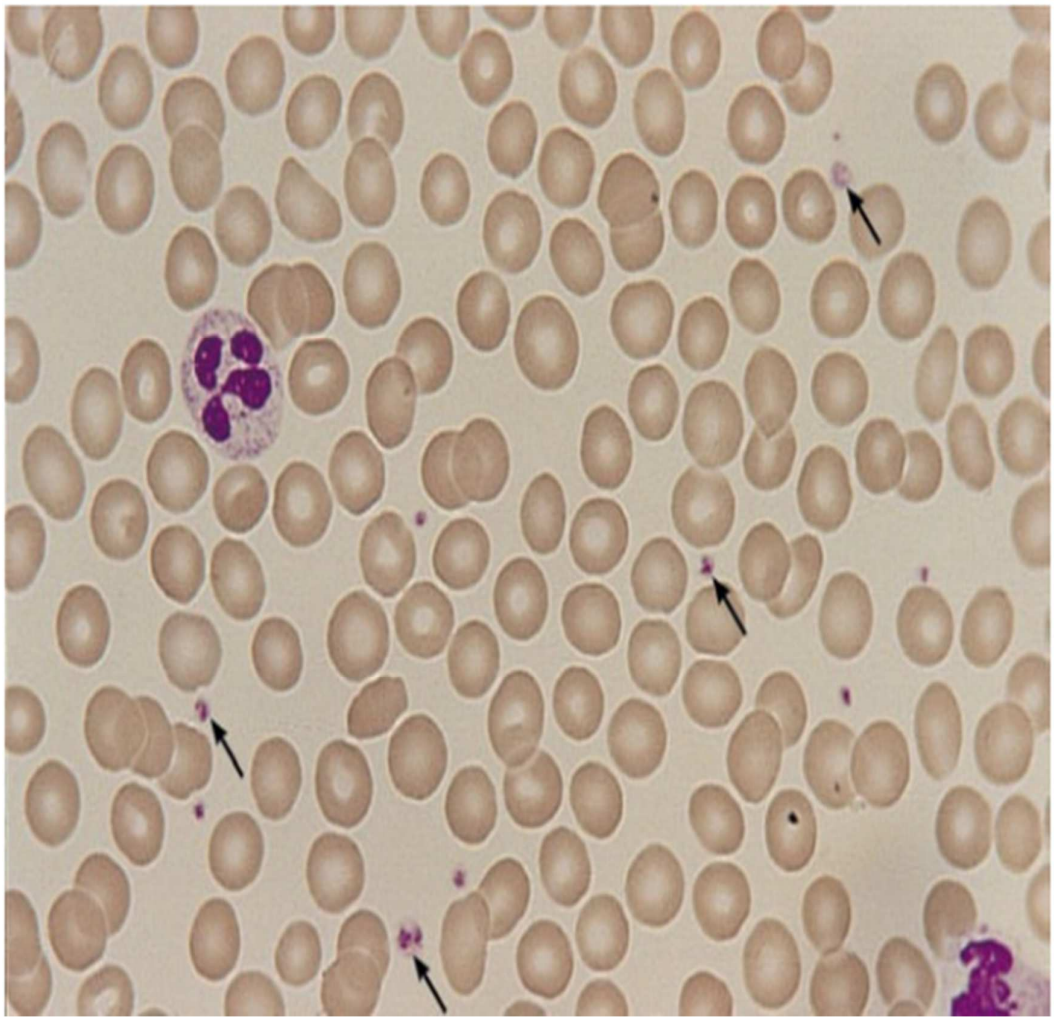


Fig.6- “A human peripheral blood smear is stained with Wright-Giemsa. Platelets, indicated by arrows, are interspersed between erythrocytes and a few leukocytes. The pale, grayish blue cytoplasm contains purple-red granules.
Original magnification of 35-mm slide ×100”.

Composition

"By dry weight, the platelet is made up of roughly 60%-protein, 15%-lipid, and 8%-carbohydrate. Zinc, magnesium, calcium, and potassium are minerals found in platelets. Significant levels of vitamin B-12, folic acid, and ascorbic acid are present in platelets. Sodium and potassium are present in the platelet at quantities of 39 and 138 mEq, respectively. An active ion pump that receives energy from a membrane ATPase of the ouabain-sensitive, Na/K-dependent type maintains this gradient against plasma, which appears to be dispersed in two distinct metabolic compartments". "By restricting Ca2+ transport from plasma and encouraging vigorous efflux of this ion from the cell, unstimulated platelets maintain a low cytoplasmic Ca2+ concentration (between 100 and 500 nmol/L). In platelets, there are two calcium pools: one that moves through the cytosol quickly and is controlled by a sodium-calcium antiporter in the plasma membrane, and the other that moves through the dense tubular system more slowly and is controlled by a Ca2+/Mg2+-ATPase. Therefore, by transporting calcium against a gradient into the extracellular space or by sequestering it in the dense tubular system, platelets are able to move calcium from the cytosol".[35]

Platelet Distribution and Survival Kinetics

Labeling The lifespan of human platelets has been estimated to be 8 to 12 days using 51Cr (chromate)-labeled platelets, and this technique has received widespread validation. 111In (indium) chelated with 8-hydroxyquinoline and 32P-labeled diisopropyl fluorophosphate, 68Ga are two other techniques reported for platelet labelling (gallium). Although platelet labelling is not frequently utilised for clinical assessments, the distribution and survival values are roughly the same throughout all published research. Distribution The spleen appears to be the location of a

concentration of about 1/3rd of the total platelet mass. The platelets in the peripheral circulation freely communicate information with the splenic pool. Nearly two-thirds of 51Cr-labeled platelets transfused into healthy people stay in the circulation, compared to nearly 100% in patients with post splenectomy. Additionally, administering epinephrine raises the peripheral platelet count by 30% to 50% by removing platelets from the spleen. Epinephrine has no impact on platelet counts in people with asplenic disease. The youngest, biggest platelets, according to some research, are found in the splenic pool. The mechanism of splenic sequestration has been postulated to result from either binding to the reticular and endothelial cells of the spleen or a prolonged transit time via the splenic cords, which platelets enter due to their tiny size. 80% to 90% of platelets may be trapped in the spleen as a result of pathophysiologic conditions, which causes thrombocytopenia. There have been reports of platelets being released from the lungs following intracardiac epinephrine injection. Additionally, platelet counts increase following intense activity, and splenectomy has no effect on this increase. About 16% of the total platelet mass is made up of this nonsplenic pool. Living Span Humans have an estimated 8–12day platelet life span depending on how long it takes for tagged platelets to be cleared from the circulation. It has been calculated that platelet turnover ranges from 1.2 to 1.5 1011 cells per day at steady state, when platelet production equals destruction. The International Committee for Standardization in Hematology and the Panel on Diagnostic Application of Radioisotopes in Hematology have both released recommendations for estimating platelet longevity, and numerous models for analysing platelet lifespan have also been put forth. As was previously mentioned, platelets can be drawn out of the bloodstream by gathering in the spleen, liver, and lung. Bcl-2 proteins control platelet lifetime. By inhibiting Bak, platelet Bcl-x(L) is

necessary for survival. The traditional apoptotic pathways that result from Bak activation cause mitochondrial damage, caspase activation, and PS exposure. Bak-deficient animals' platelets last longer than usual, indicating a planned platelet death programme.[35]

Platelet indices	Definition	Normal Range
MPV (fL)	Measure of platelet volume expressed in femtolitre	8.6-15.5
PDW (fL)	Measure of variability in platelet size/ anisocytosis	8.3-25
PDW (%)	The distribution width at the level of 20% in Platelet histogram	8.3-56.6

Table no. 5 Definitions of Platelet parameters

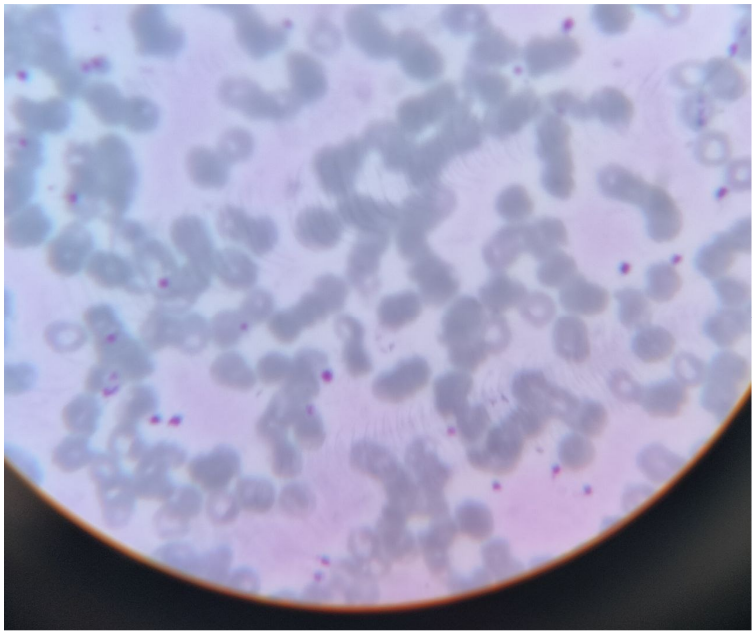


Fig. 7- Microscopic picture of Platelets

"Platelet indices and Acute Appendicitis"

Nearly 95% of healthy persons had platelet counts between 150 and 450 109/1 and MPVs between 7 and 10 fl. Thrombocytosis has been linked to rheumatoid arthritis, acute blood loss following trauma, and iron deficiency anaemia. Despite the fact that pregnancy has a normal platelet distribution, individuals with pre-eclampsia and uncomplicated hypertension in the latter stages of the pregnancy tended to have lower platelet counts and larger platelets than controls. Infection, renal failure, and malignant disease under treatment were all observed to have varied platelet patterns.(12)

Yasemin and murat studied relationship between platelet indices- plateletcrit, MPV and platelet distribution width in non-traumatic abdominal emergencies in their systemic review and they found that there are alterations in MPV values in both Acute Appendicitis and Mesenteric ischemia. It was evident in their study that low MPV value were seen in acute appendicitis and mesenteric ischemia. Whereas high MPV was suggesting poor prognosis for acute mesenteric ischemia. (13)

Emin Da ldal and Hasan Dagmura, "the correlation between complete blood count parameters and appendix diameter for diagnosis of acute appendicitis has concluded that in patients with suspicious of Acute Appendicitis, increased Neutrophil, MPV and NLR and reduced PDW are needful biomarkers for diagnosis of acute appendicitis. Diameter measurement of appendix with usg and CT have 88.4% diagnostic accuracy. Estimation of appendix diameter and complete blood profile parameters can be used together to increase the diagnostic value of Acute Appendicitis".(36)

Lalahruaitluanga and Chawngthu vanlalhlua, "platelet indices in the diagnosis of Acute Appendicitis have concluded that MVP has no higher sensitivity compared to TLC in the diagnosis of 'Acute Appendicitis' but PDW has an higher sensitivity than TLC and is increased in complicated appendicitis. Therefore, PDW may help in the assessment of acute appendicitis and has a appreciative role in evaluating complicated appendicitis".(11)

Hossien Najd, Alireza Negahi, Seyed Hamzeh, Mohammed Nasiri., "Evaluation of the potential association of platelet levels, mean platelet volume and platelet distribution width with acute appendicitis showed PDW <10.05 had a sensitivity of 35% and specificity of 75%, platelet count less than 2229500 had sensitivity -24% and specificity -75% and MPV < 8.95 had sensitivity of 70% and specificity of 71% and concludes, the platelet indices such as MPV and PDW could relatively co-relate with Acute Appendicitis in children. Hence MPV and PDW as a simple and low-cost lab test for diagnosing acute appendicitis is useful".(15)

Akin Aydogan, Seckin Akkucuk et al., concluded that "Mean platelet volume, platelet distribution width, and platelet all exhibited positive correlation. In compared to patients without perforation, cases with perforation had greater levels of age, leukocyte, platelet, mean platelet volume, and platelet distribution width. In the early stages of acute appendicitis, they believe that mean platelet volume and platelet distribution width may be helpful markers to identify the likelihood of perforation".(16)

Y. Albayrak, M.D., A Albayrak et al, mean platelet volume: A New predictor in confirming Acute Appendicitis Diagnosis., said that best MPV level cutoff point for AA was 7.6 fL with sentivity, specificity, PPV and NPV of 73%, 84%, 84% and 74%, respectively. The study concluded that as the MPV value is included in the CBC analysis, it increases the sensitivity and NPVs of WBC in AA diagnosis

without need for extra analyses, loss of time, or cost increase. Therefore, they believe that the MPV value should also be taken into consideration along with the WBC in every patient with suspected AA.[8]

Manoranjan U.D., Divyarani M.N., Durganna T., Swaroop N and Nikhil Suresh., concludes that their study showed PDW is raised in 'Acute Appendicitis' patients. PDW analysis can be used as a promising marker in diagnosis of Acute Appendicitis without any additional tests requirement, thus subsiding the cost and improving patient management.[37]

In Conclusion, above studies suggest that there is variation in MPV and PDW in cases of acute appendicitis and there is variation in complication of acute appendicitis like gangrenous appendix and appendicular perforation. But there are few studies that estimate MPV an PDW in diagnosing Appendicitis an its complications. Therefore, we are undertaking this study to evaluate the diagnostic necessitiy of MPV and PDW in Acute Appendicitis and its complications.

MATERIALS AND METHODS

The source of data will be patients with acute appendicitis admitted in general surgery wards at KAHER'S Dr. Prabhakar Kore Charitable Hospital and Medical Research Centre, Nehru Nagar, Belagavi

a) Study design:

Observational study

b) Duration of data collection:

1 year

c) Study Period:

January 2021 to December 2021.

d) Sample size:

Sample size for experimental studies

The minimum sample size formula based on prevalence rate is

$$n = \frac{z_\alpha^2 P(1-P)}{d^2}$$

where P is the percentage of prevalence and d is the percentage likely difference in the prevalence.

z_α is linked with the level of significance. For 5% level of the significance $z_\alpha = 1.96$.

Reference:

With P = 50% and d = 25% of P = 12.5%, the sample size is 61.

To get more confirmative results the sample size will be raised to 70.

e) Sampling procedure:

Universal sampling

f) Selection criteria

- **Inclusion criteria**

a) Willing to participate in the study

b) Clinical diagnosis of acute appendicitis and undergoing appendectomy.

c) More than 18 years and less than 70 years

- **Exclusion criteria**

a. Immunocompromised patients

b. Patients on steroids.

c. Patients on chemotherapy for malignancy.

d. Pregnant female.

e. h/o blood transfusion in past 1 year

f. severe anemia

Acute or chronic infectious diseases

Methodology-

Data collection instrument is used for data collection.

All the patients who satisfy the inclusion criteria are subjects of study. The patients are then enrolled into the study after taking written and informed consent.

Demographic data of the patients is noted in a predesigned proforma. The primary for this study is the blood investigations of the patients which is Routine blood investigations i.e., (complete blood count, platelet count, reticulocyte count), platelet indices (MPV and PDW). Collection of data includes age, sex, symptoms time duration, clinical dx and platelet indices. Clinical dx was confirmed by imaging studies. Clinical and investigations will be complied and evaluated, and observed. Routine MPV and PDW results were compared with normal laboratory reference

values. After taking consent, patients will undergo surgery, and the Appendectomy specimen will be examined histopathologically. The HPR will be accounted as the final diagnosis. The reference values are are7.6-11.0 fL for MPV and 10% to 18% for PDW. An independent pathologist expert will be approving all of the results.

Outcome- sensitivity, specificity, positive predictive value and negative predictive value of MPV and PDW in diagnosing acute appendicitis and its complications.

Fig. 8. CBC CALIBRATOR

Statistical Analysis-

The data collected will be expressed in percentages & ratios. Continuous data are expressed as means and standard deviation or medians (interquartile range) according to the results of normal distribution analysis. Categorical data and frequency distributions are shown as absolute values. Using SPSS Statistics software, Student's t test & the Chi-square test will be used for analyzing differences in continuous variables and proportions. The diagnostic performance of each of the scoring systems will be compared by conducting a receiver operating characteristic (ROC) analysis The sensitivity, specificity, positive and negative predictive values (PPV, NPV) of each of the four scores are going to be calculated separately. The receiver operating characteristic (ROC) curve will be used to evaluate the predictive value of the scores.

RESULTS

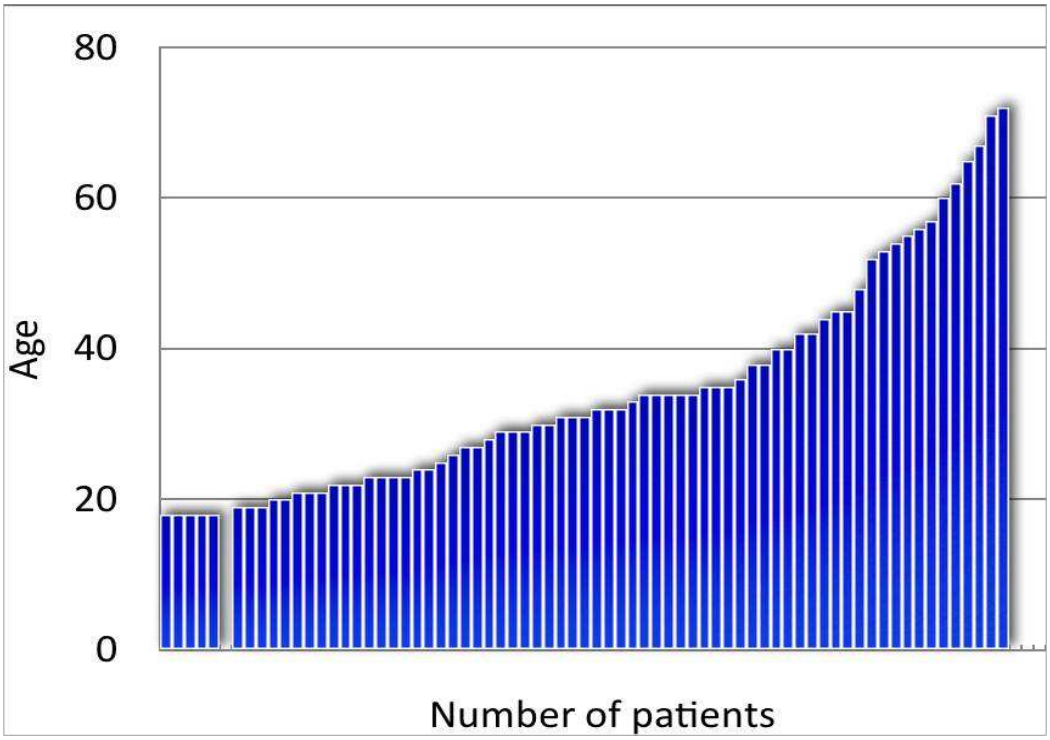
After analysing the data of the 70 patients who presented with diagnosis Appendicitis, results are as follows-

1. AGE

Table 6: Descriptive analysis of Age in the study population (N=70)

Name	Mean ± S.D	Median	Minimum	Maximum	95% CI	
					Lower CI	Upper CI
Age	34.50±14.25	31.50	18.00	72.00	31.16	37.84

GRAPH 1: Bar chart of Age in the study group



The mean age of the study population of 70 subjects is 34.50+/-14.25, with min. age being 18 yrs and oldest being 72 years

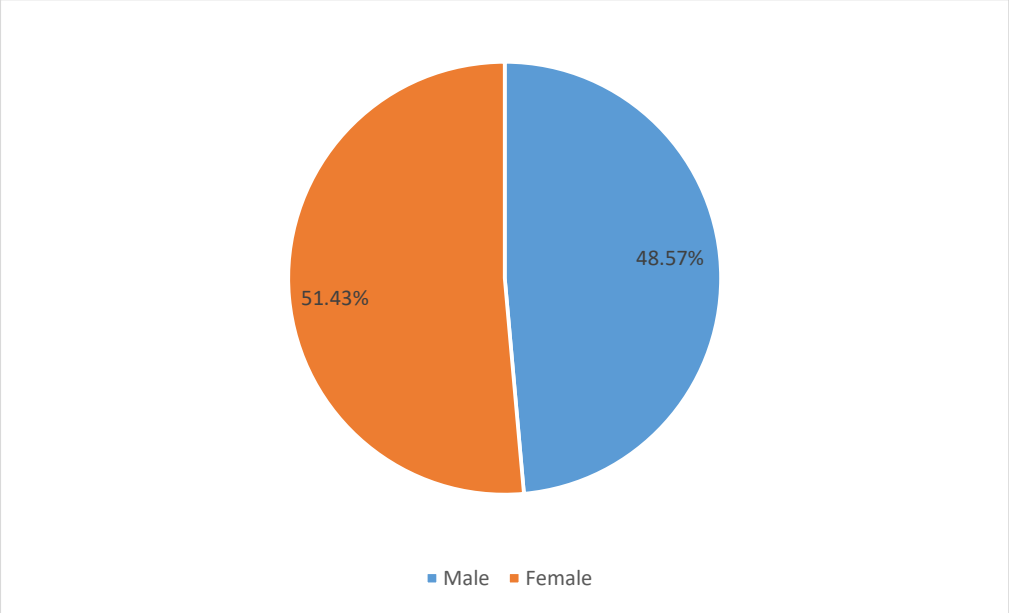
2. GENDER

Table 7: Descriptive analysis of Gender in this study (N=70)

Gender	Frequency	Percentage
M	34	48.57%
F	36	51.43%

There are total of 36 females in this study, 34 males in this study. Although more females are present there is no statistical significance.

Graph 2: Pie Chart of Gender in study population (N=70)



Among the 70 (100%) study subjects, 34 (48.6%) subjects were males and the remaining 36 (51.4%) were females. Out of the 11 (100%) subjects who were not pathologically diagnosed with acute appendicitis. Out of 59 subjects who were pathologically diagnosed with acute appendicitis, 26 (44.1%) were males and the remaining 33 (55.9%) were females. However, this difference in gender distribution was not found to be statistically significant ($p>0.05$).

3. DURATION OF PAIN

Table 8: Descriptive analysis of Duration of pain (Days) in the study population (N=70)

Name	Mean ± S.D	Median	Minimum	Maximum	95% CI	
					Lower CI	Upper CI
Duration of pain (Days)	35.98±91.95	4.50	0.50	547.50	14.44	57.52

Parameter	Acute appendicitis		p-value
	No Mean ±SD	Yes Mean ±SD	
Duration of pain in hours	1088.82±3142.83	809.58±1841.24	0.653

The mean duration of pain in patients who were clinically diagnosed to have acute appendicitis is 35.98+/-91.95 days, median of 4.5 days

Most of the patients presented at a duration of 4-5 days from onset of pain.

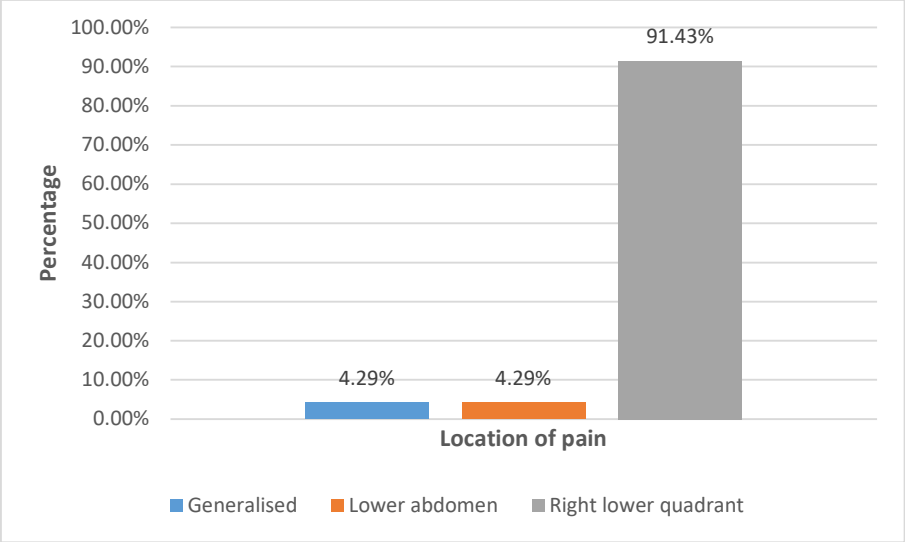
4. LOCATION OF PAIN

Table 9: Description of Location of pain in this study (N=70)

Location of pain	Frequency	Percentage
Generalised	3	4.29%
Lower abdomen	3	4.29%
Right lower quadrant	64	91.43%

91.43% patients presented with pain only in right lower quadrant, 3 patients presented with generalised ternderness and 3 others presented with lower abdominal tenderness.

Graph 3: Bar Chart of Location of pain of the study group (N=70)



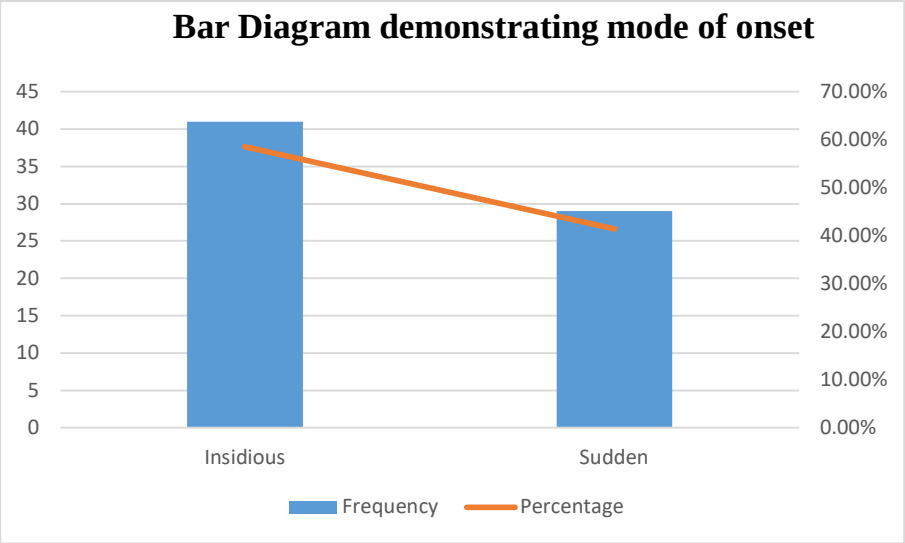
Above mentioned bar diagram depicts the location of the pain in study subjects, majority of them had come with complaints of pain in right lower quadrant (91.43%).

5. MODE OF ONSET

Table 10: Description of Mode of onset in the study group (N=70)

Mode of onset	Frequency	Percentage
Insidious	41	58.57%
Sudden	29	41.43%

Graph 4- Bar Diagram demonstrating mode of onset



Around 58.57% patients had pain which was insidious in onset out of 70 patients. Whereas 29 patients presented with sudden onset of pain.

6. PHYSICAL FINDINGS

Table 11: Association between various physical findings and acute appendicitis

Physical finding		Acute appendicitis		Total	P-value
		Absent n (%)	Present n (%)		
Right iliac fossa tenderness	No	4 (100)	0 (0)	4 (100)	0.254
	Yes	16 (24.2)	50 (75.8)	66 (100)	
Rebound tenderness	No	18 (33.3)	36 (66.7)	54 (100)	0.741
	Yes	3 (18.8)	13 (81.2)	16 (100)	
Guarding	No	19 (29.7)	45 (70.3)	64 (100)	0.650
	Yes	1 (43.2)	5 (56.8)	6 (100)	
Rigidity	No	16 (24.6)	49 (75.4)	65 (100)	0.817
	Yes	1 (20)	4 (80)	5 (100)	
Bowel sounds	No	1 (33.3)	2 (66.7)	3 (100)	0.709
	Yes	16 (23.9)	51 (76.1)	67 (100)	

All the four (100%) study subjects who had no right iliac fossa tenderness were not diagnosed with acute appendicitis. Out of 66 (100%) subjects with right iliac fossa tenderness, 50 (75.8%) were diagnosed with acute appendicitis and the remaining 16 (24.2%) were not diagnosed with the same. However, there is no statistical significance ($p>0.05$).

Out of 54 (100%) subjects who had no rebound tenderness, 36 (66.7%) were diagnosed with acute appendicitis and the remaining 18 (33.3%) were not diagnosed with the same. Out of 16 (100%) subjects with rebound tenderness, 13 (81.2%) were diagnosed with acute

appendicitis and the remaining three (18.8%) were not diagnosed with the same. However, there is no statistical significance($p>0.05$).

Out of 64 (100%) subjects who were not presented with guarding, 45 (70.3%) were diagnosed with acute appendicitis and the remaining 19 (29.7%) were not diagnosed with the same. Out of six (100%) subjects with guarding, five (56.8%) were diagnosed with acute appendicitis and the only one (43.2%) was not diagnosed with the same. However, there is no statistical significance ($p>0.05$).

Out of 65 (100%) subjects who were not presented with rigidity, 49 (75.4%) were diagnosed with acute appendicitis and the remaining 16 (24.6%) were not diagnosed with the same. Out of five (100%) subjects with rigidity, four (80%) were diagnosed with acute appendicitis and only one (20%) was not diagnosed with the same. However, there is no statistical significance ($p>0.05$).

Out of three (100%) subjects who were not presented with bowel sounds, two (66.7%) were diagnosed with acute appendicitis and only one (33.3%) was not diagnosed with the same. Out of 67 (100%) subjects who presented with bowel sounds, 51 (76.1%) were diagnosed with acute appendicitis and 16 (23.9%) were not diagnosed with the same. However, there is no statistical significance ($p>0.05$).

7. IMAGING STUDIES

Table 12: Diagnostic accuracy of ultrasonogram in detecting acute appendicitis

			Histopathology		Total
			Negative	Positive	
Ultrasonogram	Negative	Count	10	17	27
		%	58.8%	32.1%	38.6%
	Positive	Count	7	36	43
		%	41.2%	67.9%	61.4%
Total		Count	17	53	70
		%	100.0%	100.0%	100.0 %

Parameter	Estimate	Lower – Upper 95% Cis	Method
Sensitivity	67.92%	(54.52, 78.91)	Wilson Score
Specificity	58.82%	(36.01, 78.39)	Wilson Score
Positive Predictive Value	83.72%	(70.03, 91.88)	Wilson Score
Negative Predictive Value	37.04%	(21.53, 55.77)	Wilson Score
Diagnostic Accuracy	65.71%	(54.04, 75.75)	Wilson Score

The sensitivity and specificity of ultrasonogram to detect acute appendicitis was found to be 67.92% (95% CI: 54.52 – 78.91%) and 58.82% (95% CI: 36.01-78.39%). The positive and negative predictive values were 83.72% (95% CI: 70.03-91.88%) and 37.04% (21.53-55.77%). The positive and negative likelihood ratios were 1.65 (95% CI: 1.215-2.239) and 0.54 (95% CI: 0.423-0.701).

Table 13: Diagnostic accuracy of CT scan in detecting acute appendicitis

			Histopathology		Total
			Negative	Positive	
CT	Negative	Count	17	47	64
		%	100.0%	88.7%	91.4%
	Positive	Count	0	6	6
		%	0.0%	11.3%	8.6%
Total		Count	17	53	70
		%	100.0%	100.0%	100.0%

Parameter	Estimate	Lower – Upper 95% Cis	Method
Sensitivity	11.32%	(5.293, 22.58)	Wilson Score
Specificity	100%	(81.57, 100)	Wilson Score
Positive Predictive Value	100%	(60.97, 100)	Wilson Score
Negative Predictive Value	26.56%	(17.3, 38.48)	Wilson Score
Diagnostic Accuracy	32.86%	(23, 44.5)	Wilson Score

The sensitivity and specificity of CT scan to detect acute appendicitis was found to be 11.32% (95% CI: 5.293 – 22.58%) and 100% (95% CI: 81.57-100%). The positive and negative predictive values were 100% (95% CI: 60.97-100%) and 26.56% (17.3-38.48%).

8. AVERAGE OF PLATELET PARAMETERS

Table 14: Comparison of Platelet parameters among study subjects

Parameter	Acute appendicitis		p-value
	No Mean ±SD	Yes Mean ±SD	
Platelet Count	2.85±1.36	2.68±0.75	0.520
MPV	10.36±3.47	8.30±1.56	0.001
PDW	0.16±0.04	0.12±0.03	<0.001

The mean duration of pain in hours among study subjects without acute appendicitis (1088.82±3142.83) was comparatively higher than those with acute appendicitis (809.58±1841.24). However, this difference was not statistically significant (p>0.05).

The mean plan platelet count among study subjects without acute appendicitis (2.85±1.36) was comparatively higher than those with acute appendicitis (2.68±0.75). However, this difference was not statistically significant (p>0.05).

The mean platelet volume (MPV) among study subjects without acute appendicitis (10.36±3.47) was comparatively higher than those with acute appendicitis (8.30±1.56). This difference in mean platelet volume among subjects with and without acute appendicitis was found to be statistically significant (p=0.001).

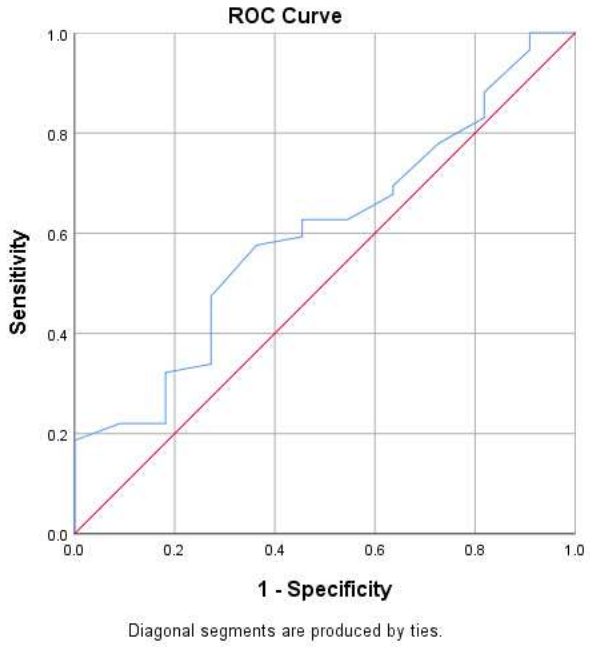
Mean platelet distribution width (PDW) among study subjects without acute appendicitis (0.16±0.04) was comparatively higher than

those with acute appendicitis (0.12±0.03). This difference in mean platelet distribution width among subjects with and without acute appendicitis was found to be statistically highly significant ($p<0.001$).

9. PLATELET PARAMETERS

MEAN PLATELET VOLUME(MPV)- ROC curve:

Graph 5: Predictive validity of MPV in predicting Acute appendicitis (N=60)



Above shown figure shows the receiver operating characteristic curve showing predictive value of MPV in Acute Appendicitis

Table 15: Area under the curve for predictive validity of MPV in predicting Acute appendicitis (N=60)

Test Result Variable(s): MPV				
Area Under the Curve	**Std. Error**	**95% Confidence Interval of AUC**		**P Value**
		Lower Bound	**Upper Bound**	
0.601	0.087	0.430	0.772	0.291

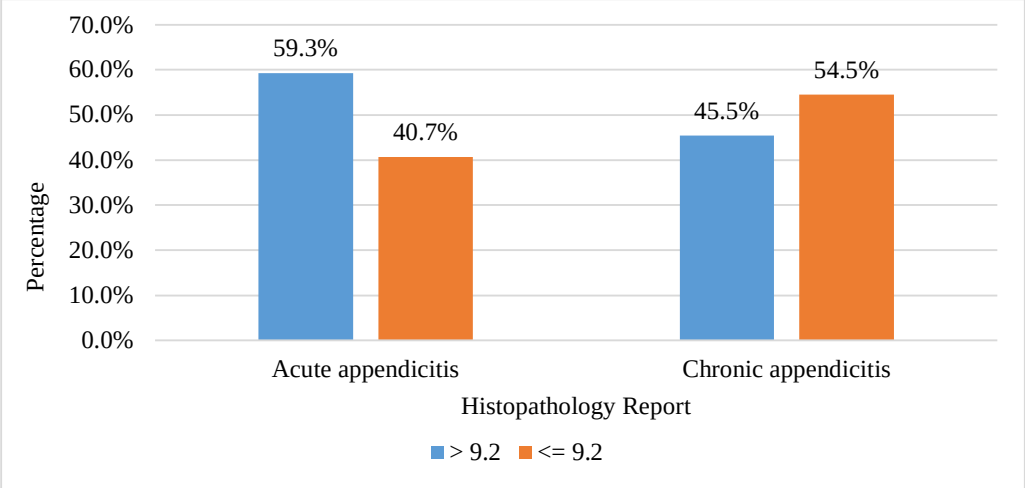
Area under the curve is 0.601 with standard error of 0.087 and a P value of 0.291

Table 16: Comparison of MPV between histopathology report (N=70)

MPV	**Histopathology Report**		**Chi square**	**Fisher exact P value**
	Acute Appendicitis (N=59)	**Chronic Appendicitis (N=11)**		
ROC Cut off				
>8.1fl	34 (57.63%)	4 (36.36%)	1.689	0.194
≤ 8.1fl	25 (42.37%)	7 (63.64%)		

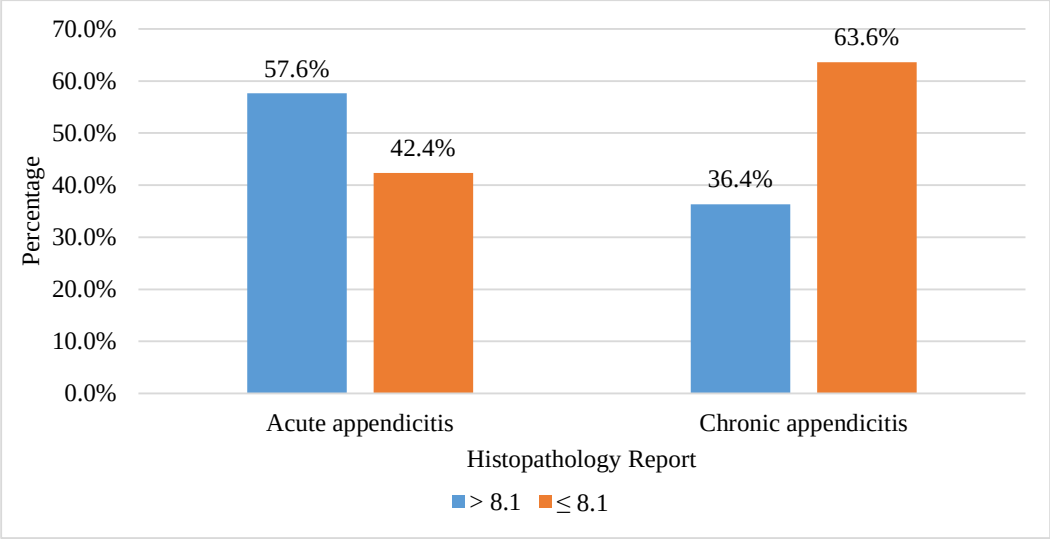
A cut off of 8.1 fl was determined via ROC curve and around 57.63% patietns with acute appendicitis have MPV value less than 8.1 fl.

Graph 6: Cluster bar chart of comparison of MPV between Acute Appendicitis and Chronic appendicitis (N=70)



A ROC curve was used to determine the cut off for MPV to find out the diagnostic value of Acute Appendicitis. A cut off value of 8.1fl was determined. Around 34 patients had MPV value of more than 8.1fl and 25 patients had less than 8.1fl MPV value. Although more patients had MPV value more than 8.1fl, it was not statistically significant.

Graph 7: Cluster bar chart of comparison of MPV between histopathology report (N=70)



This bar diagram is showing the values of MPV in both Acute appendicitis and chronic appendicitis groups. In which more patients of chronic appendicitis have

MPV value less than 8.1 fl, whereas more patients in Acute appendicitis group has MPV value more than 8.1fl.

Table 17: Predictive validity of MPV in predicting Acute Appendicitis(N=70)

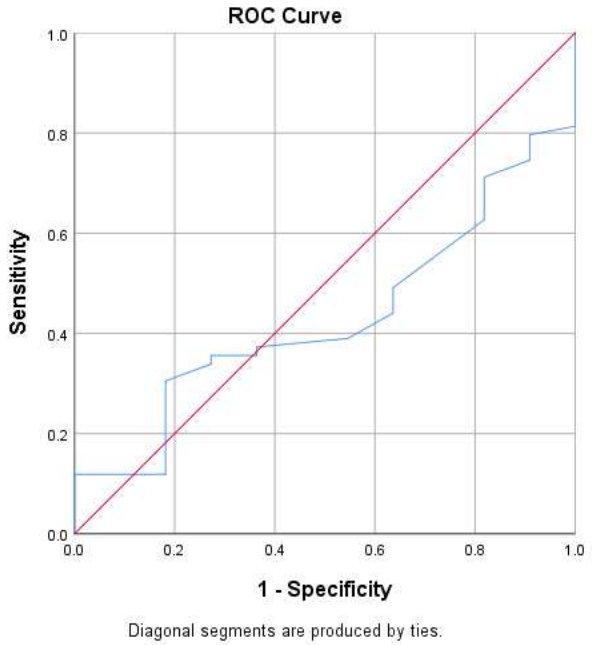
Parameter	Value	95% CI	
		Lower	Upper
ROC Cut off			
Sensitivity	57.63%	44.07%	70.39%
Specificity	63.64%	30.79%	89.07%
False positive rate	36.36%	10.93%	69.21%
False negative rate	42.37%	29.61%	55.93%
Positive predictive value	89.47%	75.20%	97.06%
Negative predictive value	21.88%	9.28%	39.97%
Diagnostic accuracy	58.57%	46.17%	70.23%

The sensitivity of MPV in determining Acute Appendicitis is only 57.63%, with specificity of 63.64% and a diagnostic accuracy of 58.57%

"PLATELET DISTRIBUTION WIDTH"-

ROC curve:

Graph 8: Predictive validity of PDW (%) in predicting Acute appendicitis (N=60)



Above show graph depicts the predictive value of the platelet distribution width in predicting Acute appendicitis.

Table 18: Area under the curve for predictive validity of PDW (%) in predicting Histopathology Report (N=60)

Test Result Variable(s): PDW (%)				
Area Under the Curve	**Std. Error**	**95% Confidence Interval of AUC**		**P Value**
		Lower Bound	**Upper Bound**	
0.431	0.070	0.276	0.587	0.473

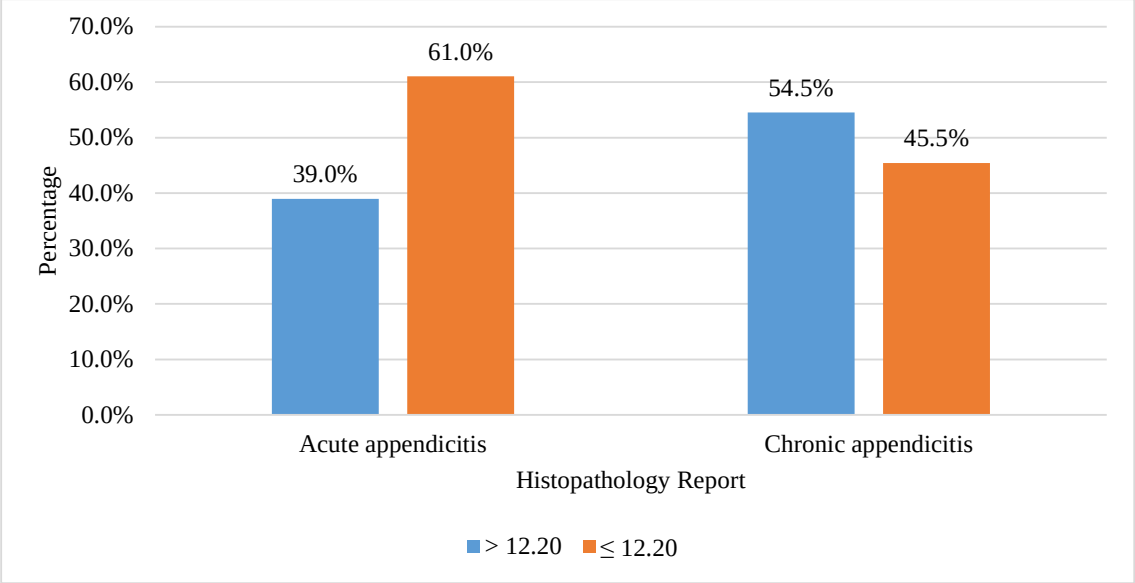
ROC curve test results shows, area under curve pf 0.431 with standard deviation of 0.070 and P value of 0.473.

Table 19: Comparison of PDW (%) between Acute and chronic Appendicitis (N=70)

PDW (%)	Histopathology Report		Chi square	Fisher exact P value
	Acute Appendicitis (N=59)	Chronic Appendicitis (N=11)		
> 12.20	23 (38.98%)	6 (54.55%)	0.925	0.506
≤ 12.20	36 (61.02%)	5 (45.45%)		

A ROC curve was used to determine the cut off for PDW to find out the diagnostic value of Acute Appendicitis. A cut off value of 12.20% was determined. Around 23 patients had PDW value of more than 12.20% and 36 patients had less than 12.20%. Although more patients had PDW less than 12.20%, it was not statistically significant

Graph 9: Cluster bar chart of comparison of PDW (%) between histopathology report (N=70)



This bar diagram shows that more patients in acute appendicitis group had PDW value less than 12.20. whereas in chronic appendicitis group around 54.5% patients had PDW value of more than 12.20%.

Table 20: Predictive validity of PDW (%) in predicting Acute Appendicitis(N=70)

Parameter	Value	95% CI	
		Lower	Upper
Sensitivity	38.98%	26.55%	52.56%
Specificity	45.45%	16.75%	76.62%
False positive rate	54.55%	23.38%	83.25%
False negative rate	61.02%	47.44%	73.45%
Positive predictive value	79.31%	60.28%	92.01%
Negative predictive value	12.20%	4.08%	26.20%
Diagnostic accuracy	40.00%	28.47%	52.41%

The sensitivity of PDW stands only at 39.98%, with specificity of only 45.45%. with 79.31% positive predictive value and only 40% diagnostic value.

Table 21: Comparison of platelet parameters between subjects with complicated and non-complicated acute appendicitis

Parameter	Complexity of acute appendicitis		p-value
	Non-complicated Mean ±SD (n)	Complicated Mean ±SD (n)	
Plan Platelet Count	2.65±0.74 (58)	3.06±1.56 (12)	0.17
MPV	8.14±1.38 (58)	12.01±3.25 (12)	<0.001
PDW	0.12±0.02 (58)	0.18±0.04 (12)	<0.001
Mean Total Count	8787.59±2608.33 (58)	13178.33±5293.34 (12)	<0.001

The mean plan platelet count among study subjects with complicated acute appendicitis (3.06±1.56) was comparatively higher than those with non-complicated acute appendicitis (2.65±0.74). However, this difference was not statistically significant (p>0.05).

The mean platelet volume (MPV) among study subjects with complicated acute appendicitis (12.01±3.25) was comparatively higher than those with non-complicated acute appendicitis (8.14±1.38). This difference in mean platelet volume between subjects with complicated and non- complicated AA was found to be statistically highly significant ($p<0.001$).

The mean platelet distribution width (PDW) among study subjects with complicated acute appendicitis (0.18±0.04) was comparatively higher than those with non-complicated acute appendicitis (0.12±0.02). This difference in mean platelet distribution width between subjects with complicated and non-complicated AA was found to be statistically highly significant ($p<0.001$).

The mean total count among study subjects with complicated acute appendicitis (13178.33±5293.34) was comparatively higher than those with non-complicated acute appendicitis (8787.59±2608.33). This difference in mean total count between subjects with complicated and non-complicated acute appendicitis was found to be statistically highly significant ($p<0.001$).

Table 22: Sensitivity and specificity of platelet count in detecting complicated acute appendicitis

Platelet Count		Complicated acute appendicitis		Total
		No	Yes	
Normal	Count	51	10	61
	%	83.6%	16.4%	100.0%
Abnormal	Count	7	2	9
	%	77.8%	22.2%	100.0%
Total	Count	58	12	70
	%	82.9%	17.1%	100.0%

Parameter	Estimate	Lower - Upper 95% CIs	Method
Sensitivity	22.22%	(6.322, 54.74)	Wilson Score
Specificity	83.61%	(72.39, 90.84)	Wilson Score
Positive Predictive Value	16.67%	(4.696, 44.8)	Wilson Score
Negative Predictive Value	87.93%	(77.12, 94.03)	Wilson Score
Diagnostic Accuracy	75.71%	(64.5, 84.25)	Wilson Score

The sensitivity and specificity of platelet count to detect complicated acute appendicitis was found to be 22.22% (95% CI: 6.32 – 54.74%) and 83.61% (95% CI: 72.39-90.84%). The positive and negative predictive values were 16.67% (95% CI: 4.69-44.8%) and 87.93% (77.12-94.03%). The positive and negative likelihood ratios were 1.356 (95% CI: 0.036-50.92) and 0.93 (95% CI: 0.697-1.24).

Table 23: Sensitivity and specificity of mean platelet volume in detecting complicated acute appendicitis

MPV		Complicated		Total
		No	Yes	
Normal	Count	28	3	31
	%	90.3%	9.7%	100.0%
Abnormal	Count	30	9	39
	%	76.9%	23.1%	100.0%
Total	Count	58	12	70
	%	82.9%	17.1%	100.0%

Parameter	Estimate	Lower - Upper 95% CIs	Method
Sensitivity	23.08%	(12.65, 38.34)	Wilson Score
Specificity	90.32%	(75.1, 96.65)	Wilson Score
Positive Predictive Value	75%	(46.77, 91.11)	Wilson Score
Negative Predictive Value	48.28%	(35.93, 60.84)	Wilson Score
Diagnostic Accuracy	52.86%	(41.32, 64.1)	Wilson Score

The sensitivity and specificity of mean platelet volume to detect complicated acute appendicitis was found to be 23.08% (95% CI: 12.65 – 38.34%) and 90.32% (95% CI: 75.1-96.65%). The positive and negative predictive values were 75% (95% CI: 46.77-91.11%) and 48.2% (35.93-60.84%). The positive and negative likelihood ratios were 2.38 (95% CI: 0.600-9.47) and 0.851 (95% CI: 0.791-0.916).

Table 24: Sensitivity and specificity of platelet distribution width in detecting complicated acute appendicitis

PDW		Complicated		Total
		No	Yes	
Normal	Count	44	5	49
	%	89.8%	10.2%	100.0%
Abnormal	Count	14	7	21
	%	66.7%	33.3%	100.0%
Total	Count	58	12	70
	%	82.9%	17.1%	100.0%

Parameter	Estimate	Lower - Upper 95% CIs	Method
Sensitivity	33.33%	(17.19, 54.63)	Wilson Score
Specificity	89.8%	(78.24, 95.56)	Wilson Score
Positive Predictive Value	58.33%	(31.95, 80.67)	Wilson Score
Negative Predictive Value	75.86%	(63.47, 85.04)	Wilson Score
Diagnostic Accuracy	72.86%	(61.46, 81.88)	Wilson Score

The sensitivity and specificity of platelet distribution width to detect complicated acute appendicitis was found to be 33.33% (95% CI: 17.19 – 54.63%) and 89.8% (95% CI: 78.24-95.56%). The positive and negative predictive values were 58.33% (95% CI: 31.95-80.67%) and 75.86% (63.47-85.04%). The positive and negative likelihood ratios were 3.267 (95% CI: 1.261-8.464) and 0.742 (95% CI: 0.642-0.858).

Table 25: Sensitivity and specificity of total count in detecting complicated acute appendicitis

Total count		Complicated		Total
		No	Yes	
Normal	Count	40	4	44
	%	90.9%	9.1%	100.0%
Abnormal	Count	18	8	26
	%	69.2%	30.8%	100.0%
Total	Count	58	12	70
	%	82.9%	17.1%	100.0%

Parameter	Estimate	Lower - Upper 95% CIs	Method
Sensitivity	30.77%	(16.5, 49.99)	Wilson Score
Specificity	90.91%	(78.84, 96.41)	Wilson Score
Positive Predictive Value	66.67%	(39.06, 86.19)	Wilson Score
Negative Predictive Value	68.97%	(56.2, 79.38)	Wilson Score
Diagnostic Accuracy	68.57%	(56.97, 78.24)	Wilson Score

The sensitivity and specificity of total count to detect complicated acute appendicitis was found to be 30.77% (95% CI: 16.5 – 49.99%) and 90.91% (95% CI: 78.84-96.41%). The positive and negative predictive values were 66.67% (95% CI: 39.06-86.19%) and 68.57% (56.97-78.24%). The positive and negative likelihood ratios were 3.385 (95% CI: 1.195-9.588) and 0.761 (95% CI: 0.679-0.853).

DISCUSSION

Every 1/1000 of the general population suffers from Acute Appendicitis.[38] Abdominal pain is the classical symptom of appendicitis, which begins around the periumbilical area and then shifts to right lower quadrant within 24 hrs. in 60% of patients nausea, vomiting, lack of appetite and diarrhoea persists.[39] As compared to previous years, the morbidity and mortality of AA are less but the differential diagnosis may be still be difficult. Since past 50 years mortality rate due to perforated appendicitis is declining; however, the complication rate is still high. [16][40]

Appropriately diagnosing acute appendicitis is still difficult, even though the topic of diagnosis of appendicitis is not new. It requires a two-stage diagnostic work-up with sufficient precision in each stage. In the initial stage Acute appendicitis must be separated from other urgent or non-emergent abdominal illness during the diagnostic stage. Differentiating between complicated and non-complicated appendicitis is necessary in the 2nd diagnostic stage of individuals with acute appendicitis.

Relying solely on laboratory tests necessitates weighing the trade-offs between the risk of postponing treatment for complicated appendicitis (due to insufficient sensitivity for complex appendicitis) and the risk of unsuccessful surgical evaluation because no clinical or laboratory test has combined high sensitivity and high specificity (inadequate specificity for complicated appendicitis). In case of appendicitis, imaging is still necessary for distinguishing complicated and uncomplicated appendicitis.[41]

Variables predictive of the development of perforation in cases of appendicitis reported previously include serum CRP level, body temperature, serum bilirubin level, heart rate, and time from onset of symptoms to hospital presentation. However,

leucocyte count and neutrophil ratio were not predictors of perforation in acute appendicitis. The interval between the beginning of symptoms and presentation to hospital, in contrast to leucocyte count/neutrophil, didn't indicate this condition, according to our data, which is in agreement with the literature. Our findings indicate that MPV is predictive of complication, contrary to earlier reports. In our study, MPVs were lesser in those who had appendicitis with no complications compared to the healthy control group and those who had the illness with complications.[42]

Recent research has focused on thrombocyte inflammation and tissue injury. Thrombocytes are tiny, disk-shaped components that vary in size, density, age, and metabolic capabilities. Megakaryocyte growth is increased together with the formation of mean platelet volume in response to thrombopoietic stress. Stress thrombocytes are larger thrombocytes. The primary indicator of thrombocyte volume is the level of megakaryocyte activation as indicated by DNA content.[16]

Interleulin-6 (IL-6) activates bone marrow megakaryocytes and enhances the release of youthful, larger-sized platelets into the bloodstream in disorders accompanied by inflammation; As a result, MPV value rises.[9,43] This is especially true for people with inflammatory diseases like rheumatoid arthritis and colitis ulcerosa during times of low disease activity. On the other hand, MPV levels drop at times of high disease activity.[43] This discovery was attributed by Danese et al. to increased big and active platelet sequestration and destruction at inflammatory sites during times of extremely high inflammatory activity, which causes the circulation to be predominately made up of tiny platelets.[44] MPV has been reported to increase swiftly in relation with occurrence of sepsis[45]. It was claimed that a late reaction, such as increased generation of immature platelets, could not account for such a quick rise in MPV from the bone marrow, but that it might be explained by platelets

activating and enlarging during inflammation[46,47]. It is believed that early platelet activation brought on by inflammation and a late increase in the release of young platelets from the bone marrow into the bloodstream cause a rise in MPV, whereas "increased sequestration and destruction of activated platelets at sites of inflammation cause a decrease in MPV". According to three investigations linking acute appendicitis with MPV, patients with appendicitis had lower MPV levels.[8,43,48] We consider that increased sequestration and destruction of activated platelets at sites of inflammation results in a decrease in MPV in diseases accompanied by active inflammation, such as early noncomplicated acute appendicitis, and that release of young platelets from the bone marrow into the bloodstream results in an increase in MPV in diseases like perforated appendicitis in the late stages. We think that failing to evaluate individuals with difficult and simple appendicitis individually may be the cause of the contradictory findings about MPV and appendicitis in the literature.[42]

In this study, we have taken 70 patients who were diagnosed to have Acute appendicitis on clinical and imaging basis. Out of which 34 were males and 36 were females, with a mean age of 34.5+/-14.25 years. The median of duration pain with which patients have presented to hospital was 4.5 days and a median of 35.98+/-91.95 days. Most of the patients presented with complaints of pain in right lower quadrant, only 3 patients presented with a complaint of generalised pain abdomen. 4 patients who did not have right iliac fossa tenderness were reported as chronic appendicitis on histopathology.

The sensitivity and specificity of ultrasonogram to detect acute appendicitis was found to be 67.92% (95% CI: 54.52 – 78.91%) and 58.82% (95% CI: 36.01-78.39%). The positive and negative predictive values were 83.72% (95% CI: 70.03-91.88%) and 37.04% (21.53-

55.77%). The positive and negative likelihood ratios were 1.65 (95% CI: 1.215-2.239) and 0.54 (95% CI: 0.423-0.701). The sensitivity and specificity of CT scan to detect acute appendicitis was found to be 11.32% (95% CI: 5.293 – 22.58%) and 100% (95% CI: 81.57-100%). The positive and negative predictive values were 100% (95% CI: 60.97-100%) and 26.56% (17.3-38.48%).

Around 34 patients had MPV value of more than 8.1 and 25 patients had less than 8.1 MPV value. Although more patients had MPV value more than 8.1, it was not statistically significant. The sensitivity of MPV in determining Acute Appendicitis is only 57.63%, with specificity of 63.64% and a diagnostic accuracy of 58.57%. Around 23 patients had PDW value of more than 12.20% and 36 patients had less than 12.20%. Although more patients had PDW less than 12.20%, it was not statistically significant. The sensitivity of PDW stands only at 39.98%, with specificity of only 45.45%. with 79.31% positive predictive value and only 40% diagnostic value.

The mean platelet volume (MPV) among study subjects with complicated acute appendicitis (12.01±3.25) was comparatively higher than those with non-complicated acute appendicitis (8.14±1.38). This difference in mean platelet volume between subjects with complicated and non-complicated AA was found to be statistically highly significant ($p<0.001$).

The mean platelet distribution width (PDW) among study subjects with complicated acute appendicitis (0.18±0.04) was comparatively higher than those with non-complicated acute appendicitis (0.12±0.02). This difference in mean platelet distribution

width between subjects with complicated and non-complicated AA was found to be statistically highly significant ($p<0.001$).

The mean TLC among study subjects with complicated acute appendicitis (13178.33±5293.34) was comparatively higher than those with non-complicated acute appendicitis (8787.59±2608.33). This difference in mean total count between subjects with complicated and non-complicated AA was found to be statistically highly significant ($p<0.001$).

The sensitivity and specificity of MPV to detect complicated acute appendicitis was found to be 23.08% (95% CI: 12.65 – 38.34%) and 90.32% (95% CI: 75.1-96.65%). The positive and negative predictive values were 75% (95% CI: 46.77-91.11%) and 48.2% (35.93-60.84%).

The sensitivity and specificity of PDW to detect complicated acute appendicitis was found to be 33.33% (95% CI: 17.19 – 54.63%) and 89.8% (95% CI: 78.24-95.56%). The positive and negative predictive values were 58.33% (95% CI: 31.95-80.67%) and 75.86% (63.47-85.04%).

Mehmet Emin Gunes et_al in his study of Diagnostic value of platelet indices in acute appendicitis and comparison with histopathology found that there was no statistical significance of MPV and PDW in diagnosis of Acute Appendicitis[(49)]. There are 3 studies who compared platelet indices and diagnosis of appendicitis, Emin Daldal et al demonstrated that patients with <6mm of appendix with acute appendicitis had elevated mean platelet volume(MPV)[(36)].

A study by Lalhruaitluanga et al concluded that MPV did not have a greater sensitivity in diagnosing acute appendicitis than total counts, but PDW had higher sensitivity, is found higher in complicated appendicitis[(11)]. Whereas in a study done by hossien Najd et al had different results, the MPV value was significantly higher in AA when compared to perforated appendicitis and gangrenous appendicitis, even PDW was significantly higher in complicated appendicitis group[(15)]. Zhe Fan et al in their study of mean platelet volume and platelet distribution width as markers in the diagnosis of Acute Gangrenous Appendicitis shows that the MPV is reduced and the PDW is increased in the patients with Acute gangrenous appendicitis (AGA), but there is no significant difference in AGA and control group values.

In our study, results were different from above mentioned studies and was a bit similar to a study done by Bahadir Ceylan et al, which concluded that in cases of non-complicated appendicitis had lower MPV values when compared to complicated appendicitis group, study also mentions that MPV can be used as a predictor for complicated appendicitis[(9)].

Jyotindu Debnath [1], Rajesh Kumar et al, in there study found that USG alone had sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy of 81, 88, 92.6, 71.6, and 83 %, respectively. But in our study The sensitivity and specificity of ultrasonogram to detect acute appendicitis was found to be 67.92% (95% CI: 54.52 – 78.91%) and 58.82% (95% CI: 36.01-78.39%). The positive and negative predictive values were 83.72% (95% CI: 70.03-91.88%) and 37.04% (21.53-55.77%)

The sensitivity and specificity were 92.7% (95% confidence interval 89.5% to 95.0%) and 96.1% (95% confidence interval 94.2% to 97.5%), respectively; the positive likelihood ratio=24 and the negative likelihood ratio=0.08 as per Diagnostic accuracy of non-contrast computed tomography for appendicitis in adults: a systematic review which when compared our study, results are like, the sensitivity and specificity of CT scan to detect acute appendicitis was found to be 11.32% (95% CI: 5.293 – 22.58%) and 100% (95% CI: 81.57-100%). The positive and negative predictive values were 100% (95% CI: 60.97-100%) and 26.56% (17.3-38.48%).

Results in our study shows that around 34 out 59 patients with acute appendicitis had MPV values greater than 8.1 and 36 out of 59 patients with acute appendicitis has PDW value less than 12.2%, but these results were not statistically significant. When the values of MPV and PDW were compared between Acute appendicitis and complicated appendicitis, MPV and PDW were significantly higher in complicated appendicitis group. Hence, we conclude that although MPV and PDW values are not help in diagnosing Acute appendicitis when compared to imaging and total count values. But they can be used as a cheaper alternative to determine the severity of the Acute Appendicitis in early stages of presentation to hospital.

Table 26. Comparison of MPV and PDW in predicting diagnostic value in Acute Appendicitis and its complications with respect to previous studies

Mean platelet volume	**Present study**		**Ceylan B et_al [9]**		**Lalhruaitluanga et_al[11]**		**Hossien Najd et_al[15]**	
MPV	Acute appendicitis	Complicated appendicitis	Acute appendicitis	Complicated appendicitis	Acute appendicitis	Complicated appendicitis	Acute appendicitis	Complicated appendicitis
Sensitivity	57.63%	23.08%	—	59%	63.3%	60%	35%	70%
Specificity	63.64%	90.32%	—	59.5%	54.0%	46.4%	75%	80%
Positive predictive value	89.47%	75%	—	26.2%	—		—	—
Negative predictive value	21.88%	48.28%	—	43.3%			—	—
Diagnostic accuracy	58.57%	52.86%	—	—			—	—

Platelet distribution width	**Present study**		**Lalhruaitluanga et_al[11]**		**Hossien Najd et_al[15]**	
PDW	Acute appendicitis	Complicated appendicitis	Acute appendicitis	Complicated appendicitis	Acute appendicitis	Complicated appendicitis
Sensitivity	38.98%	33.33%	88.87%	90.91%	35%	59%
Specificity	45.45%	89.8%	84.7%	93.91%	75%	76%
Positive predictive value	79.31%	58.335	—		—	—
Negative predictive value	12.20%	75.86%			—	—
Diagnostic accuracy	40.00%	72.86%			—	—

CONCLUSION

This study where we anticipated to find the relation between mean platelet volume (MPV) and platelet distribution width (PDW) in Acute appendicitis with or without complications. Here we conclude that MPV values were higher in AA group in comparison with non-acute appendicitis group but it was not statistically significant, similar results were seen with PDW as well where more patients with acute appendicitis had low PDW values, but results were not statistically significant. There was statistically significant difference of MPV and PDW values were seen in complicated appendicitis when compared to Acute Appendicitis.

we conclude that although MPV and PDW values are not help in diagnosing Acute appendicitis when compared to imaging and total count values. But they can be used as a cheaper alternative to determine the severity of the Acute Appendicitis in early stages of presentation to hospital.

Recommendations-

- Requires larger sample size
- As this is a single institutional study, we recommend a multi-institutional study.
- We recommend a better study design like case-control study.
- Requires further studies like systemic reviews and meta-analysis to further prove the hypothesis.

SUMMARY

In this study, we have taken 70 patients who were diagnosed to have Acute appendicitis on clinical and imaging basis. Out of which 34 were males and 36 were females, with a mean age of 34.5+/-14.25 years. The median duration of pain with which patients have presented to hospital was 4.5 days and a median of 35.98+/-91.95 days. Most of the patients presented with complaints of pain in right lower quadrant, only 3 patients presented with a complaint of generalised pain abdomen. 4 patients who did not have right iliac fossa tenderness were reported as chronic appendicitis on histopathology.

The sensitivity and specificity of ultrasonogram to detect acute appendicitis was found to be 67.92% (95% CI: 54.52 – 78.91%) and 58.82% (95% CI: 36.01-78.39%). The positive and negative predictive values were 83.72% (95% CI: 70.03-91.88%) and 37.04% (21.53-55.77%). The positive and negative likelihood ratios were 1.65 (95% CI: 1.215-2.239) and 0.54 (95% CI: 0.423-0.701). The sensitivity and specificity of CT scan to detect acute appendicitis was found to be 11.32% (95% CI: 5.293 – 22.58%) and 100% (95% CI: 81.57-100%). The positive and negative predictive values were 100% (95% CI: 60.97-100%) and 26.56% (17.3-38.48%).

Results in our study shows that around 34 out 59 patients with acute appendicitis had MPV values greater than 8.1fl and 36 out of 59 patients with acute appendicitis had PDW value less than 12.2%, but these results were not statistically significant. When the values of MPV and PDW were compared between Acute appendicitis and complicated appendicitis, MPV and PDW were significantly higher in complicated

appendicitis group. Hence, we conclude that although MPV and PDW values are not help in diagnosing Acute appendicitis when compared to imaging and total count values. But they can be used as a cheaper alternative to determine the severity of the Acute Appendicitis in early stages of presentation to hospital.

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ANNEXURE I

INFORMED CONSENT

Purpose of the study

I have been informed by REG NO: BH0120004, Post Graduate in M.S. General Surgery under the guidance of Dr. _____, Department of General Surgery, J.N. Medical College, KAHER, Belagavi is conducting PROSPECTIVE EVALUATION OF PLATELET PARAMETERS IN DIAGNOSIS OF ACUTE APPENDICITIS- ONE YEAR OBSERVATIONAL STUDY at KAHER'S DR. PRABHAKAR CHARITABLE HOSPITAL AND MEDICAL RESEARCH CENTRE, BELAGAVI.

Acute appendicitis is most common emergency that presents to causality, with complains of acute pain abdomen, which requires quick diagnosis and intervention. Delay in diagnosis or unable to assess the complications can lead to mortality and morbidity. Therefore, this study aims towards early diagnosis and early detection of complications with cost effective, simple laboratory parameters and reduce the rates mortality and morbidity rates of Acute Appendicitis.

Study procedure

Once you have signed the informed consent, necessary personal information and detailed medical history will be taken by the investigator. After this blood sample will be collected and will be sent for investigations viz, CBC, platelet counts, reticulocyte counts, platelet indices (MPV, PDW) and these values will be compared with the reference values.

Potential risks

Nil

Benefits

The benefit of study is early diagnosis of Acute Appendicitis and its complications

Financial incentive for participation

You will not receive any payment for taking part in this study.

Alternatives

Your participation in this study is entirely voluntary. You are free to refuse to participate or withdraw from the study at any time. You will still receive standard medical care from the hospital. The investigator holds the right to terminate the study at any time

Privacy

To protect my privacy, all the collected information will be given a number rather than using my name. Any information collected during the study will remain confidential. My medical files will be reviewed only at the hospital (or study doctor's office) to check the information and verify the result without breaking my confidentiality.

Authorization to publish results

The information about me will be analyzed together with other study participants. Results of this study will be published and presented to scientific groups for scientific purposes, but I will never be individually identified in the presentation of the study results.

Institutional policy

In case you have any questions related to the study, in future or in case of study related injury or illness, you can contact REG NO: BH0120004, Department of General Surgery, KAHER University's J. N Medical College. Dr._____ Dept. Of General surgery, KAHER University's J. N Medical College, Belagavi.

Voluntary participation

Your participation in the study is voluntary. In case you need any further information regarding your rights as study participant, you may contact Dr. Harsha Hegde, Chairperson, JNMC, IEC & Scientist D, ICMR, National Institute of Traditional Medicine, Belagavi 9480422500

Institutional Ethics Committee on Human Subjects Research, Phone No.0831 2473777 ext-1527 at J. N. Medical College, Belagavi. You are free to stop participation in this study at any time and for any reason.

CONSENT FORM

Study title PROSPECTIVE EVALUATION OF PLATELET PARAMETERS IN DIAGNOSIS OF ACUTE APPENDICITIS- ONE YEAR OBSERVATIONAL STUDY at KAHERs Dr Prabhakar Kore Charitable Hospital and Medical Research Centre, Belagavi.

I confirm that I have read and understood the information sheet for the above study and have had the opportunity to ask questions.

I understood that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.

I understood that sponsor of the clinical trial, others working on the sponsor's behalf, the Ethics Committee and the regulatory authorities will

not need my permission to look at my health records both in respect of current study and any further research that may be conducted in relation to it, even if I withdraw from the trial. I agree to this access. However, I understood that

my identity will not be revealed in any information released to third parties or published.

I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purposes.

I agree to take part in the above study.

Subject's name:

Signature / left thumb impression of subject:

Name of person obtaining informed consent:

Signature of person obtaining informed consent:

If a patient has limited ability to read and write, an impartial witness should be present during the entire informed consent discussion and patient's legally acceptable representative should sign on the patient's behalf.) In these instances the patient his/her thumb impression taken in place of signature. **Patient's legally acceptable representative's statement: NA**

I, as the patient's legally acceptable representative was present during the consenting procedure and understand the preceding information describing this study. All of the questions regarding the study and the patient's participation in it have been answered to my satisfaction. I state that all aspects of the study were clearly presented during the consent procedure. The patient is willing to participate in this study and I sign below on his/her behalf testifying to this effect.

Name of the patient: Name of representative:

Relationship to the patient: Signature of representative:

Impartial witness declaration:

By signing the consent form I attest that the information was accurately explained to and apparently understood by the patient and the representative (if applicable) and that the informed consent was freely given by the patient.

Name of impartial witness:

Signature: Date

ತಿಳುವಳಿಕೆಯ ಸಮ್ಮತಿ

ಅಧ್ಯಯನದ ಶೀರ್ಷಿಕೆ: ಕಾಹೇರ್‌ನ ಡಾ.ಪ್ರಭಾಕರ್ ಕೋರೆ ಆಸ್ಪತ್ರೆ ಮತ್ತು ವೈದ್ಯಕೀಯ ಸಂಶೋಧನಾ ಕೇಂದ್ರದಲ್ಲಿ 'ಪೂರ್ವ-ಆಪರೇಟಿವ್ ಪ್ರತಿಜೀವಕಗಳ ಏಕ ಪ್ರಮಾಣವು ಶುದ್ಧ ಚುನಾಯಿತ ಲ್ಯಾಪರೊಸ್ಕೋಪಿಕ್ ಕೊಲೆಸಿಸ್ಟೆಕ್ಟಮಿ- ಒಂದು ವರ್ಷದ ರಾಂಡೋ ಮೈಸ್ಡ್ ಟ್ರಯಲ್' ನೀವು ಎಲೆಕ್ಟಿವ್ ಲ್ಯಾಪರೊಸ್ಕೋಪಿಕ್ ಕೊಲೆಸಿಸ್ಟೆಕ್ಟೊಮಿಗೆ ಒಳಗಾಗುವ ರೋಗಿಯಾಗಿರುವುದರಿಂದ ಈ ಸಂಶೋಧನೆಯಲ್ಲಿ ಭಾಗವಹಿಸಲು ನಿಮ್ಮನ್ನು ಆಹ್ವಾನಿಸಲಾಗಿದೆ. ಉದ್ದೇಶಗಳಲ್ಲಿ ಹೇಳಿದಂತೆ ಲ್ಯಾಪರೊಸ್ಕೋಪಿಕ್ ಕೊಲೆಸಿಸ್ಟೆಕ್ಟಮಿ ನಂತರ ಶಸ್ತ್ರಚಿಕಿತ್ಸೆಯ ನಂತರದ ಪ್ರತಿಜೀವಕಗಳ ಪಾತ್ರವನ್ನು ನಿರ್ಧರಿಸಲು ಈ ಅಧ್ಯಯನವನ್ನು ಮಾಡಲಾಗುತ್ತಿದೆ. REG NO: BH0120004ಪ್ರಧಾನ ತನಿಖಾಧಿಕಾರಿ ಮತ್ತು ಅಧ್ಯಯನವನ್ನು ಡಾ. ನೇರ ಮೇಲ್ವಿಚಾರಣೆಯಲ್ಲಿ ನಡೆಸಲಾಗುವುದು. ಡಾ _____.

ವಿಧಾನ:

ಈ ಅಧ್ಯಯನದಲ್ಲಿರಲು ನೀವು ಸಮ್ಮತಿಸಿದರೆ, ನಿಮಗೆ ಒದಗಿಸಿದ ಪ್ರೊಫಾರ್ಮಾದ ಪ್ರಕಾರ ಸಂಬಂಧಿತ ಡೇಟಾವನ್ನು ಸಂಗ್ರಹಿಸಲಾಗುತ್ತದೆ. ತದನಂತರ ನಿಮಗೆ ಎರಡು ವಿಭಿನ್ನ ಗುಂಪುಗಳಾಗಿ ರಾಂಡೋ ಮಿಲಿಯನ್ನು ಹಂಚಲಾಗುತ್ತದೆ. ಎ ಗುಂಪಿನಲ್ಲಿರುವ ರೋಗಿಯು ಇಂಜಿನ ಒಂದೇ ಪ್ರಮಾಣವನ್ನು ಮಾತ್ರ ಸ್ವೀಕರಿಸುತ್ತಾರೆ. ಸೆಫೋಟಾಕ್ಸಿಮ್ 1 ಗ್ರಾಂ IV + ಇಂಜೆ. ಪ್ರಚೋದನೆಯ ಸಮಯದಲ್ಲಿ ಮೆಟ್ರೋನಿಡಜೋಲ್ 100 ಎಂಎಲ್ ಐವಿ, ಬಿ ಗುಂಪಿನಲ್ಲಿರುವ ರೋಗಿಯು 2 ಡೋಸ್ ರೀತಿಯ ಪ್ರತಿಜೀವಕಗಳ ಪೋಸ್ಟ್ ಅನ್ನು ಆಪರೇಟಿವ್ ಆಗಿ ಸ್ವೀಕರಿಸುತ್ತಾರೆ.

ಲಾಭಗಳು

ಸಮುದಾಯಕ್ಕೆ ದೊಡ್ಡದಾಗಿದೆ.

1. ಅಧ್ಯಯನದಿಂದ ಪಡೆದ ದತ್ತಾಂಶವು ಚುನಾಯಿತ ಲ್ಯಾಪರೊಸ್ಕೋಪಿಕ್ ಕೊಲೆಸಿಸ್ಟೆಕ್ಟೊಮಿಗೆ ಒಳಗಾಗುವ ರೋಗಿಗಳಲ್ಲಿ ಶಸ್ತ್ರಚಿಕಿತ್ಸೆಯ ನಂತರದ ಪ್ರತಿಜೀವಕಗಳ ಪಾತ್ರದ ಬಗ್ಗೆ ಮಾಹಿತಿಯನ್ನು ಒದಗಿಸಲು ಸಹಾಯ ಮಾಡುತ್ತದೆ.

ಅಪಾಯಗಳು

ಈ ಅಧ್ಯಯನಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ಅಪಾಯಗಳಿಲ್ಲ.

ಪರ್ಯಾಯಗಳು:

ನೀವು ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ನಿರಾಕರಿಸಿದರೆ, ನಿಮ್ಮ ನಿರ್ಧಾರವು ಬದಲಾಗುವುದಿಲ್ಲ
ಪ್ರಸ್ತುತ ಅಥವಾ ಭವಿಷ್ಯದ ಆರೋಗ್ಯ ರಕ್ಷಣೆ ಅಥವಾ ನೀವು ಸ್ವೀಕರಿಸುವ ಇತರ ಸೇವೆಗಳು. ನಿಮಗೆ ನೀಡಲಾದ ಚಿಕಿತ್ಸೆಯು ನಿಮ್ಮ ಸ್ಥಿತಿಗೆ ಮಾನದಂಡವಾಗಿರುತ್ತದೆ.

ಅಧ್ಯಯನದಿಂದ ಸ್ವಯಂಪ್ರೇರಿತ ಭಾಗವಹಿಸುವಿಕೆ / ಹಿಂತೆಗೆದುಕೊಳ್ಳುವಿಕೆ :

ನೀವು ಯಾವಾಗ ಬೇಕಾದರೂ ಅಧ್ಯಯನದಿಂದ ಹಿಂದೆ ಸರಿಯಬಹುದು ಮತ್ತು ಅದಕ್ಕಾಗಿ ನಿಮಗೆ ದಂಡ ವಿಧಿಸಲಾಗುವುದಿಲ್ಲ. ಸೇರ್ಪಡೆ ಮಾನದಂಡಗಳನ್ನು ನೀವು ಪೂರೈಸದಿದ್ದರೆ ನಿಮ್ಮನ್ನು ಅಧ್ಯಯನದಿಂದ ತೆಗೆದುಹಾಕಬಹುದು.

ಗೌಪ್ಯತೆ ಮತ್ತು ಗೋಪ್ಯತೆ :

ಅಧ್ಯಯನದ ಅವಧಿಯಲ್ಲಿ ವಿಷಯದ ಬಗ್ಗೆ ಎಲ್ಲಾ ಮಾಹಿತಿಯು ಕಾನೂನಿನಿಂದ ಅನುಮತಿಸಲಾದ ಮಟ್ಟಿಗೆ ಗೌಪ್ಯವಾಗಿರುತ್ತದೆ. ಕೋಡ್ ಸಂಖ್ಯೆಗಳು ಈ ಸಂಶೋಧನಾ ದಾಖಲೆಯಲ್ಲಿ ವಿಷಯವನ್ನು ಗುರುತಿಸುತ್ತವೆ. ಈ ಅಧ್ಯಯನದ ಮಾಹಿತಿಯನ್ನು ಪ್ರಕಟಿಸಬಹುದು ಆದರೆ ಯಾವುದೇ ಪ್ರಕಟಣೆಯಲ್ಲಿ ವಿಷಯದ ಗುರುತು ಗೌಪ್ಯವಾಗಿರುತ್ತದೆ.

ವೆಚ್ಚಗಳು :

ಉದ್ದೇಶಿತ ಹಸ್ತಕ್ಷೇಪಕ್ಕಾಗಿ ರೋಗಿಯು ಯಾವುದೇ ಹೆಚ್ಚುವರಿ ಮೊತ್ತವನ್ನು ಪಾವತಿಸಬೇಕಾಗಿಲ್ಲ

ಪ್ರಶ್ನೆಗಳು

ನೀವು ಅಧ್ಯಯನಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಯಾವುದೇ ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿದ್ದರೆ, ಭವಿಷ್ಯದಲ್ಲಿ ಅಥವಾ ಅಧ್ಯಯನಕ್ಕೆ ಸಂಬಂಧಿಸಿದ ಗಾಯ ಅಥವಾ ಅನಾರೋಗ್ಯದ ಸಂದರ್ಭದಲ್ಲಿ, ನೀವು ಸಾಮಾನ್ಯ ಶಸ್ತ್ರಚಿಕಿತ್ಸಾ ವಿಭಾಗದ REG NO: BH0120004 ಅವರನ್ನು ಸಂಪರ್ಕಿಸಬಹುದು ಕೆ ಎಲ್ ಇ ಎಸ್ ಡಾ. ಪ್ರಭಾಕರ್ ಕೊರೆ ಹಾಸ್ಪಿಟಲ್ & ಎಂಆರ್ಸಿ, ಬೆಳಗಾವಿ. ದೂರವಾಣಿ ಸಂಖ್ಯೆ: _____ ಅಥವಾ ಡಾ. _____. ಜನರಲ್ ಸರ್ಜರಿ ವಿಭಾಗದಲ್ಲಿ ಪ್ರೊಫೆಸರ್, ಕೆಎಲ್ಇ ಡಾ.. ಪ್ರಭಾಕರ್ ಕೊರೆ ಹಾಸ್ಪಿಟಲ್ & ಎಂಆರ್ಸಿ, ಬೆಳಗಾವಿ.

ಒಂದು ವಿಷಯವಾಗಿ ನೀವು ಹಕ್ಕುಗಳ ಬಗ್ಗೆ ಯಾವುದೇ ಪ್ರಶ್ನೆಗಳನ್ನು ಹೊಂದಿದ್ದರೆ, ನೀವು ಕರೆ ಮಾಡಬಹುದು ಡಾ. _____, ಪೀಡಿಯಾಟ್ರಿಕ್ಸ್ ವಿಭಾಗದ ಪ್ರಾಧ್ಯಾಪಕರು ಮತ್ತು ಅಧ್ಯಕ್ಷ ಜೆ.ಎನ್ ಮೆಡಿಕಲ್ ಕಾಲೇಜ್ ಇನ್ಸ್ಟಿಟ್ಯೂಶನಲ್ ಎಥಿಕಲ್ ಕಮಿಟಿ ಫಾರ್ ಹ್ಯೂಮನ್ ಸಬ್ಜೆಕ್ಟ್ ರಿಸರ್ಚ್, ದೂರವಾಣಿ ಸಂಖ್ಯೆ: _____ ಅಥವಾ ವಿಸ್ತರಣೆ _____ ಬೆಳಗವಿಯ ಜವಾಹರಲಾಲ್ ನೆಹರು ವೈದ್ಯಕೀಯ ಕಾಲೇಜಿನಲ್ಲಿ.

ಒಪ್ಪಿಗೆಯ ಹೇಳಿಕೆ:

ನಾನು ಭಾಗವಹಿಸುವ ನಿರೀಕ್ಷೆಯಿರುವ ಸಂಶೋಧನಾ ಅಧ್ಯಯನದ ವಿವರಗಳನ್ನು, ಇದಕ್ಕಾಗಿ ನಾನು ಯಾದೃಚ್ಛ ಗಾತ್ರದ ನಿಯಂತ್ರಣ ಹಾದಿಗೆ ಒಳಗಾಗಬೇಕಾಗಿದೆ.
ನಾನು ಸ್ವಇಚ್ಛೆಂದ, ಸಂಶೋಧಕನ ಯಾವುದೇ ಒತ್ತಡದಲ್ಲಿ ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಭಾಗವಹಿಸಲು ಒಪ್ಪುವುದಿಲ್ಲ, ಮತ್ತು ಎಲ್ಲಾ ತನಿಖೆಗಳಲ್ಲಿ ಭಾಗವಹಿಸಲು ಒಪ್ಪುತ್ತೇನೆ. ನಾನು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಹಿಂತೆಗೆದುಕೊಳ್ಳಬಹುದು. ಈ ಫಾರ್ಮ್ಗೆ ಸಹಿ ಮಾಡುವ ಮೂಲಕ ನಾನು ನನ್ನ ಯಾವುದೇ ಕಾನೂನು ಹಕ್ಕುಗಳನ್ನು ಬಿಟ್ಟುಕೊಡುತ್ತಿಲ್ಲ.

ಕೆಳಗಿನ ನನ್ನ ಸಹಿ ನಾನು ಈ ಸಂಪೂರ್ಣ ಒಪ್ಪಿಗೆ ಫಾರ್ಮ್ ಅನ್ನು ಓದಿದ್ದೇನೆ ಅಥವಾ ಅದನ್ನು ನನಗೆ ಓದಲಾಗಿದೆ ಮತ್ತು ನನ್ನ ಎಲ್ಲಾ ಪ್ರಶ್ನೆಗಳಿಗೆ ಉತ್ತರಿಸಿದೆ ಎಂದು ಸೂಚಿಸುತ್ತದೆ. ಈ ಒಪ್ಪಿಗೆ ಪತ್ರದ ನಕಲನ್ನು ನನಗೆ ನೀಡಲಾಗುವುದು.

ಭಾಗವಹಿಸುವವರ ಅಥವಾ ಕಾನೂನುಬದ್ಧವಾಗಿ ಅಧಿಕೃತ ಪ್ರತಿನಿಧಿಯ ಸಹಿ.

ಭಾಗವಹಿಸುವವರ ಹೆಸರು:

ಸಹಿ:

ಕಾನೂನುಬದ್ಧವಾಗಿ ಅಧಿಕೃತ ಪ್ರತಿನಿಧಿಯ ಹೆಸರು:

ಸಹಿ:

ಸಾಕ್ಷಿಯ ಹೆಸರು:

ಸಹಿ:

ತನಿಖಾಧಿಕಾರಿಗಳ ಹೆಸರು ಮತ್ತು ಸಹಿ:

ದಿನಾಂಕ ಮತ್ತು ಸ್ಥಳ:

सहमति पत्र

अध्ययन का शीर्षक: प्री-ऑपरेटिव एंटीबायोटिक्स का एकल खुराक स्वच्छ ऐच्छिक लेप्रोस्कोपिक कोलेसीस्टेक्टोमी के लिए पर्याप्त है- काहेर के डॉ. प्रभाकर कोरेस हॉस्पिटल एंड मेडिकल रिसर्च सेंटर में एक साल का रैंडमाइज्ड ट्रेल '

 पको इस शोध में भाग लेने के लिए मंत्रित किया जाता है क्योंकि प ऐच्छिक लेप्रोस्कोपिक कोलेसीस्टेक्टॉमी से गुजर रहे हैं। यह अध्ययन लेप्रोस्कोपिक कोलेसिस्टेक्टोमी के बाद पोस्ट-ऑपरेटिव एंटीबायोटिक्स की भूमिका को निर्धारित करने के लिए किया जा रहा है जैसा कि उद्देश्यों में उल्लेख किया गया है। डॉ _____ मुख्य अन्वेषक हैं और अध्ययन डॉ _____ की प्रत्यक्ष देखरेख में योजित किया जाएगा

प्रक्रिया

यदि प इस अध्ययन में शामिल होने के लिए सहमत हैं, तो संबंधित डेटा पको प्रदान किए गए प्रोफार्मा के अनुसार एकत्र किया जाता है। और फिर पको यादृच्छिक रूप से दो अलग-अलग समूहों में वंटित किया जाएगा। समूह ए में रोगी केवल इंज की एकल खुराक प्राप्त करेंगे। सेपोटैक्सिम 1 ग्राम ईवी + इंज। इंडक्शन के समय मेट्रोनिडाज़ोल 100 मिली। ईवी जबकि समूह बी में रोगी को इसी तरह के एंटीबायोटिक्स पोस्ट की 2 खुराक भी ऑपरेटिव रूप से मिलेगी।

लाभ

बड़े पैमाने पर समुदाय के लिए

1. अध्ययन से प्राप्त ंकड़ों से ऐच्छिक लेप्रोस्कोपिक कोलेसिस्टेक्टॉमी से गुजरने वाले रोगियों में पोस्ट-ऑपरेटिव एंटीबायोटिक्स की भूमिका के बारे में जानकारी प्रदान करने में मदद मिलेगी.

जोखिम

इस अध्ययन से जुड़े कोई जोखिम नहीं हैं।

विकल्प

यदि प अध्ययन में भाग लेने से इनकार करते हैं, तो पका निर्णय नहीं बदलेगा
वर्तमान या भविष्य में स्वास्थ्य देखभाल या अन्य सेवाएं जो पको प्राप्त होंगी। पके द्वारा दिया गया उपचार पकी स्थिति के लिए मानक होगा।

अध्ययन से हटना / हटाना :

 प किसी भी समय के दौरान अध्ययन से हट सकते हैं और प उसी के लिए दंडित नहीं होंगे। यदि प समावेश मानदंडों को पूरा नहीं करते हैं, तो पको अध्ययन से हटाया जा सकता है।

गोपनीयता और गोपनीयता :

अध्ययन के दौरान विषय के बारे में सभी जानकारी कानून द्वारा अनुमत सीमा तक गोपनीय रखी जाएगी। कोड संख्या इस शोध रिकॉर्ड में विषय की पहचान करेगी। इस अध्ययन से जानकारी प्रकाशित की जा सकती है लेकिन किसी भी प्रकाशन में विषय की पहचान गोपनीय होगी।

लागत:

प्रस्तावित हस्तक्षेप के लिए रोगी को कोई अतिरिक्त राशि नहीं देनी होगी

सवाल :

यदि पके पास अध्ययन से संबंधित कोई प्रश्न है, तो भविष्य में या अध्ययन से संबंधित चोट या बीमारी के मामले में, प जनरल सर्जरी विभाग, के एल ई। डॉ। प्रभाकर कोरे अस्पताल और एम रसी, बेलागवी से संपर्क कर सकते हैं। फोन नंबर: _____ या डॉ _____ जनरल सर्जरी विभाग में प्रोफेसर, के एल ई एस डॉ। प्रभाकर कोरे अस्पताल और एम रसी, बेलगावी।

यदि पके पास विषय के रूप में अधिकारों के बारे में कोई प्रश्न हैं, तो प डॉ। _____, बाल रोग विभाग और अध्यक्ष जेएन मेडिकल कॉलेज इंस्टीट्यूशनल एथिकल कमेटी फॉर ह्यूमन सब्जेक्ट्स रिसर्च, फोन नंबर: _____ या एक्सटेंशन _____ जवाहरलाल नेहरू मेडिकल कॉलेज, बेलागवी में कॉल कर सकते हैं.

सहमति का कथन

अनुसंधान अध्ययन का विवरण जिसमें मुझे भाग लेने की उम्मीद है, जिसके लिए मुझे एक यादृच्छिक नियंत्रण निशान से गुजरना होगा मुझे समझाया गया है।
मैं स्वेच्छा से, शोधकर्ता के इस अध्ययन में भाग लेने के लिए सहमत नहीं हूं, और सभी जांचों में भाग लेने के लिए सहमत हूं। मैं किसी भी समय वापस ले सकता हूं। मैं इस फॉर्म पर हस्ताक्षर करके अपने किसी भी कानूनी अधिकार को नहीं छोड़ रहा हूं।
नीचे दिए गए मेरे हस्ताक्षर से संकेत मिलता है कि मैंने इस संपूर्ण सहमति फॉर्म को पढ़ लिया है या यह मुझे पढ़ा गया है, और मेरे सभी सवालों के जवाब दिए गए थे। मुझे इस सहमति फॉर्म की एक प्रति दी जाएगी।

सहभागी या कानूनी रूप से अधिकृत प्रतिनिधि का हस्ताक्षर।

प्रतिभागियों का नाम:

हस्ताक्षर:

कानूनी रूप से अधिकृत प्रतिनिधि का नाम:

हस्ताक्षर:

साक्षी का नाम:

हस्ताक्षर:

जांचकर्ताओं का नाम और हस्ताक्षर:

तारीख और जगह:

माहितीपूर्ण संमती

अभ्यासाचे शीर्षकः 'क्लेअर इलेक्टीव्ह लेप्रोस्कोपिक कोलेसिस्टेक्टॉमी- एक वर्षाचे यादृच्छिक ट्रेल' साठी 'प्री-ऑपरेटिव्ह अन्टीबायोटिक्सची एक डोस पुरेसे हे' काहेरच्या डॉ. प्रभाकर कोरे हॉस्पिटल णि मेडिकल रिसर्च सेंटर येथे.

 पण या संशोधनात सहभागी होण्यासाठी मंत्रित हात कारण पण इलेलेक्टिव लेप्रोस्कोपिक कोलेसिस्टेक्टॉमी घेतलेले एक रुग्ण हात. उद्देशाने नमूद केल्यानुसार लेप्रोस्कोपिक कोलेसिस्टेक्टॉमीनंतर ऑपरेशनल अँटीबायोटिक्सची भूमिका निश्चित करण्यासाठी हा अभ्यास केला जात हे REG NO: BH0120004 हे मुख्य अन्वेषक हेत णि **डॉ. _____**यांच्या थेट देखरेखीखाली हा अभ्यास केला जाईल.

प्रक्रिया

 पण या अभ्यासामध्ये असण्यास संमती दिल्यास, पल्याला प्रदान केलेल्या प्रोफार्मानुसार संबंधित डेटा गोळा केला जातो. णि नंतर पल्याला यादृच्छिकपणे दोन भिन्न गटांमध्ये वाटप केले जाईल. गट अ मधील रुग्णाला इंजची एकच डोस प्राप्त होईल. सेफोटॅक्साईम 1 ग्रॅम चतुर्थ + इंज. मेट्रोनिडाझोल 100 मिली चतुर्थांश इंडक्शनच्या वेळी तर ग्रुप बी मधील रुग्ण क्रियान्वित दोन समान प्रतिजैविकांच्या डोस देखील प्राप्त करेल.

फायदे

मोठ्या प्रमाणात समुदायास.

1. अभ्यासानुसार मिळालेला डेटा वैकल्पिक लॅप्रोस्कोपिक कोलेसिस्टेक्टॉमी घेतलेल्या रुग्णांमध्ये पोस्ट-ऑपरेटिव्ह अँटीबायोटिक्सच्या भूमिकेबद्दल माहिती प्रदान करण्यास मदत करेल

धोके

या अभ्यासाशी संबंधित कोणतीही जोखीम नाही.

विकल्प

 पण अभ्यासामध्ये भाग घेण्यास नकार दिल्यास पला निर्णय बदलणार नाही
वर्तमान किंवा भविष्यातील रोग्य सेवा किंवा पल्याला प्राप्त झालेल्या इतर सेवा. पल्याला दिलेला उपचार पल्या स्थितीसाठी मानक असेल.

अभ्यासामधून पैसे काढणे / काढणे :

 पण इच्छित असलेल्या वेळी पण अभ्यासामधून माघार घेऊ शकता णि त्यासाठी पल्याला दंड कारला जाणार नाही. पण समावेश निकष पूर्ण न केल्यास पल्याला अभ्यासामधून काढून टाकले जाऊ शकते.

गोपनीयता णि गोपनीयतेची :

अभ्यासादरम्यान या विषयाबद्दल सर्व माहिती कायद्याद्वारे परवानगी दिलेल्या मर्यादेपर्यंत गोपनीय ठेवली जाईल. कोड नंबर या संशोधन रेकॉर्डमधील विषय ओळखतील. या अभ्यासावरील माहिती प्रकाशित केली जाऊ शकते परंतु कोणत्याही प्रकाशनात या विषयाची ओळख गोपनीय असेल .

खर्च:

प्रस्तावित हस्तक्षेपासाठी रुग्णाला कोणतीही अतिरिक्त रक्कम मोजावी लागणार नाही

प्रश्न

अभ्यासाशी संबंधित काही प्रश्न असल्यास, भविष्यात किंवा अभ्यासाशी संबंधित दुखापत किंवा जारपणाच्या बाबतीत पण REG NO: BH0120004, जनरल सर्जरी विभाग, के एल ई एस डॉ. प्रभाकर कोरे हॉस्पिटल व एम रसी, बेलागावी यांच्याशी संपर्क साधू शकता. फोन नंबर: _____ किंवा डॉ _____. प्रभाकर कोरे हॉस्पिटल अँड एम रसी, बेलागावी जनरल सर्जरी विभागातील प्राध्यापक

 पल्याकडे विषय म्हणून हक्कांबद्दल काही शंका असल्यास पण डॉ. _____ प्राध्यापक, बालरोग विभाग णि अध्यक्ष जे. एन. मेडिकल कॉलेज मानवी विषय संशोधनासाठी संस्था नैतिक समिती, फोन नंबर: _____ किंवा विस्तार _____ जवाहरलाल नेहरू वैद्यकीय महाविद्यालय, बेलगावी येथे पाठवू शकता .

संमती विधान

मी ज्या संशोधन अभ्यासामध्ये भाग घेण्याची अपेक्षा करतो त्याचा तपशील, ज्यासाठी मला यादृच्छिक नियंत्रण मागून जावे लागेल ते मला स्पष्ट केले हे.
मी स्वेच्छेने, संशोधकाच्या कोणत्याही दबावाखाली या अभ्यासामध्ये भाग घेण्यास कबूल नाही णि सर्व तपासांमध्ये भाग घेण्यास तयार हे. मी कधीही माघार घेऊ शकतो. या फॉर्मवर सही करून मी माझा कोणताही कायदेशीर हक्क सोडत नाही.
खाली माझी स्वाक्षरी सूचित करते की मी हा संपूर्ण संमती फॉर्म वाचला हे किंवा तो मला वाचला गेला हे, णि माझ्या सर्व प्रश्नांची उत्तरे दिली होती. मला या संमती फॉर्मची एक प्रत देण्यात येईल.

सहभागी किंवा कायदेशीररित्या अधिकृत प्रतिनिधीची सही.

सहभागींची नावे:

स्वाक्षरीः

कायदेशीररीत्या अधिकृत प्रतिनिधीचे नाव:

स्वाक्षरीः

साक्षीदाराचे नाव:

स्वाक्षरीः

अन्वेषकांची नावे व स्वाक्षरीः

तारीख णि ठिकाण:

ANNEXURE - II – PROFORMA

I.D.No

1.Name of The Patient:

2.Age:

3.Gender: 1.Male 2.Female

4. DOA:

5.DOD:

6.Date of Interview:

7.I.P. No:

8: Address: 1. Belagavi 2. Outside Belagavi

Phone:

9. Occupation: 1-Unemployed

2- Unskilled

3- Semi-skilled 4-Skilled

5-Professional

10.Education:
1. Illiterate
2. Primary (1^{st}-7^{th} std) ☐
3. High school (8^{th}-10^{th} std)
4. Intermediate
5. Degree and above

11. Socio-economic status: 1-Low 2-Middle 3-High

Screening -

12. H/O Appendicitis: 1 yes 2-No ☐

13. H/O other illness: 1-Yes 2-No ☐

14. If yes: ☐
1-Malignancy
2-Asthma/COPD
3-HIV/AIDS
4-Autoimmune disorders
5-Hemoglobinopathy
6-Anemia
7- acute/ chronic infectious diseases

15. Applicant is willing to give consent: ☐
1-Yes 2-N0

16) FINAL RESULT ☐
1- Ineligible
2- Eligible but refused
3- Eligible and participation

Data collection instrument:

1. Duration of Pain – ☐

2. Location of pain- ☐

   1. Right lower quadrant
   2. Left lower quadrant
   3. Right upper quadrant
   4. Left upper quadrant

3. Mode of onset- ☐

   1. Spontaneous ☐
   2. Insidious

4. Associated symptoms-

   1. Fever
   2. Pain
   3. vomiting
   4. nausea

5. Medical history:

	Yes	No
Diabetes mellitus		
Hypertension		
Asthma		
CVD		

Examination:

1.

Height	Weight	BMI

2.

Pulse rate	Blood pressure	Temperature	Respiratory Rate

3. Per abdomen examination
4.

1) Point of tenderness-

Right iliac fossa ☐ yes ☐ no

2)Rebound ☐ ☐

Tenderness - yes no

3) Guarding ☐ yes ☐ no

4) Rigidity ☐ yes ☐ no

5) Bowel Sounds ☐ yes ☐ no

ANALYSIS PLAN

Platelet indices	**Values**	**Reference ranges**
Platelet count		150-400 x 10^9/L
MPV		7.6-11.0 fL
PDW		10%- 18%

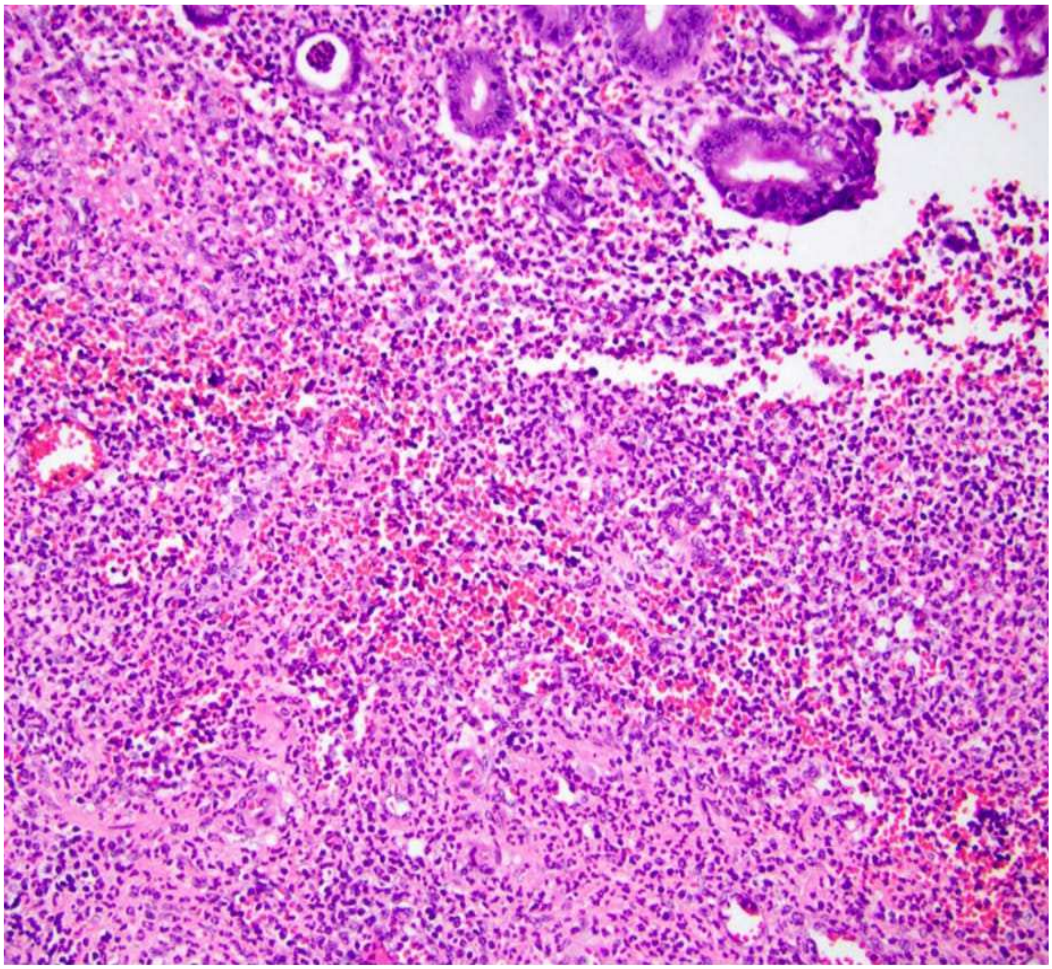
USG findings- 1. Acute Appendicitis 2. Others ☐

DIAGNOSIS- ----------

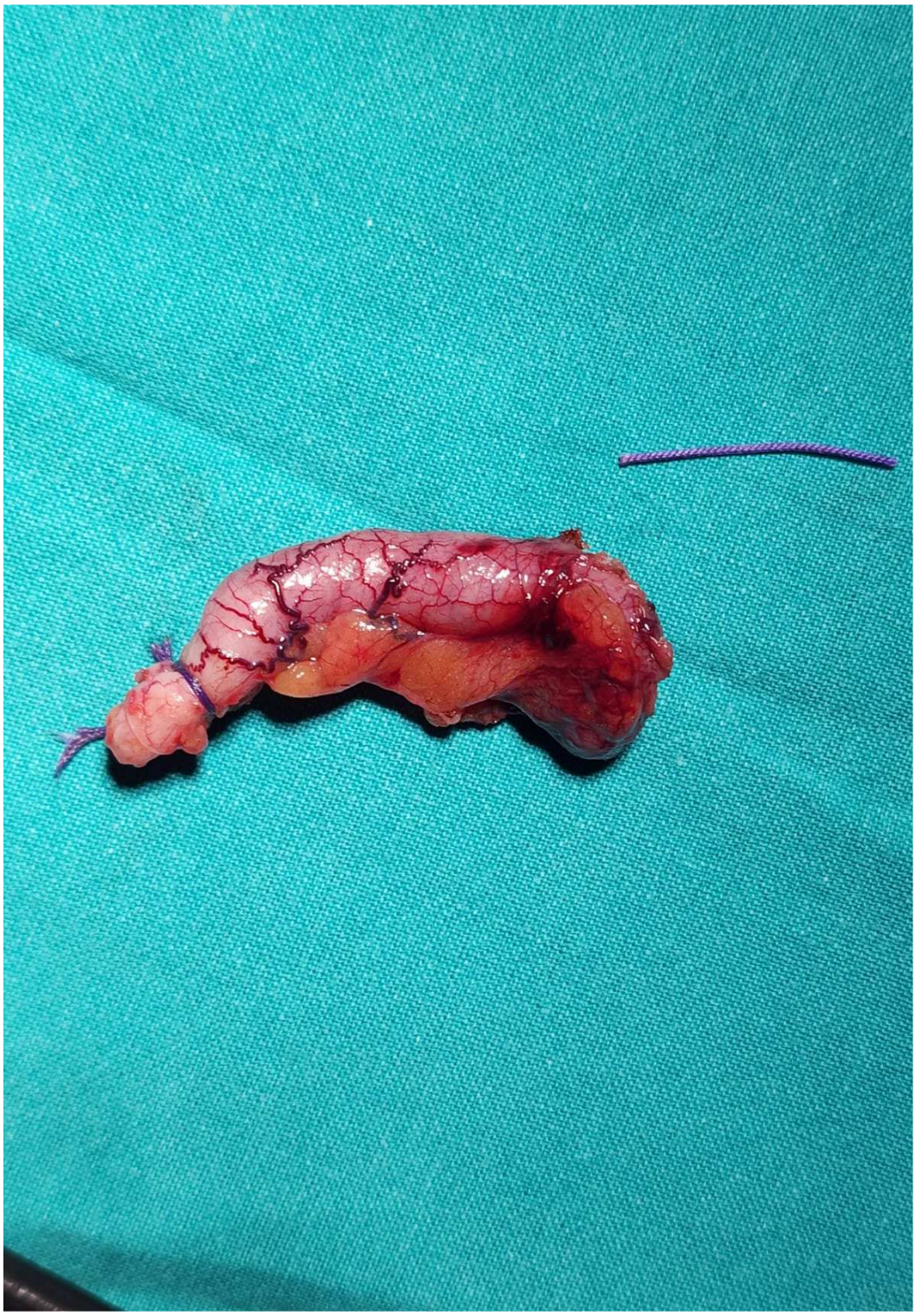
Histopathology Report-

1. Normal appendix ☐
2. Appendicitis
3. Gangrenous appendix
4. Perforated appendix

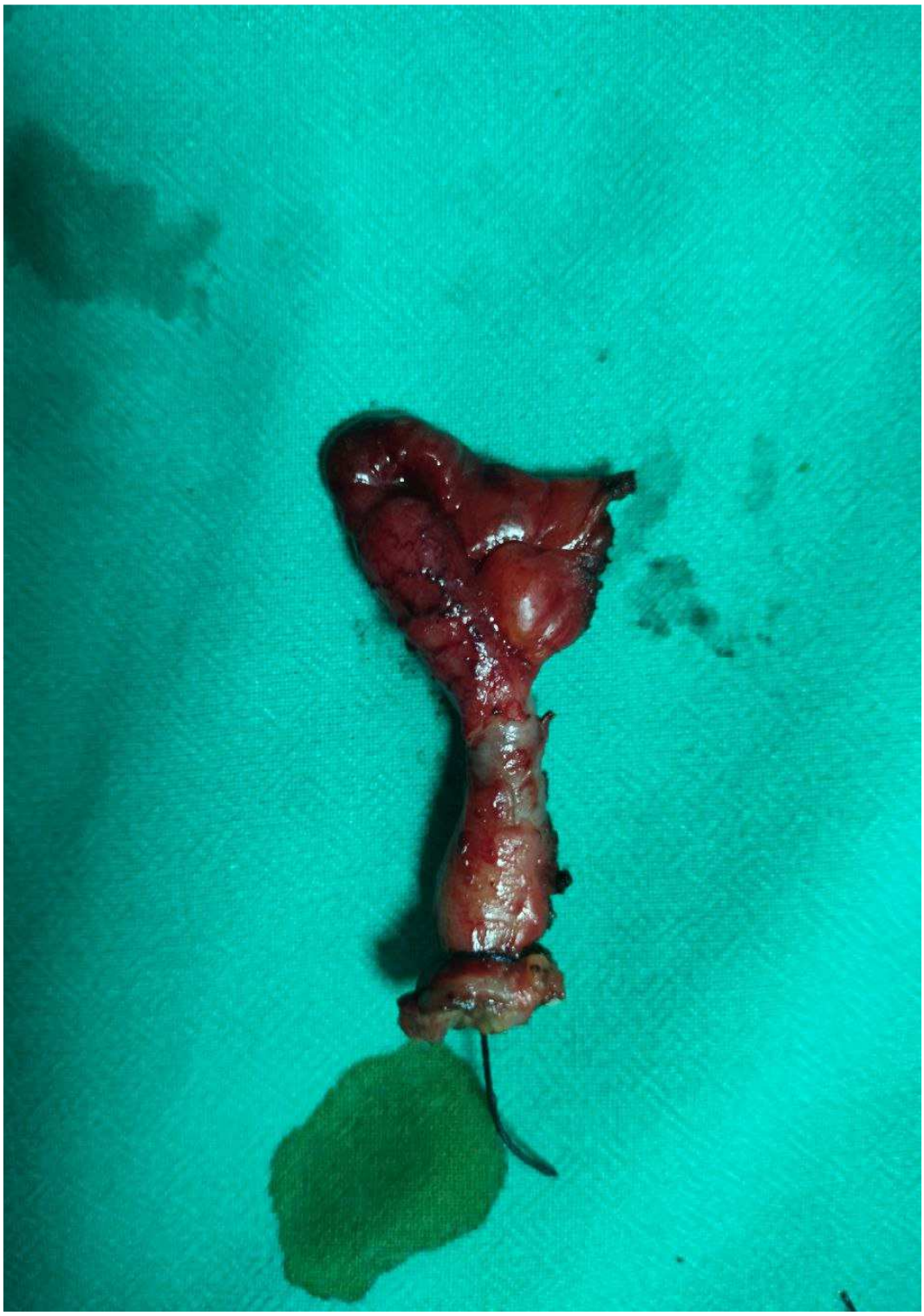
PHOTOGRAPHS



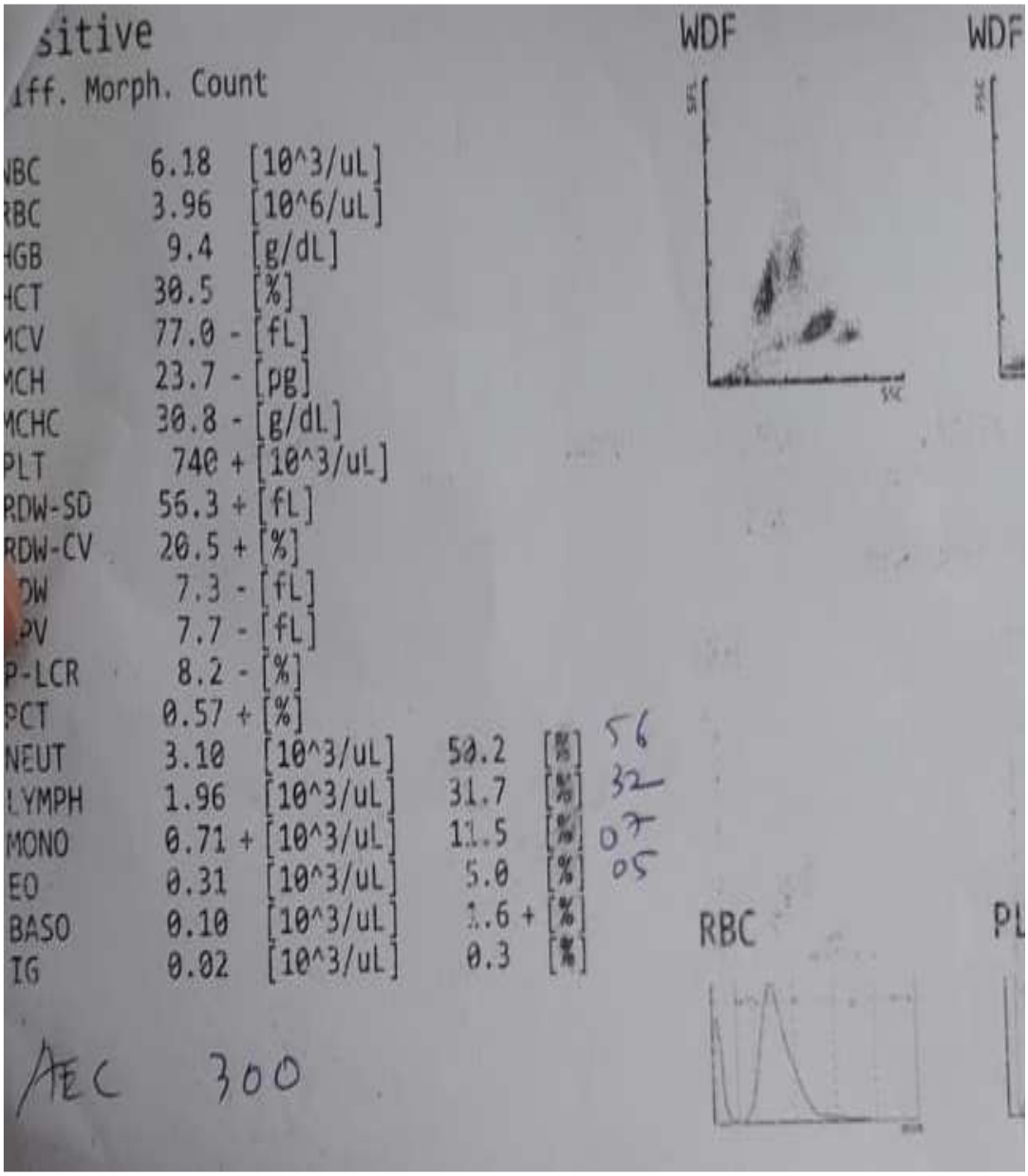
MICROSCOPIC APPEARANCE OF ACUTE APPENDICITIS



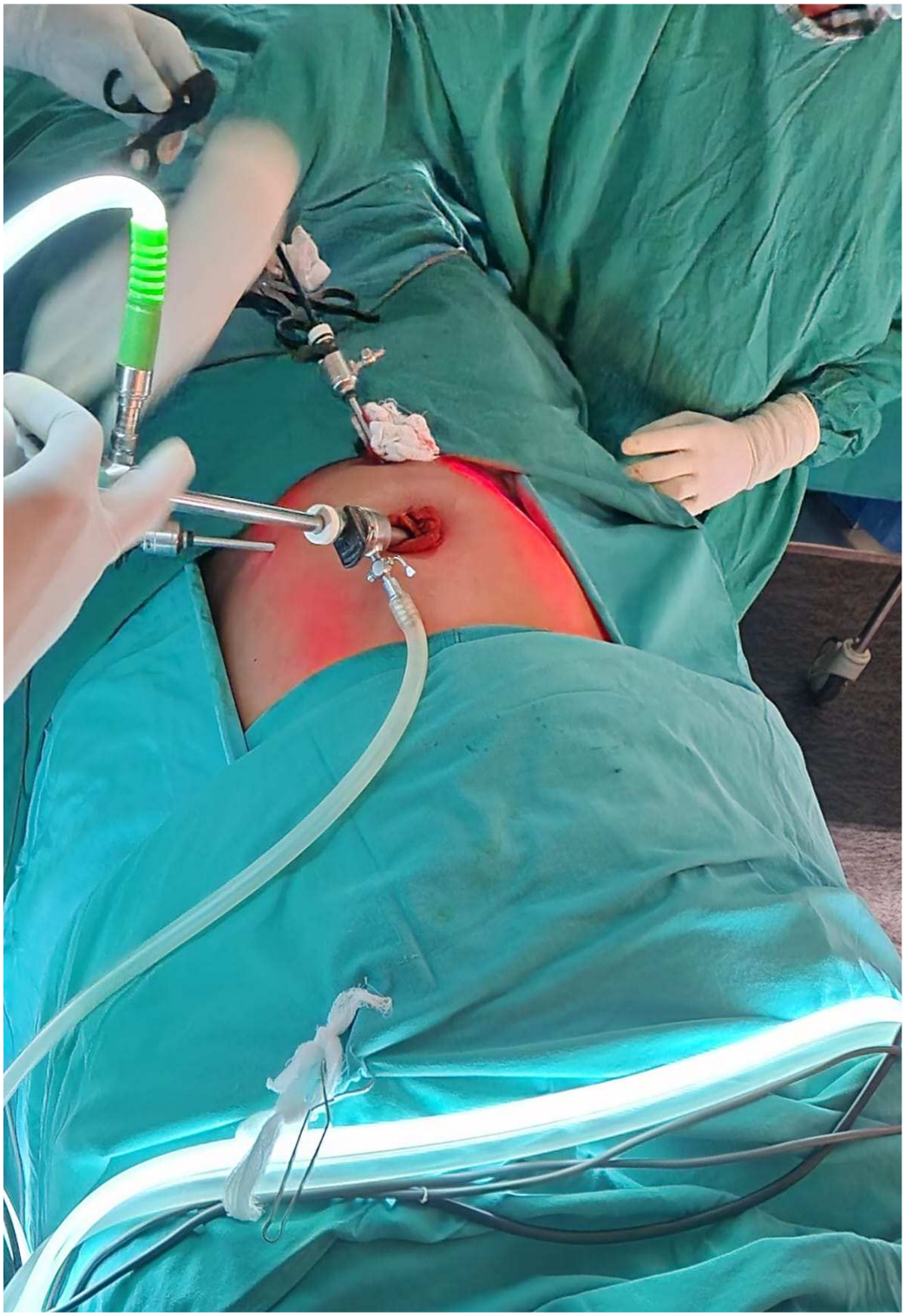
INFLAMMED APPENDIX



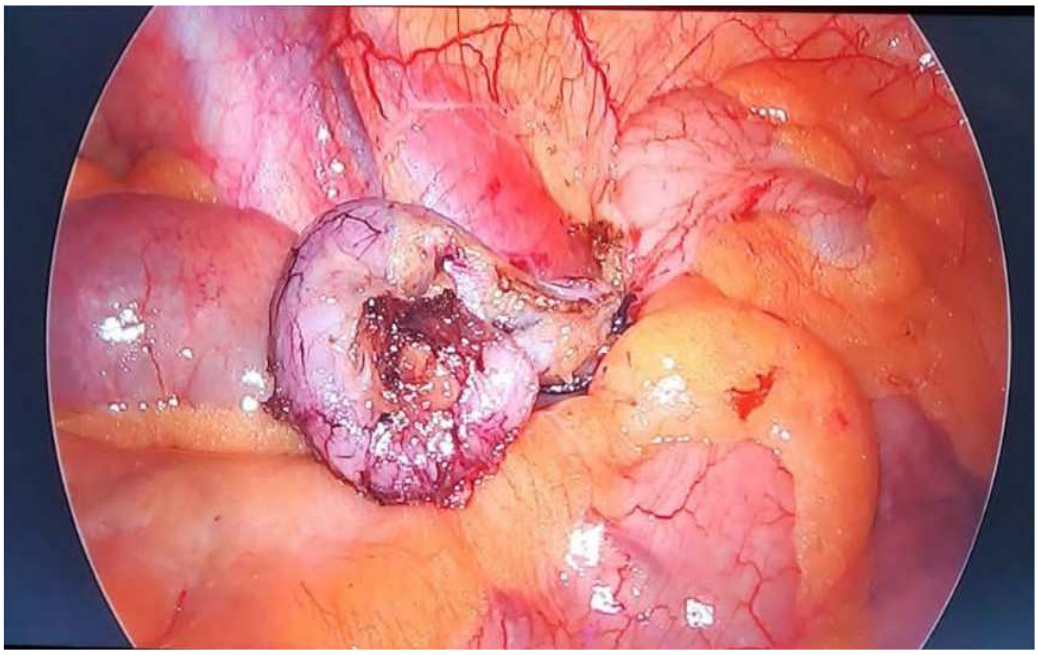
ACUTE GANGRENOUS APPENDICITIS



COMPLETE BLOOD COUNTS WITH DIFFERENT PLATELET PARAMETERS



PORT POSITION IN LAPAROSCOPIC APPENDICECTOMY



INTRA-OPERATIVE IMAGE OF ACUTE APPENDICITIS

CBC CALIBRATOR

ANNEXURE IV – KEY TO MASTERCHART

1. S.No - Serial Number
2. IP No - Inpatient number
3. Gender - M= male, F= female
4. MPV - Mean Platelet volume
5. PDW - Platelet distribution width
6. USG - Ultrasonography
7. CT - Computed tomography

S.No	IP.No	Age	Gender	Duration of pain	Location of pain	Mode of onset	Associated symptoms	Per Abdomen examination					Analysis Plan			USG findings	CT findings	Histopathology report
								Right Iliac fossa tenderness	Rebound tenderness	Gaurding	Rigidity	Bowel sounds	Platelet Count	MPV	PDW			
1	1036383	65	F	4 days	lower abdomen	sudden	fever	yes	no	no	no	yes	4.49	12.8	24%		Appendicular abscess	Perforated appendix
2	1048545	27	M	8 days	right lower quadrant	insidious	nausea	yes	no	no	no	yes	2.03	8.2	16%	Acute supperative appendicitis		Acute perforated appendix
3	1052520	34	M	3 days	right lower quadrant	insidious	vomiting	yes	yes	no	no	yes	3.24	11.2	19.60%	Acute appendicitis		acute supperative appendicitis
4	1043498	38	F	2 weeks	right lower quadrant	insidious	nausea	yes	no	no	no	yes	2.54	7.1	10.20%	Acute appendicitis		Subacute appendicitis
5	1033407	26	M	1 day	right lower quadrant	sudden	vomiting	yes	no	no	no	yes	2.24	7.4	9.40%	Acute appendicitis		Subacute appendicitis
6	1045470	18	M	3 days	right lower quadrant	sudden	vomiting,nausea	yes	no	no	no	yes	2.12	7	13%	Acute appendicitis		Chronic appendicitis
7	1045930	34	M	3 days	right lower quadrant	sudden	nil	yes	yes	no	no	yes	1.26	6.4	11%	Acute appendicitis		Subacute appendicitis
8	1049566	36	M	5 days	right lower quadrant	insidious	vomiting	yes	yes	no	no	yes	3.26	6.8	9.20%	Acute appendicitis		Acute appendicitis
9	1033656	31	M	7 days	right lower quadrant	sudden	nil	yes	no	no	no	yes	3.07	10.4	16%	Acute appendicitis		Acute on chronic appendicitis
10	1055398	28	F	1 day	right lower quadrant	sudden	nausea	yes	yes	no	no	yes	2.27	7.2	14%	Acute appendicitis		Chronic appendicitis
11	1052976	55	F	1 month	right lower quadrant	insidious	fever,vomiting,nausea	yes			yes	yes	3.55	8	12%	Acute appendicitis		Acute appendicitis
12	1051217	22	F	4 days	right lower quadrant	sudden	fever	yes			yes	no	2.77	10.4	20%		Perforated appendix	Perforated appendix
13	1050563	45	M	4 days	right lower quadrant	sudden	vomiting	yes	no	no	no	yes	7.4	20	24%		Perforated appendix	Perforated appendix
14	1049745	23	F	1 month	right lower quadrant	insidious		yes	yes	no	no	yes	4.01	11.2	18%	Acute appendicitis		Acute appendicitis
15	1047947	29	M	6 months	right lower quadrant	insidious		yes	no	no	no	yes	3.46	8.2	11%	normal	acute appendicitis	Acute on chronic appendicitis
16	1058837	18	M	2 months	right lower quadrant	insidious	fever	yes	no	no	no	yes	1.88	8	12%	Acute appendicitis		Chronic appendicitis
17	1047947	29	M	6 months	right lower quadrant	insidious		yes	no	no	no	yes	3.46	8.2	11%	Subacute appendicitis		Acute on chronic appendicitis
18	1033417	44	M	2 months	right lower quadrant	sudden		yes	no	no	no	yes	2.18	6.8	12.40%	?Acute appendicitis		Chronic appendicitis
19	1053985	21	M	20 days	right lower quadrant	insidious	nausea	yes	no	no	no	yes	2.62	9.1	14%	Acute appendicitis		Acute appendicitis
20	1047284	40	M	2 days	right lower quadrant	sudden					yes	yes	3.32	12	19.20%		Perforated appendix	acute ruptured appendicitis
21	1053179	31	M	3 days	right lower quadrant	sudden	fever	yes	no	yes	no	yes	2.55	11.8	19%		Perforated appendix	Perforated appendix
22	1061521	23	M	2 days	generalised	insidious	fever	yes	no	no	no	yes	1.75	8.2	11%	Acute appendicitis		Acute on chronic appendicitis
23	1057445	42	F	3 months	right lower quadrant	insidious		yes	no	yes	no	yes	3.12	8.4	11%	appendicular mass		Acute appendicitis
24	1061676	19	M	3 days	right lower quadrant	insidious	vomiting	yes	yes	no	no	yes	1.35	6.9	9.80%	Acute appendicitis		Acute on chronic appendicitis
25	1060727	57	F	12 hours	generalised	sudden	vomiting			yes	yes	no	1.87	10.8	16%		Perforated appendix	acute ruptured appendicitis
26	1062697	35	F	3 days	right lower quadrant	sudden	nausea	yes	no	no	no	yes	3.23	7.8	11.20%		acute appendicitis	Acute on chronic appendicitis
27	1056819	71	F	1 month	right lower quadrant	insidious		yes	no	no	no	yes	2.26	8.2	12.40%	normal		Chronic appendicitis
28	1059580	18	F	1 month	right lower quadrant	insidious		yes	no	no	no	yes	2.65	9.2	11%	chronic appendicitis		Chronic appendicitis
29	1080148	24	F	2 days	right lower quadrant	sudden	vomiting	yes	no	no	no	yes	2.44	7.3	11%		acute appendicitis	Acute appendicitis
30	1078625	56	F	3 days	right lower quadrant	insidious	nausea	yes	no	no	no	yes	4.46	8.3	15.90%	Acute appendicitis		Acute appendicitis
31	1079337	29	M	3 days	right lower quadrant	insidious	nausea	yes	yes	no	no	yes	2.88	9	16.10%	normal		
32	1033191	52	F	3 days	right lower quadrant	sudden	fever	yes	yes	no	no	yes	2.33	7.1	13.10%	appendicolith		acute appendicitis

33	1056787	20	M	6 days	right lower quadrant	sudden	nausea,vomiting	yes	no	yes	no	yes	3.26	9.4	16.00%	Acute appendicitis		acute on chronic appendicitis
34	1045919	19	M	4 days	right lower quadrant	insidious		yes	no	no	no	yes	1.95	6.8	10.20%	Acute appendicitis		acute appendicitis
35	1046225	35	M	8 days	right lower quadrant	insidious		yes	yes	no	no	yes	2.82	7.4	11.30%	Acute appendicitis		acute appendicitis
36	1037184	72	M	15 days	lower abdomen	sudden	fever	yes	no	yes	no	yes	2.17	8.2	12.00%		acute appendicitis	Acute appendicitis
37	1057516	30	F	1 day	right lower quadrant	sudden	nausea	yes	no	yes	no	yes	3.11	7.4	11.00%	Acute appendicitis		Acute appendicitis
38	1065511	32	F	1 year	right lower quadrant	insidious		yes	no	no	no	yes	3.41	7.2	10.40%		acute appendicitis	Acute appendicitis
39	1056214	21	F	2 months	right lower quadrant	insidious	nausea	yes	no	no	no	yes	2.41	7.2	10.40%	normal		Acute appendicitis
40	1058384	42	F	1 year	right lower quadrant	insidious		yes	no	no	no	yes	1.38	6.8	9.40%	Acute appendicitis		Acute appendicitis
41	1060636	31	F	1.5 years	right lower quadrant	insidious	nausea	yes	no	no	no	yes	3.88	10.6	17.20%	normal		Chronic appendicitis
42	1054753	54	F	3 days	right lower quadrant	insidious	nausea	yes	no	no	no	yes	1.55	6.5	14.00%	Acute appendicitis		Acute appendicitis
43	1056790	33	F	2 days	right lower quadrant	sudden		yes	yes	no	no	yes	2.31	8.2	12.40%	Acute appendicitis		Acute on chronic appendicitis
44	1040230	18	M	20 days	right lower quadrant	sudden	vomiting	yes	no	no	no	yes	2.6	8.3	12.00%	normal		Acute appendicitis
45	1034336	25	F	8 days	right lower quadrant	insidious		yes	no	no	no	yes	3.35	7.1	9.00%	normal		Acute appendicitis
46	1035308	27	F	2 months	right lower quadrant	insidious	nausea	yes	yes	no	no	yes	2.46	7.2	10.80%	Acute appendicitis		Acute appendicitis
47	1036239	32	F	2 days	right lower quadrant	sudden	nausea	yes	no	no	no	yes	2.53	7	10.20%	Acute appendicitis		Acute appendicitis
48	1034679	22	M	15 days	right lower quadrant	insidious		yes	yes	no	no	yes	2.6	7.4	10.80%	Acute appendicitis		Acute appendicitis
49	1065438	34	F	1 day	generalised	sudden	vomiting				yes	no	4.34	12	12.80%		Perforated appendix	Acute appendicitis with peri-appendicitis
50	1071443	20	F	4 days	right lower quadrant	insidious		yes	no	no	no	yes	2.65	6.8	9.20%	Acute appendicitis		Acute on chronic appendicitis
51	1074348	48	F	4 days	right lower quadrant	insidious		yes	yes	no	no	yes	2.7	7.2	8.40%	Acute appendicitis		Acute Appendicitis
52	1058831	60	M	6 days	lower abdomen	insidious	vomiting	no	no	no	no	yes	2.19	6.9	9%	acute appendicitis		appendicitis with impending perforation
53	1083601	30	F	3 months	right lower quadrant	insidious	vomiting,nausea	yes	no	no	no	yes	3.7	6.7	10%	others		Acute on chronic appendicitis
54	1062697	35	F	3 days	right lower quadrant	insidious	vomiting	yes	no	no	no	yes	3.23	7.1	9.20%	Acute appendicitis		Acute on chronic appendicitis
55	1084916	19	F	2 months	right lower quadrant	insidious	vomiting,nausea, fever	yes	no	no	no	yes	2.46	11.6	14.10%	others		Acute Appendicitis
56	1067130	24	M	2 days	right lower quadrant	sudden	vomiting, nausea	yes	no	no	no	yes	1.96	7.5	17%	Acute appendicitis		Subacute appendicitis
57	1086690	32	F	2 days	right lower quadrant	insidious		yes	no	no	no	yes	2.9	9	9%	others	acute appendicitis	acute appendicitis
58	1084903	18	M	5 days	right lower quadrant	insidious		yes	no	no	no	yes	1.7	10.1	10.90%	Acute appendicitis		acute appendicitis
59	1084212	23	F	7 days	right lower quadrant	sudden	fever	yes	no	no	no	yes	1.87	6.8	11%	Acute appendicitis		acute appendicitis
60	1076537	38	F	4 days	right lower quadrant	sudden		yes	no	no	no	yes	2.68	14	16.80%	Acute appendicitis		gangrenous appendix
61	1065655	67	M	4 days	right lower quadrant	sudden		yes	yes	no	no	yes	1.76	12.8	14.70%	Acute appendicitis		Perforated appendix
62	1079707	21	M	5 days	right lower quadrant	sudden		yes	no	no	no	yes	2.46	13.2	15.60%		perforated appendix	Perforated appendix
63	1080509	40	F	3 days	right lower quadrant	sudden		yes	no	no	no	yes	2.45	8.6	11%	Acute appendicitis		acute appendicitis
64	1084230	45	M	7 days	right lower quadrant	insidious		yes	no	no	no	yes	3.33	10.3	15.00%	Acute appendicitis		acute appendicitis
65	1084264	62	M	5 days	right lower quadrant	insidious		yes	no	no	no	yes	2.63	9.9	9.10%	Acute appendicitis		acute appendicitis
66	1086686	34	M	4 days	right lower quadrant	insidious	fever,vomiting,nausea	yes	yes	no	no	yes	3.49	8.5	8.50%	others		acute appendicitis
67	1046578	22	M	3 days	right lower quadrant	insidious	fever	yes	no	no	no	yes	2.45	10.8	9.60%	Acute appendicitis		acute appendicitis
68	1057312	53	F	5 days	right lower quadrant	sudden	fever	yes	yes	no	no	yes	1.87	7.8	11.00%	Acute appendicitis		Acute appendicitis with peri-appendicitis
69	1056479	23	F	5 days	right lower quadrant	insidious		yes	no	no	no	yes	2.45	9.2	8.40%	Acute appendicitis		acute appendicitis
70	1034578	34	M	3 days	right lower quadrant	insidious		yes	no	no	no	yes	1.45	7.2	8.60%	Acute appendicitis		*acute appendicitis*