

# RELAPAROTOMY IN GENERAL SURGERY – ROLE AND OUTCOME

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## ABSTRACT

### Introduction:-

Laparotomy, also known as celiotomy, is performed by making a large incision in the abdomen to gain access to the peritoneal cavity.<sup>[1]</sup> Following elective or emergency laparotomy, many patients develop complications which may require reexploration for the correction of these complications. Relaparotomy means repeat laparotomy after run through an abdominal operation of abdominal cavity which is related to initial surgery .<sup>[2]</sup> Relaparotomy can be classified as early or late, radical or palliative, planned or urgent depending on time of repeat surgery , its goal and nature of urgency respectively.<sup>[2]</sup> Relaprotomy predominately found higher in males. Co morbid diseases adds to complicated first laparotomy and prolonged healing time and recovery. There are many Researches suggesting that the incidence rate of relaparotomy varies between 0.5 to 15% and incidence found higher in GI surgeries <sup>[3]</sup>

### Aims:-

To evaluate the clinical profile of relaparotomy in indoor cases admitted to the surgery department in Sir T Hospital, Bhavnagar.

### Objectives:-

1. To estimate proportion of indications of primary laparotomy amongst patients undergone for relaparotomy.
2. To estimate proportions of complications requiring relaparotomy.
3. To assess clinical outcome of patients undergone for relaparotomy.
4. To compare clinical outcome of relaparotomy patients between early vs delayed relaparotomy groups.

## Material & Methods :-

This was cross sectional observational study carried out in all relaparotomies cases which had already done in past 2 years and one which was done in 1 year of study period in tertiary care center (Sir T Hospital, Bhavnagar).

### Inclusion criteria

Patients with age > 18 years

### Exclusion criteria

Patient not willing to participate in the study.

### Results:-

Male patient (83%) predominance female patient (17%) in number of relaparotomy . Bowel obstruction (40%) was most common indication for laparotomy. Fecal fistula (27%) had highest indication for relaparotomy followed by failure of primary closure (23%). Incidence of relaparotomy is highest in 18 -35 years age group (i.e. 30%). In relaparotomy, 50 % underwent resection and anastomosis with proximal diversion as operative procedure. Most of patient underwent early relaparotomy (i.e 73.3%)than late relaparotomy (26.7%). Early relaparotomy (81.8%) has better outcome than late relaparotomy(75%).Among co morbidity ,relaparotomy patients with diabetic mellitus (i.e 33.3%) were in highest number .Among mortality ,46-50 years age group were in highest number (i.e 33.3%) .

**Keywords:** Relaparotomy, early relaparotomy ,late relaparotomy, planned relaparotomy ,unplanned /urgent relaparotomy, .

**Category:** General Surgery.

## 1 INTRODUCTION

Laparotomy, also known as celiotomy, is performed by making a large incision in the abdomen to gain access to the peritoneal cavity. A standard laparotomy usually involves a sagittal, midline incision along the linea alba<sup>[1]</sup>

Following elective or emergency laparotomy, many patients develop complications which may require reexploration for the correction of these complications. Abdomen is also called Pandora's Box; many wonders are revealed opening the abdomen. Relaparotomy means repeat laparotomy after run through an abdominal operation of abdominal cavity which is related to initial surgery .The term laparotomy has been raised from Greek word lapara meaning flank and tomy means cut<sup>[2]</sup>

Unplanned urgent relaparotomy may represent a failure of the primary operation, but this should be differentiated from planned relaparotomy – for example in cases of necrotising pancreatitis where a single laparotomy was unlikely to succeed. Relaparotomy is performed every 36 to 48 hours to give lavage , inspection , drainage until the findings are negative for ongoing peritonitis.<sup>[2]</sup>

Research studies suggested that the incidence rate of Relaparotomy varies between 0.5 to 15% and it was also found that the incidence of relaparotomy is considered higher in GI

surgeries; this may be due to complications in the antecedent surgery or because of severe intraabdominal sepsis already present. Abdominal operations that have to be redone in association with the initial surgery are called relaparotomies . Prachi Srivastava et al [3] suggested that 9 out of 10 patients, who required relaparotomy, underwent emergency primary laparotomy surgery whereas remaining 1 patient undergone elective laparotomy surgery.

High mortality and morbidity rate has been associated with secondary peritonitis despite of advancement in surgical procedures and treatment. Recent studies suggested that many of the patients with secondary peritonitis required on demand relaparotomy whereas the rest of the patients required planned relaparotomy. Mortality rate found to be higher in patients with late relaparotomy as compared to patients with early relaparotomy.<sup>[6,7]</sup>

Intraperitoneal sepsis developed after primary abdominal procedures may be benefitted by relaparotomy. Relaparotomy can be done in patients presented with post op fecal fistula, adhesions band, perforation etc. Thus, this study was planned to identify the indications, procedure, risk factors and outcomes / prognosis of relaparotomy.<sup>[4]</sup>

## **MATERIAL AND METHODS**

Type of study :-

Cross sectional observational study

Study population:-

All relaparotomy cases which were already done in past 2 years and one which were done in 1 year of study period in tertiary care center (Sir T Hospital Bhavnagar).

Sample size :-

30 cases

Study duration :-

1 year

Inclusion Criteria:-

Age > 18 years

Exclusion Criteria:-

Patient not giving consent.

Ethical clearance:-

The study protocol was reviewed by The Institutional Ethical Committee of the institution and permitted by it.

**Method of study**

This was an observational cross sectional Study Carried out in Sir T Hospital Bhavnagar after approval from the Ethics Committee of Government Medical College Bhavnagar.

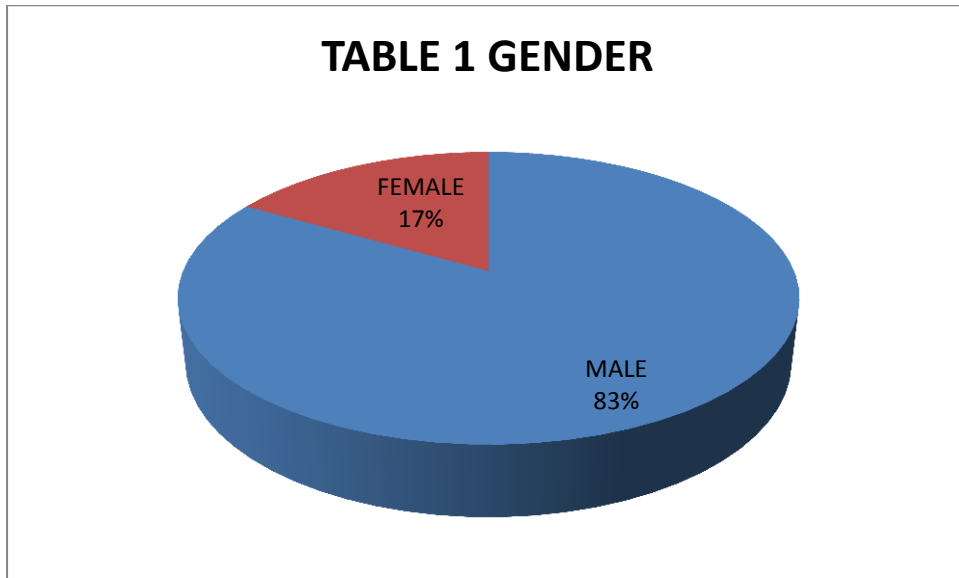
All the enrolled patients / their relatives were explained about study related procedures in detailed which were mentioned in Patient Information Sheet and Informed Consent Form.

After the enrollment, detailed medical history of the patient along with admission history was collected. Data collected from cases includes demographic details and clinical presentation with respect to diagnosis for relaparotomy, signs and symptoms, co morbidities, chief complaints. Family history for similar complaints was extracted . Clinical examination of abdomen was done with respect to exact location of the pain, presence of palpable lump or any organomegaly. Reports of routine investigations like complete hemogram, Blood creatinine, Random blood sugar , Serum electrolytes and Serology were noted.

- X-ray abdomen standing & chest x ray with both dome of diaphragm were further recorded .CECT Abdomen pelvis was done in selected patients.
- Post-operative complication and incidence rate of mortality were noted in pre-defined proforma.
- Patients' General Information, Primary indication for 1 st laparotomy, Indication of 2 nd laparotomy , Operative procedure done during relaparotomy ,Co morbidity was Collected From Medical case Records. Statistical analysis was done . Microsoft Word and Excel have been used to generate charts and tables.

**5. OBSERVATIONS AND RESULTS****TABLE 1: GENDER**

GENDER	NO.	PERCENTAGE
MALE	25	83%
FEMALE	5	17%
TOTAL	30	100%

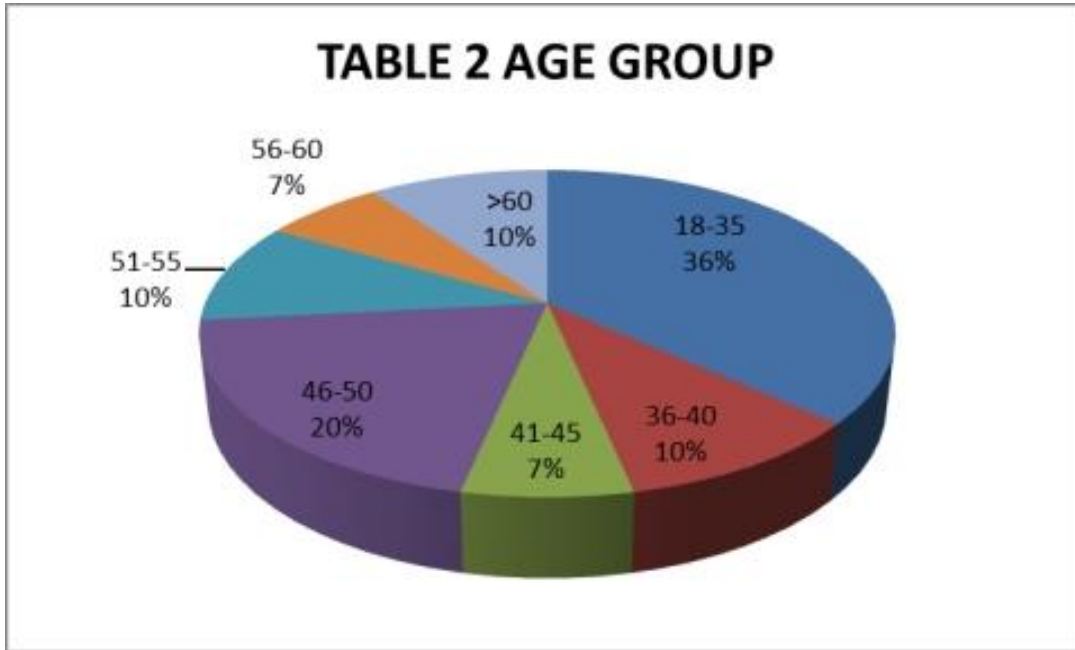


In the present study there were total 30 patients who undergone relaparotomy at Department of General Surgery, during my study period of 1 year showed a male predominance of 83% over 17% incidence in females.

Relaparotomy was significantly higher in male patients as compared to female patients. This study also showed that male: female ratio was 5:1. As compared to other study conducted by H Patel et al, they also showed that predominance of male patients over female patients in terms of incidence of relaparotomy. In H Patel et al it was 4:1.<sup>[24]</sup>

**Table 2: Age Group**

AGE GROUPS	NO	PERCENTAGE
18-35	11	36%
36-40	3	10%
41-45	2	7%
46-50	6	20%
51-55	3	10%
56-60	2	7%
>60	3	10%
TOTAL	30	100%



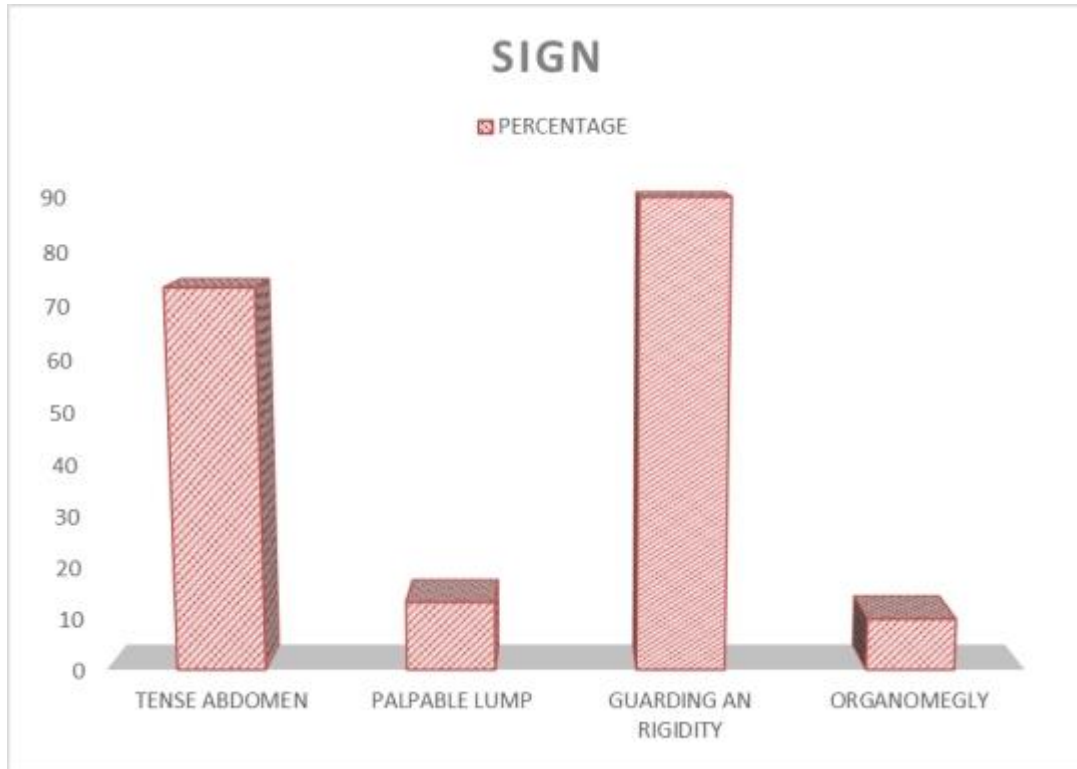
In our present study ,Incidence of relaparotomies in age group 18-35 is 36%, age group 36-40 is 10%, in age group 41-45 is 7%, in age group 46-50 is 20%, in age group 51-55 is 10%, 56-60 is 7%, and >60 is 10%.

Present study showed that mean age of the patient was 43.16 years

whereas in H Patel et al mean age of the patients was 39.42 years so it was concluded that more incidence was found in middle age group.<sup>[24]</sup>

**Graph 4: Signs at time of first laparotomy**

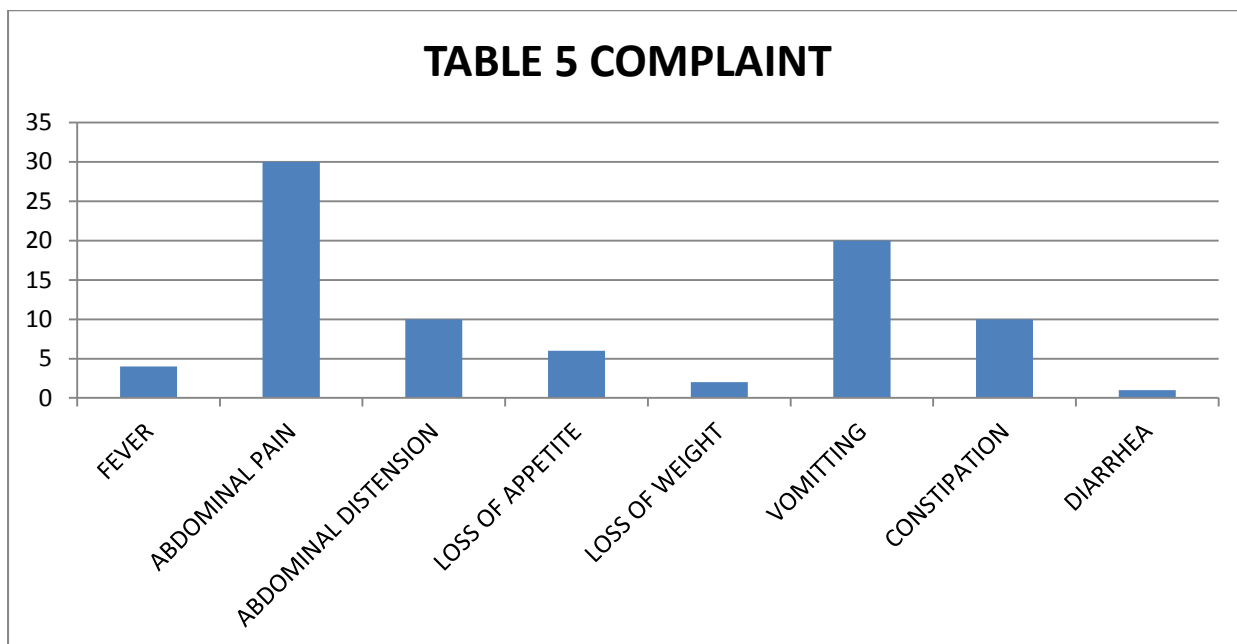
SIGN	NO.	PERCENTAGE
TENSE ABDOMEN	22	73.3%
PALPABLE LUMP	4	13.3%
GUARDING AND RIGIDITY	27	90%
ORGANOMEGLY	3	10%



In present study ,At time of first laparotomy 73.3% had Tense Abdomen, 13.3% has palpable Lump, 90% guarding rigidity, and 10.00% had Organomegaly. No comparable study was found.

**Table 5: symptoms at time of first laprotomy**

TABLE 5		
SYMPTOMES	NO OF PATIENT	PERCENTAGE
FEVER	4	13.3%
ABDOMINAL PAIN	30	100%
ABDOMINAL DISTENSION	10	33.3%
LOSS OF APPETITE	6	20%
LOSS OF WEIGHT	2	6.7%
VOMITTING	20	66.7%
CONSTIPATION	10	33.3%
DIARRHEA	1	3.3%

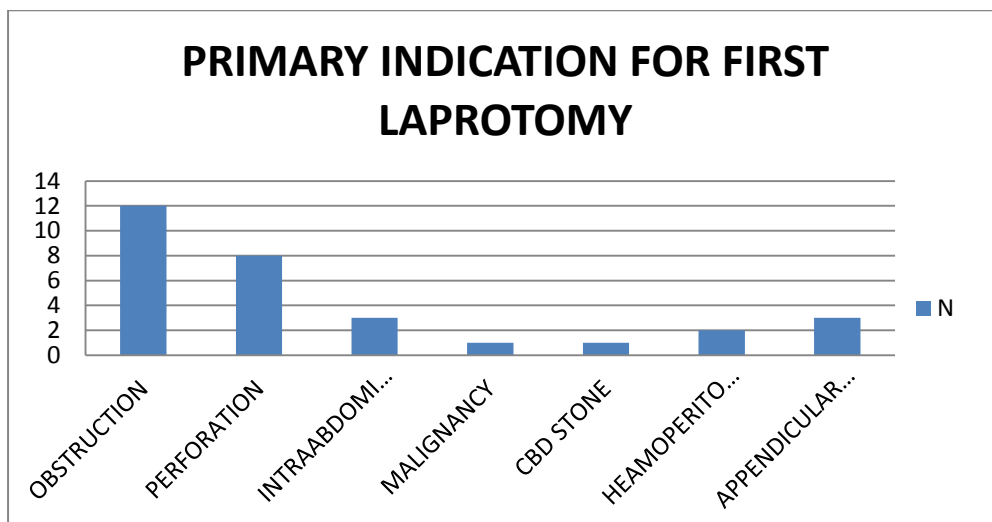


In present study ,100% had Abdominal Pain, 66.7% were complaining of Vomiting, and 33.3% had Abdominal Distension, 33.3 % had constipation, 20.00% had Loss of appetite, 13.3% of patients had complaints of Fever,6.7% had Loss of weight and 3.3% had Diarrhea.(**symptoms before first relaprotomy**).

**Table 6: Primary Indication for first laparotomy**

Indication	N	%
OBSTRUCTION	12	40%
PERFORATION	8	26.7%
INTRAABDOMINAL ABSCESS	3	10%
MALIGNANCY	1	3.3%
CBD STONE	1	3.3%
HEAMOPERITONEUM	2	6.7%
APPENDICULAR MASS/ABSCESS	3	10%
TOTAL	30	100%





In above table and graph indication for primary laparotomy has been seen and it showed that 40% had Obstruction, 26.7% patients had perforation, 10% had intraabdominal abscess, 10% had appendicular mass/ abscess, 6.7% had heamoperitoneum, 3.3% patients had CBD Stone, and 3.3% patient had malignancy. Whereas in study conducted by H.Patel et al showed that that 30.6 % had Obstruction, 52.8 % patients had perforation, 2.8% had appendicular mass /abscess, 5.6 % had heamoperitoneum and other such as intra-abdominal abscess , carcinoma of rectum, pseudocyst of pancreas and necrotizing pancreatitis were in 22.2% of study group. [24]

**Table 7: Comorbidities**

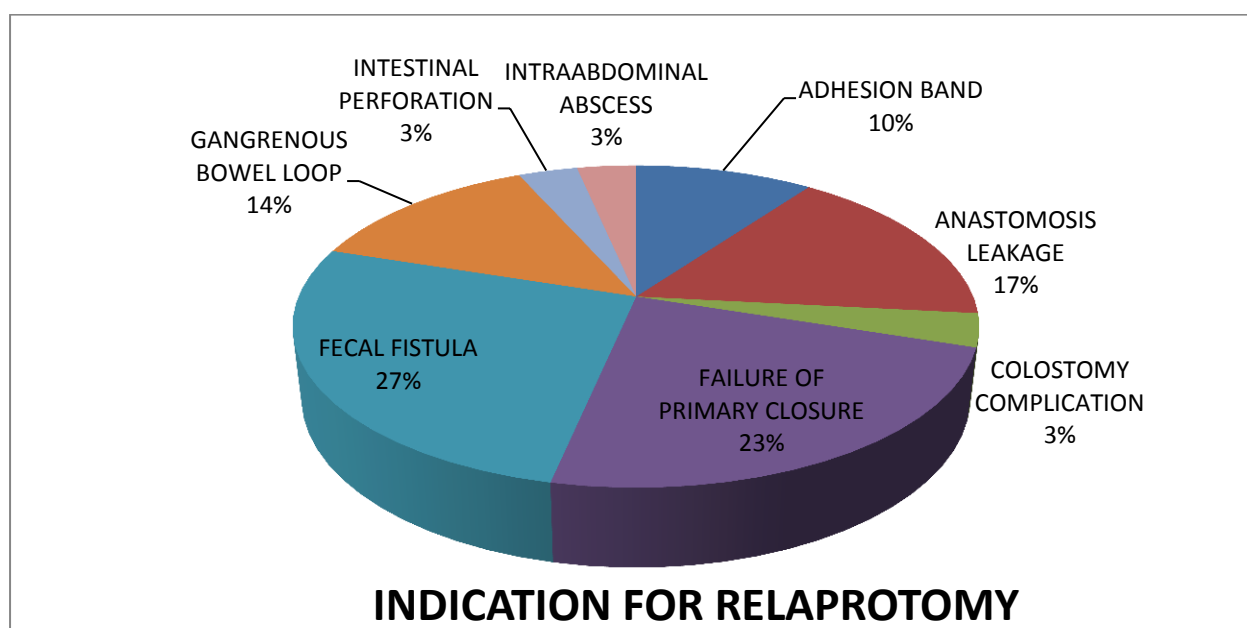
COMORBIDITY		
	NO	PERCENTAGE
Diabetes mellitus(DM)	5	16.7%
Hypertension (HTN)	3	10%
JAUNDICE	1	3.3%
Tuberculosis(TB)	3	10%
Renal diseases	0	0
Cardiovascular diseases	1	3.3%

In present study 16.7% had Diabetes Mellitus, 10% had Hypertension, 10 % had tuberculosis, 3.3 % had jaundice 3.3% had Cardiac Disease, and 0% had Renal Failure.

**TABLE 9:- INDICATION FOR RELAPAROTOMY**

Table 9: INDICATION FOR RELAPAROTOMY		
Indication	N	%
ADHESION BAND	3	10%
ANASTOMOSIS LEAKAGE	5	17%

COLOSTOMY COMPLICATION	1	3%
FAILURE OF PRIMARY CLOSURE	7	23%
FECAL FISTULA	8	27%
GANGRENOUS BOWEL LOOP	4	14%
INTESTINAL PERFORATION	1	3%
INTRAABDOMINAL ABSCESS	1	3%
TOTAL	30	100%

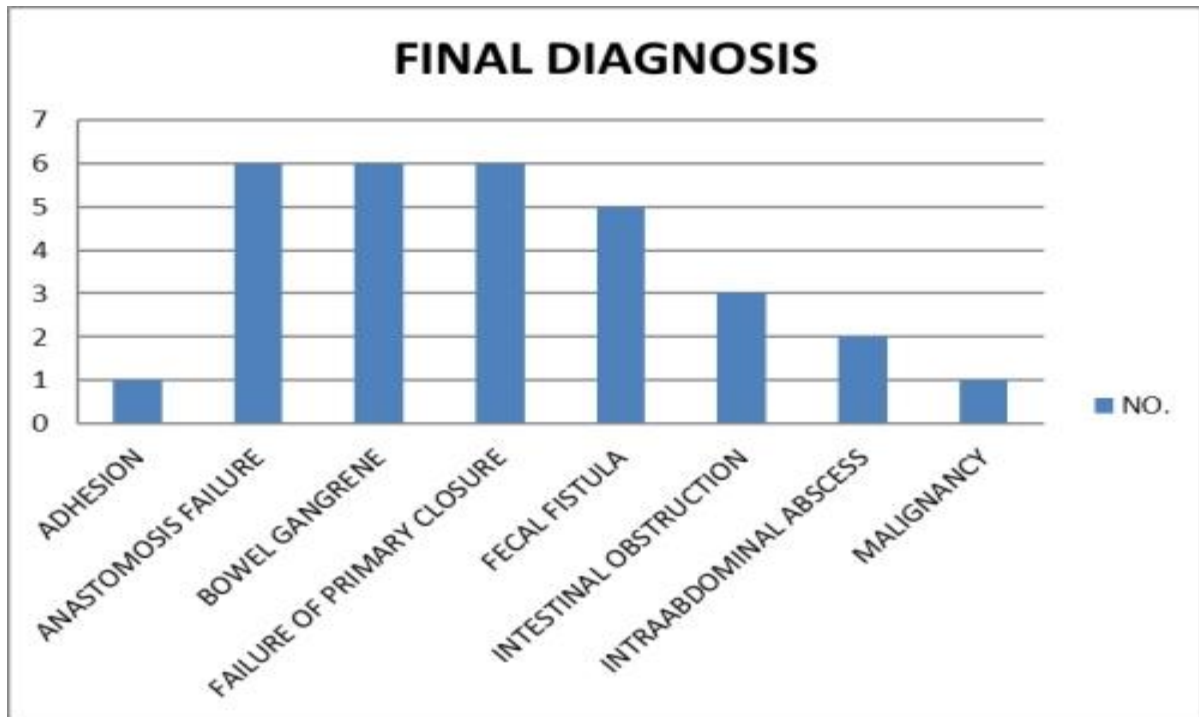


In above table and graph indication for relaparotomy has been seen and it showed that 27% had fecal fistula, 23% patients had failure of primary closure, 17% were had anastomotic leakage, 14% had gangrenous bowel loop, 10% had adhesion band, 3% had intestinal perforation, 3% had intraabdominal abscess, 3% had colostomy complication . Whereas in study conducted by H Patel et al showed that 45.33% had Anastomotic Leak followed by 9.33% had Obstruction and 5.33% had Hemorrhage. [24]

**Table 10: final Diagnosis**

TABLE 10		
DIAGNOSIS	NO.	PERCENTAGE
ADHESION	1	3%
ANASTOMOSIS FAILURE	6	20%
BOWEL GANGRENE	6	20%
FAILURE OF PRIMARY CLOSURE	6	20%
FECAL FISTULA	5	17%
INTESTINAL OBSTRUCTION	3	10%
INTRAABDOMINAL ABSCESS	2	7%

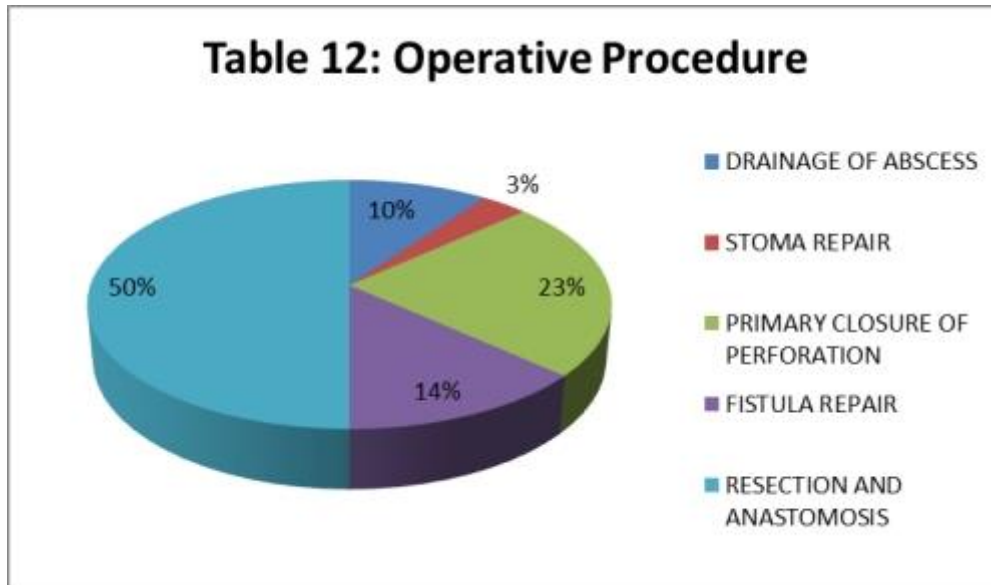
MALIGNANCY	1	3%
TOTAL	30	100%



In present study, 20 % of the patient had anastomotic failure, 20% of patient of bowel gangrene, 20% of patient of failure of primary closure , 17 % had fecal fistula, intestinal obstruction were present in 10%, Intraabdominal abscess in 7 % , 3% of patients had malignancy and 3 % of patients had adhesion.

**Table 12: Operative Procedure**

Operative Procedures	N	%
DRAINAGE OF ABSCESS	3	10%
STOMA REPAIR	1	3%
PRIMARY CLOSURE OF PERFORATION	7	23%
FISTULA REPAIR	4	14%
RESECTION AND ANASTOMOSIS	15	50%
<b>Total</b>	<b>30</b>	<b>100%</b>



In present study 50% patients underwent Resection and Anastomosis with proximal stoma . 23% underwent Primary Closure of Perforation, 14% underwent fistula repair, 10% underwent Drainage of abscess, 3% underwent stoma repair. whereas in study conducted by H. Patel et al 45.40% underwent Resection & Anastomosis, 38.60% underwent primary closure of perforation, 1.30% Drainage and 5.30% underwent controlling of Bleeder .<sup>[24]</sup>

**Resection and anastomosis** was treatment of choice based on the condition of the bowel i.e. if the bowel was necrosed or presence of mass which was adherent to the bowel and where anastomotic leakage was present from gangrenous changes in the bowel.

**Drainage of abscess** done for peritoneal collection such as pus, hemoperitoneum, abscesses.

**Table 13: TYPE OF RELAPAROTOMY**

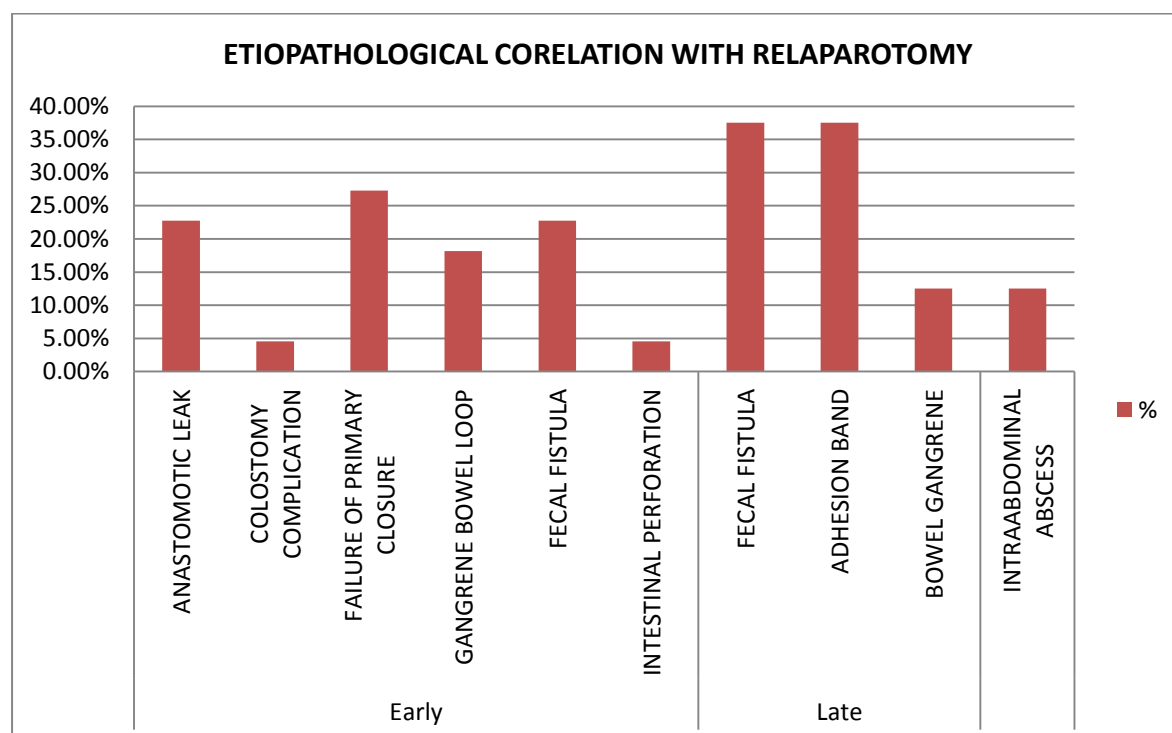
Duration	Relaparotomy	%
Early(1-21days)	22	73%
Late(22-60days)	8	27%
<b>Total</b>	<b>30</b>	<b>100%</b>

In present study 73% underwent early relaparotomy and 27% were underwent late relaparotomy whereas in H PATEL CH et al study 76% were underwent early relaparotomy and 24% were underwent Late relaparotomy.<sup>[24]</sup>

**Table 14: Etiopathological correlation with relaparotomies**

Duration	Etiopathology	N	%
Early	ANASTOMOTIC LEAK	5	22.7%

	COLOSTOMY COMPLICATION	1	4.5%
	FAILURE OF PRIMARY CLOSURE	6	27.3%
	GANGRENE BOWEL LOOP	4	18.3%
	FECAL FISTULA( HIGH OUTPUT )	5	22.7%
	INTESTINAL PERFORATION	1	4.5%
Late	FECAL FISTULA(LOW OUTPUT)	3	37.5%
	ADHESION BAND	3	37.5%
	BOWEL GANGRENE	1	12.5%
	INTRAABDOMINAL ABSCESS	1	12.5%
	TOTAL	30	100.00%

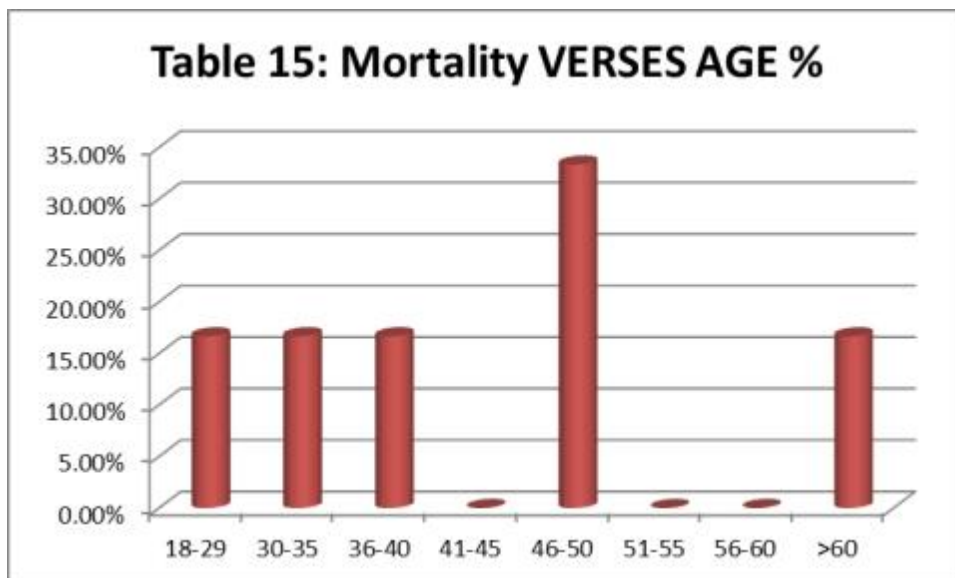


In present study patients who underwent Early Relaparotomy had failure of primary closure 27.3% cases, 22.7% patients of fecal fistula(high output) , 27.3 % patients had failure of primary closure, anastomotic leakage in 22.7% of cases, gangrenous bowel loop in 18.3 %. 4.5 % of patients had intestinal perforation and 4.5% patients had colostomy leakage.

Patients who underwent Late Relaparotomy had adhesion band 37.5% cases, fecal fistula(low output) in 37.5 % of cases. Bowel gangrene in 12.5 % of cases and 12.5 % of cases has intraabdominal abscess.

**Table 15: Mortality verses age**

Table 15: mortality verses age		
Age Group	Mortality	%
18-29	1	16.7%
30-35	1	16.7%
36-40	1	16.7%
41-45	0	0.00%
46-50	2	33.3%
51-55	0	0.00%
56-60	0	0.00%
>60	1	16.6%
TOTAL	6	100.00%

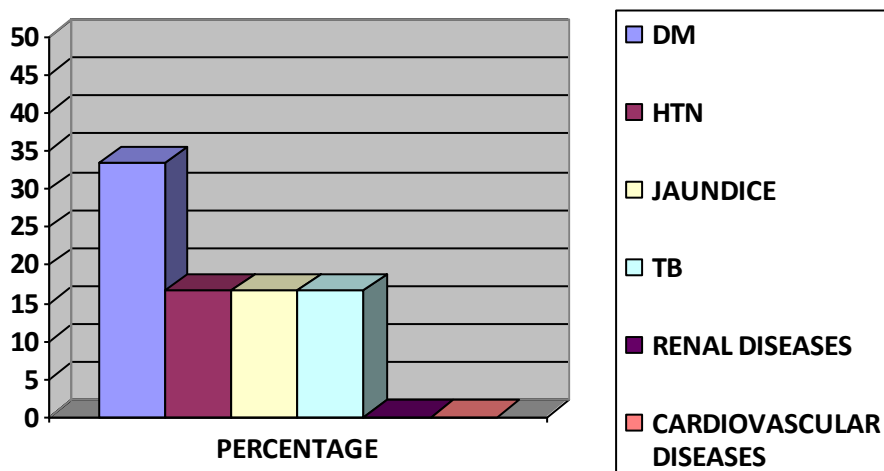


Total mortality in my study is 6 out of 30 cases which is 20 % of the total cases whereas in H.Patel et al study , Out of 75 relaparotomy ,25 cased died which was 34.72% of the total cases. <sup>[24]</sup>

In present study ,46-50 years age group ,it was 33.3% ,16.7% of patients were died in age group 18-29years. In age group 30-35 years it was 16.7%, in age group of 36-40 , it was 16.7 and followed by 16.6% were died in >60 year age group.

**Table 17: Comorbidity and Mortality**

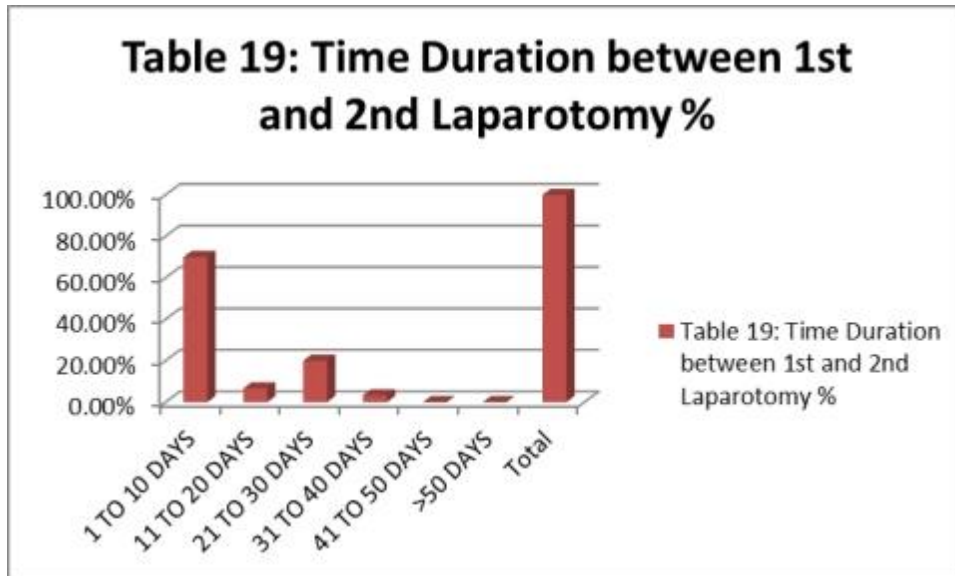
MORTALITY AND COMORBIDITIES		
COMORBIDITIES	NO.	PERCENTAGE
Diabetes mellitus(DM)	2	33.3
Hypertension(HTN)	1	16.7
JAUNDICE	1	16.7
Tuberculosis(TB)	1	16.7
RENAL DISEASES	0	0
CARDIOVASCULAR DISEASES	0	0



Out of 6 patients who were died in the study, 3 patients were had commodities and out of them 33% had Diabetes, 16.7% had HTN and 16.7% had jaundice , 16.7 % had TB .

**Table 18: Time Duration between 1<sup>st</sup> and 2<sup>nd</sup> Laparotomy**

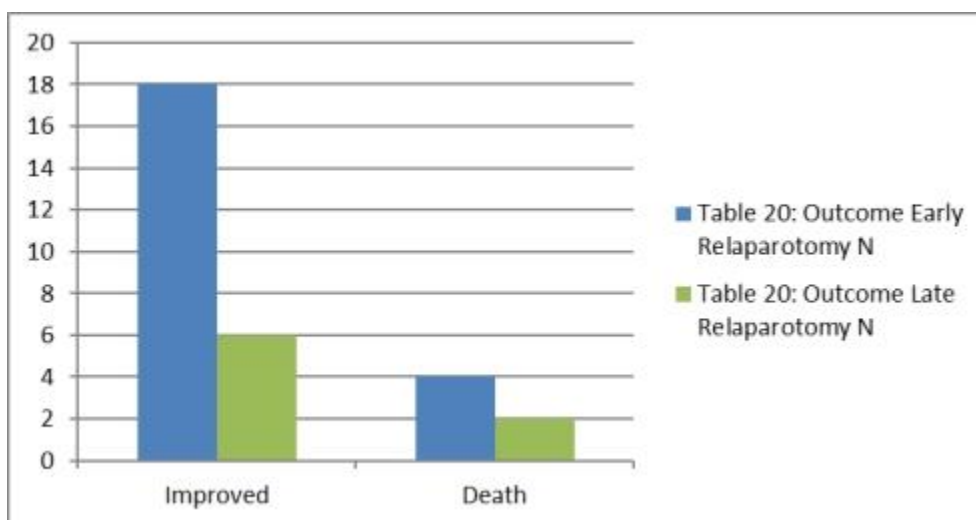
Time Duration	N	%
1 TO 10 DAYS	21	70.00%
11 TO 20 DAYS	2	6.67%
21 TO 30 DAYS	6	20.00%
31 TO 40 DAYS	1	3.33%
41 TO 50 DAYS	0	0.00%
>50 DAYS	0	0.00%
<b>Total</b>	<b>30</b>	<b>100.00%</b>



In present study in it was observed that 70% of patients required re laparotomy within duration of 10 days of 1<sup>st</sup> laparotomy .20% patient of in age group of 21 30 days.6.67 % patient of were in age group of 41-50 and 3.33% patient were in age group of 31-40 years

**Table 20: OUTCOME**

Table 20: Outcome				
Outcome	Early Relaparotomy		Late Relaparotomy	
	N	%	N	%
Improved	18	81.8%	6	75.00%
Death	4	18.2%	2	25.00%
TOTAL	22	73.3	8	26.7





Above table shows that in early relaparotomy 81.8% of patients were improved and death occurred in 18.2% of patients while in late relaparotomy 75% patients were improved and death occurred in 25 % of patients. This results shows that early relaparotomy gives better outcome as compared to late relaparotomies.

Early intervention had better prognosis as compared to late intervention. Because in late intervention patients had more chances of developing secondary infections, which can cause more complications associated with co morbidities and addictions in late intervention.

It is usually found that older age group had more co-morbidities and addictions as compared to younger age group. In case of diabetic patients they have low healing power and more susceptible to catching secondary infections which worse the outcome of relaparotomy.<sup>[24]</sup>

In my present study, septicemia was found to be most common cause of mortality in relaparotomy patient .Septicemia is presence of overwhelming and multiplying bacteria in blood with toxins causing SIRS i.e. systemic inflammatory response syndrome and MODS i.e. multiorgan dysfunction syndrome.

Due to septicemia patient can go into various complications such as ARDS (acute respiratory distress syndrome), liver dysfunction, renal failure, bone marrow suppression, multiorgan failure, and also in some cases DIC (disseminated intravascular coagulation) can also occur.

Due to so many complications associated with septicemia main cause of death is septicemia.

## **6. CONCLUSION**

From our observation and discussion , it can be concluded that Relaparotomy has significant impact on increase of morbidity and mortality of patient particularly in patient with co morbid condition and sepsis . So all measures should be taken at time of primary laparotomy to prevent relaparotomy .

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