"VALIDATION OF BOEY'S SCORE IN PREDICTING MORBIDITY AND MORTALITY IN PEPTIC ULCER PERFORATION PERITONITIS"

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BRANCH – I

GENERAL SURGERY

REG. NO. : 221811054

STANLEY MEDICAL COLLEGE

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

CHENNAI

MAY – 2021

CERTIFICATE

This is to certify that this dissertation on **"VALIDATION OF BOEY'S SCORE IN PREDICTING MORBIDITY AND MORTALITY IN PEPTIC ULCER PERFORATION PERITONITIS"** is a bonafide work done by **Dr. GOKUL RAM V** Post graduate student (2018- 2021) in the **Department of General Surgery, Government Stanley Medical College & Hospital, Chennai** under my direct guidance and supervision, in partial fulfilment of the regulations of The Tamilnadu Dr.M.G.R. Medical University, Chennai for the award of **M.S., Degree (**General Surgery) Branch-I, examination to be held in May 2021.

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DECLARATION

I, **Dr GOKUL RAM V**., solemnly declare that this dissertation titled **"VALIDATION OF BOEY'S SCORE IN PREDICTING MORBIDITY AND MORTALITY IN PEPTIC ULCER PERFORATION PERITONITIS"** is a bonafide work done by me, in the Department of General Surgery, Government Stanley Medical College & Hospital-Chennai, under the guidance and supervision of my unit chief PROF. Dr. C. BALAMURUGAN M.S.,

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ABSTRACT

Background

Peptic ulcer perforation is reported in 2-10% of all the known cases of peptic ulcers. There are many scoring systems for peptic ulcer perforation and peritonitis.

Aim and Objective

This study was done to evaluate the accuracy of Boey's scoring system in predicting post-operative morbidity and mortality in a patient operated for peptic ulcer perforation.

Material and Methods

The study was done among 50 patients as a prospective observational single centre study

Results

The mean age of the participants is 45.02 years with a standard deviation of 6.4 years. The age ranged between 34 to 60 years. The median age was 45 years. All of the study participants were males. For the Boey's scoring system, the systolic pressure is an important parameter. The mean systolic blood pressure was 116.4 mm/Hg (S.D=14.67) with only four patients with systolic BP less than 90 mm/Hg. The mean diastolic blood pressure was 74.4 mm/Hg (S.D=8.8). The mean duration of hospital stay is 12.7 days with a standard deviation of 6 days. The

median number of days in 9.5 days ranging between 6 to 25 days. Out of 50 patients, 19 of them (38%) had morbidity. Out of 50 patients, only one of them (2%) died.

All cases were handled through omental Patch Closure. Out of 50 patients, 19 of them (38%) had morbidity. Out of 50 patients, only one of them (2%) died. Around 42% (n=21) had post-operative complications.

Around 12% (n=6) had chest infections. Around 42% (n=21) had wound infections. Around 12% (n=6) had wound dehiscence. Around 10% (n=5) had Intraabdominal collection.

Chi-square analysis shows that comparison of Boey's score with post-operative complications shows that it is significant with a value of 41.9 with a statistical significant value ($p<0.005$). ROC analysis for postoperative complications and Boey's score shows that Boey's score is highly sensitive for detecting post-operative complications with an area under curve=0.966.

ROC analysis for morbidity and Boey's score shows that Boey's score is highly sensitive for detecting morbidities with an area under curve=0.916. ROC analysis for mortality and Boey's score shows that Boey's score is highly sensitive for detecting mortality with an area under curve=0.969.

Conclusion

In conclusion, Boey's score is a simple and effective system to diagnose peptic ulcer perforation and peritonitis.

INDEX

INTRODUCTION

INTRODUCTION

Peptic ulcer is a multifactorial disease that has a complex interplay of the following factors[1-4];

a) Genetic factors
b) Environmental factors
c) H.Pylori
d) NSAIDs

In the western countries, the incidence was high in the early 20th century which reduced in the later half[5]. This can be attributed to the better hygiene and the use of histamine-2 receptor antagonists (H2RA) and proton pump inhibitors (PPI). However, in India, there is still an increased incidence of peptic ulcer disease[6]. With improved hygiene, life style changes and better availability of treatment has led to the stabilisation of the incidence of peptic ulcer disease[7].

Studies show an estimated prevalence of 5 to 15%[8]. The major complications of peptic ulcer disease are;

a) Haemorrhage
b) Perforation
c) Gastric outlet obstruction

Perforation is reported in 2-10% of all the known cases of peptic ulcers[9].

Although studies show the multifactorial nature of the disease, microbial infection in conjunction with NSAIDs constitute the major contributory factor in the etiopathogenesis of peptic ulcer disease and subsequent perforation.

Few decades back, peptic ulcer perforation was mainly managed electively. With the advancement in diagnostic and treatment of peptic ulcer disease, emergency management has improved though the incidence has remained stable[10]. The morbidity, mortality and surgical outcome rates vary between different set ups. Studies show a mortality rate of 6-14%[11].

One of the important aspects of management of peptic ulcer disease is the risk stratification. Better stratification will help in better management protocols. This led to the development of scoring systems using the three prognostic factors;

a) Preoperative shock
b) Long-standing perforation
c) Associated medical diseases

This was developed by Boey et al in 1982[12]. Later on, this was validated in 1987[13].

The scoring system developed by Boey is simple and most commonly used. It has a high positive predictive value[14-15].

There are not many Indian studies that deals with the validation of this scoring system.

Studies show that perforation accounts for 70% of deaths related to peptic ulcer disease. This is often the first clinical sign[16].

The site of perforation is[17];

1. Anterior wall of duodenum (60%)
2. Antrum (20%)
3. Lesser-curvature (20%)

Most of the investigators show that the first part of the duodenum followed by prepyloric region and body of stomach is the commonly involved sites[18-19]. Males are more commonly affected. This can be attributed to the tobacco smoking and alcohol consumption behaviour of males.

Literature gives a range between 17% to 63% for postoperative complications[20-21]. Among these complications, chest infections are the most common[22]. The wound infection rate of 15-40% is noted[23-24].

There are many scoring systems for peptic ulcer perforation and peritonitis;

1. Acute Physiology and Chronic Health Evaluation (APACHE) score
2. Simplified Acute Physiology Score (SAPS)
3. Jabalpur Index
4. Multi Organ Failure (MOF) Score
5. Mannheim Peritonitis Index (MPI)

However, none of these scoring systems have proven 100% efficacy. Some of them are more useful in specific contexts.

Boey's scoring system has the following advantages over the other systems;

1. It is more sensitive in predicting postoperative complications and death in peptic perforation patients.
2. The odds ratio of developing mortality and morbidity increased progressively with increasing numbers of the Boey score.
3. It is easy to calculate
4. It has better precision

The easy applicability of the Boey's score in peptic perforation peritonitis makes it superior to other scoring methods.

This prospective observational single centre study was done to evaluate the accuracy of Boey's scoring system in predicting post-operative morbidity and mortality in a patient operated for peptic ulcer perforation revealed the following findings. The study also aimed to study the clinical profile of patients who present with peptic ulcer perforation and the morbidity and mortality in a patient operated for peptic ulcer perforation.

AIM OF THE STUDY

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To evaluate the accuracy of Boey's scoring system in predicting post-operative morbidity and mortality in a patient operated for peptic ulcer perforation.

OBJECTIVES

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STUDY

OBJECTIVES OF THE STUDY

Primary Objectives

To evaluate the accuracy of Boey's scoring system in predicting post-operative morbidity and mortality in a patient operated for peptic ulcer perforation

Secondary Objectives

To study the clinical profile of patients who present with peptic ulcer perforation

To study the morbidity and mortality in a patient operated for peptic ulcer perforation

REVIEW

OF

LITERATURE

AN OVERVIEW OF PEPTIC ULCER DISEASE

Peptic ulcer disease affects approximately half a million people each year. The epidemiology of the disease has altered over the last few decades with more people being affected in the developing countries. This can be attributed to the better diagnostic and treatment of H.pylori infection. The age of peak incidence is 55-65 years of age. Men are more prone for duodenal ulcers while in women gastric ulcers are more common. Peptic ulcer disease is known to cause less mortality however, the morbidity associated with it leads to serious lifestyle related problems.

Following sites are prone for developing peptic ulcer;

1. Oesophagus
2. Stomach
3. Duodenum
4. At the margin of a gastroenterostomy
5. Jejunum
6. In Zollinger Ellison syndrome
7. In association with a Meckel's diverticulum containing ectopic gastric mucosa.

The presentation of peptic ulcer disease is caused partly by gastric acid and presents with a range of symptoms from mild abdominal comfort and in extreme cases leads to perforation, bleeding, peritonitis and death.

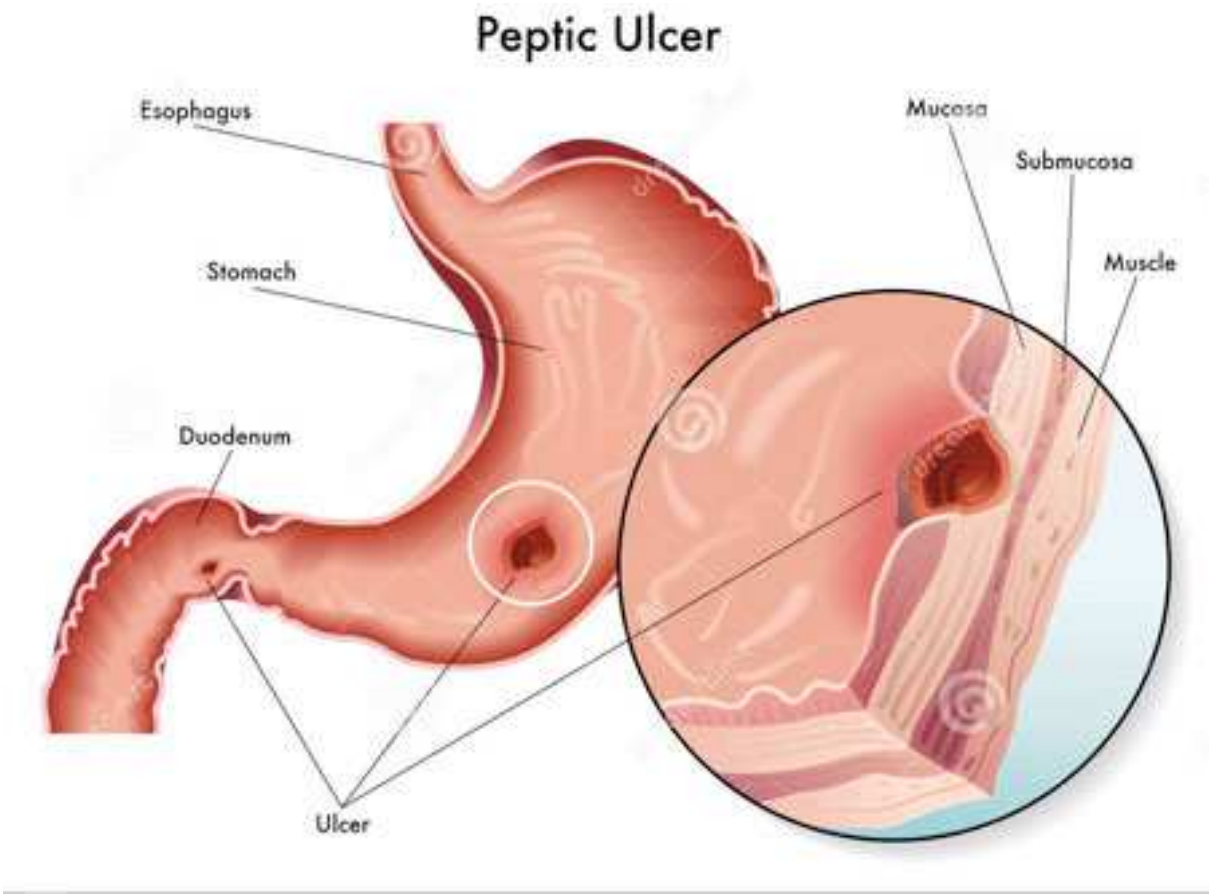


Figure 1: Illustration of peptic ulcer

Duodenal and gastric ulcers are breaks in the anatomic continuuom of their mucosa. It is related to the corrosive action of hydrochloric acid and pepsin on the mucosa of the upper gastrointestinal tract. The diameters of the ulcers may range from 3 mm upto few centimeters. It presents as nausea, pain and abdominal discomfort. The pain is localised to the epigastrium which is non-radiating. The

symptoms may vary based on severity of the disease. If the pain radiates to the back, then it might indicate that the ulcer has perforated posteriorly. It will have a typical association with food intake. Duodenal ulcers are relieved by food whereas gastric ulcers are aggravated by food. Antacids may provide temporary relief. The association with food leads to either weight loss or weight gain.

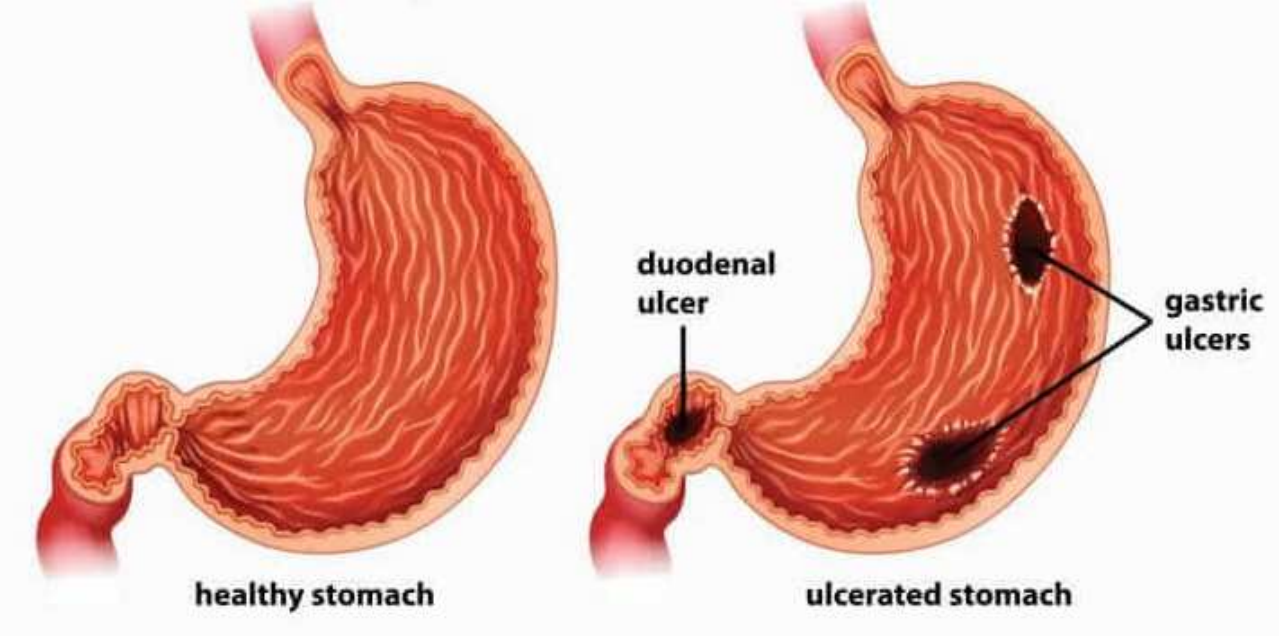


Figure 2: Difference between a healthy stomach and ulcerated stomach

Anatomy

Stomach is located beneath the diaphragm in the upper part of the abdomen. The position, size and shape of the stomach vary with the amount of food in it. This is facilitated by the free mesentery. Duodenum extends from the pylorus till the

ligament of Treitz. Duodenum is retroperitoneal and is a relatively fixed organ. Anatomically, these two parts are related in function.

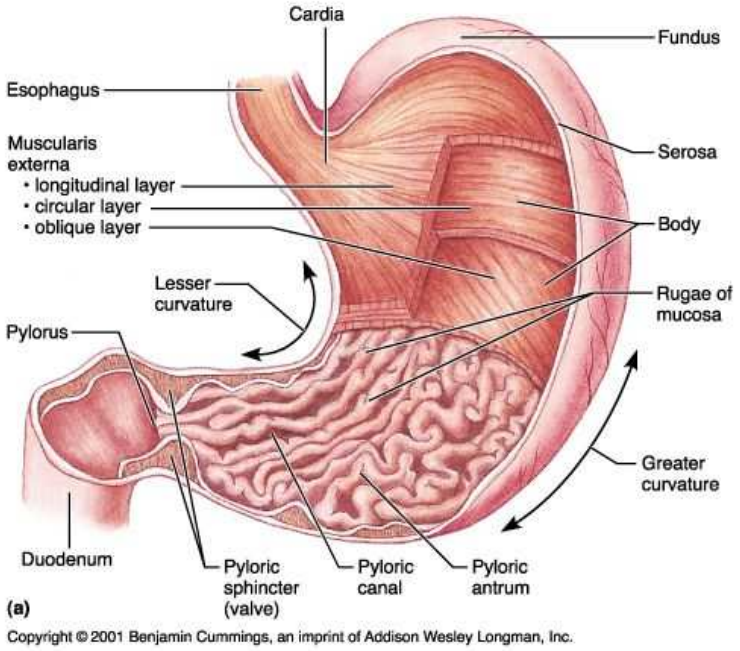


Figure 3: Anatomy of Stomach

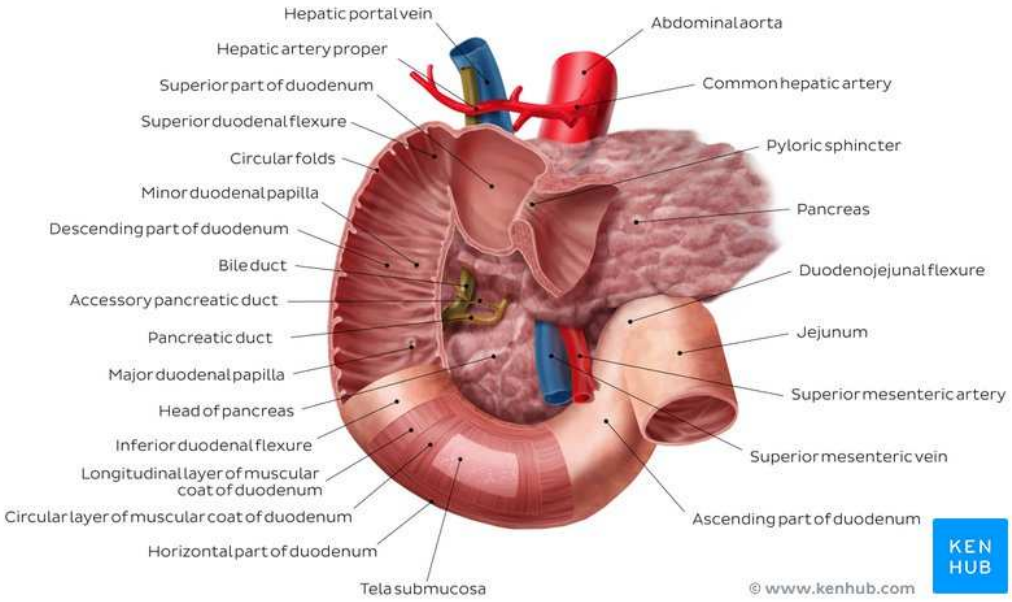


Figure 4: Anatomy of duodenum

Etiology of Peptic ulcer disease

The most common causative agent is the helicobacter pylori. NSAIDs have a strong correlation with peptic ulcer incidence. The following image shows the various etiologic agents of peptic ulcer disease.

Common Causes	Infrequent Causes
- *Helicobacter Pylori* Infection - NSAIDs and ASA Treatment - Stress Ulcers	- Gastrinoma (Zollinger-Ellison syndrome) - Hyperplasia/hyperfunction of antral G cells - Systemic mastocytosis - Myeloproliferative Syndromes with basophilia - Viral infections (herpes simplex virus tipo I and cytomegalovirus) - Vascular insufficiency (cocaine) - Ischemia caused by stenosis of celiac artery - Radiation - Chemoembolization (via hepatic artery) - Crohn´s Disease - Type II amyloidosis - Neuhauser syndrome (tremor-nystagmus-ulcer) - Porphyria cutanea tarda - Other drugs (potassium chloride, biphosphonates, mycophenolate) - Idiopathic

Figure 5: Etiology of peptic ulcer disease

PATHOGENESIS

The reason for the breach in the mucosal continuum is due to the lack of balance between the protective and damaging forces. Normally, whenever there is a damage, the mucosal epithelium signals a response to heal itself. When this mechanism is altered, it leads to ulceration.

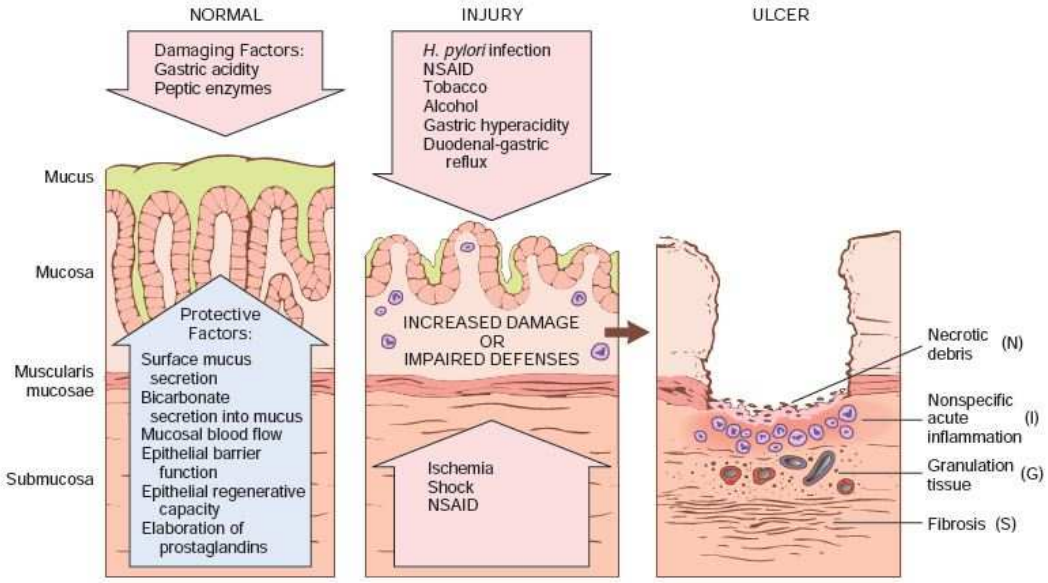


Figure 6: Balance between protective and damaging forces

In most of the cases, the NSAID use along with Pylori infection act together to cause the mucosal damage. The following figure shows the relationship between NSAID use and H.Pylori Infection.

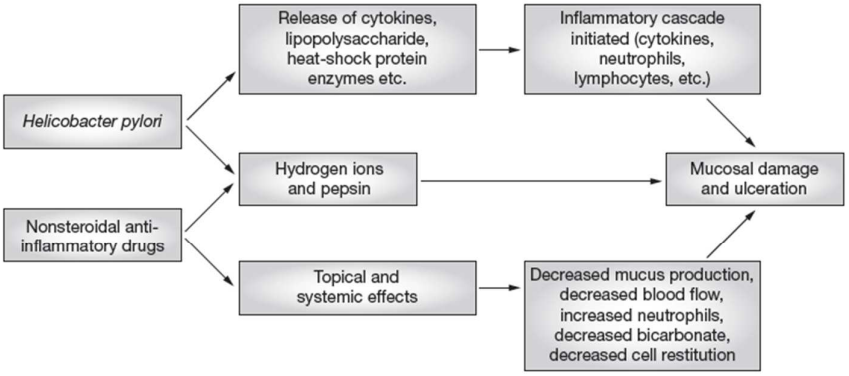
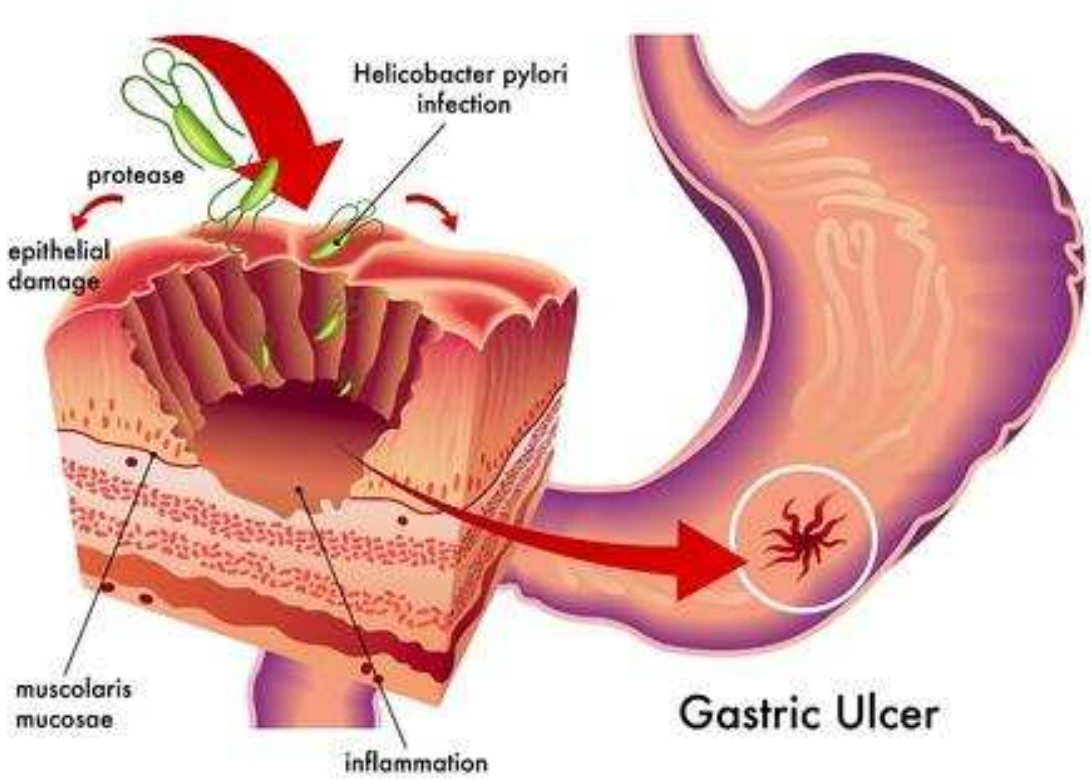


Figure 1 *Helicobacter pylori* and nonsteroidal anti-inflammatory drugs have synergistic effects on gastric mucosal damage. Both *H. pylori* infection and NSAID use have been found to independently and significantly increase the risk of gastric and duodenal mucosal damage and ulceration. *H. pylori* and NSAIDs act synergistically through pathways of inflammation in the development of ulcers and in ulcer bleeding.

Figure 7: the relationship between NSAID use and H.Pylori Infection.

History of peptic ulcer perforation and peritonitis

In the initial days, peptic ulcer peritonitis was attributed to poisoning[25]. At times, the hole in the stomach was attributed to the dissector's knife[26]. More cases were reported between 1600 and 1800[27].Since then, the treatment has been the same; open the abdomen, sew the hole and clean the abdominal cavity[28]. This treatment is the same till date with primary closure of the perforation with omental patch[29-33]. The first modern documented peptic ulcer peritonitis was done by Edward Crisp in 1843[34].

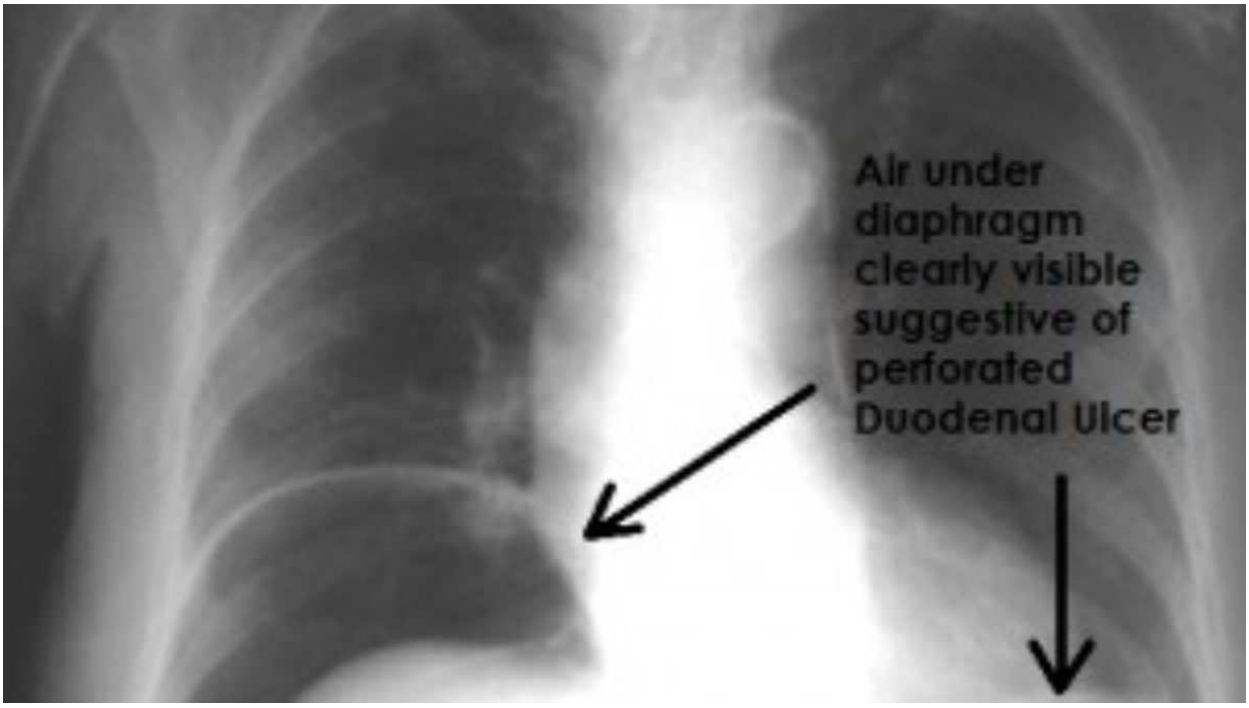


Clinical Presentation

The typical presentation is the sudden onset of sharp acute pain in the epigastrium with an associated shoulder pain The pain in the shoulder indicates the presence of air under the diaphragm[35]. Majority of them are males with a history of peptic ulcer disease or use of NSAIDs. It may present with nausea and vomiting. Clinical examination may reveal the following[36];

1) Quickened pulse
2) Low systolic blood pressure, sometimes with shock[37]
3) Fever and hypotension may be present later
4) X-ray of abdomen shows air under the diaphragm[38]

Abdominal ultrasound and CT scans with oral contrast are also used[39].



Clinical phases of perforated peptic ulcer

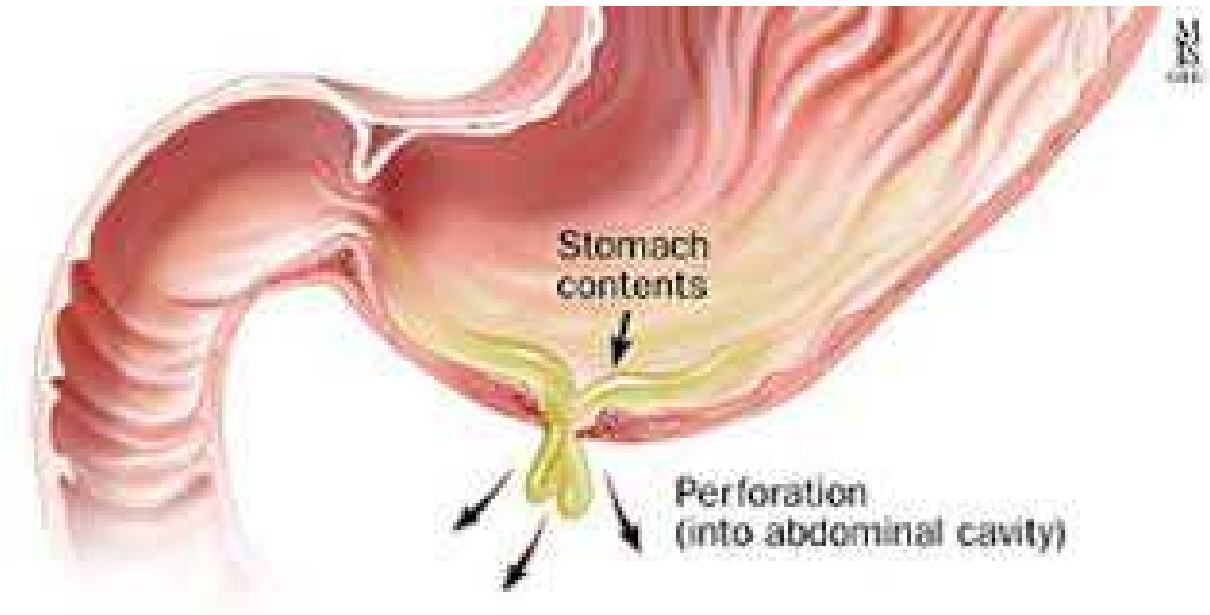
Figure 8 shows the clinical phases of perforated peptic ulcer

Phase 1: *Chemical peritonitis/contamination.* The perforation causes a chemical peritonitis. Acid sterilizes the gastroduodenal content; it is only when gastric acid is reduced by treatment or disease (gastric cancer) that bacteria and fungi are present in the stomach and duodenum.

Phase 2: *Intermediate stage.* After 6–12 h many patients obtain some relief of pain. This is probably due to the dilution of the irritating gastroduodenal contents by ensuing peritoneal exudates.

Phase 3: *Intra-abdominal infection.* After 12–24 h intra-abdominal infection supervenes.

Figure 8: clinical phases of perforated peptic ulcer



Management[40]

Management comprises of the following[41];

a) Resuscitation with large volume crystalloids, nasogastric suction

b) Use of broad-spectrum antibiotics

c) Non-operative management (Taylor Method)

d) Operative management

Taylor Method comprises of[42, 43,]

a) Nasogastric aspiration

b) Antibiotics

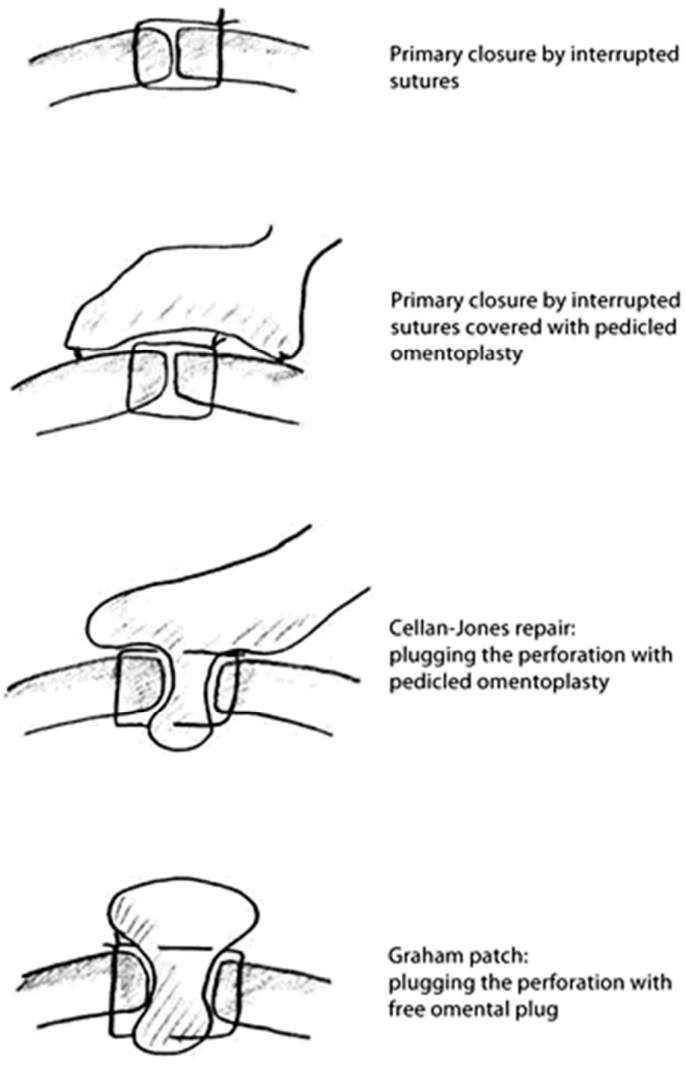
c) Intravenous fluids

d) H.Pylori triple therapy

Surgical management

Surgical management is usually a simple suture that consists of open repair technique or using a laparoscopy. The following image shows the various open repair techniques

Different suture techniques for closure of the perforation



RELATED STUDIES TO THE PRESENT STUDY

There are not many Indian studies that deal specifically the objectives of the present study. However, following study is similar to the present topic.

The study was a single centre observational study among 180 patients who underwent open surgery for peptic ulcer perforation. This study reported that there is a positive correlation between Boey's scores and morbidity[44].

This prospective observational single centre study was done to evaluate the accuracy of Boey's scoring system in predicting post-operative morbidity and mortality in a patient operated for peptic ulcer perforation revealed the following findings. The study also aimed to study the clinical profile of patients who present with peptic ulcer perforation and the morbidity and mortality in a patient operated for peptic ulcer perforation.

MATERIALS AND METHODS

MATERIAL AND METHODS

PLACE OF STUDY: Department of General Surgery- Government Stanley Medical College, Chennai

DURATION: February 2020 to August 2020

STUDY DESIGN: Prospective observational single centre study

SAMPLE SIZE: 50 (All patients who presented to the department were recruited)

Minimum Sample Size calculation based on the reference study

Formula:

$n = 2(Z_a+Z_B)^2SD^2/(M_1-M_2)^2$

Where $Z_a = 1.96$ (statistical significant constant for 95% CI)

$Z_B = 0.84$ (80% power)

SD =1.04 (Standard deviation of Boey's Score among those who developed complications after 30 days.)

M_1 =1.41 (Mean Boey's Score among those who developed complications after 30 days.)

M_2 =0.39 (Mean of Boey's Score among those who did not develop complications after 30 days.)

$(M_1-M_2)^2 = 1.04$ (1.02 x 1.02)

On substituting in the formula

n = 15.6 x 1.04 x 1.04 / 1.04

n = 17 (Minimum Sample Size Required)

Adding 10% non-response rate (i.e. 10% 0f 17 = 2)

n = 19(minimum sample size)

Inclusion criteria

1. All patients of above the age of 12 who presented with peptic ulcer perforation and who was operated with primary omental patch closure

Exclusion criteria

1. Patients who died before surgery
2. Patients on whom procedure other than primary omental patch closure has been done.
3. Patient who has had malignancy related perforation.
4. Patients with recurrent perforation after previous surgery
5. Age group less than 12 years

METHODOLOGY:

- Written informed consent will be obtained from all subjects before enrolment in study

- Prospective study done in patients presenting with symptoms suggestive of peptic ulcer perforation and who was operated with primary omental plasty
- All the patients underwent detailed clinical examination and below mentioned investigations and post-operative evaluation.
- Detailed general and abdominal examination
- X-chest erect
- In suspicious cases , CT abdomen is done as confirmatory evidence.
- Emergency laparotomy with primary omental patch closure is done with abdominal drain , and antibiotics for 3-5 days given post operatively
- Post-operative complications dealt with accordingly and documented
- Patient discharged after ambulation and appetite and reviewed on 15 day after discharge and reviewed for documentation and hence forth reviewed as necessary.

Clinical Data

- Systolic blood pressure

-Duration of disease- onset of pain to admission to hospital

- After getting the following data, scoring system is put up

BOEY'S SCORE:

1. Concomitant medical illness
2. Preoperative shock -systolic BP less than 90mm hg
3. Duration of perforation more than 24 hrs

A score of 0-1 is given to each positive aspect, with an overall score ranging from 0-3.

The number of patients in each Boey's score is calculated and then percentage calculated and then association statistically oriented.

PRIVACY/CONFIDENTIALITY OF STUDY SUBJECTS:

Privacy of the subjects shall be maintained.

STATISTICAL ANALYSIS

- All data were recorded in structured questionnaires, coded and entered in Microsoft Excel.
- The data was then cleaned, checked for inconsistencies, missing values and prepared for analysis using SPSS v23.
- The data was then analysed for descriptive statistics and inferential statistics. The tests for significance were run to statistically validate the data. The results were then tabulated and visualised in Microsoft word.

RESULTS

RESULTS

Prospective observational single centre study among 50 patients to evaluate the accuracy of Boey's scoring system in predicting post-operative morbidity and mortality in a patient operated for peptic ulcer perforation revealed the following findings. The study also aimed to study the clinical profile of patients who present with peptic ulcer perforation and the morbidity and mortality in a patient operated for peptic ulcer perforation.

The mean age of the participants is 45.02 years with a standard deviation of 6.4 years. The age ranged between 34 to 60 years. The median age was 45 years. All of the study participants were males. For the Boey's scoring system, the systolic pressure is an important parameter. The mean systolic blood pressure was 116.4 mm/Hg (S.D=14.67) with only four patients with systolic BP less than 90 mm/Hg. The mean diastolic blood pressure was 74.4 mm/Hg (S.D=8.8). The mean duration of hospital stay is 12.7 days with a standard deviation of 6 days. The median number of days in 9.5 days ranging between 6 to 25 days. Out of 50 patients, 19 of them (38%) had morbidity. Out of 50 patients, only one of them (2%) died.

Out of 50 patients, 22 (44%) did not have any concomitant medical illness while the rest (n=28, 56%) had concomitant medical illness. Majority of them had hypertension (n=11, 22%). Majority of them (72%, n=36) had the symptoms for less than 24 hours. While the rest of them had symptoms for more than 24 hours (n=14, 28%). Majority of them had Boey's scores; 0 (n=22, 44%), 1 (n=13, 26%),

2 (n=11, 22%) and 3 (n=4, 8%). Majority of them had peptic ulcer- D1 perforation peritonitis (n=18, 36%). Around 34% (n=17) had peptic ulcer- D2 perforation peritonitis while around 15 (30%) had peptic ulcer perforation alone.

All cases were handled through omental Patch Closure. Out of 50 patients, 19 of them (38%) had morbidity. Out of 50 patients, only one of them (2%) died. Around 42% (n=21) had post-operative complications.

Around 12% (n=6) had chest infections. Around 42% (n=21) had wound infections. Around 12% (n=6) had wound dehiscence. Around 10% (n=5) had intraabdominal collection.

Chi-square analysis shows that comparison of Boey's score with post-operative complications shows that it is significant with a value of 41.9 with a statistical significant value ($p<0.005$). ROC analysis for postoperative complications and Boey's score shows that Boey's score is highly sensitive for detecting post-operative complications with an area under curve=0.966.

ROC analysis for morbidity and Boey's score shows that Boey's score is highly sensitive for detecting morbidities with an area under curve=0.916. ROC analysis for mortality and Boey's score shows that Boey's score is highly sensitive for detecting mortality with an area under curve=0.969.

SOCIODEMOGRAPHIC FEATURES

AGE DISTRIBUTION

The mean age of the participants is 45.02 years with a standard deviation of 6.4 years. The age ranged between 34 to 60 years. The median age was 45 years. The following table and figure shows the age distribution of the participants.

Age distribution (Parameters)	Age (years)
Mean	45.02
Median	45.00
Mode	38[a]
Std. Deviation	6.454
Minimum	34
Maximum	60

Table 1: Age Distribution

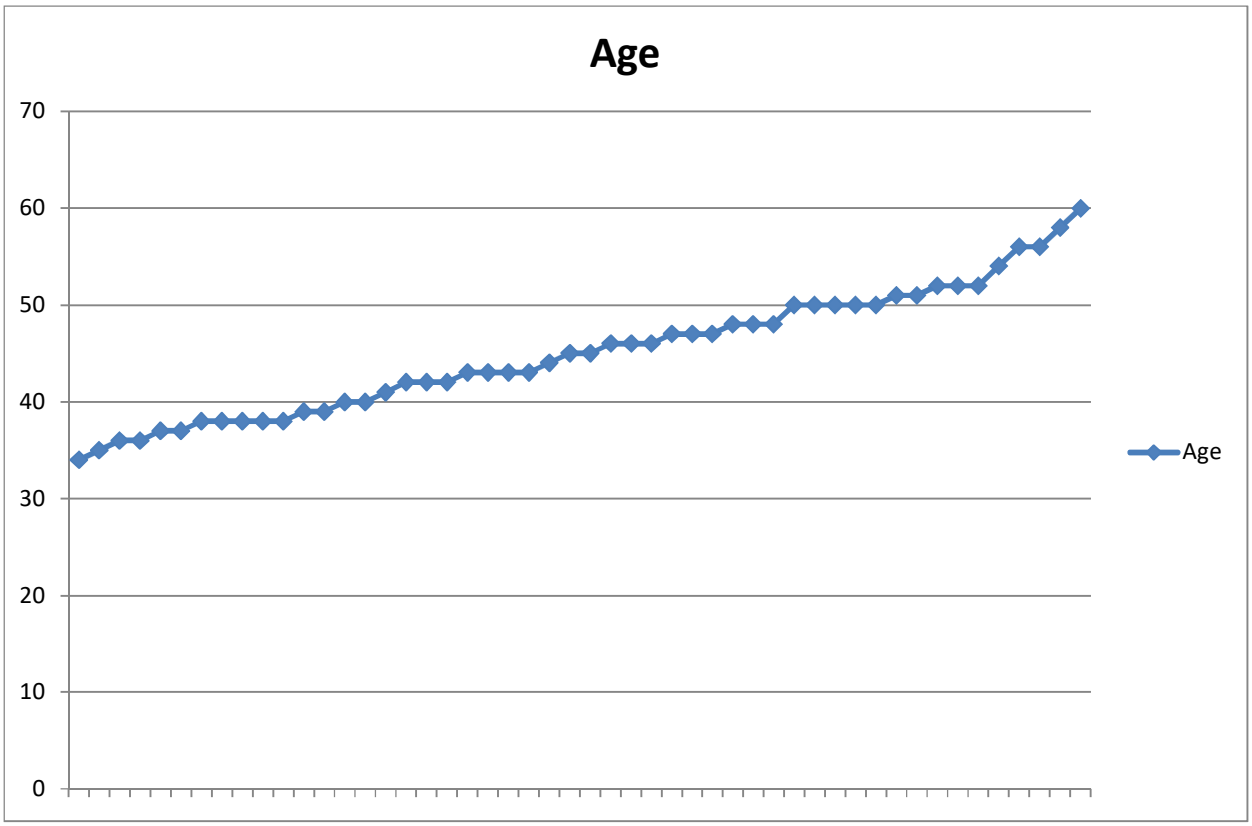


Figure 1: Age Distribution

Gender distribution

All of the study participants were males.

CLINICAL FEATURES

For the Boey's scoring system, the systolic pressure is an important parameter. The mean systolic blood pressure was 116.4 mm/Hg (S.D=14.67) with only four patients with systolic BP less than 90 mm/Hg. The mean diastolic blood pressure was 74.4 mm/Hg (S.D=8.8). The following tables and figures show the systolic and diastolic pressures of the study participants.

Systolic BP parameters	Systolic (mg)
Mean	116.40
Median	110.00
Mode	110
Std. Deviation	14.675
Minimum	90
Maximum	140

Table 2: Systolic BP

Diastolic BP parameters	Diastolic
Mean	74.40
Median	80.00
Mode	80
Std. Deviation	8.843
Minimum	60
Maximum	90

Table 3: Diastolic BP

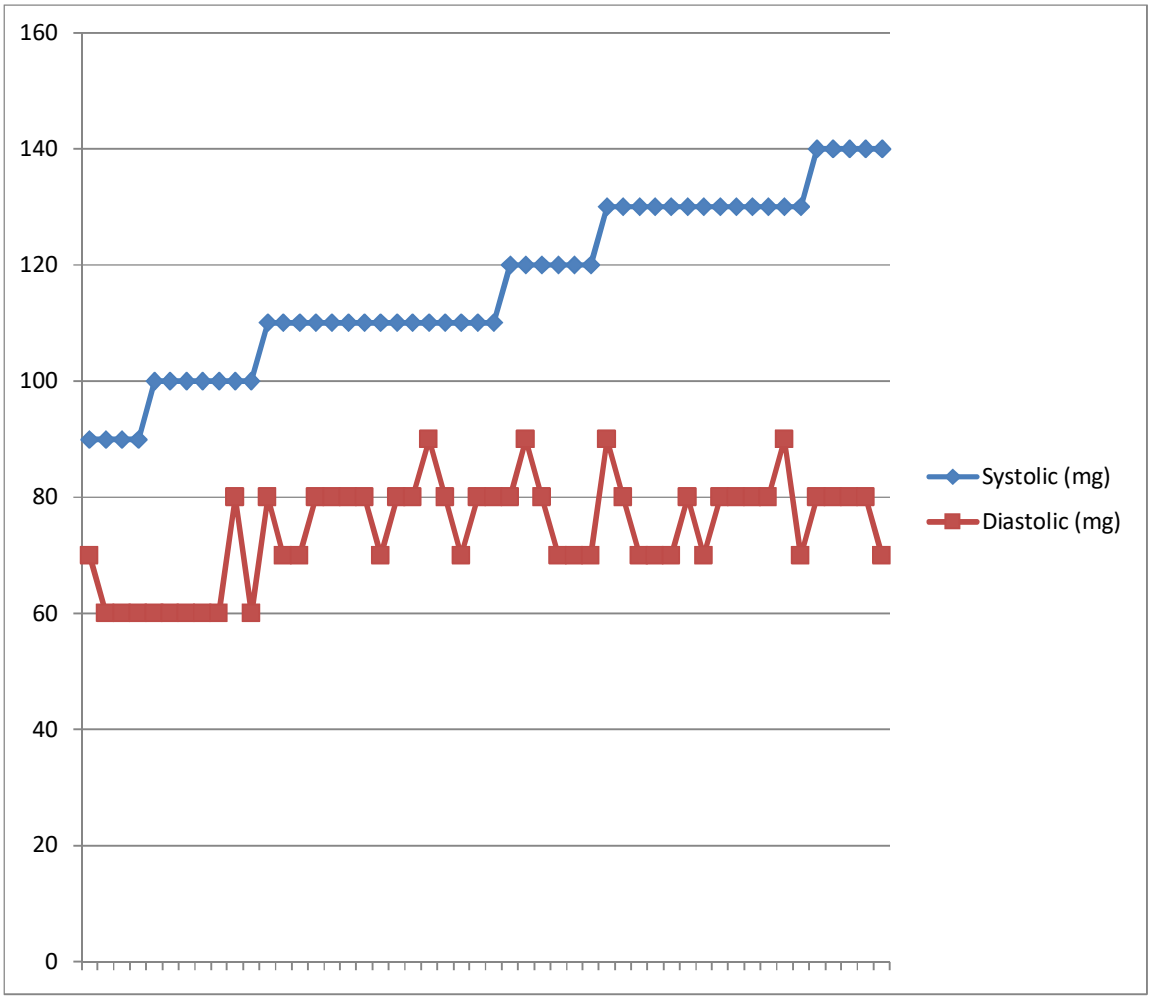


Figure 2: Blood Pressure of the Participants

CONCOMITANT MEDICAL ILLNESS

Out of 50 patients, 22 (44%) did not have any concomitant medical illness while the rest (n=28, 56%) had concomitant medical illness. Majority of them had hypertension (n=11, 22%).

S.No	**Concomitant Medical Illness**	If, yes, type	Frequency	Percentage
1	Yes	Bronchial Asthma	1	2.0
2		Coronary Artery Disease /Chronic Kidney Disease/Type-II DM	1	2.0
3		Coronary Artery Disease / Type-II DM	1	2.0
4		Chronic Obstructive Pulmonary Disease	1	2.0
5		Type-II DM	5	10.0
6		Type-II DM/ Hypertension	5	10.0
7		Type-II DM/ Hypertension/ Asthma	1	2.0
8		Hypertension	11	22.0
9		Pulmonary Tuberculosis	2	4.0
10	No	No Concomitant Medical Illness	22	44.0
		Total	50	100.0

Table 4: Concomitant Medical Illness

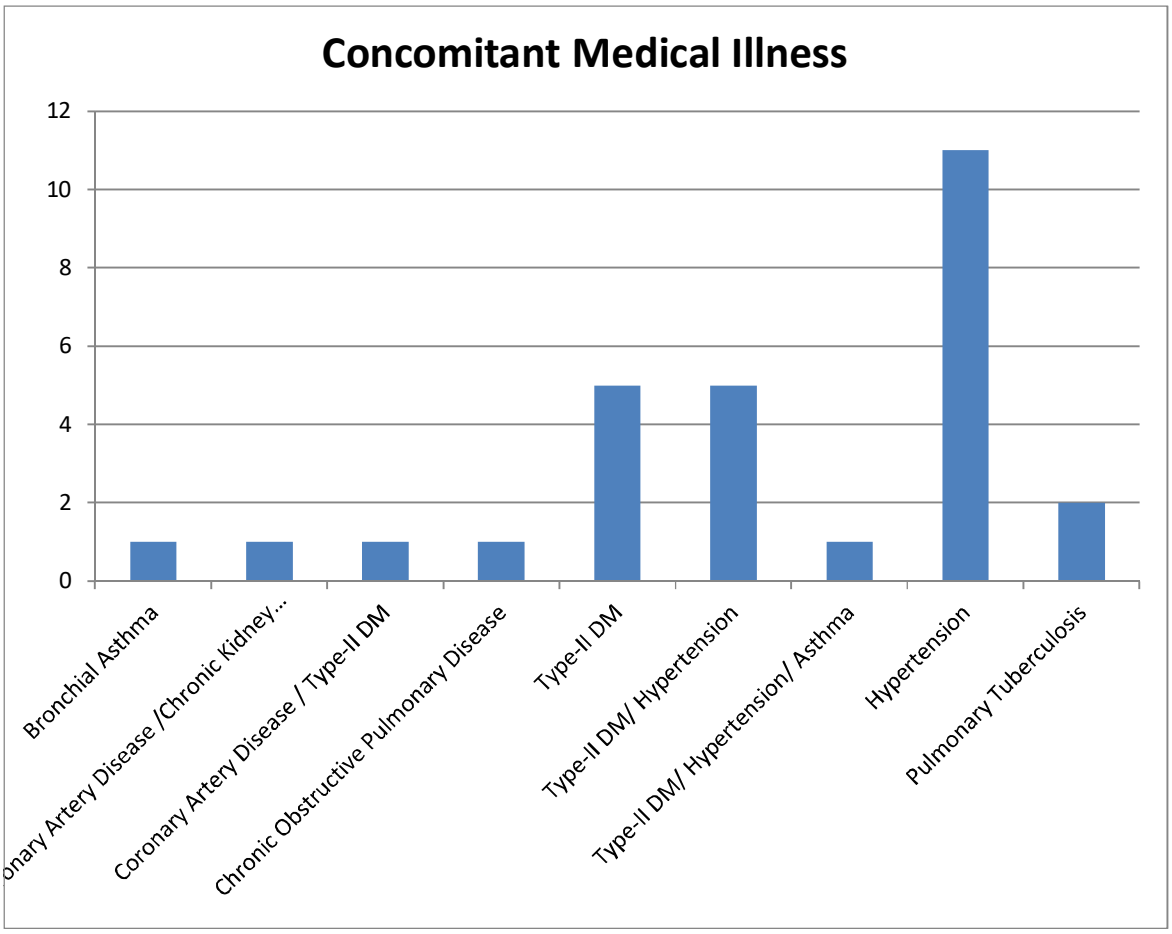


Figure 3: Concomitant Medical Illness

DURATION OF SYMPTOMS

The following table and figure shows the duration of symptoms. Majority of them (72%, n=36) had the symptoms for less than 24 hours. While the rest of them had symptoms for more than 24 hours (n=14, 28%).

	Duration of symptoms (in hours)	Frequency	Percent
	<24	36	72.0
	>24	14	28.0
	Total	50	100.0

Table 5: Duration of Symptoms

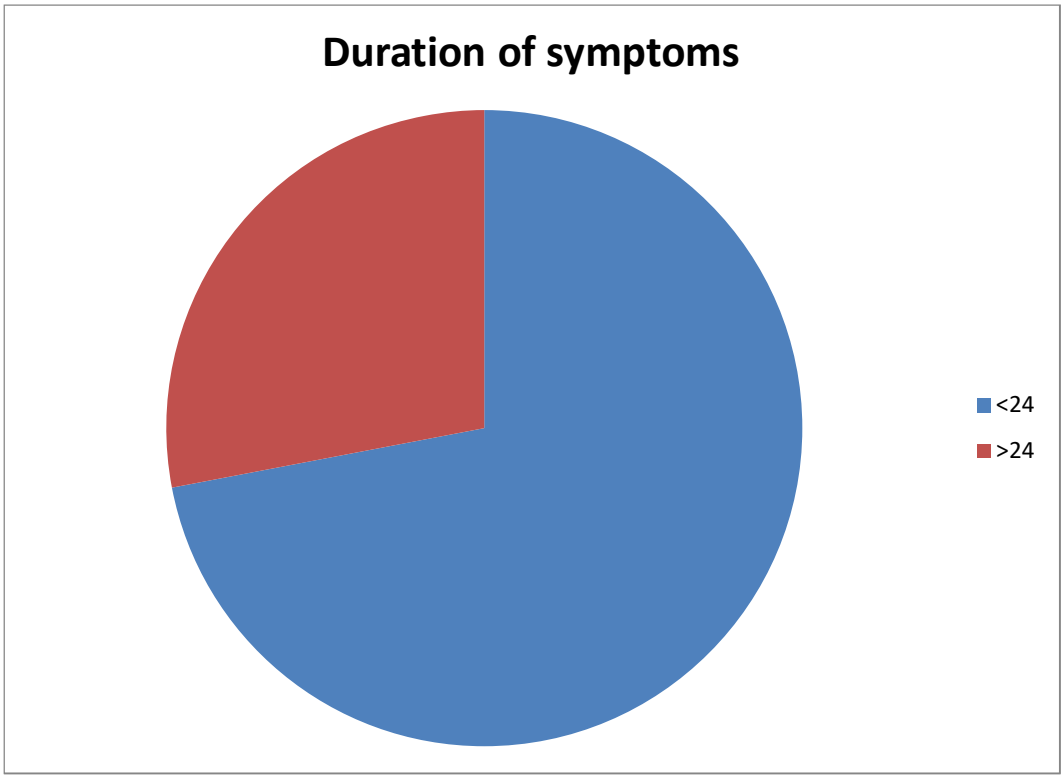


Figure 4: Duration of Symptoms

BOEY'S SCORE

The following table and figure shows the Boey's score. Majority of them had Boey's scores; 0 (n=22, 44%), 1 (n=13, 26%), 2 (n=11, 22%) and 3 (n=4, 8%).

Boey's score		Frequency	Percent
	0	22	44.0
	1	13	26.0
	2	11	22.0
	3	4	8.0
	Total	50	100.0

Table 6: Boey's Score

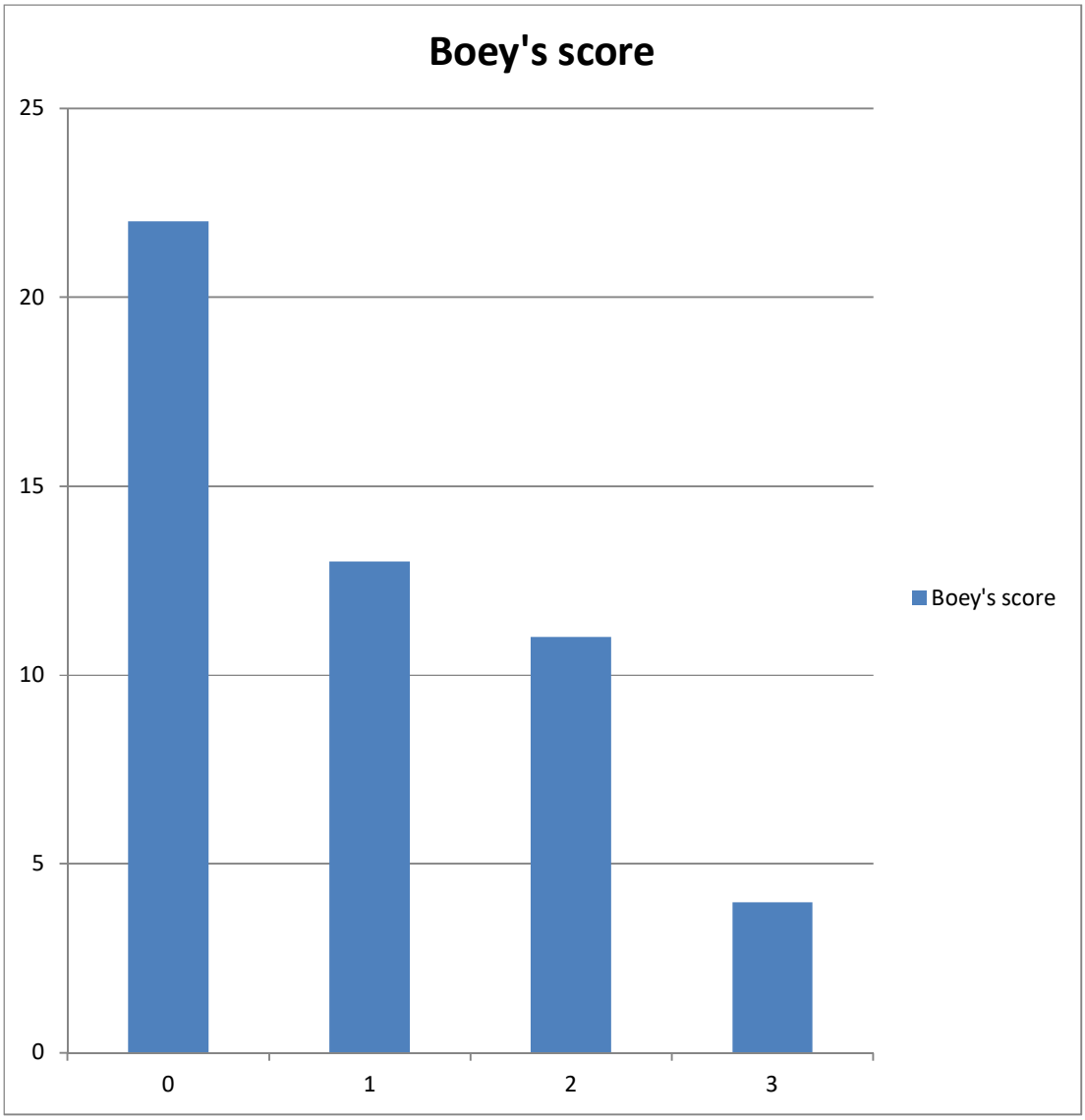


Figure 5: Boey's Score

DURATION OF HOSPITAL STAY

The following table and figure shows the duration of hospital stay (in days). The mean duration of hospital stay is 12.7 days with a standard deviation of 6 days. The median number of days in 9.5 days ranging between 6 to 25 days.

Duration of hospital stay parameters)	Duration of hospital stay (days)
Mean	12.680
Median	9.500
Mode	8.0
Std. Deviation	5.9674
Minimum	6.0
Maximum	25.0

Table 7: Duration of Hospital Stay

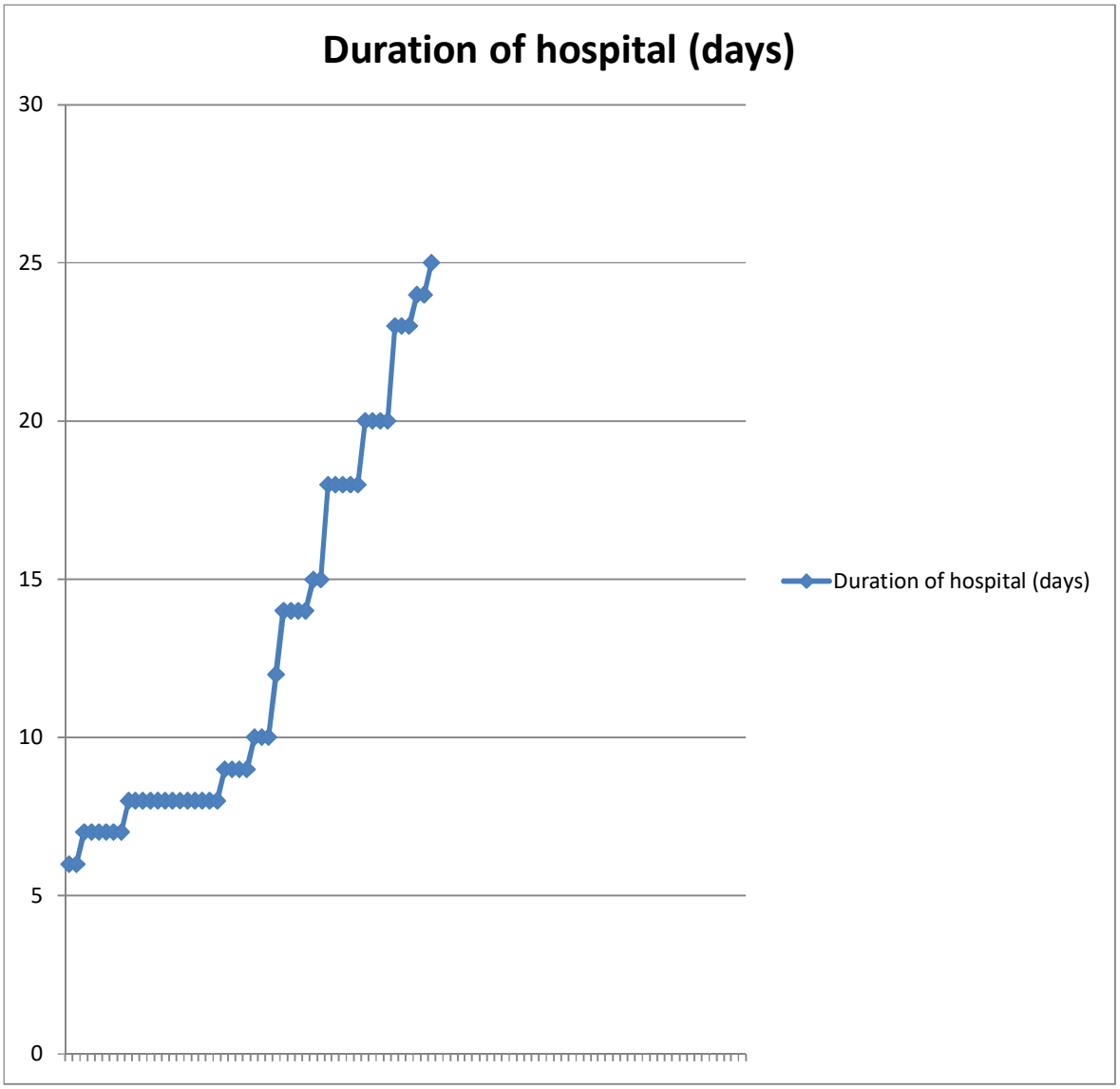


Figure 6: Duration of Hospital Stay

DIAGNOSIS

The following table and figure shows the diagnosis. Majority of them had peptic ulcer- D1 perforation peritonitis (n=18, 36%). Around 34% (n=17) had peptic ulcer- D2 perforation peritonitis while around 15 (30%) had peptic ulcer perforation alone.

S.No	**Diagnosis**	Frequency	Percentage
1	Peptic ulcer - D1 perforation peritonitis	18	36.0
2	Peptic ulcer - D2 perforation peritonitis	17	34.0
3	Peptic ulcer perforation	15	30.0
	Total	50	100

Table 8: Diagnosis

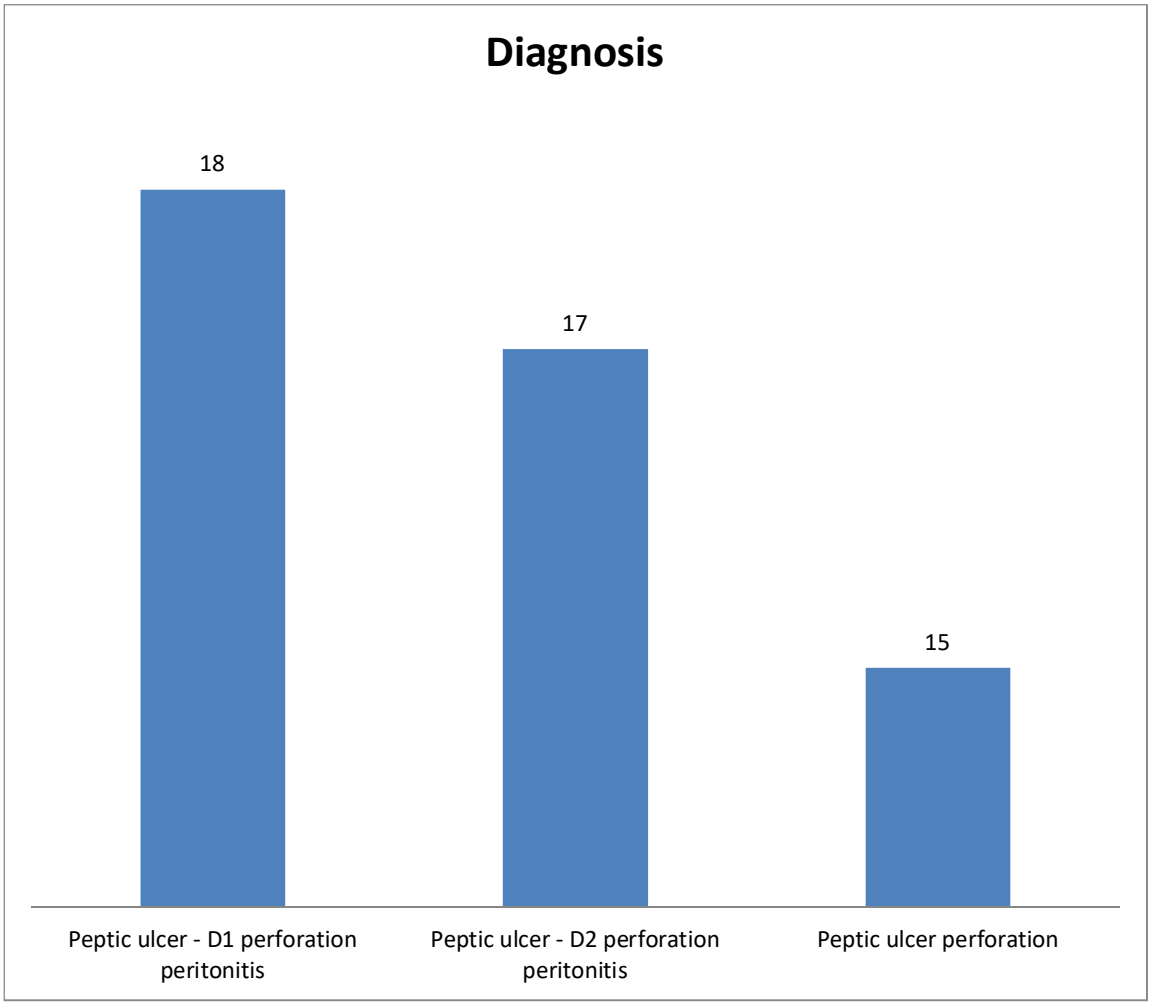


Figure 7: Diagnosis

PROCEDURE DONE

All cases were handled through omental Patch Closure

MORBIDITY

Out of 50 patients, 19 of them (38%) had morbidity. The following table and figure shows the incidence of morbidity in the study.

S.No	Morbidity	Frequency	Percentage
1	Yes	19	38
2	No	31	62
	Total	50	100

Table 9: Morbidity

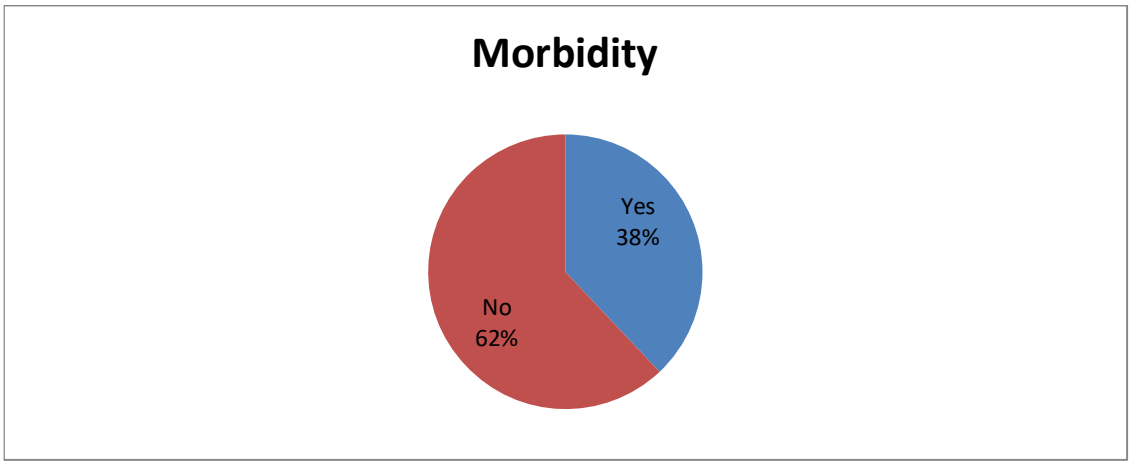


Figure 8: Morbidity

MORTALITY

Out of 50 patients, only one of them (2%) died. The following table and figure shows the incidence of mortality in the study.

S.No	Mortality	Frequency	Percentage
1	Yes	1	2
2	No	49	98
	Total	50	100

Table 10: Mortality

Figure 9: Mortality

Postoperative complications

The following table and figure shows post-operative complications. Around 42% (n=21) had post-operative complications.

S.No	Postoperative complications	Frequency	Percentage
1	Yes	21	42
2	No	29	58
	Total	50	100

Table 11: Post-operative complications

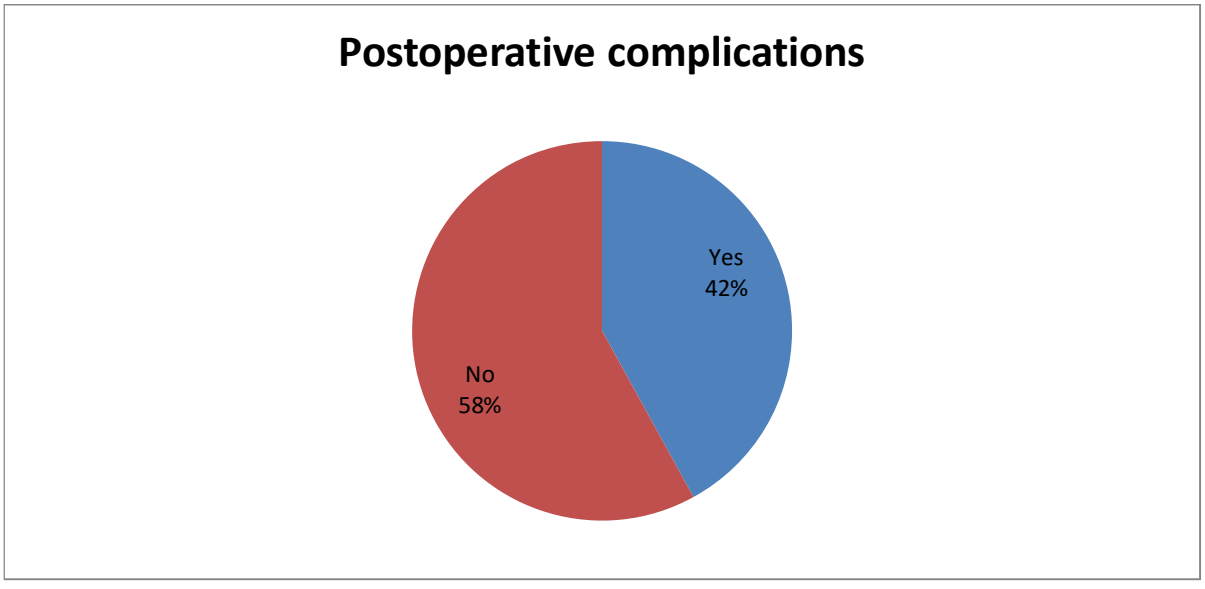


Figure 10: Post-operative complications

CHEST INFECTION

The following table and figure shows chest infection. Around 12% (n=6) had chest infections.

S.No	Chest Infection	Frequency	Percentage
1	Yes	6	12
2	No	44	88
	Total	50	100

Table 12: Chest Infection

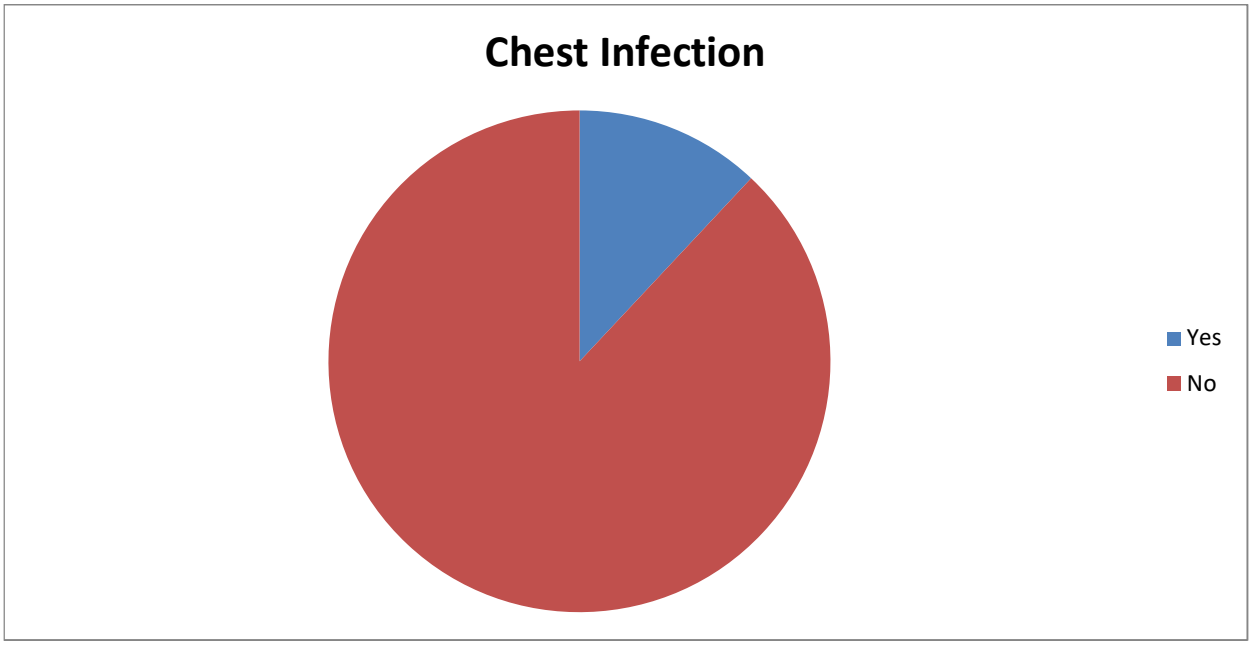


Figure 11: Chest Infection

WOUND INFECTION

The following table and figure shows wound infection. Around 42% (n=21) had wound infections.

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S.No	**Wound infection**	Frequency	Percentage
1	Yes	21	42
2	No	29	58
	Total	50	100

Table 13: Wound Infection

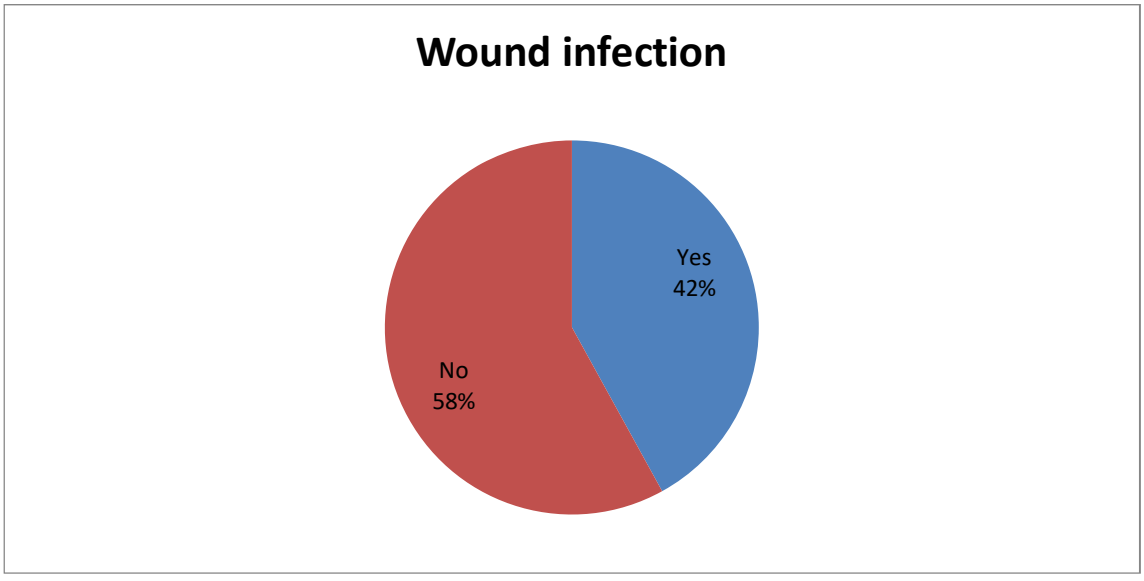

Figure 12: Wound Infection

WOUND DEHISCENCE

The following table and figure shows wound dehiscence. Around 12% (n=6) had wound dehiscence.

S.No	**Wound dehiscence**	Frequency	Percentage
1	Yes	6	12
2	No	44	88
	Total	50	100

Table 14: Wound dehiscence

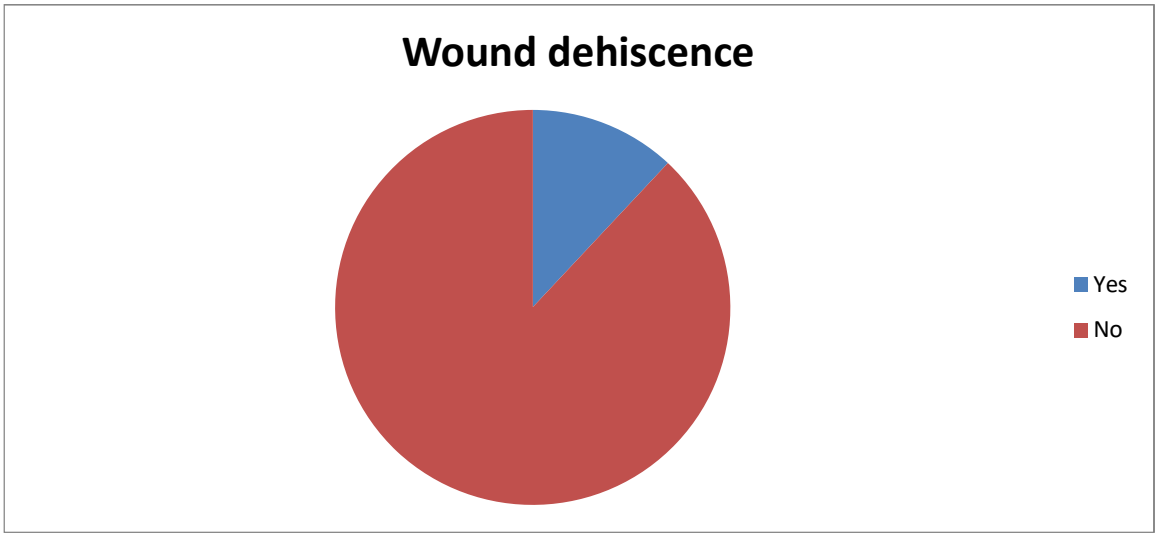

Figure 13: Wound dehiscence

INTRAABDOMINAL COLLECTION

The following table and figure shows intraabdominal collection. . Around 10% (n=5) had intraabdominal collection.

S.No	**Intraabdominal collection**	Frequency	Percentage
1	Yes	5	10
2	No	45	90
	Total	50	100

Table 15: Intraabdominal Collection

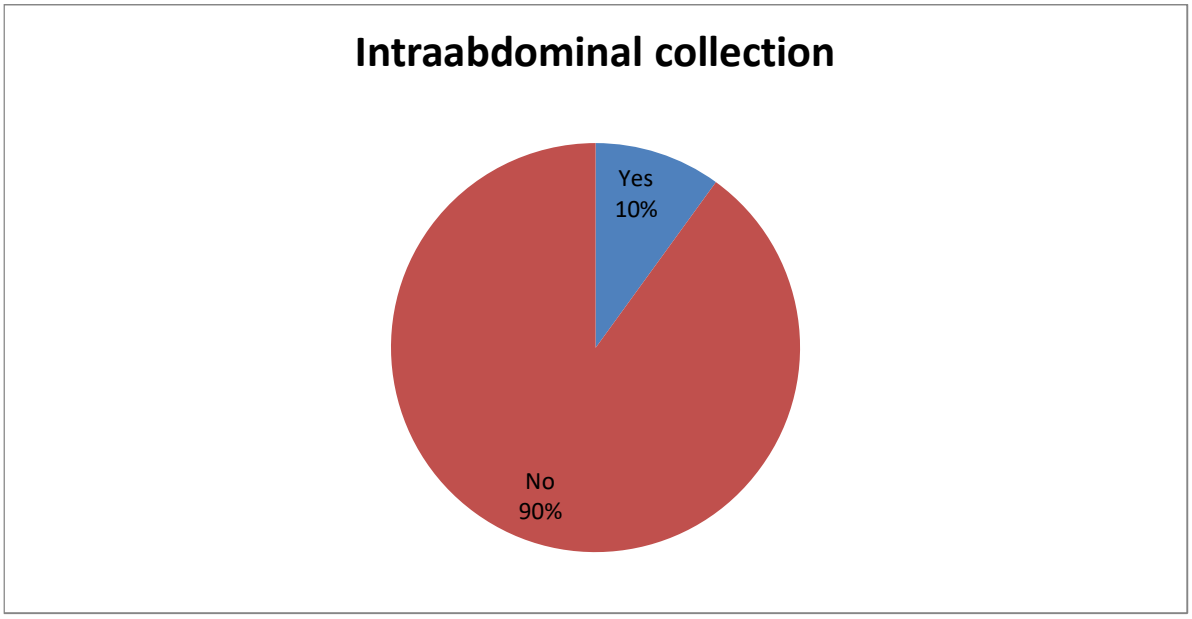

Figure 14: Intraabdominal Collection

POST-OPERATIVE COMPLICATIONS

The following figure shows the frequency of post-operative complications.

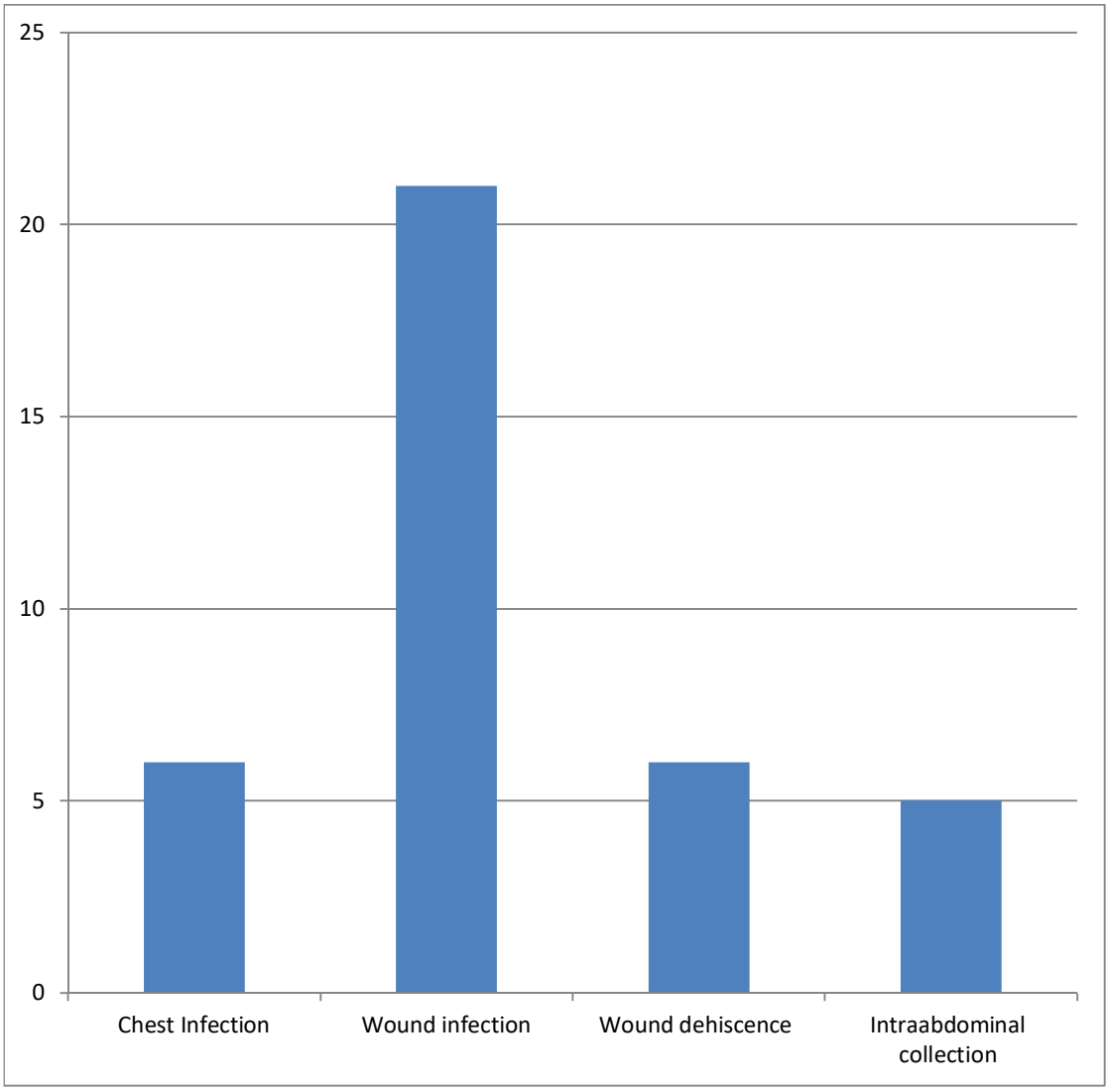

Figure 15: Post-operative complications

INFERENTIAL STATISTICS

Comparison of Boey's score with post-operative complications

Chi-square analysis shows that comparison of Boey's score with post-operative complications shows that it is significant with a value of 41.9 with a statistical significant value ($p<0.005$). The following table and figure shows the chi-square analysis shows that comparison of Boey's score with post-operative complications.

	Post-operative complications			Chi-square Analysis P-Value
Boey's Score	Yes	No	Total	41.913 P=0.000
0	0	22	22	
1	6	7	13	
2	11	0	11	
3	4	0	4	
Total	21	29	50	

Table 16: Comparison of Boey's score with post-operative complications

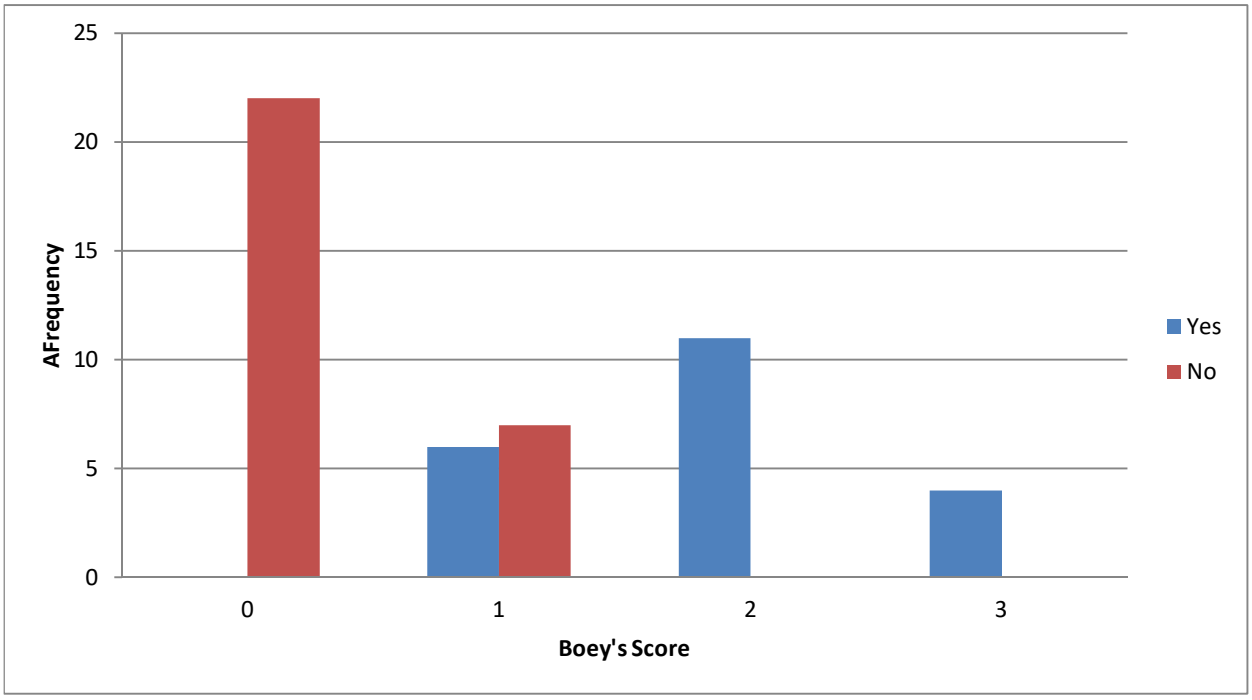

Figure 16: Comparison of Boey's score with post-operative complications

ROC analysis for the various parameters under study

ROC analysis for postoperative complications and Boey's score shows that Boey's score is highly sensitive for detecting post-operative complications with an area under curve=0.966. The following tables and figure shows the ROC analysis of postoperative complications and Boey's score

Post-operative complications	Frequency
Yes[a]	21
No	29
Larger values of the test result variable(s) indicate stronger evidence for a positive actual state.	
a. The positive actual state is 1.00.	

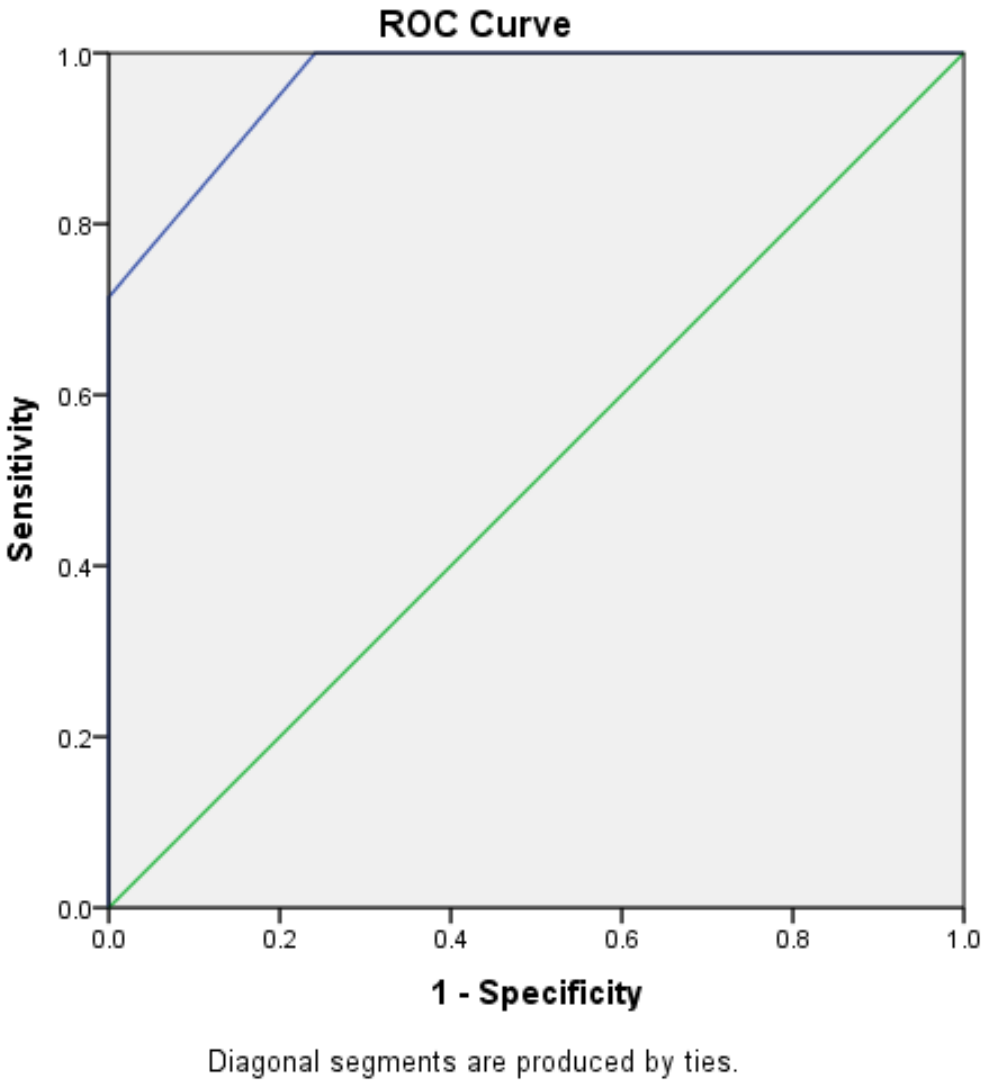

Figure 17: ROC analysis for postoperative complications and Boey's score

Area Under the Curve
Test Result Variable(s): Boey's score
Area=0.966
The test result variable(s): Boey's score has at least one tie between the positive actual state group and the negative actual state group. Statistics may be biased.

Coordinates of the Curve		
Test Result Variable(s): Boey's score		
Positive if Greater Than or Equal To[a]	Sensitivity	1 - Specificity
-1.00	1.000	1.000
.50	1.000	.241
1.50	.714	.000
2.50	.190	.000
4.00	.000	.000
The test result variable(s): Boye's score has at least one tie between the positive actual state group and the negative actual state group.		
a. The smallest cutoff value is the minimum observed test value minus 1, and the largest cutoff value is the maximum observed test value plus 1. All the other cutoff values are the averages of two consecutive ordered observed test values.		

ROC analysis for morbidity and Boey's score shows that Boey's score is highly sensitive for detecting morbidities with an area under curve=0.916. The following tables and figure shows the ROC analysis of morbidity and Boey's score.

Morbidity	Valid N (listwise)
Yes[a]	19
No	31
Larger values of the test result variable(s) indicate stronger evidence for a positive actual state.	
a. The positive actual state is 1.00.	

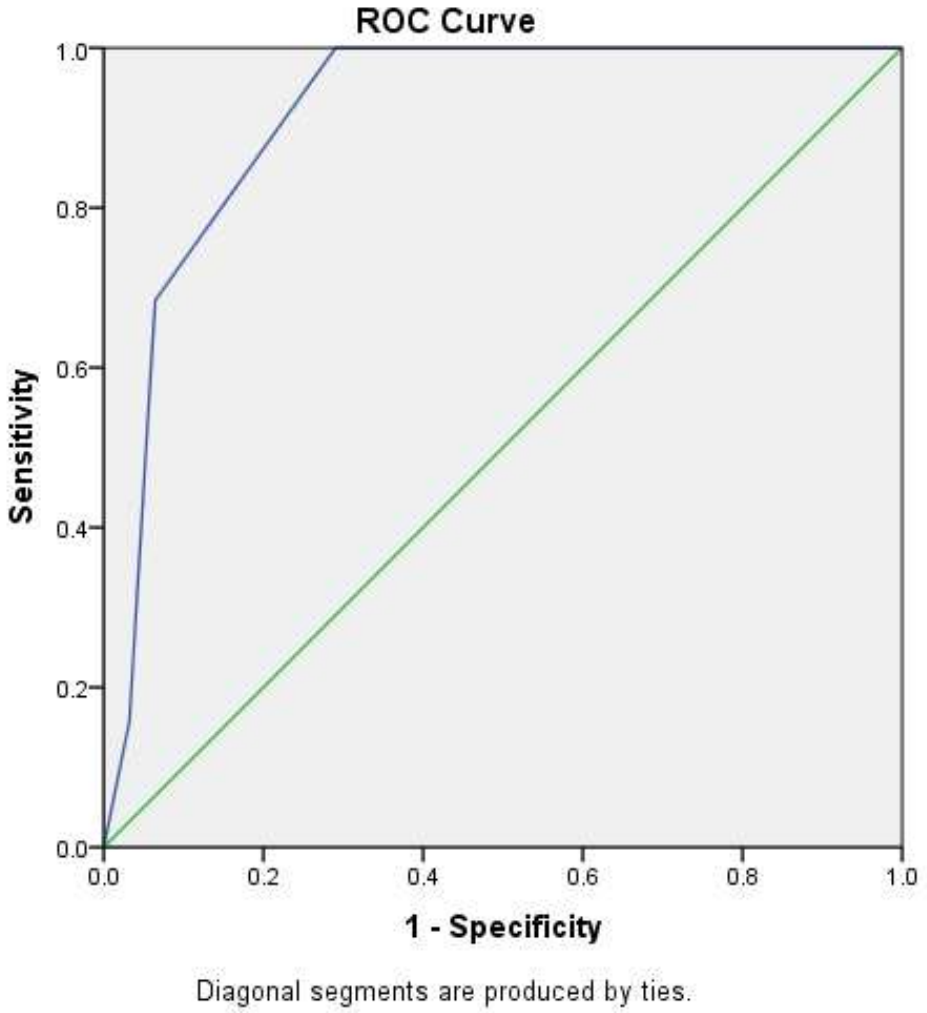

Figure 18: ROC analysis for morbidity and Boey's score

Area Under the Curve
Test Result Variable(s): Boye's score
Area=.916
The test result variable(s): Boye's score has at least one tie between the positive actual state group and the negative actual state group. Statistics may be biased.
Coordinates of the Curve

Test Result Variable(s): Boye's score		
Positive if Greater Than or Equal To[a]	Sensitivity	1 - Specificity
-1.00	1.000	1.000
.50	1.000	.290
1.50	.684	.065
2.50	.158	.032
4.00	.000	.000
The test result variable(s): Boye's score has at least one tie between the positive actual state group and the negative actual state group.		
a. The smallest cutoff value is the minimum observed test value minus 1, and the largest cutoff value is the maximum observed test value plus 1. All the other cutoff values are the averages of two consecutive ordered observed test values.		

ROC analysis for mortality and Boey's score shows that Boey's score is highly sensitive for detecting mortality with an area under curve=0.969. The following tables and figure shows the ROC analysis of mortality and Boey's score.

Mortality	Valid N (listwise)
Yes[a]	1
No	49
Larger values of the test result variable(s) indicate stronger evidence for a positive actual state.	
a. The positive actual state is 1.00.	

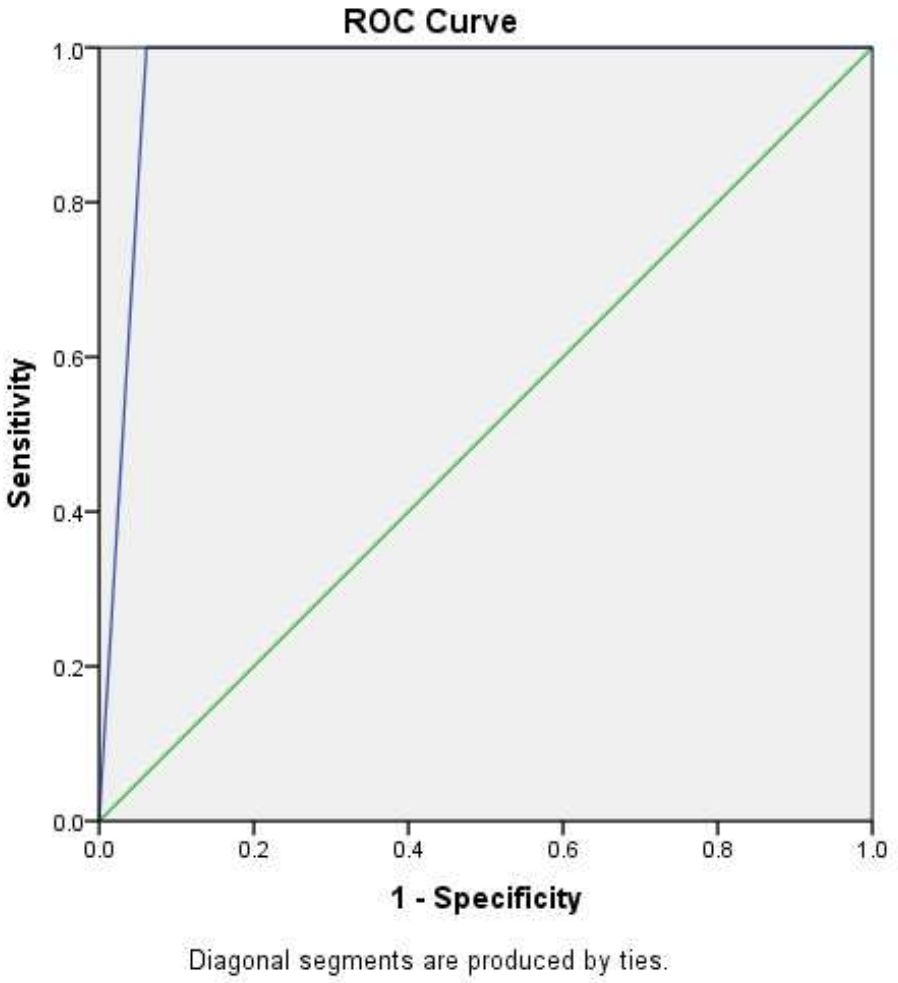

Figure 19: ROC analysis for mortality and Boey's score

Area Under the Curve
Test Result Variable(s): Boye's score
Area
.969
The test result variable(s): Boye's score has at least one tie between the positive actual state group and the negative actual state group. Statistics may be biased.

Coordinates of the Curve		
Test Result Variable(s): Boye's score		
Positive if Greater Than or Equal To[a]	Sensitivity	1 - Specificity
-1.00	1.000	1.000
.50	1.000	.551
1.50	1.000	.286
2.50	1.000	.061
4.00	.000	.000
The test result variable(s): Boye's score has at least one tie between the positive actual state group and the negative actual state group.		
a. The smallest cutoff value is the minimum observed test value minus 1, and the largest cutoff value is the maximum observed test value plus 1. All the other cutoff values are the averages of two consecutive ordered observed test values.		

Condition on discharge

All were stable on discharge

Follow up

There were no complaints with a normal OGD study

DISCUSSION

DISCUSSION

Peptic ulcer is a multifactorial disease that has a complex interplay of the following factors[1-4]; Genetic factors, Environmental factors, H.Pylori and NSAIDs. In the initial days, peptic ulcer peritonitis was attributed to poisoning[25]. At times, the hole in the stomach was attributed to the dissector's knife[26]. More cases were reported between 1600 and 1800[27].Since then, the treatment has been the same; open the abdomen, sew the hole and clean the abdominal cavity[28]. This treatment is the same till date with primary closure of the perforation with omental patch[29-33]. The first modern documented peptic ulcer peritonitis was done by Edward Crisp in 1843[34].

In the western countries, the incidence was high in the early 20th century which reduced in the later half[5]. This can be attributed to the better hygiene and the use of histamine-2 receptor antagonists (H2RA) and proton pump inhibitors (PPI). However, in India, there is still an increased incidence of peptic ulcer disease[6]. With improved hygiene, life style changes and better availability of treatment has led to the stabilisation of the incidence of peptic ulcer disease[7].

Studies show an estimated prevalence of 5 to 15%[8]. The major complications of peptic ulcer disease are; Haemorrhage, Perforation and Gastric outlet obstruction. Perforation is reported in 2-10% of all the known cases of peptic ulcers[9].

Although studies show the multifactorial nature of the disease, microbial infection in conjunction with NSAIDs constitute the major contributory factor in the etiopathogenesis of peptic ulcer disease and subsequent perforation.

The typical presentation is the sudden onset of sharp acute pain in the epigastrium with an associated shoulder pain The pain in the shoulder indicates the presence of air under the diaphragm[35]. Majority of them are males with a history of peptic ulcer disease or use of NSAIDs. It may present with nausea and vomiting. Clinical examination may reveal the following[36];

1. Quickened pulse
2. Low systolic blood pressure, sometimes with shock[37]
3. Fever and hypotension may be present later
4. X-ray of abdomen shows air under the diaphragm[38]

Abdominal ultrasound and CT scans with oral contrast are also used[39].

Few decades back, peptic ulcer perforation was mainly managed electively. With the advancement in diagnostic and treatment of peptic ulcer disease, emergency management has improved though the incidence has remained stable[10]. The morbidity, mortality and surgical outcome rates vary between different set ups. Studies show a mortality rate of 6-14%[11].

One of the important aspects of management of peptic ulcer disease is the risk stratification. Better stratification will help in better management protocols. This led to the development of scoring systems using the three prognostic factors;

1. Preoperative shock
2. Long-standing perforation
3. Associated medical diseases

This was developed by Boey et al in 1982[12]. Later on, this was validated in 1987[13].

The scoring system developed by Boey is simple and most commonly used. It has a high positive predictive value[14-15].

There are not many Indian studies that deals with the validation of this scoring system.

Studies show that perforation accounts for 70% of deaths related to peptic ulcer disease. This is often the first clinical sign[16].

The site of perforation is[17];

1. Anterior wall of duodenum (60%)
2. Antrum (20%)
3. Lesser-curvature (20%)

Most of the investigators show that the first part of the duodenum followed by prepyloric region and body of stomach is the commonly involved sites[18-19]. Males are more commonly affected. This can be attributed to the tobacco smoking and alcohol consumption behaviour of males.

Literature gives a range between 17% to 63% for postoperative complications[20-21]. Among these complications, chest infections are the most common[22]. The wound infection rate of 15-40% is noted[23-24].

There are many scoring systems for peptic ulcer perforation and peritonitis;

1. Acute Physiology and Chronic Health Evaluation (APACHE) score
2. Simplified Acute Physiology Score (SAPS)
3. Jabalpur Index
4. Multi Organ Failure (MOF) Score
5. Mannheim Peritonitis Index (MPI)

However, none of these scoring systems have proven 100% efficacy. Some of them are more useful in specific contexts.

Boey's scoring system has the following advantges over the other systems;

1. It is more sensitive in predicting postoperative complications and death in peptic perforation patients.
2. The odds ratio of developing mortality and morbidity increased progressively with increasing numbers of the Boey score.
3. It is easy to calculate
4. It has better precision

The easy applicability of the Boey's score in peptic perforation peritonitis makes it superior to other scoring methods.

There are not many Indian studies that deal specifically the objectives of the present study. However, following study is similar to the present topic.

The study was a single centre observational study among 180 patients who underwent open surgery for peptic ulcer perforation. This study reported that there is a positive correlation between Boey's scores and morbidity[44].

This prospective observational single centre study was done to evaluate the accuracy of Boey's scoring system in predicting post-operative morbidity and mortality in a patient operated for peptic ulcer perforation revealed the following findings. The study also aimed to study the clinical profile of patients who present with peptic ulcer perforation and the morbidity and mortality in a patient operated for peptic ulcer perforation.

Prospective observational single centre study among 50 patients to evaluate the accuracy of Boey's scoring system in predicting post-operative morbidity and mortality in a patient operated for peptic ulcer perforation revealed the following findings. The study also aimed to study the clinical profile of patients who present with peptic ulcer perforation and the morbidity and mortality in a patient operated for peptic ulcer perforation.

The mean age of the participants is 45.02 years with a standard deviation of 6.4 years. The age ranged between 34 to 60 years. The median age was 45 years. All of the study participants were males. For the Boey's scoring system, the systolic pressure is an important parameter. The mean systolic blood pressure was 116.4

mm/Hg (S.D=14.67) with only four patients with systolic BP less than 90 mm/Hg. The mean diastolic blood pressure was 74.4 mm/Hg (S.D=8.8). The mean duration of hospital stay is 12.7 days with a standard deviation of 6 days. The median number of days in 9.5 days ranging between 6 to 25 days. Out of 50 patients, 19 of them (38%) had morbidity. Out of 50 patients, only one of them (2%) died.

Out of 50 patients, 22 (44%) did not have any concomitant medical illness while the rest (n=28, 56%) had concomitant medical illness. Majority of them had hypertension (n=11, 22%). Majority of them (72%, n=36) had the symptoms for less than 24 hours. While the rest of them had symptoms for more than 24 hours (n=14, 28%). Majority of them had Boey's scores; 0 (n=22, 44%), 1 (n=13, 26%), 2 (n=11, 22%) and 3 (n=4, 8%). Majority of them had peptic ulcer- D1 perforation peritonitis (n=18, 36%). Around 34% (n=17) had peptic ulcer- D2 perforation peritonitis while around 15 (30%) had peptic ulcer perforation alone.

All cases were handled through omental Patch Closure. Out of 50 patients, 19 of them (38%) had morbidity. Out of 50 patients, only one of them (2%) died. Around 42% (n=21) had post-operative complications.

Around 12% (n=6) had chest infections. Around 42% (n=21) had wound infections. Around 12% (n=6) had wound dehiscence. Around 10% (n=5) had Intraabdominal collection.

Chi-square analysis shows that comparison of Boey's score with post-operative complications shows that it is significant with a value of 41.9 with a statistical

significant value ($p<0.005$). ROC analysis for postoperative complications and Boey's score shows that Boey's score is highly sensitive for detecting post-operative complications with an area under curve=0.966.

ROC analysis for morbidity and Boey's score shows that Boey's score is highly sensitive for detecting morbidities with an area under curve=0.916. ROC analysis for mortality and Boey's score shows that Boey's score is highly sensitive for detecting mortality with an area under curve=0.969.

In conclusion, Boey's score is a simple and effective system to diagnose peptic ulcer perforation and peritonitis.

SUMMARY AND CONCLUSIONS

SUMMARY AND CONCLUSIONS

Prospective observational single centre study among 50 patients to evaluate the accuracy of Boey's scoring system in predicting post-operative morbidity and mortality in a patient operated for peptic ulcer perforation revealed the following findings. The study also aimed to study the clinical profile of patients who present with peptic ulcer perforation and the morbidity and mortality in a patient operated for peptic ulcer perforation.

The mean age of the participants is 45.02 years with a standard deviation of 6.4 years. The age ranged between 34 to 60 years. The median age was 45 years. All of the study participants were males. For the Boey's scoring system, the systolic pressure is an important parameter. The mean systolic blood pressure was 116.4 mm/Hg (S.D=14.67) with only four patients with systolic BP less than 90 mm/Hg. The mean diastolic blood pressure was 74.4 mm/Hg (S.D=8.8). The mean duration of hospital stay is 12.7 days with a standard deviation of 6 days. The median number of days in 9.5 days ranging between 6 to 25 days. Out of 50 patients, 19 of them (38%) had morbidity. Out of 50 patients, only one of them (2%) died.

Out of 50 patients, 22 (44%) did not have any concomitant medical illness while the rest (n=28, 56%) had concomitant medical illness. Majority of them had hypertension (n=11, 22%). Majority of them (72%, n=36) had the symptoms for less than 24 hours. While the rest of them had symptoms for more than 24 hours

(n=14, 28%). Majority of them had Boey's scores; 0 (n=22, 44%), 1 (n=13, 26%), 2 (n=11, 22%) and 3 (n=4, 8%). Majority of them had peptic ulcer- D1 perforation peritonitis (n=18, 36%). Around 34% (n=17) had peptic ulcer- D2 perforation peritonitis while around 15 (30%) had peptic ulcer perforation alone.

All cases were handled through omental Patch Closure. Out of 50 patients, 19 of them (38%) had morbidity. Out of 50 patients, only one of them (2%) died. Around 42% (n=21) had post-operative complications.

Around 12% (n=6) had chest infections. Around 42% (n=21) had wound infections. Around 12% (n=6) had wound dehiscence. Around 10% (n=5) had Intraabdominal collection.

Chi-square analysis shows that comparison of Boey's score with post-operative complications shows that it is significant with a value of 41.9 with a statistical significant value ($p<0.005$). ROC analysis for postoperative complications and Boey's score shows that Boey's score is highly sensitive for detecting post-operative complications with an area under curve=0.966.

ROC analysis for morbidity and Boey's score shows that Boey's score is highly sensitive for detecting morbidities with an area under curve=0.916. ROC analysis for mortality and Boey's score shows that Boey's score is highly sensitive for detecting mortality with an area under curve=0.969.

In conclusion, Boey's score is a simple and effective system to diagnose peptic ulcer perforation and peritonitis.

LIMITATIONS

LIMITATIONS

This study has the following limitations;

1) It is a single center study which affects the generalizability of the results
2) The sample size is small which affects the validation process of Boey's score
3) The study did not have external funding which affected the design of the study

FUTURE

RECOMMENDATIONS

FUTURE RECOMMENDATIONS

1) Similar studies should be done using a multicentric design
2) A larger sample size with widespread representation across the country is necessary
3) Different scoring systems should be compared in the same study to assess the reliability of these scores and how each one differs from the other

ETHICAL COMMITTEE APPROVAL LETTER

GOVERNMENT STANLEY MEDICAL COLLEGE & HOSPITAL,CHENNAI -01

INSTITUTIONAL ETHICS COMMITTEE

TITLE OF THE WORK	:"VALIDATION OF BOEY'S SCORE IN PREDICTING MORBIDITY AND MORTALITY IN PEPTIC ULCER PERFORATION PERITONITS"
PRINCIPAL INVESTIGATOR	: DR GOKUL RAM .V,
DESIGNATION	: PG IN GENERAL SURGERY,
DEPARTMENT	: DEPARTMENT OF GENERAL SURERY, GOVT. STANLEY MEDICAL COLLEGE.

The request for an approval from the Institutional Ethical Committee (IEC) was considered on the IEC meeting held on 29.01.2020 at the Council Hall, Stanley Medical College, Chennai-1 at 10am.

The members of the Committee, the secretary and the Chairman are pleased to approve the proposed work mentioned above, submitted by the principal investigator.

The Principal investigator and their team are directed to adhere to the guidelines given below:

1. You should inform the IEC in case of changes in study procedure, site investigator investigation or guide or any other changes.
2. You should not deviate from the area of the work for which you applied for ethical clearance.
3. You should inform the IEC immediately, in case of any adverse events or serious adverse reaction.
4. You should abide to the rules and regulation of the institution(s).
5. You should complete the work within the specified period and if any extension of time is required, you should apply for permission again and do the work.
6. You should submit the summary of the work to the ethical committee on completion of the work.

MEMBER SECRETARY, 21/2/20
IEC, SMC, CHENNAI

PROFORMA

- NAME
- AGE/SEX
- DATE OF ADMISSION
- IP.NO
- COMPLAINTS
- COMORBIDITIES
- CLINICAL FEATURES
- DURATION OF DISEASE
- VITALS :PR= ,BP= , TEMP= ,RR=
- Boey's score
- TREATMENT PLAN -emergency open laparotomy with primary omental patch closure
- OUTCOME:
    1. DURATION OF HOSPITAL STAY
    2. POST OPERATIVE COMPLICATIONS
    3. Follow up .

MORTALITY:

- HISTOPATHOLOGY:

CONDITION ON DISCHARGE:

Signature of Researcher
Date :

INFORMED CONCENT

DISSERTATION TOPIC: VALIDATION OF BOYE'S SCORE IN PREDICTING THE MORTALITY AND MORBIDITY OF PEPTIC ULCER PERFORATION PERITONITIS

- PLACE OF STUDY: GOVT. STANLEY MEDICAL COLLEGE, CHENNAI

- NAME AND ADDRESS OF PATIENT:

- _____ஆகிய எனக்கு, எனது சொந்த மொழியில் ஆய்வுவிவரங்கள் பற்றி தெரிவிக்கப்பட்டது. நான் ஆய்வு விவரங்கள் பற்றிமுற்றிலும் அறிந்து கொண்டேன்.

- ஆய்வில் பங்கெடுத்துள்ள நான், சாத்தியமான அபாயங்களையும், பயன்களையும் நன்கு அறிந்திருக்கிறேன்

- நான் எந்த நேரத்திலும் இந்த ஆய்விலிருந்து வெளிவரமுடியும் என்றும் அதன் பின்னர், நான் வழக்கம்போல் மருத்துவசிகிச்சை பெறலாம் என்றும் புரிந்து கொண்டேன்.

- நான் இந்த ஆய்வில் பங்குகொள்வதால் எந்த பணமும் பெறமுடியாது என்பதையும் அறிந்தேன்.

- இந்த ஆய்வின் முடிவு எந்த மருத்துவஇதழிலும் வெளியிடப்படலாம் என்றும், எனினும் எனது தனிப்பட்ட அடையாளம் வெளியிடப்படாது என்றும் நன்கு உணர்ந்தேன்.

- நல்லெண்ணத்துடன் மேற்கொள்ளப்படும் இந்தஆய்வில் பங்குகொள்வேன் என்றும் எனது முழு ஒத்துழைப்பை நீட்டிப்பேன் என்றும் உறுதியளிக்கிறேன்.

- பெயர் மற்றும் தொண்டர் முகவரி:

- தொண்டர்கையொப்பம்/ பெருவிரல்ரேகை:

- நாள்:

- சாட்சிகள்: (கையொப்பம், பெயர்மற்றும்முகவரி)

- நாள்:

- பெயர்மற்றும்புலன்விசாரணையாளர்கையொப்பம்:

GOVT.STANLEY MEDICAL COLLEGE, CHENNAI- 600 001

INFORMED CONCENT

TOPIC: VALIDATION OF BOEY' SCORE IN PREDICTING THE MORTALITY AND MORBIDITY OF PEPTIC ULCER PERFORATION PERITONITIS

- PLACE OF STUDY: GOVT. STANLEY MEDICAL COLLEGE, CHENNAI
- NAME AND ADDRESS OF PATIENT:
- I, _____ have been informed about the details of the study in my own language.
- I have completely understood the details of the study.
- I am aware of the possible risks and benefits, while taking part in the study.
- I understand that I can withdraw from the study at any point of time and even then, I will continue to receive the medical treatment as usual.
- I understand that I will not get any payment for taking part in this study.
- I will not object if the results of this study are getting published in any medical journal, provided my personal identity is not revealed.
- I know what I am supposed to do by taking part in this study and I assure that I would extend my full co-operation for this study.

Name and Address of the Volunteer:

Signature/Thumb impression of the Volunteer

Date:

Witnesses:

(Signature, Name & Address)

Date:

Name and signature of investigator:

ANNEXURES

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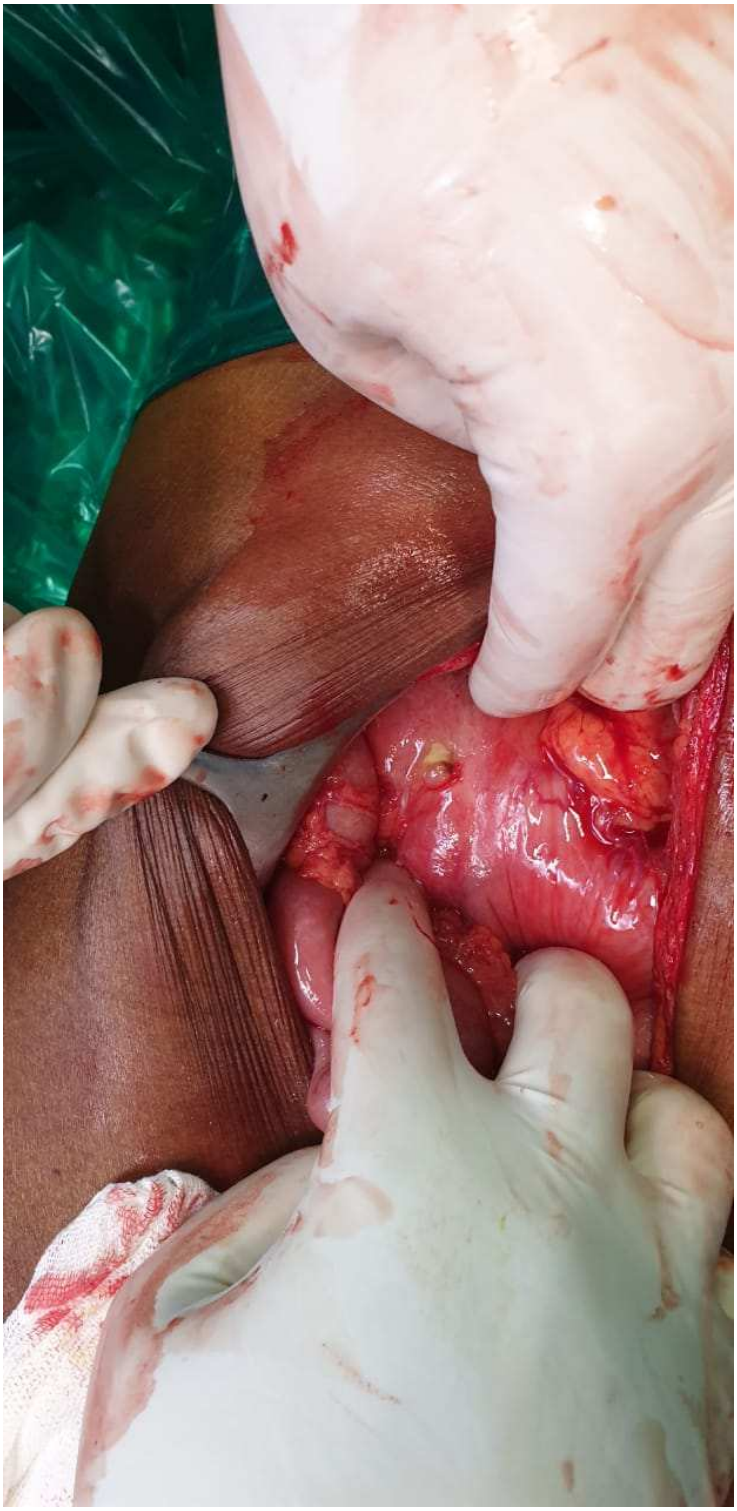
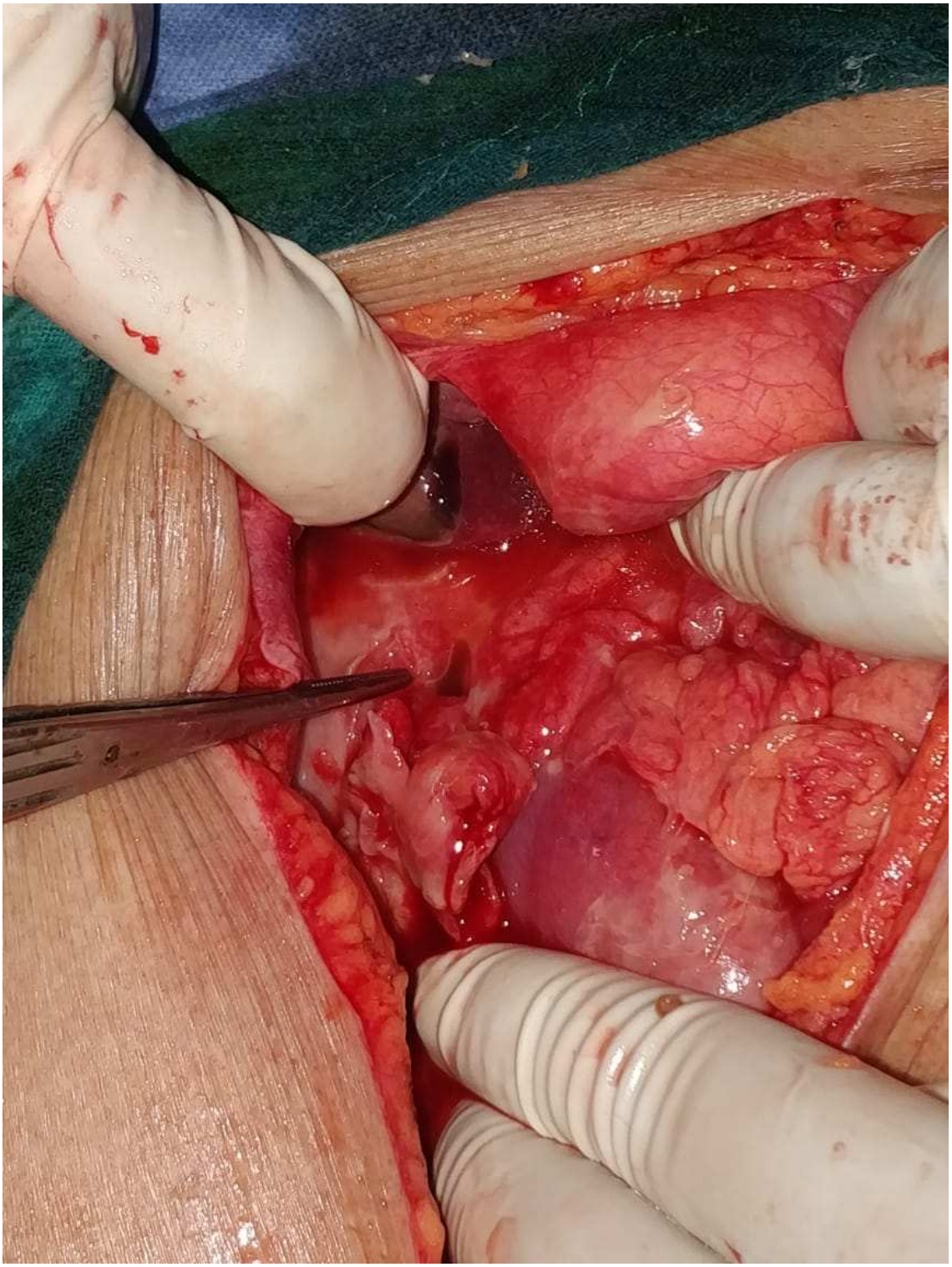
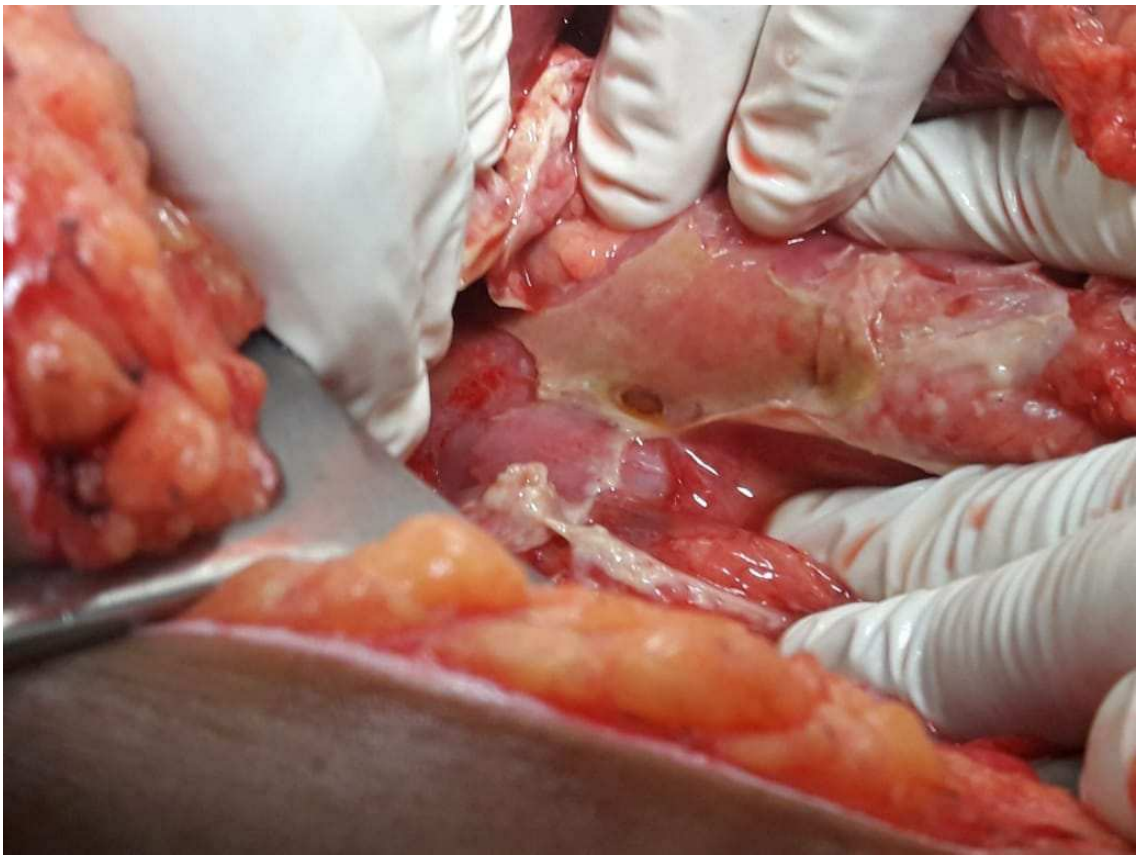
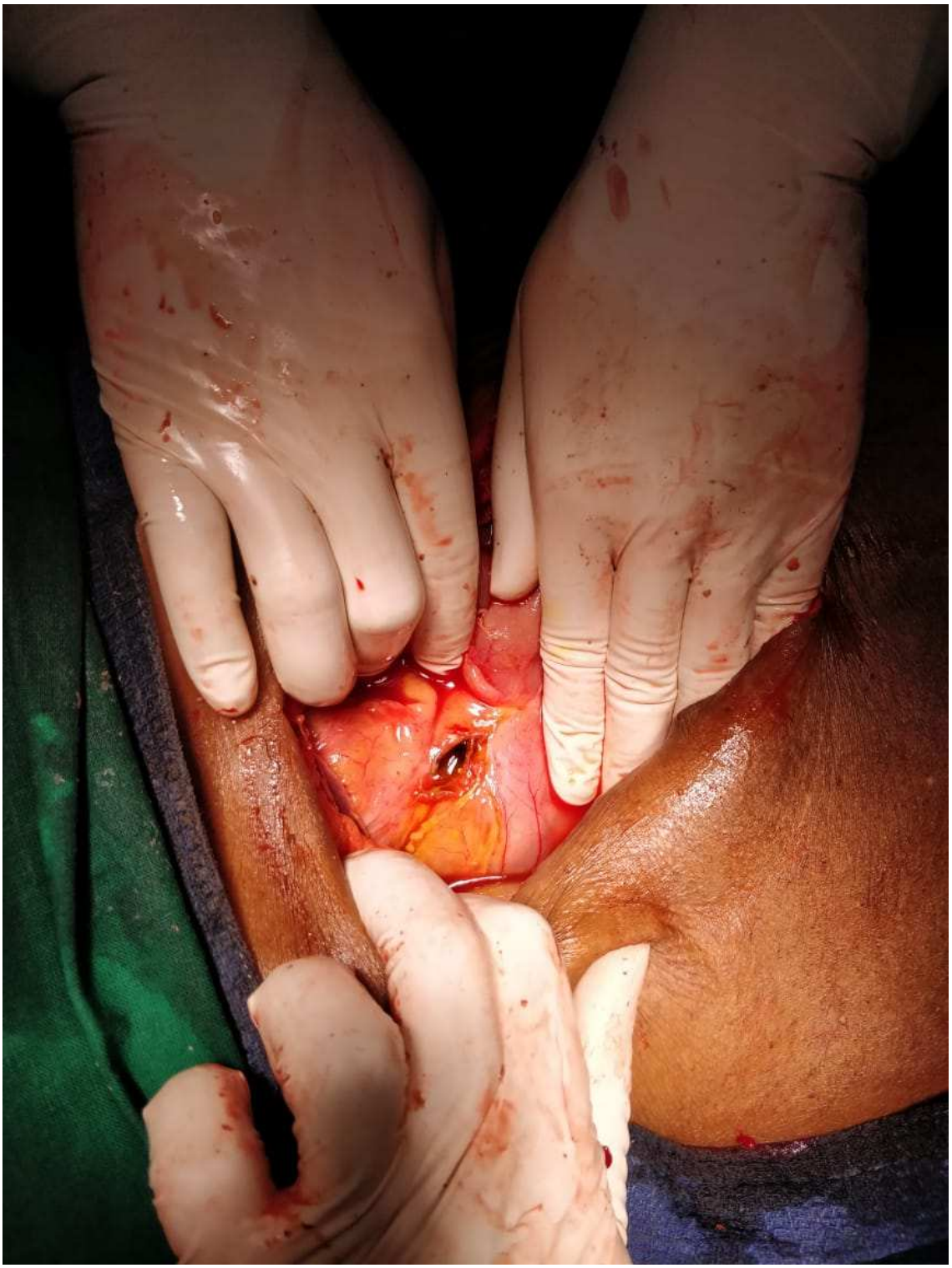
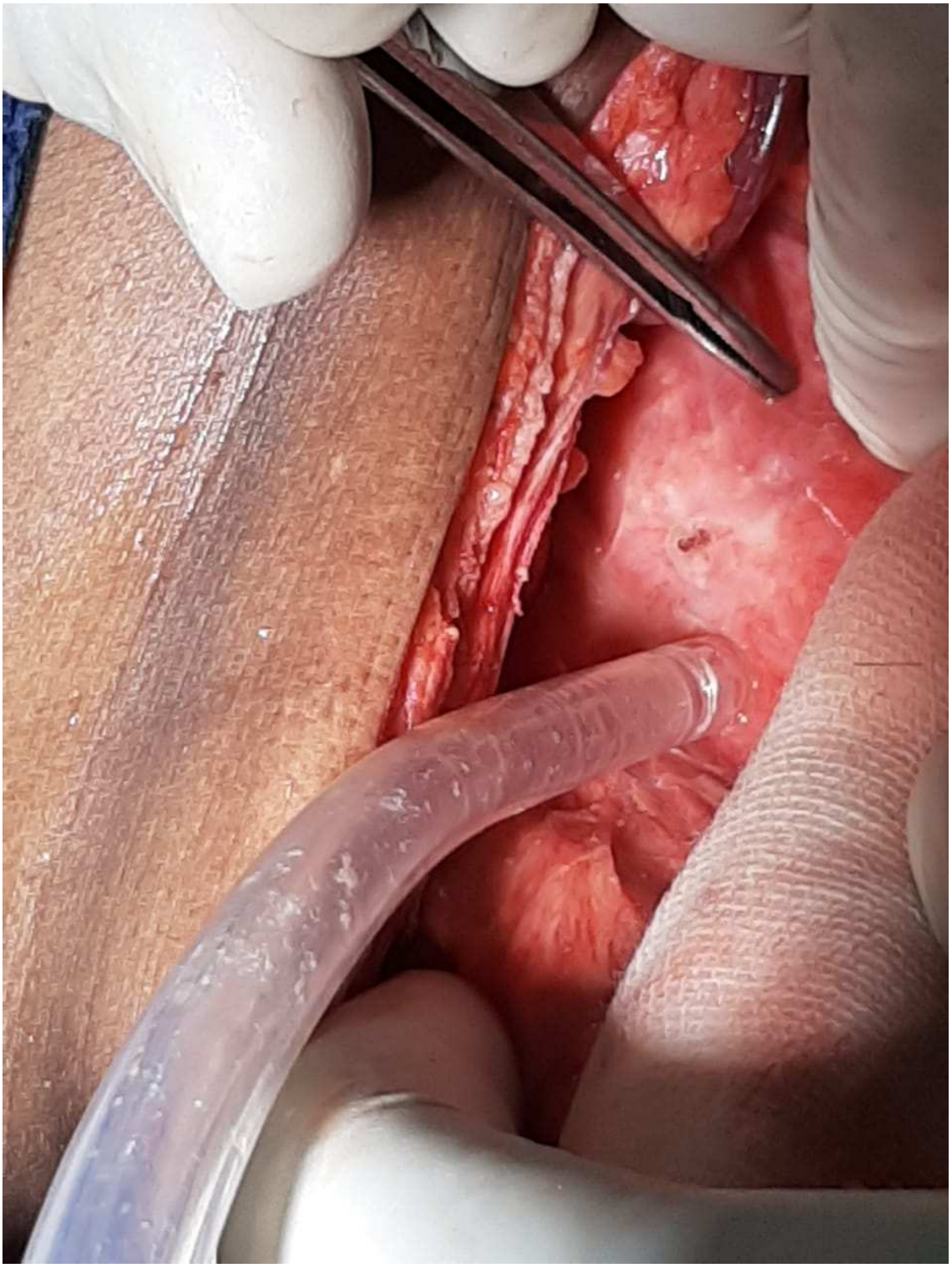
INTRAOPERATIVE IMAGES

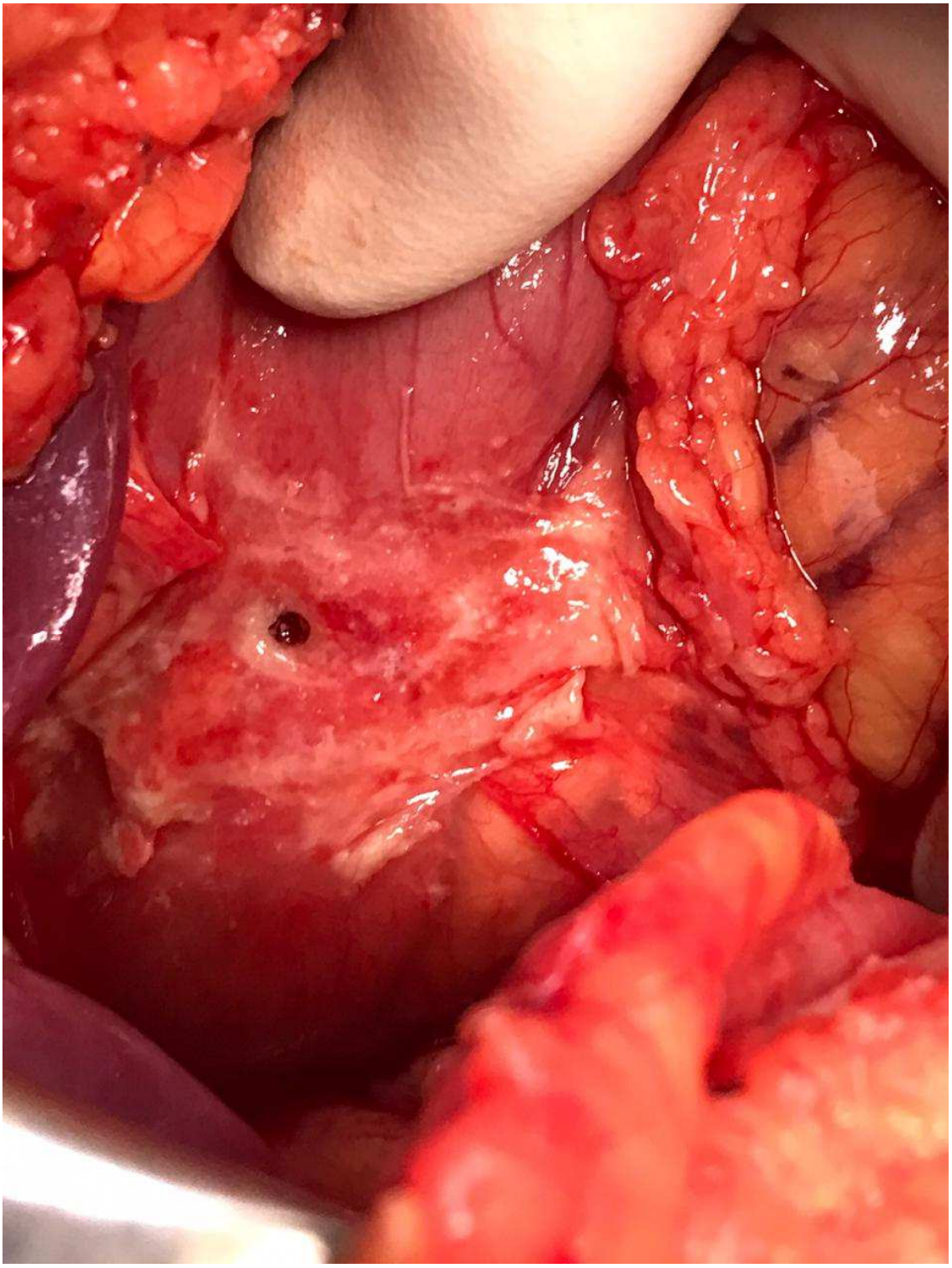


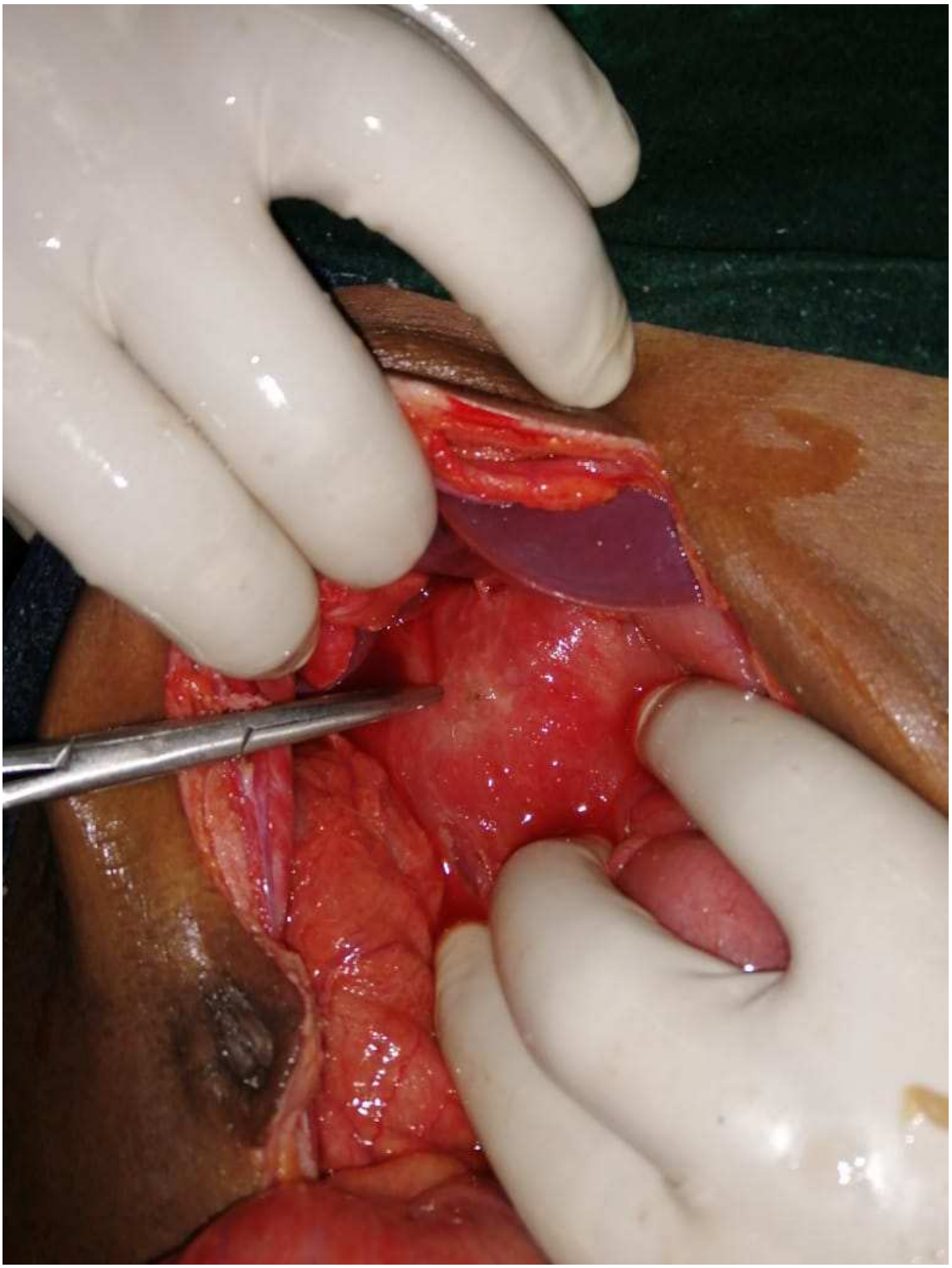












MASTER CHART

S.No	Salutation	Name	Age (years)	Sex	ZPNo	Conconsinont medical illness	Systolic (mg)	Duration of (hrs)	Boye's score	Diagnnosis
1	Mr	Ramesh	50	M	2010289	Nil	130/90	<24	0	Peptic ulcer - D1 perforation peritonitis
2	Mr	Chandrasekar	48	M	2018022	HTN	120/80	<24	1	Peptic ulcer - D1 perforation peritonitis
3	Mr	Nagaraj	50	M	2018219	DH2	110/80	<24	2	Peptic ulcer - D1 perforation peritonitis
4	Mr	Manigandan	38	M	2020726	Nil	130/80	<24	0	Peptic ulcer - D1 perforation peritonitis
5	Mr	Chinna	37	M	2020548	Nil	130/70	<24	0	Peptic ulcer - D1 perforation peritonitis
6	Mr	Abdullah	52	M	2042244	DH2/HTN	110/70	>24	2	Peptic ulcer - D1 perforation peritonitis
7	Mr	Murugesan	43	M	2044159	HTN	130/70	<24	1	Peptic ulcer - D1 perforation peritonitis
8	Mr	Venkatesan	46	M	2044426	DH2	100/60	>24	2	Peptic ulcer - D1 perforation peritonitis
9	Mr	Elumalai	37	M	2044417	Nil	110/70	<24	0	Peptic ulcer - D1 perforation peritonitis
10	Mr	Devendran	46	M	2049107	HTN	110/80	<24	1	Peptic ulcer - D1 perforation peritonitis
11	Mr	Xavier	35	M	2046000	PTB	120/90	<24	1	Peptic ulcer - D1 perforation peritonitis
12	Mr	Vincent	38	M	2009105	Nil	140/80	<24	0	Peptic ulcer - D1 perforation peritonitis
13	Mr	Raja	50	M	2049096	DH2	100/60	>24	2	Peptic ulcer - D1 perforation peritonitis
14	Mr	Abbas	51	M	204573	CPOD	110/80	>24	2	Peptic ulcer - D1 perforation peritonitis
15	Mr	Mustapah Fabeer	54	M	2049384	DH2/HTN	110/80	<24	1	Peptic ulcer - D1 perforation peritonitis
16	Mr	Thilak	34	M	2049407	Nil	130/70	<24	0	Peptic ulcer - D1 perforation peritonitis
17	Mr	Boominathan	56	M	2045312	DH2/HTN	<90	>24	3	Peptic ulcer - D2 perforation peritonitis
18	Mr	Rajan	47	M	2048317	HTN3	140/80	<24	1	Peptic ulcer - D2 perforation peritonitis
19	Mr	Zahir Husain	44	M	2058711	Nil	120/80	<24	0	Peptic ulcer - D2 perforation peritonitis
20	Mr	Mohanarangan	48	M	2063212	Nil	130/80	<24	0	Peptic ulcer - D2 perforation peritonitis
21	Mr	Kannan	39	M	2068112	Nil	130/70	<24	0	Peptic ulcer - D2 perforation peritonitis
22	Mr	Deepakraja	40	M	2072114	DH2	90/60	>24	3	Peptic ulcer - D2 perforation peritonitis
23	Mr	Selvan	43	M	2074113	HTN	140/80	<24	1	Peptic ulcer - D2 perforation peritonitis
24	Mr	Balaji	45	M	2073112	Nil	110/80	<24	0	Peptic ulcer - D2 perforation peritonitis
25	Mr	Madhurmuthu	47	M	2036721	HTN	120/70	>24	2	Peptic ulcer - D2 perforation peritonitis
26	Mr	Solomonraj	43	M	2081121	Nil	130/80	<24	0	Peptic ulcer - D2 perforation peritonitis
27	Mr	Prabhakaran	46	M	2086123	Nil	110/70	<24	0	Peptic ulcer - D2 perforation peritonitis
28	Mr	Munnusamy	56	M	2087123	DH2/HTN	100/60	>24	2	Peptic ulcer - D2 perforation peritonitis
29	Mr	Krishnan	38	M	2086712	Nil	110/80	<24	0	Peptic ulcer - D2 perforation peritonitis
30	Mr	Madhankumar	52	M	2011859	DH2/HTN/Asthma	100/60	>24	2	Peptic ulcer perforation
31	Mr	Nijamudhullah	42	M	2011816	HTN	<90	>24	3	Peptic ulcer perforation
32	Mr	Dhanasekar	43	M	2011956	Nil	110/80	<24	0	Peptic ulcer perforation
33	Mr	Nagapoosanam	40	M	2011850	Nil	120/70	<24	0	Peptic ulcer perforation
34	Mr	Mari	36	M	2011780	Nil	130/80	<24	0	Peptic ulcer perforation
35	Mr	Michael	42	M	2013672	HTN	110/90	<24	1	Peptic ulcer perforation
36	Mr	Ameer Basha	47	M	2010289	PTB	110/80	<24	1	Peptic ulcer perforation
37	Mr	Lokesh	48	M	2011948	HTN	100/60	>24	2	Peptic ulcer perforation
38	Mr	Tamil Selvam	50	M	2013600	DH2/HTN	110/70	<24	1	Peptic ulcer perforation
39	Mr	Dinesh	51	M	2014270	CAD/DH2	110/80	<24	1	Peptic ulcer perforation
40	Mr	Ganesan	38	M	2018371	Nil	130/80	<24	0	Peptic ulcer perforation
41	Mr	Durairaj	36	M	2016550	BA	100/80	>24	2	Peptic ulcer perforation
42	Mr	Mukesh	52	M	2016638	DH2	130/80	<24	1	Peptic ulcer perforation
43	Mr	Paartheeban	60	M	2013279	HTN	140/80	<24	1	Peptic ulcer perforation
44	Mr	Salim	58	M	2016259	CAD/CKD/DH2	<90	>24	3	Peptic ulcer perforation
45	Mr	Gowthaman	38	M	2015423	Nil	130/90	<24	0	Peptic ulcer - D2 perforation peritonitis
46	Mr	Pasupathi	39	M	2016626	Nil	110/80	<24	0	Peptic ulcer - D2 perforation peritonitis
47	Mr	Jeyachandran	45	M	2011947	Nil	140/70	<24	0	Peptic ulcer - D1 perforation peritonitis
48	Mr	Nagalingam	42	M	2015422	HTN	100/60	>24	2	Peptic ulcer - D1 perforation peritonitis
49	Mr	Pandimuthan	50	M	2017951	NIL	130/70	<24	0	Peptic ulcer - D2 perforation peritonitis
50	Mr	Rangan	41	M	2018011	NIL	120/70	<24	0	Peptic ulcer - D2 perforation peritonitis

MASTER CHART

S.No	Procedure Done	Post-op Complication	Chest inf	Wounding	Wound dehisence	intaab collection	Duration of hospital (days)	Morbidity	Mortality	Condition on discharge	Followup	
1	Pomental Patch closure	Nil	No	No	No	No	6	No	-	Stable	no complaints	OGD-NORMAL STUDY
2	Pomental Patch closure	Nil	No	No	No	No	7	No	-	Stable	no complaints	OGD-NORMAL STUDY
3	Pomental Patch closure	Yes	No	Yes	No	No	14	Yes	-	Stable	no complaints	OGD-NORMAL STUDY
4	Pomental Patch closure	Nil	No	No	No	No	7	No	-	Stable	no complaints	OGD-NORMAL STUDY
5	Pomental Patch closure	Nil	No	No	No	No	6	No	-	Stable	no complaints	OGD-NORMAL STUDY
6	Pomental Patch closure	Yes	No	Yes	No	Yes	20	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
7	Pomental Patch closure	Yes	No	Yes	No	No	12	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
8	Pomental Patch closure	Yes	No	Yes	Yes	No	25	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
9	Pomental Patch closure	Nil	No	No	No	No	7	No	No	Stable	no complaints	OGD-NORMAL STUDY
10	Pomental Patch closure	Nil	No	No	No	No	10	No	No	Stable	no complaints	OGD-NORMAL STUDY
11	Pomental Patch closure	Nil	No	No	No	No	10	No	No	Stable	no complaints	OGD-NORMAL STUDY
12	Pomental Patch closure	Nil	No	No	No	No	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
13	Pomental Patch closure	Yes	No	Yes	No	Yes	24	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
14	Pomental Patch closure	Yes	Yes	Yes	No	No	20	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
15	Pomental Patch closure	Yes	No	Yes	No	No	18	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
16	Pomental Patch closure	Nil	No	No	No	No	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
17	Pomental Patch closure	Yes	Yes	Yes	No	Yes	24	-	Yes	-		
18	Pomental Patch closure	Nil	No	No	No	No	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
19	Pomental Patch closure	Nil	No	No	No	No	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
20	Pomental Patch closure	Nil	No	No	No	No	7	No	No	Stable	no complaints	OGD-NORMAL STUDY
21	Pomental Patch closure	Nil	No	No	No	No	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
22	Pomental Patch closure	Yes	No	Yes	Yes	Yes	23	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
23	Pomental Patch closure	Yes	No	Yes	No	No	15	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
24	Pomental Patch closure	Nil	No	No	No	No	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
25	Pomental Patch closure	Yes	No	Yes	No	No	14	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
26	Pomental Patch closure	Nil	No	No	No	No	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
27	Pomental Patch closure	Nil	No	No	No	No	7	No	No	Stable	no complaints	OGD-NORMAL STUDY
28	Pomental Patch closure	Yes	Yes	Yes	No	No	20	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
29	Pomental Patch closure	Nil	No	No	No	No	9	No	No	Stable	no complaints	OGD-NORMAL STUDY
30	Pomental Patch closure	Yes	Yes	Yes	No	No	18	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
31	Pomental Patch closure	Yes	-	Yes	Yes	Yes	23	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
32	Pomental Patch closure	No	Nil	Nil	Nil	Nil	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
33	Pomental Patch closure	No	Nil	Nil	Nil	Nil	7	No	No	Stable	no complaints	OGD-NORMAL STUDY
34	Pomental Patch closure	No	Nil	Nil	Nil	Nil	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
35	Pomental Patch closure	No	Nil	Nil	Nil	Nil	9	No	No	Stable	no complaints	OGD-NORMAL STUDY
36	Pomental Patch closure	No	Nil	Nil	Nil	No	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
37	Pomental Patch closure	Yes	Nil	Yes	Yes	No	20	No	No	Stable	no complaints	OGD-NORMAL STUDY
38	Pomental Patch closure	Yes	Nil	Yes	No	No	18	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
39	Pomental Patch closure	Yes	Nil	Yes	No	No	15	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
40	Pomental Patch closure	No	Nil	Nil	Nil	Nil	18	No	No	Stable	no complaints	OGD-NORMAL STUDY
41	Pomental Patch closure	Yes	Yes	Yes	Nil	Nil	14	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
42	Pomental Patch closure	Yes	Nil	Yes	No	No	14	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
43	Pomental Patch closure	No	Nil	Nil	Nil	Nil	10	No	No	Stable	no complaints	OGD-NORMAL STUDY
44	Pomental Patch closure	Yes	Yes	Yes	Yes	Nil	23	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
45	Pomental Patch closure	NO	Nil	Nil	Nil	Nil	9	No	No	Stable	no complaints	OGD-NORMAL STUDY
46	Pomental Patch closure	NO	Nil	Nil	Nil	Nil	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
47	Pomental Patch closure	NO	Nil	Nil	Nil	Nil	8	No	No	Stable	no complaints	OGD-NORMAL STUDY
48	Pomental Patch closure	YES	Nil	Yes	Yes	No	18	Yes	No	Stable	no complaints	OGD-NORMAL STUDY
49	Pomental Patch closure	NO	Nil	Nil	Nil	Nil	9	No	No	Stable	no complaints	OGD-NORMAL STUDY
50	Pomental Patch closure	NO	Nil	Nil	Nil	Nil	8	No	No	Stable	no complaints	OGD-NORMAL STUDY