

***A COMPARITIVE STUDY BETWEEN PATIENTS OF SMALL  
AND LARGE BOWEL PERFORATION MANAGED BY STOMAS  
WITH DRAINS AND WITHOUT DRAINS***

**A DISSERTATION SUBMITTED TO  
THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY**

*In partial fulfillment of the regulations for the award of the*

**M.S.DEGREE EXAMINATION**

**BRANCH I GENERAL SURGERY**



**DEPARTMENT OF GENERAL SURGERY  
STANLEY MEDICAL COLLEGE AND HOSPITAL  
THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY  
CHENNAI**

**MAY 2020**

## **CERTIFICATE**

This is to certify that the dissertation titled “***A COMPARITIVE STUDY BETWEEN PATIENTS OF SMALL AND LARGE BOWEL PERFORATION MANAGED BY STOMAS WITH DRAINS AND WITHOUT DRAINS***”

” is the bonafide work done by ***Dr. A.AJAY KUMAR***, Post Graduate student (2017 – 2020) in the Department of General Surgery, Government Stanley Medical College and Hospital, Chennai under my direct guidance and supervision, in partial fulfillment of the regulations of The Tamil Nadu Dr. M.G.R Medical University, Chennai for the award of M.S., Degree (General Surgery) Branch - I, Examination to be held in May 2020.

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## **DECLARATION**

I, **DR.A.AJAY KUMAR**, solemnly declare that this dissertation titled  
***“A COMPARITIVE STUDY BETWEEN PATIENTS OF SMALL  
AND LARGE BOWEL PERFORATION MANAGED BY STOMAS  
WITH DRAINS AND WITHOUT DRAINS***

” is a bonafide work done by me in the Department of General Surgery, Government Stanley Medical College and Hospital, Chennai under the guidance and supervision of my unit chief.

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This dissertation is submitted to The Tamilnadu Dr.M.G.R. Medical University, Chennai in partial fulfillment of the university regulations for the award of M.S., Degree (General Surgery) Branch - I, Examination to be held in May 2020.

Place: Chennai.

Date: October 2019

**DR.A.AJAY KUMAR**

## **CERTIFICATE BY GUIDE**

This is to certify that this dissertation work titled “**A COMPARATIVE STUDY BETWEEN PATIENTS OF SMALL AND LARGE BOWEL PERFORATIONS MANAGED BY STOMAS WITH DRAINS AND WITHOUT DRAINS**” of the candidate **DR.A.AJAY KUMAR** with registration number **221711051** for the award of M.S general surgery degree. I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to conclusion pages and result shows **8%** of plagiarism in the dissertation

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# PLAGIARISM CERTIFICATE



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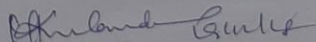
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DESIGNATION : PG IN MS GENERAL SURGERY  
DEPARTMENT : DEPARTMENT OF GENERAL SURGERY,  
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The request for an approval from the Institutional Ethical Committee (IEC) was considered on the IEC meeting held on 07.12.2018 at the Council Hall, Stanley Medical College, Chennai-1 at 10am.

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

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6. You should submit the summary of the work to the ethical committee on completion of the work.

  
**MEMBER SECRETARY,**  
**IEC, SMC, CHENNAI**

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## INTRODUCTION

Even in this recent era, a drain tube is placed many a times without any particular indications by many surgeons. Most of the time it is kept with a blind reason for surgeons satisfaction. Drains are placed in view to detect haemorrhage, intra-abdominal pus, reactive effusion, detect leak, surgeons satisfaction. At the same time, there are many drain related complications like infection, local pain, omental prolapse, drain tube site hernia.

So to know the real face of a drain tube this study is planned and patients were observed post-operatively.



## **AIMS & OBJECTIVES:**

- To do a comparative study between patients of small and large bowel perforation managed by stomas with and without drain tubes in our institution and to find advantages and disadvantages of drain tube in these patients post operatively.

## **MATERIALS AND METHODS**

### **PLACE OF STUDY:**

Department of General Surgery, Govt. Stanley Medical College &  
Hospital, Chennai.

### **DURATION:**

DEC 2018 TO SEP 2019

### **STUDY DESIGN:**

interventional study

**SAMPLE SIZE : 50**

**INCLUSION CRITERIA:**

- Patient age more than 12 years and willing for study
- Any cause of perforation including blunt injury abdomen, SMA and SMV

thrombosis with intra abdominal sepsis

- Multiple perforations of small/large bowel with distance between the perforations is more where resection will be highly morbid and where all perforations were closed with an Ostomy proximal to all perforations
- Any ostomy-ileostomy,colostomy and any type of ostomy –loop,double barrel

**EXCLUSION CRITERIA:**

- Those patients who died in the post op period

- Blunt injury abdomen with associated solid organ injury
- Patients with associated DCLD/ASCITES/
- Patients who are not giving consent for study
- Excluding duodenal perforations in small bowel



## **METHODOLOGY:**

- Written informed consent will be obtained from all subjects before enrolment in  
  
the study
- All patients are thoroughly examined.
- Patients were divided into two groups into GROUP A and GROUP B by  
  
randomization.
- Group A patients will receive drain tube and group B will not receive drain tube.
- All patients were regularly examined post operatively regarding complications,  
  
mobility of patient and duration of hospital stay.
- All patients were followed up for a period of two months.
- All details regarding the study will be recorded according to the pre designed  
  
proforma mentioned below

**PROFORMA**

- NAME :
  
- AGE/SEX :
  
- IP.NO :
  
- DIAGNOSIS :
  
- PROCEDURE DONE :
  
- DATE OF SURGERY
  
- DATE AND TIME OF STUDY :
  
- DATE OF DISCHARGE :
  
- COMORBIDITIES:
  
- PAST HISTORY :
  
- PATIENT WITH DRAIN TUBE OR WITHOUT DRAIN TUBE:-
  
- DURATION OF HOSPITAL STAY :

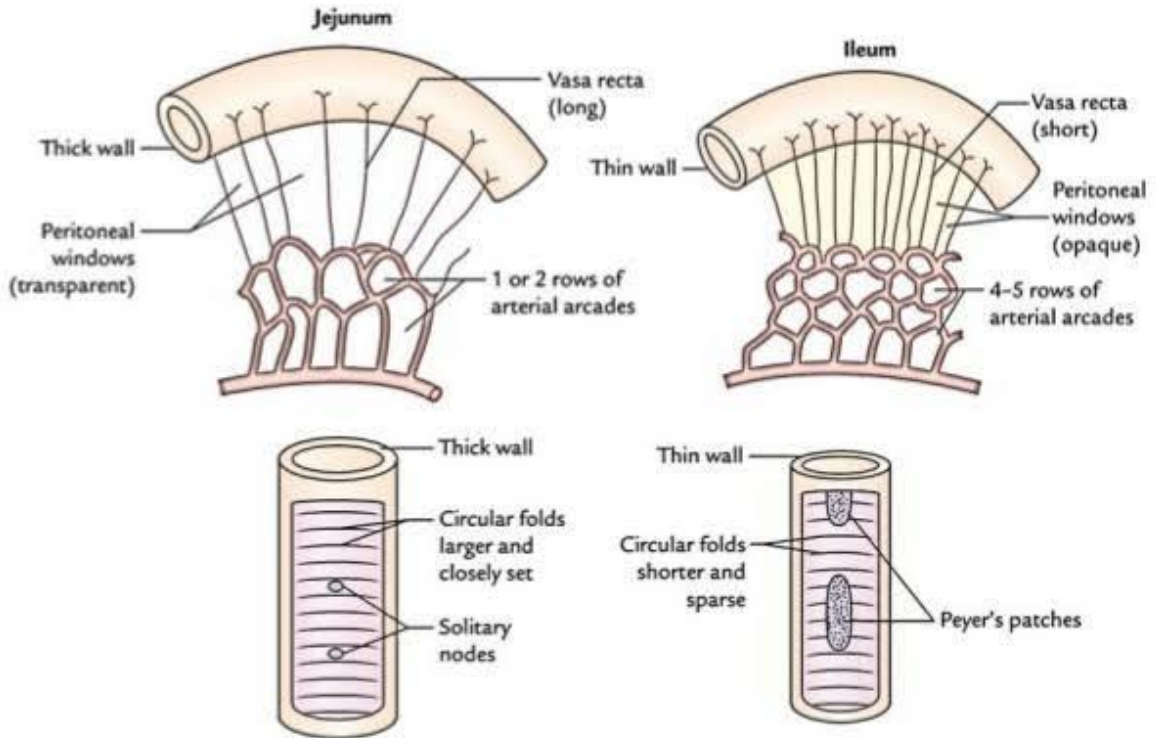
- TIME OF EARLY MOBILISATION :
- DT RELATED COMPLICATIONS :
- DT UNRELATED COMPLICATIONS :

## **REVIEW OF LITERATURE**

### **ANATOMY OF SMALL BOWEL**

It extends from duodenum to ileo-caecal junction. Approximately it is about 6 metres in length. It has three parts duodenum, jejunum, and ileum. In our study we exclude the perforations occurring in duodenal level and considering only jejunal and ileal level. Jejunum is about 40% and ileum is about 60% of small bowel. Both the parts are suspended from the posterior abdominal wall by mesentry through which the vascular supply comes.

## DIFFERENCES BETWEEN JEJUNUM AND ILEUM



<i>Jejunum</i>	<i>Ileum</i>
Long and few vasa rectae	Short and numerous vasa rectae
Less peyer's patches	More peyer's patches
Thick wall	Thin wall
Villi-leaf like and more abundant	Finger like and less abundant
Long plicae	Small plicae
Mesentry transparent	Mesentry contains fat

## **ANATOMY OF LARGE BOWEL (COLON AND RECTUM)**

Large bowel extends from caecum to anus and consist of the following caecum, appendix, ascending colon, transverse colon, descending and sigmoid colon, the rectum and anal canal. It has an alternating pattern of fixed and mobile components. The mobile parts are caecum, transverse and sigmoid colon and the parts fixed to posterior abdominal wall are ascending and descending colon. The upper one third of rectum is covered by peritoneum and it is relatively immobile. The characteristic feature of large intestine is they have appendices epiploicae ( fat bodies enclosed by peritoneum ) and taeniae coli. The names of taenia coli are taenia omental (posterior taenia), taenia libera (anterior) and taenia mesocolica (lateral). The caecum is the most dilated, saccular part of large intestine. Proximally the distal ileum is attached to the medial border of caecum and superiorly it is continuous as ascending colon. The caecum is the most common site of large bowel perforation due to its thin wall nature. The space which is lateral to the

ascending colon is the right paracolic gutter. This is due to the reflection of the peritoneum. Collection can occur in this space when there is free fluid in the abdomen. Surgeons usually dissect this border, the “white fascial line of Toldt” to mobilize the ascending colon. The transverse colon is fully intra peritoneal and is hanging from the posterior abdominal wall by transverse mesocolon. Like ascending colon, the left paracolic sulcus is lateral to the descending colon and it is also an avascular plane. After crossing the iliac crest the colon acquires the mesentery and forms as sigmoid colon. It acquires its blood supply from the sigmoid mesocolon which is suspended from the posterior wall of the pelvis in a V shaped manner. The blood supply to the large bowel is from superior and inferior mesenteric artery. The branches of superior mesenteric artery are middle colic, right colic and ileocolic artery. The branches of inferior mesenteric artery are left colic artery, sigmoidal arteries and superior rectal artery. Both the superior and inferior

mesenteric artery branches forms the marginal artery and supplies the entire large bowel. The rectum is also supplied by middle and inferior rectal artery. If segmental resection of colon is planned for colon cancer, the named blood supply should also be removed. Large intestine has four sets of lymph nodes. They are

1. epicolic – nodes along the bowel wall
2. paracolic – nodes along the medial side of bowel wall near the mesocolic border
3. intermediate – nodes along the major branches
4. principal – nodes along superior and inferior mesenteric arteries.

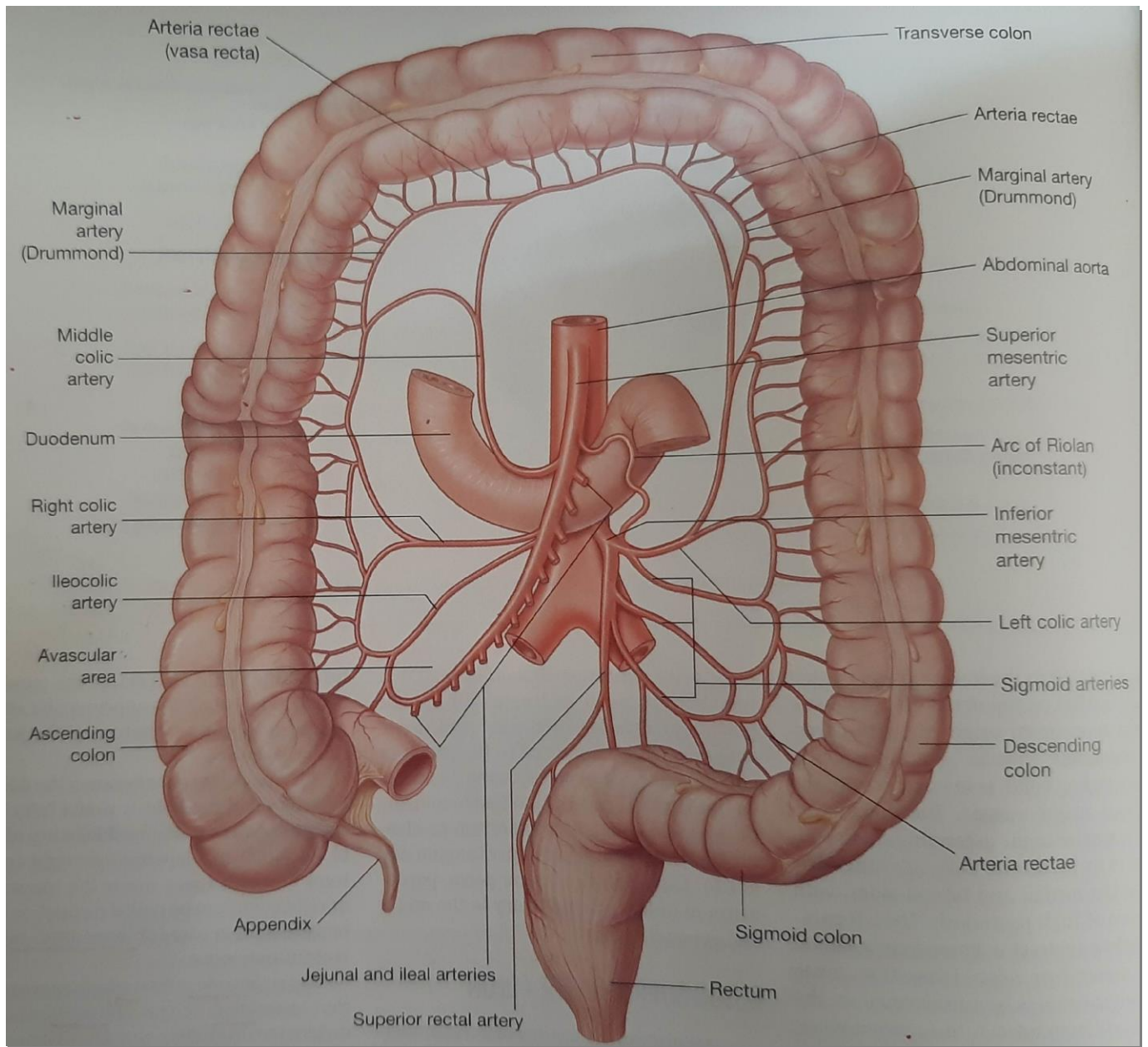


Fig – 1: blood supply of large bowel

## PHYSIOLOGY OF SMALL AND LARGE BOWEL

The splanchnic circulation consists of the blood supply to the gastrointestinal tract, liver, spleen, and pancreas. It consists of two large capillary beds partially in series. The small splanchnic arterial branches supply the capillary beds and then the efferent



venous blood flows into the portal vein. The portal vein and hepatic artery supply blood

flow to the liver. The mesenteric circulation refers to the vasculature of the intestines.

The main arterial vasculature consists of the celiac, superior mesenteric, and inferior

mesenteric arteries. Small mesenteric arteries form an extensive vascular network in

the intestinal submucosa. The arterial branches penetrate the longitudinal and circular

muscle layers of the intestines and give rise to arterioles. In an intestinal villus, blood

flows in the opposite direction in the capillaries and venules compared to that of the

main arterioles. This creates a countercurrent exchange system in which sodium and

water can be absorbed while oxygen diffuses from arterioles to tissues to venules.

Blood flow regulation in the gastrointestinal tract is maintained within narrow limits

and changes in response to various intrinsic and extrinsic controls. There are intrinsic

vasoregulatory control systems, such as pressure-flow autoregulation, and functional

hyperemia. Pressure-flow autoregulation of the intestines is not as developed as in

other vascular beds such as the kidney and brain and is still incompletely understood.

Internal regulation of blood flow by splanchnic vessels occurs when there is a reduction in perfusion. To preserve tissue perfusion, arteriolar smooth muscles relax in response to adenosine or other metabolites that accumulate in tissue injury or ischemia.<sup>13</sup> The most metabolically active region of the intestine is the mucosa and it has the greatest autoregulation ability within the intestine. Although blood flow is not perfectly regulated with an arterial pressure varying between 100 and 50 mm Hg, oxygen consumption remains within normal limits over the same range of pressures. In vitro human intestinal studies, oxygen consumption remains constant until flow decreases to a critical level of 30 mL/min/100 g. Tissue oxygenation, rather than blood flow, is thought to be the trigger for autoregulation within the intestine.

Adenosine concentration in mesenteric venous blood also rises after arterial occlusion.

Adenosine is a potent vasodilator in the mesenteric vascular bed and may also be a

major metabolic mediator of autoregulation.<sup>12</sup> Hyperemia is an engorgement or excess of blood. Arterial hyperemia is due to local or general relaxation of arterioles.

Postprandial hyperemia is an increase in blood flow that occurs in response to a meal.

During ingestion of food, the gastrointestinal blood flow remains unchanged. In animal studies, blood flow to the stomach and proximal bowel increases 30 to 90 minutes after ingestion of a meal. Blood flow to the ileum increases 45 to 120 minutes postprandially. Colonic blood flow does not increase. Blood flow in the superior mesenteric artery of conscious animals typically increases by 25% to 130% after ingestion of a meal. Depending on the type and quantity of a meal, the splanchnic vasodilation may last for 4 to 7 hours. Hyperemia in the human intestines is demonstrated on duplex examination. Normal duplex examination of SMA flow shows an increase in vessel diameter that peaks 45 minutes after a 1000-calorie

meal. At the same time, flow velocity increases from a mean velocity of 22 to 57 cm/sec. The Doppler waveform changes from a high-resistance, triphasic signal in the preprandial state to a low-resistance pattern with high end-diastolic flow postprandially.<sup>26</sup> Blood flow is continuously required after eating.<sup>26</sup> An abnormal mesenteric duplex result is when the postprandial pattern of blood flow in the superior mesenteric and inferior mesenteric arteries continues to have high resistance. This is suggestive of a stenosis or mesenteric ischemia. The blood flow pattern in the celiac artery is not affected postprandially, but it still needs to be examined for proximal stenosis. Normal peak systolic velocity in the celiac artery is less than 160 cm/sec with end-diastolic velocities of less than 55 cm/sec. An abnormal fasting peak systolic velocity of greater than 200 cm/sec is predictive of a greater than 70% to 99% diameter reduction. Normal peak systolic velocities in the SMA are less than 175 cm/sec.

Abnormal fasting peak systolic velocities of greater than 275 cm/sec are predictive of a greater than 70% to 99% diameter reduction.<sup>27</sup> Food ingestion and absorption also increases intestinal blood flow. Much research has been done to define luminal stimuli that are responsible for postprandial hyperemia. Some mechanical stimulation of mucosa elicits a hyperemia response, but chyme does not produce enough mechanical stimulation necessary to increase intestinal blood flow. Undigested food does not increase blood flow, although digested food does. It has been proposed that hydrolytic products of food digestion may initiate hyperemia. Osmolality of a meal can dilate vasculature if luminal osmolalities exceed 1500 mOsm/kg, but there is no response at lower osmolalities. Gut blood flow also increases when luminal pH is less than 2.5. Bile causes glucose and long-chain fatty acids to become vasoactive but does not increase jejunal blood flow. Bile acids double blood flow in the ileum.

Protein meals in humans also increase splanchnic blood flow. Glucose within the lumen produces only slight hyperemia in animal models.<sup>28,32</sup> Long-chain fatty acids appear to be the most potent luminal stimulus of postprandial intestinal hyperemia.<sup>29,32</sup> Lipids, protein, and carbohydrates may act synergistically to stimulate intestinal hyperemia.

Intestinal absorption of nutrients is required to initiate a vasomotor response that leads to an intestinal hyperemia.<sup>33</sup> Nonabsorbed substances or water has little effect on mesenteric blood flow. Extrinsic neurohumoral mechanisms also contribute to the control of intestinal blood flow. These mechanisms include the sympathetic nervous system, the renin-angiotensin system (RAS), and vasopressin. Splanchnic organs receive 25% of cardiac output and contain 25% of total blood volume at rest. Changes in the resistance of mesenteric arterioles cause fluctuation in splanchnic blood flow. Cardiac output to the intestines varies from 10% to 35%. Most of the variability of

mesenteric blood flow is accounted for by changes in flow to the small intestine. Neural regulatory control of the mesenteric circulation is mostly sympathetic and is mediated by alpha receptors. This response causes constriction of the mesenteric arterioles and capacitance vessels. Preganglionic cholinergic fibers of the greater splanchnic nerves synapse at the celiac ganglia. Postganglionic adrenergic fibers of the celiac ganglia cause mesenteric artery and arteriolar vasoconstriction. An infusion of  $\beta$ -receptor agonists results in vasodilation. During a fight-or-flight response, vasoconstriction occurs in the mesenteric vascular bed. This shifts blood flow from the temporarily less important intestinal circulation to the more crucial areas of the heart and brain. Parasympathetic fibers of the vagi innervate the intestine but exert little effect on the mesenteric vasculature. When extracellular volume decreases, the RAS is stimulated and causes selective mesenteric vasoconstriction directly through angiotensin II and indirectly

through adrenergic potentiation. Loss of blood volume and increase in hyperosmolarity also results in stimulation of the neurohypophysis axis, and pituitary release of vasopressin (antidiuretic hormone) occurs. This causes mesenteric vasoconstriction and venorelaxation.

## PERITONEUM AND PERITONITIS

It is the epithelium lining membrane covering the abdominal cavity which has outer fibrous layer and inner mesothelial layer. The peritoneum has two parts. Parietal peritoneum lines the inner surface of abdominal cavity and is pain sensitive. Visceral peritoneum lines outer surface of abdominal visceral organs and is pain insensitive. Normally around 100 ml of clear fluid is secreted into the peritoneal cavity by mesothelial cells. The quality and quantity of fluid varies in pathological conditions.



Peritonitis is infection and inflammation of peritoneum due to various causes. There are 3 types of peritonitis

1. *primary* – here the source of infection is not found and commonly due to pneumococci, streptococci and hemophilus species.
2. *secondary* – it is secondary to perforation of bowel and common organisms involved are e.coli and anaerobes
3. *tertiary* – persistent peritonitis even after treatment of primary/secondary types even after 48 hrs.

### **Stages of peritonitis:**

*Stage of chemical peritonitis* – upto 24 hrs – sudden excruciating pain with stable vitals and dehydration

*Intermediate stage* – 24 to 48 hrs – relief of pain due to dilution of contents by reactive peritoneal secretion but tachycardia occurs and dehydration progresses

*Stage of suppurative peritonitis* – after 48 hrs - pain increases, guarding

and rigidity occurs, unstable vitals, shock.

***SMALL AND LARGE BOWEL PERFORATION :***

Clinical signs and symptoms of perforative peritonitis-

- Sudden severe abdominal pain
- Fever
- Abdominal distension
- Vomiting
- Altered bowel habits - Constipation/diarrhoea depending upon the  
cause of perforation
- Guarding and rigidity
- Flanks full and be dull on percussion
- Tachycardia
- Tachypnoea
- Bowel sounds absent – silent abdomen
- Altered sensorium/loss of consciousness

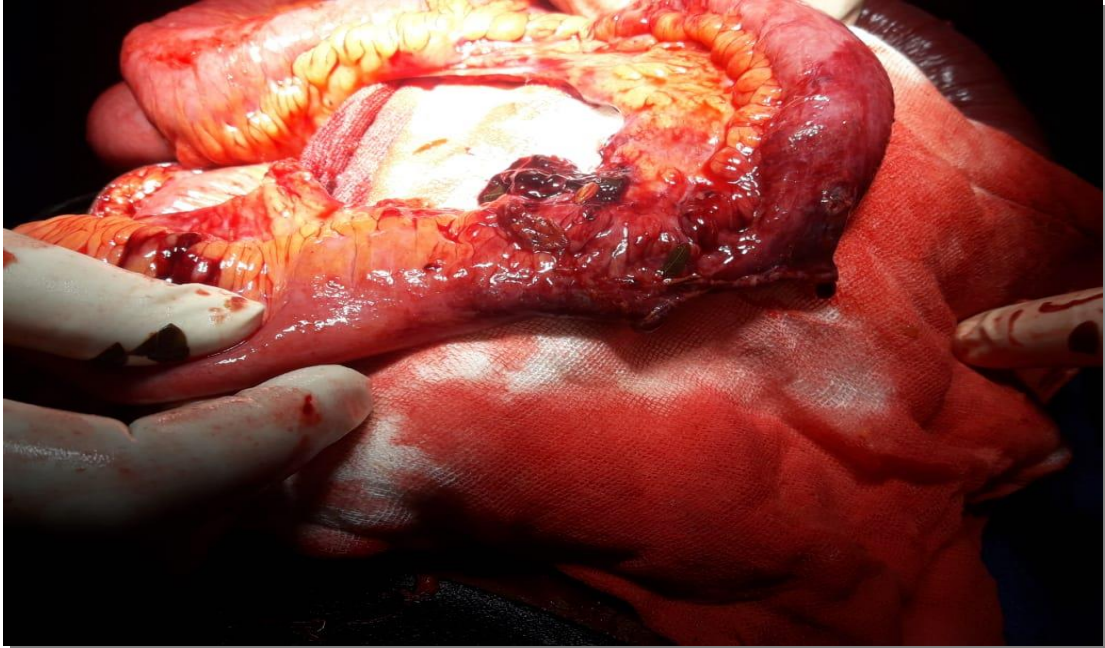


Fig 2: a case of ileal perforation with mesenteric tear due to blunt injury abdomen

- Hippocratic facies
- Septic shock

#### **CAUSES OF PERFORATION:-**

##### *Small bowel -*

- Traumatic – blunt injury abdomen, penetrating and perforating stab and gunshot injuries
- Enteric fever – usually ileal perforation
- Diverticular perforation
- SMA/SMV thrombosis – causing gangrene of small

bowel leading to perforation

- Tuberculosis abdomen
- Inflammatory bowel disease – crohns disease
- Tumours – lymphoma, adenocarcinoma, neuroendocrine tumours, etc
- Any cause of small bowel obstruction leading on to massive distension of bowel and in turn leading to perforation.

*Large bowel –*

- Traumatic – barotrauma, blunt injury abdomen, penetrating and perforating stab and gunshot injuries
- Malignant growth causing perforation by direct invasion or by causing obstruction leading to dilatation causing perforation
- Diverticular perforation
- Inflammatory bowel disease – ulcerative colitis
- Infective causes

## Investigations in perforative peritonitis:-

- Diagnostic four quadrant aspiration – presence of pus or infected fluid
- Plain xray of chest and abdomen in erect posture – free air under diaphragm with ground glass appearance
- Total count – will be increased
- Blood urea and creatinine – acute kidney injury occurs
- Serum amylase – elevated in case of perforative peritonitis (four times the normal value)
- Computed tomographic scan of abdomen – if patient is stable and may be used to find out the cause like gangrene, malignant growth, tb abdomen, etc.
- Diagnostic laparoscopy – can be used in case of primary peritonitis to give lavage and therapeutically used for duodenal ulcer perforation.

## TREATMENT:-

Before definitive treatment of perforative peritonitis every patient should be adequately resuscitated to withstand the surgery. So pre-op optimisation is vital in all these patients

### *Pre-op treatment-*

- Iv fluids – it improves tissue perfusion, increases urine output and also corrects hypotension
- Nil per oral status followed by NG tube aspiration to effectively decompress the bowel and to reduce the toxic fluid and also to prevent aspiration
- Bladder is catheterized to monitor the urine output
- If shock is present, ionotropes like nor adrenaline and dopamine should be used
- Higher empirical antibiotics covering the gram negative organisms and anaerobes

- Anaesthetics to relieve the pain
- CVP line to perfuse and to monitor
- fresh frozen plasma, platelets if needed
- ICU and ventilator support

After adequate optimisation patient is planned for emergency laparotomy.

### **DEFINITIVE TREATMENT :- ( SURGERY )**

The definitive treatment of small bowel perforative peritonitis is operative management. It is achieved by doing an emergency exploratory laparotomy. Here, in our study we include the patients either pre-operatively proven as hollow viscus (small and large bowel) perforation or by intra-op means. Duodenal and gastric perforation found intra operatively are excluded from the study. We take patients only where the surgical management is by ostomy for perforation excluding other methods of treatment like resection and anastomosis, primary closure, patch techniques, etc. The patients are randomized into two groups that is patients with drain and patients without drain and studied post operatively regarding complications.

For emergency abdominal surgery, opening and closing the abdomen through exploration for the treatment of peritonitis are the basic requirements needed.

Commonly used techniques for abdominal exploration are midline, muscle cutting and muscle splitting. The initial site of incision above or below umbilicus is difficult to choose because in jejunal perforation exudates can track along the lateral gutters and predominant symptoms appear below the umbilicus and even in colonic perforation free air can be seen under the diaphragm producing central and upper abdomen signs mimicking small bowel and gastric perforation. So if the preoperative diagnosis is in doubt then the incision should be made for a diagnosis which is the probable one.

In our study all patients are opened by vertical midline incision and the length of incision depends upon diagnosis and the operative procedure. Through midline incision, it is quick and is bloodless. The incision should divide only the linea alba without exposing the rectus muscles and circling around the umbilicus. Even incising through the umbilicus can be done which is also considered harmless. The laparotomy incision should be generous around 20 to 24 cm in length so that exposure is adequate. In our



study the skin and subcutaneous tissue are dissected by knife. The linea alba is divided by lifting up either by electro cautery or knife to expose the peritoneum. Then the peritoneum is entered by scissors. Then a complete laparotomy is made the site and cause of perforation is found, ostomy is constructed, peritoneal lavage done, drain placed or not depending upon the randomization and the abdominal wall is closed. The techniques and types of ostomy and about the drain tubes will be discussed later. In our study for all patients abdominal wall is closed by single layer mass closure technique in a continuous manner. Various other ways of closing the abdomen layered closure in continuous manner, layered closure in interrupted manner, mass closure in intermittent manner. We used only non-absorbable suture (monofilament poly propylene one metric size ) in our study. The advantages we noticed in this technique is, it is quick, less number of knots which reduces the chance of sinuses and important thing is tension over the abdominal wall is exerted equally throughout the incision.

After closing the linea alba the subcutaneous tissue is closed by interrupted sutures with absorbable sutures. The skin is closed by non-absorbable sutures in a

interrupted manner by simple or mattress method.

### ***TECHNIQUE OF ILEOSTOMY AND COLOSTOMY:-***

#### ***ILEOSTOMY-***

In an elective setting, pre-operative planning for ostomy is made. A detailed discussion should take place between the treating surgeon, patient, patient attenders and the caregivers post-operatively to discuss about the procedure. It is about the type of ostomy, position and whether the ostomy will be temporary or permanent. Pre-operatively the ostomy site should be marked considering the patient's position, folds, scars, drain sites, costal margin, iliac crest, clothing and built. Because in obese patients, if stoma is made below the umbilicus below the large abdominal pannus the visualization will be difficult to the patient and will lead to poor management of stoma. So in obese patients upper abdominal sites are preferred. In an emergency setting like our study all the above mentioned points are not necessary only the consent and plan for ostomy should be taken into consideration after explaining to the patient and relatives.

#### ***TYPES OF ILEOSTOMY ( CAN BE TEMPORARY OR PERMANENT)***

1. End ileostomy
2. Loop ileostomy
3. Double barrel ileostomy

#### INDICATIONS OF ILEOSTOMY-

- Small and large bowel perforations with peritoneal contamination and peritonitis where primary treatment is not possible or likelihood of anastomotic leak is high an stoma is made as a primary procedure or as

#### an diversion procedure – INDICATION IN OUR STUDY

- Ischemia due to various causes
- Following emergency colectomy for ischemia, c.difficile colitis, etc
- Small and large bowel obstruction as an diversion procedure
- For congenital abnormalities
- Diversion for protection of distal anastomosis like ileo anal pouch anastomosis, low colorectal, etc
- Diversion to prevent contamination like severe perineal injury,ourniers

gangrene, complex high fistula in ano, radiation proctitis, recto vaginal  
fistula and severe fecal incontinence

## SURGICAL TECHNIQUE:

### *End ileostomy-*

Patient should be placed in supine or lithotomy position depending upon the procedure planned. Iv antibiotics should be administered one hour before the incision.

In an elective setting the stoma site is marked based on the above mentioned points.

If the site is not marked like in emergency setting, it is found by placing the faceplate of the ostomy bag in right lower abdomen. Because it will avoid constructing stoma nearer to iliac crest, costal margin and umbilicus. Another way of finding the ileostomy site is a stoma 4cm below the umbilicus and 5cm lateral to midline would be sufficient.

At the marked site in an emergency or elective setting, skin is held and elevated using a allis forceps and a minimum of 2 cm diameter circular incision is made. We should always remember that the skin will stretch to create a longer diameter than the original diameter. In our study the subcutaneous tissue is cored out and removed, but it is

generally not needed and in fact the fat is preserved to in view that it supports ostomy and prevents para-stomal hernia and prolapse. After that, using retractors rectus sheath is identified and an cruciate incision is made. Muscle fibres are retracted and peritoneum is

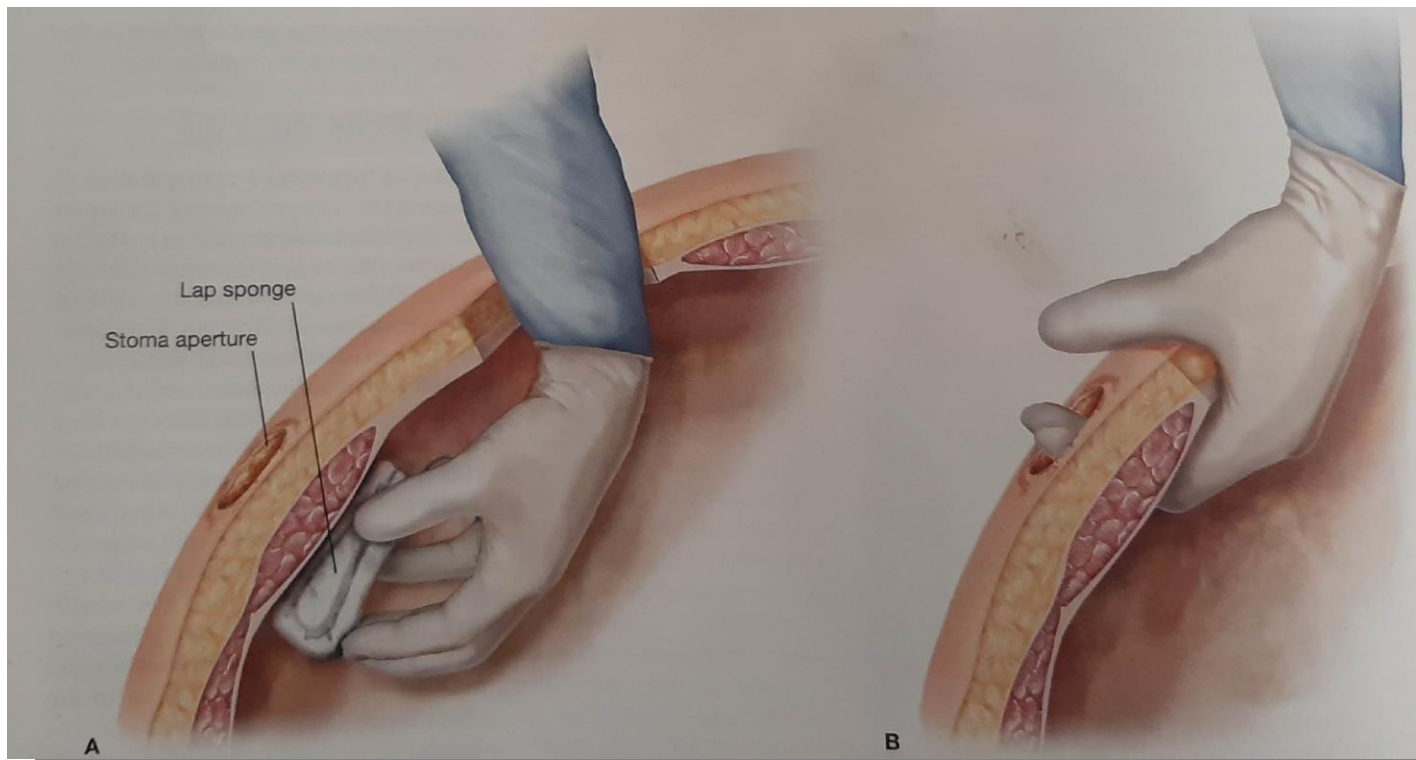


Fig – 3: technique of constructing abdominal wall defect for ostomy

opened. Babcock's clamp is introduced through the wound and the ileum or jejunal loop is hooked out through the wound with the mesentery being in a cephalad direction. During this technique the bowel should not pulled out by traction rather it should be pushed from inside. The bowel should be taken out until 4cm of bowel wall is present over the skin. Excess mesentery should not be trimmed so that devascularisation is avoided. In our study the bowel wall is sutured both to the rectus sheath and also the skin. Stitches taken

between the rectus sheath and seromuscular layer of bowel using 3-0 or 2-0 absorbable vicryl material in an interrupted manner. Three point stitches taken between the skin and end of bowel wall using 3-0 or 2-0 non absorbable silk in an interrupted manner. These intermittent stitches taken in all four quadrants of stoma. When tripod stitches are made in all quadrants the bowel wall will evert to form a 2 – 3 cm nipple. Then the ileostomy bag is placed in such a way to drain dependently in the initial post op period.

#### *Loop ileostomy-*

Commonly a loop ileostomy is created as a diversive procedure to protect the distal anastomosis and also for large perforation with severe peritoneal contamination

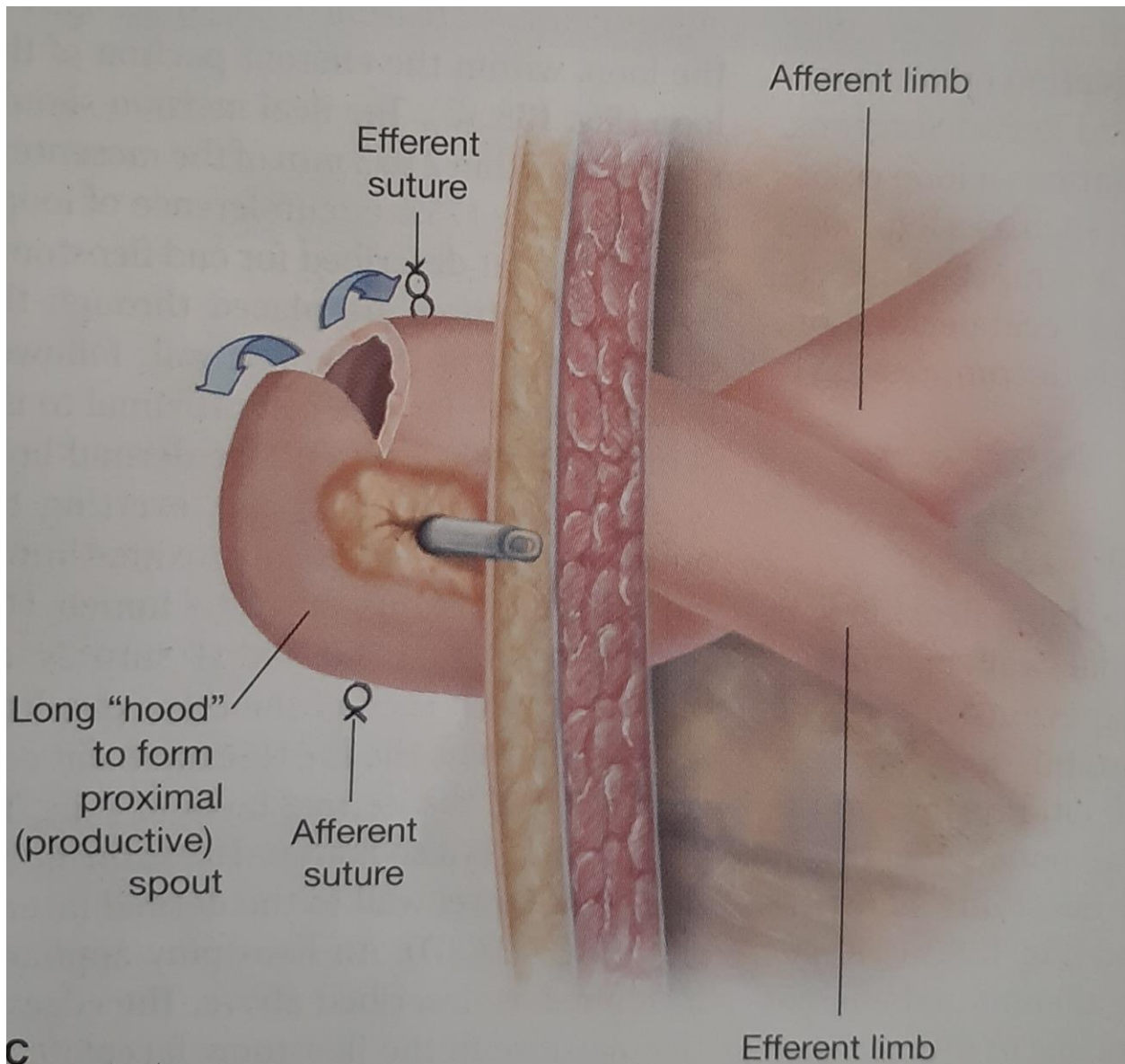


Fig- 4: technique of dividing the bowel loops for loop ostomy

where the perforation is taken out as loop ileostomy. If a diversion is needed, a loop ileostomy is preferred over loop colostomy. Loop ileostomy is associated with lower incidence of complications like peristomal infections and have a better quality of life but have higher rate of complications like dehydration and renal failure. Loop colostomy affects the quality of life.

The abdominal wall opening is created in a similar manner as described for end ileostomy. Using babcock's forceps distal ileum held 20 – 30 cm distal to ileo-caecal

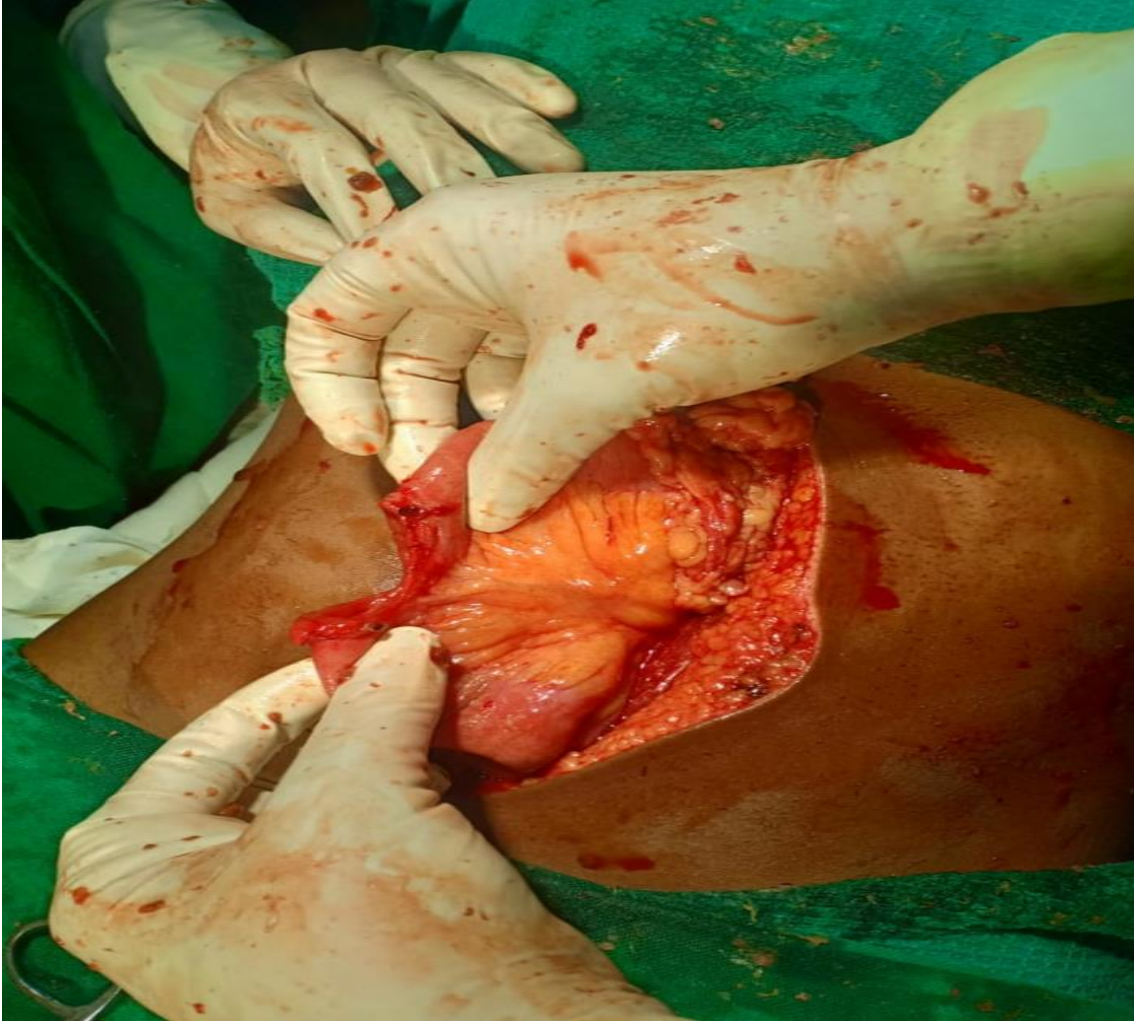


Fig 5: a case of large ileal perforation planned for loop ileostomy



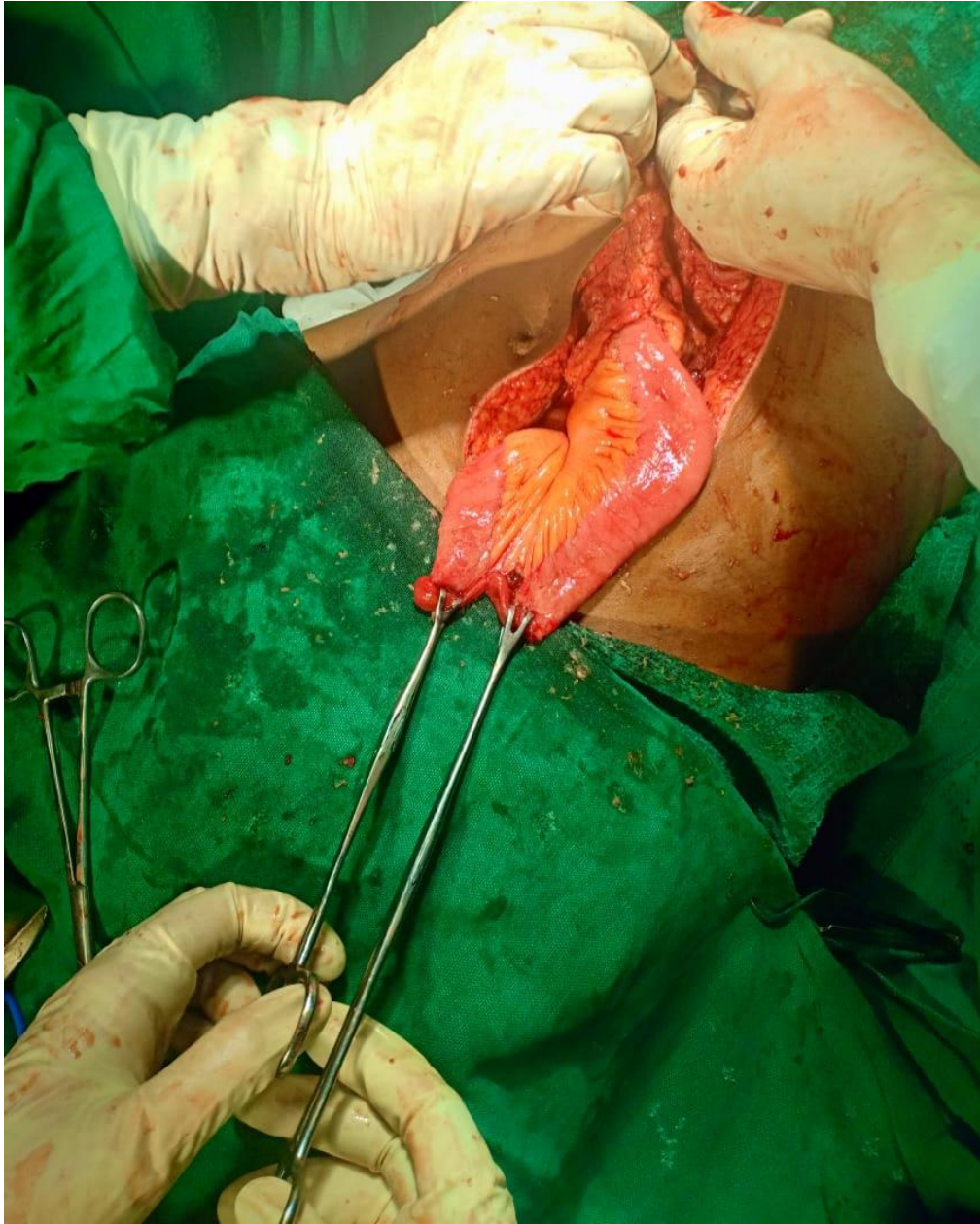


Fig 6: technique of holding bowel to construct an loop ileostomy-holding by babcocks

junction if planned as diversion procedure or the part of small bowel (jejunum or ileum)

which is planned for stoma construction is held and taken out through the abdominal

wound. We should always mark the afferent and efferent loops with either clips or

different coloured sutures so that orientation is correct. Twisting of mesentery should be

checked and to be avoided. The proximal loop can be matured either in cephalad or caudal manner and depends upon surgeon. No studies prove either one is superior to the other. Now an avascular space is created in the mesentery and a NG tube is inserted so as to support the ostomy until maturation is done. Now the abdominal wall is closed and sutures to limit the contamination. The bowel wall is opened now in the anti-mesenteric border 2 to 3 cm distal to the apex of ostomy. The opening should be done only in the efferent limb of ileostomy. Stitches taken between bowel wall and rectus sheath in a similar manner described for end ileostomy. The cut end of proximal loop is everted and sutured with the skin with three point stitches like in end ileostomy to create a 2-3cm nipple. Similarly efferent limb is also sutured to the skin in two or three point stitches. Finally an ostomy appliance is applied.

#### *Double barrel or divided loop ileostomy-*

Here the procedure is same as that of loop ileostomy the difference is the ileum is divided using stapler or manually. Both the afferent and efferent limb is taken out individually through the same abdominal wound. Stitches taken in a three point manner

to mature the ostomy. Now the corner of the efferent limb is excised and sutured to the skin inferior to the level of afferent limb. Two or three stitches are applied between the serosal layer of afferent and efferent limb to secure them in position.

### **COMPLICATIONS OF JEJUNOSTOMY AND ILEOSTOMY:-**

#### *1. Skin excoriation and pouching issues-*

Nearly 90% of jejunostomy and 60% of ileostomy develop skin irritation and excoriation due to the output which is liquid or semisolid in consistency and also bilious in nature. Another complication is leaking through the bag since the effluent is liquid in nature. Fixation difficulties also occur in nearly 50% patients.

#### *2. Dehydration and renal failure-*

More than 90% jejunostomy patients goes dehydration and renal failure if not supplemented with iv fluids and distal loop feeding of effluent. Dehydration and renal failure significantly less in ileostomy patients. It is reduced by implementation of ileostomy care pathway.

#### *3. Stoma necrosis-*

Ischemia to the newly constructed ostomy is rare but the colour of ostomy is regularly monitored. Stoma necrosis is more common when stoma is constructed for SMA/SMV thrombosis. Superficial mucosal necrosis of the stoma is common (20%) but full thickness necrosis is less than 5%. If the necrosis of the stoma extends below the rectus sheath surgical correction and revision of stoma is needed.

#### 4. *Parastomal hernia-*

It occurs when the defect in the abdominal wall is very large. If the ostomy is temporary then parastomal hernias are managed conservatively until ostomy reversal. If the ostomy is permanent then surgical management is necessary. The treatment is primary defect repair either anatomically or by mesh repair. It can be done laparoscopically or by open technique and both has equivalent results.

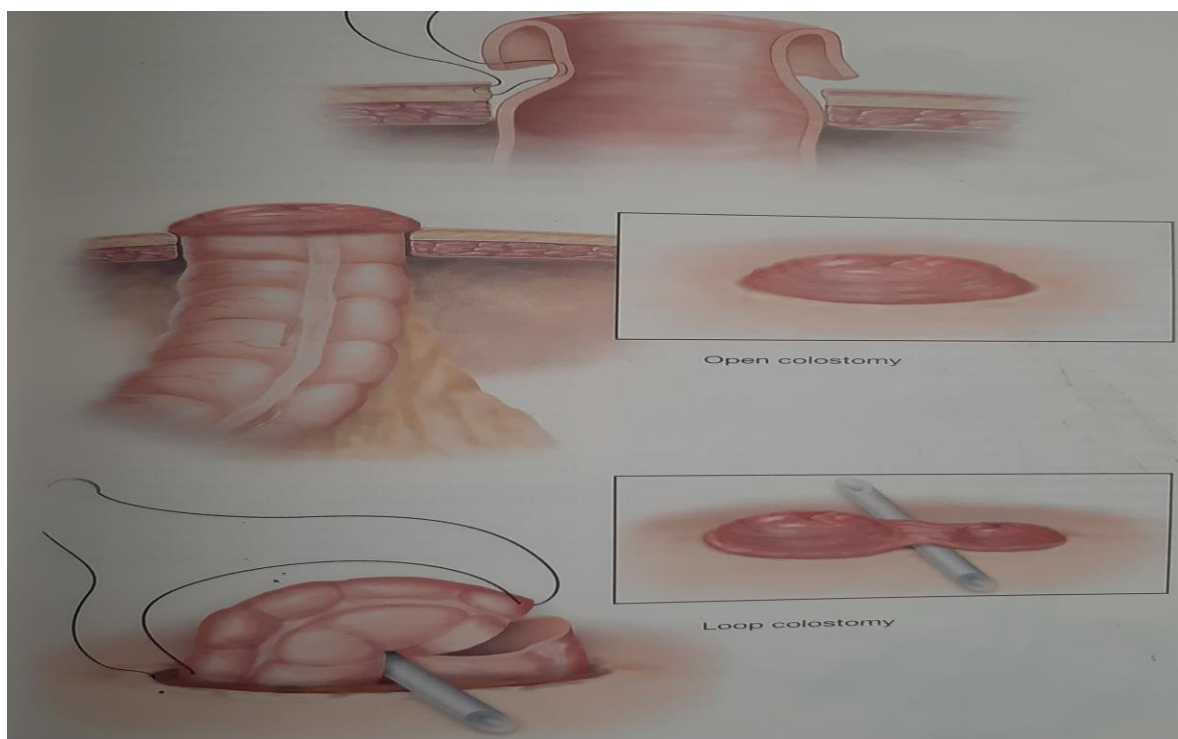
#### 5. *Others- bleeding, gall stones and renal stones, bowel obstruction*

### **COLOSTOMY :-**

Colostomy creation is done while performing emergency laparotomy for

peritonitis or trauma including diversion for penetrating rectal injury or during diverticular perforation while performing Hartmann's procedure. Colostomy is also done for large non-healing wounds, faecal incontinence, stricture in inflammatory bowel disease, decompression in distal bowel obstruction, etc. End colostomy is done if the colostomy is permanent. If planned as a temporary procedure, loop colostomy is preferred. In elective settings, like ileostomy, the stoma site should be marked considering all the above-mentioned factors and should be discussed with the patient and family members.

### *Surgical technique-*



*Fig – 7: technique of constructing colostomy*

Like ileostomy, for colostomy the bowel should be atleast 3cm above the skin level.

But the problem is most of the parts of large bowel are fixed to the posterior abdominal wall and mobilisation of colon is needed to place an colostomy. Mobilisation of descending colon is done by incising the white line of toldt and splenic flexure of colon is released from its attachments. Since it is mobilised from posterior wall care should be taken to preserve the blood supply and the cut edge of the colon should actively bleed. This is specifically remembered if there is distal resection of sigmoid colon and resection is done where the inferior mesenteric artery is ligated. In this case the collateral circulation through the marginal artery is checked and after this step only ostomy is matured.

Abdominal wall opening is made in a similar way like ileostomy by incising skin, subcutaneous tissue, rectus sheath, muscles are split and peritoneum. The stomal loop is delivered through the abdominal wound using babcock's forceps so that it protrudes 3 to 4cm above the skin level. If loop colostomy is planned twisting of mesocolon should be avoided and robinson catheter is used support the loop until it is

matured. Ostomy maturation is done by taking stitches between bowel wall and skin using three point technique using partial brookes technique in a circumferential manner. If a colostomy is unavoidable in a patient with ascites, extra peritoneal tunnelling of colon is done to prevent leakage of ascetic fluid around the stoma site. For this peritoneum is opened at the level paracolic gutter and a tunnel is created in the extra peritoneal plane and the rectus sheath is opened just lateral to rectus muscle and the loop is taken out.

### ***SURGICAL DRAINS :-***

Drains are artificial appliances which act as channels used to drain potential collection such as blood, pus, fluid, air.

#### *Ideal drain-*

1. It should be firm not too rigid
2. Should be resistant to decomposition or disintegration\
3. Wide and patent enough to prevent easy blockage
4. It should not be so soft that it may twist or kink or get blocked

5. Non reactive

6. Non carcinogenic

7. Non thrombotic

*Classification of drains-*

1. It can be open or closed

2. It can be active or passive

*Passive drains-*

These drains act by means of capillary action or by gravity

They are used when drainage fluid is too viscous

Examples are – corrugated rubber tube drains, intra abdominal drains, penrose

drains and sump drain (multiple lumen tube for continuous drainage, irrigation and aspiration)

*Active drains-*

These drains act by aided active suction



Examples are – haemovac, surgivac, redivac and Jackson pratt drains.

*Indications of drain tubes-*

Difficult indications include therapeutic, diagnostic, prophylactic, monitoring and palliative.

*Therapeutic-*

1. abscess cavity
2. seroma
3. tension pneumothorax, hemothorax
4. pleural fluid
5. suppurative arthritis

*Diagnostic –*

1. T – tube cholangiogram
2. biliary fistulas

*Prophylactic –*

1. done usually after major surgeries – like after thyroidectomy, major abdominal surgeries, thoracotomy and cardio thoracic surgeries

*Monitoring and palliative –*

1.gastro intestinal bleeding and urinary catheterization

2.advanced CA oesophagus and hydrocephalus

## **ABDOMINAL DRAINS**

In our study, patients are randomized into drained and non – drained groups and before drained is placed or not peritoneal contamination is managed. Washing the abdominal cavity before closing the abdomen has both clinical and experimental evidence that there is decreased post op abscess and wound infection. A variety of antiseptic and antibiotic solutions has been used. Commonly used normal saline wash with an antibiotic of up to 5 litres is considered adequate.

Many studies and trails have been conducted to check the role of abdominal drains for peritonitis in both elective and emergency procedures. Before keeping the drains every surgeon should keep in mind about two important points. First the need of drain and how it is to be managed? Second, consent for placing a drain ?

*Indications for drainage of the peritoneal cavity –*

Previously whenever there is doubt we always drain as said by Lawson tait. But concepts have been changed when in doubt we don't drain now a days. Major indications for placing a drain are when there is an abscess, when there is suspected anastomotic leak, when there is continuous serous discharge from inflammation and when perfect haemostasis is in doubt or it is impossible.

Drainage of a generalised purulent peritonitis is undesirable and indeed impossible. The peritoneal cavity cannot be passively drained as a whole for more than few hours. Drains should never be placed through an exploratory incision or else hernia tend to occur. Drains are placed by separate stab incisions cutting the skin and subcutaneous tissue. And the musculo fascial layer of the abdominal wall is penetrated by curved artery forceps. The drain should be placed such that there is straight course for fluid to enter it. Rarely tip of the drainage tube can be tacked to adjacent peritoneal fold with a short lasting absorbable suture (catgut).



Fig – 8 : various patients without drain in the study.

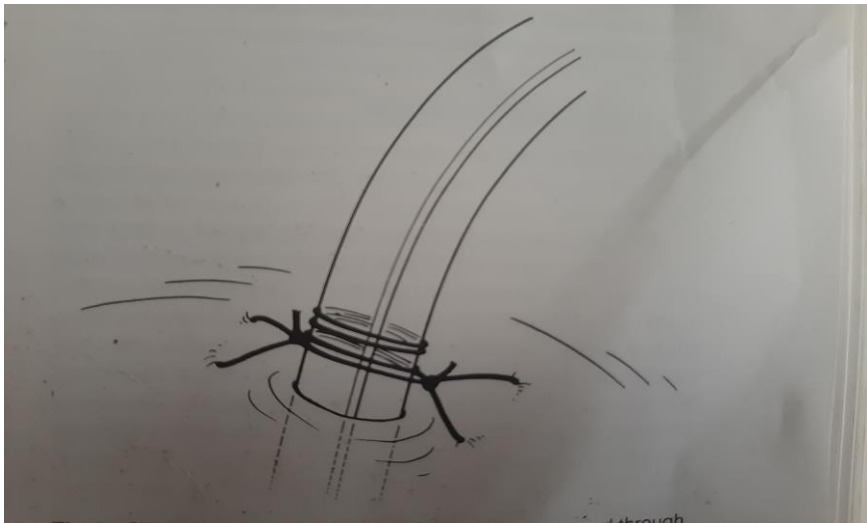


Fig – 9 : various patients with drain in our study

### *Materials and drain fixation –*

Tube drains are the best because it can be connected to drainage system , so cross infection is less. But corrugated drains can cause cross infection which can be prevented by fixing a bag to it. The materials used now a days are relatively inert and produces less reaction compared to rubber tubes used in olden days.

Drains should be anchored to the skin in a standard method. Usually it is done by fixing the drain to one or two sides of the tube there by exerting equal distribution of retraction forces and been tied several times around the tube.



*Fig – 10: ideal method of fixing the drain*

### *Removal of intra-abdominal drains –*

In our study drain tubes are removed based on the output. If output is less than 30 ml for 3 consecutive days drain tube is removed. An drain should be removed when its

purpose is over. So, drains inserted for haemorrhage should be removed within 72 hours, drains inserted into a suture line should be removed within 7 days, drains inserted into a cavity should be removed until the discharge is ceased or the cavity closes.

#### COMPLICATIONS OF DRAINS:-

Immediate –

- Pain
- Bleeding
- Irritation
- Perforation or injury to adjacent structures

Early –

- Occlusion
- Leaks around the drain
- Infection
- Displacement
- Electrolyte imbalance

Late –

- Hernia
- Fistula
- Pressure necrosis of bowel
- Omental prolapse

#### **OBSERVATION AND RESULTS :-**

***“A COMPARITIVE STUDY BETWEEN PATIENTS OF SMALL AND LARGE***

***BOWEL PERFORATION MANAGED BY STOMAS WITH DRAINS AND***

***WITHOUT DRAINS”***. In this comparative study, individual patients are

randomized into with and without drain tube groups and their post operative period

was monitored.

The factors monitored in both the group of patients are

- DT site pain



- DT site infection
- DT site omental prolapse
- DT site hernia
- \
- Post operative mobility of patients
- Number of patients undergoing re surgery
- Duration of hospital stay
- Operative site wound infection
- Other DT unrelated post-op complications

The following results were obtained.

*Age distribution of sample:*

the following figure illustrates the age distribution of the patients included in the study .

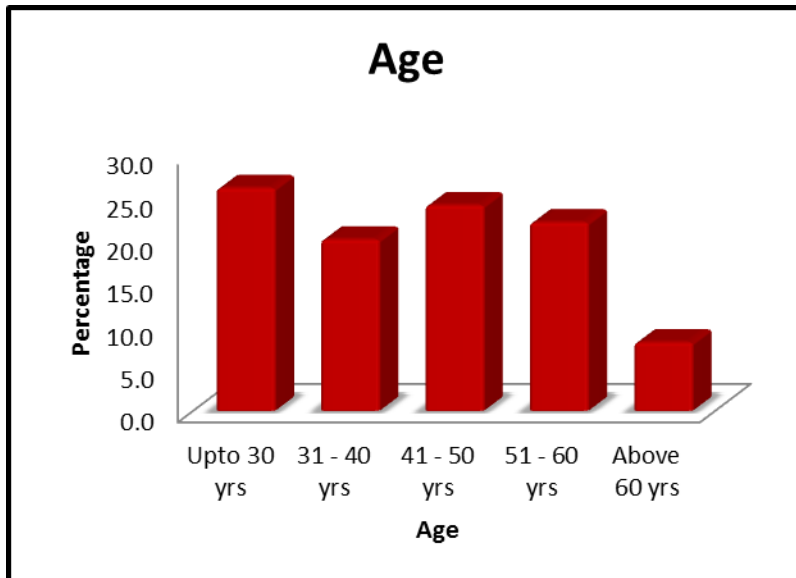


Fig – 11: age distribution of the sample

AGE		
	Frequency	Percent
Upto 30 yrs	13	26.0
31 - 40 yrs	10	20.0
41 - 50 yrs	12	24.0
51 - 60 yrs	11	22.0
Above 60 yrs	4	8.0
Total	50	100.0

Table 1

The above graph illustrates that common age group included in the study is from 25 to 50 years age group whom are vulnerable.

*Sex distribution of the sample –*

The following figure demonstrates the sex distribution of patients in our study and it shows perforation is more commoner in male patients (64%) whatever may be the cause.

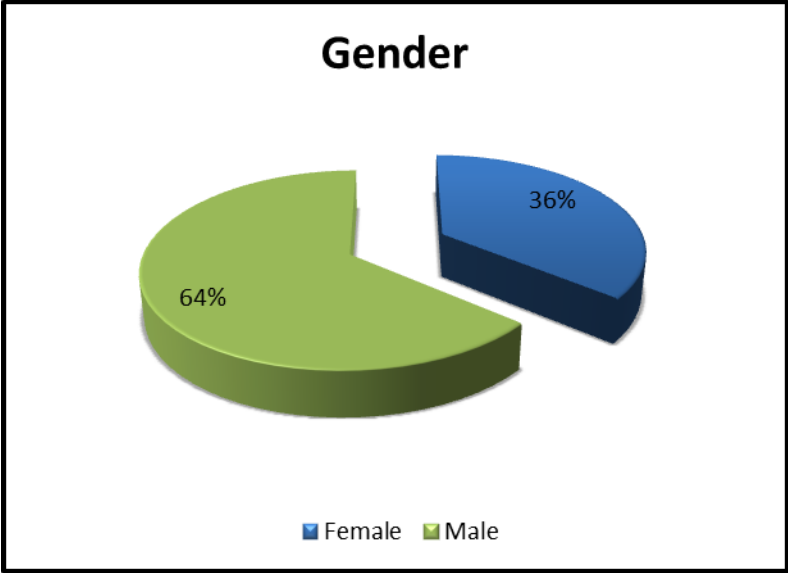


Fig – 11: sex distribution of the sample

	Frequency	Percent
Female	18	36.0
Male	32	64.0
Total	50	100.0

Table 2

*DT site pain –*

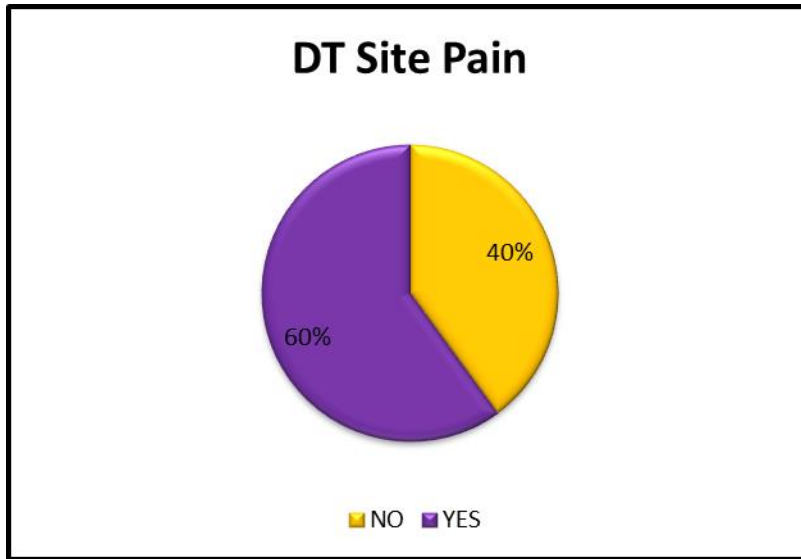


Fig – 12: percentage of patients with DT site pain

Nearly 60% patients (n=15 out of 25) with drain tubes had post op DT site pain till day of discharge which is quite significant. Most of the patients tolerated this pain but it causes discomfort during position change and during mobilisation.

	Frequency	Percent
NO	10	40.0
YES	15	60.0
Total	25	100.0

Table - 3

*DT site infection -*

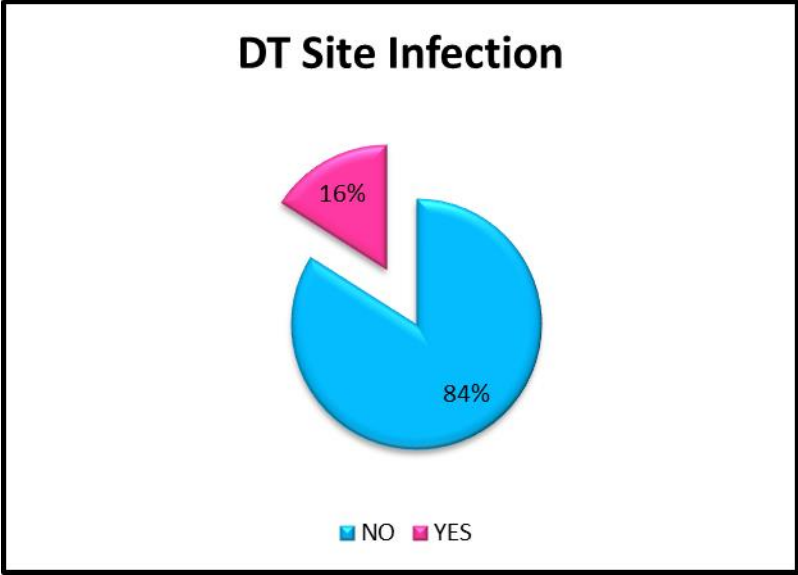


fig – 13: percentage of patients with DT site infection

About 16% of patients with drain tubes had DT site infection. They were managed conservatively with appropriate antibiotics after taking pus culture and sensitivity. This DT site infection lead to unhealthy scar over the DT site.

**DT SITE INFECTION**

	Frequency	Percent
NO	21	84.0
YES	4	16.0
Total	25	100.0

Table – 4

*DT site omental prolapse –*



Fig – 14: percentage of patients who had DT site omental prolapse

Out of 25 patients with drain tube only one patient had omental prolapse through the DT wound during DT removal. That patient is managed conservatively by taking skin sutures after replacing the omentum through the wound and also by position change. Minimal pain occurred at the site of drain tube but patient managed conservatively and it get settled within 2 days.

OMENTAL PROLAPSE		
	Frequency	Percent
NO	24	96.0
YES	1	4.0
Total	25	100.0

Table - 5

*DT site hernia –*

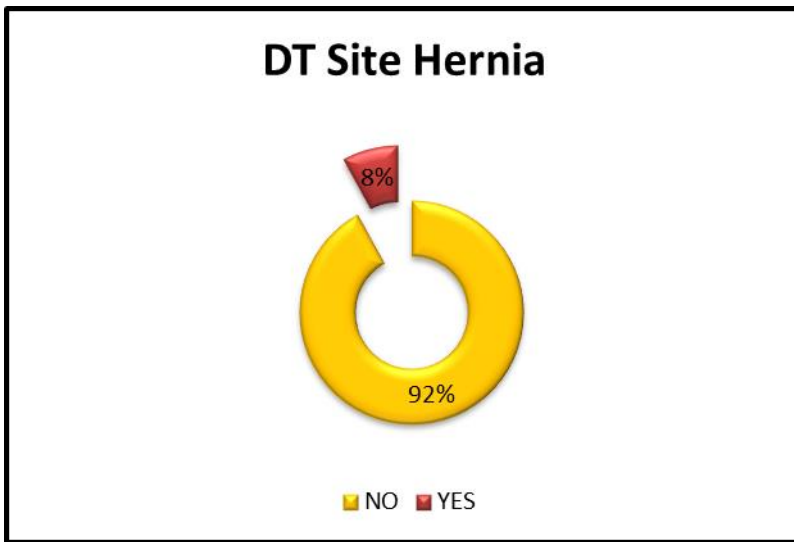


Fig – 15: percentage of patients with DT site hernia

About 8% of patients with drain tube had DT site hernia without complications of hernia. It is due to the muscular defect produced while placing a drain tube and also if superadded infection occurs the wound healing becomes poor and leads to DT site hernias with omentum as content most of the time.

**DT SITE HERNIA**

	Frequency	Percent
NO	23	92.0
YES	2	8.0
Total	25	100.0

Table – 6

Post-operative mobility of patients –

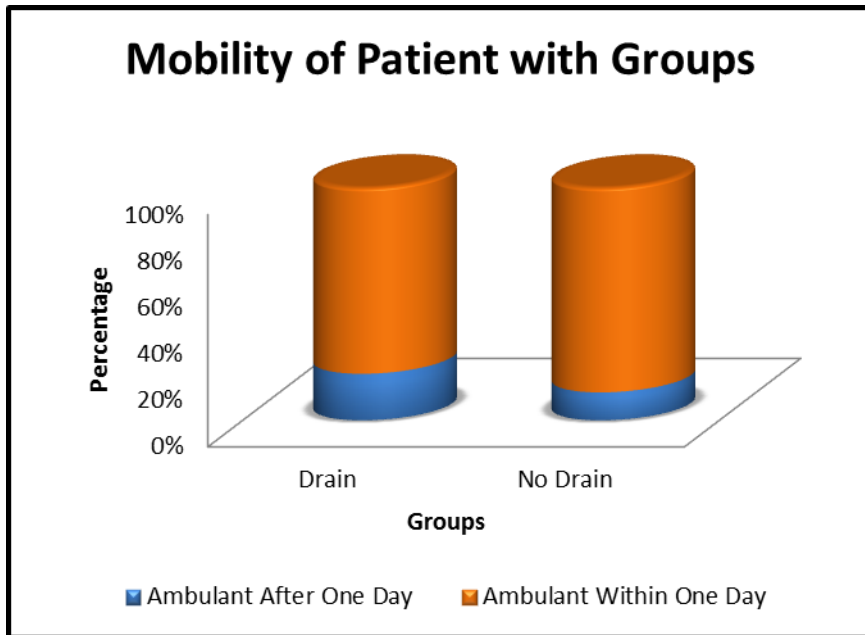


Fig – 16: compares the mobility of the patient between two groups

MOBILITY OF PATIENT with GROUPS							
			Groups		Total	χ <sup>2</sup> -value	P-value
			DRAIN	NO DRAIN			
MOBILITY OF PATIENT	AMBULANT AFTER ONE DAY	Count	5	3	8	0.595	0.702
		%	20.0%	12.0%	16.0%		
	AMBULANT WITHIN ONE DAY	Count	20	22	42		
		%	80.0%	88.0%	84.0%		
Total		Count	25	25	50		
		%	100.0%	100.0%	100.0%		
# No Statistical Significance at P>0.05 level							

Table – 7

The above table and graph compares the mobility of patients post operatively in both drained and non-drained groups. In drain tube patients 80% (n=20 out of 25) were



ambulant within first day of surgery. In patients without drain about 88% (n=22 out of 25) were ambulant within first day of surgery. Comparing the groups and the P value turned out to be 0.702, which is statistically non-significant. Though it is non-significant the above table shows us without drain tube patients mobilise early than drain tube patients.

*Patients undergoing re surgery –*

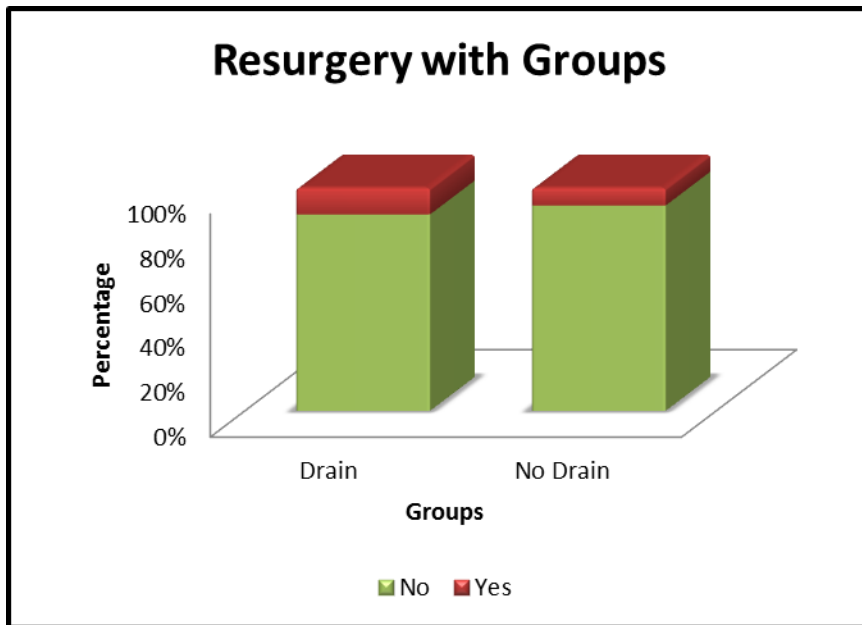


Fig – 17: percentage of patients undergoing re surgery in both the groups

RESURGERY with GROUPS				
	Groups	Total	$\chi^2$ –	P-value

			DRAIN	NO DRAIN		value	
RESURGERY	NO	Count	22	23	45	0.227	1.000
		%	88.0%	92.0%	90.0%		
	YES	Count	3	2	5		
		%	12.0%	8.0%	10.0%		
Total		Count	25	25	50		
		%	100.0%	100.0%	100.0%		
# No Statistical Significance at P>0.05 level							

Table – 8

The table and graph shows re surgery in DT placed groups is about 12% (n=3 out of 25) and in no drain group it is about 8% (n=2 out of 25). Comparing the groups the P value is found to be 1.000 which is a insignificant difference. We doesn't take hold of the causes of re surgery in both groups. From the above result it is clear that both groups have equal incidence of re surgery. Presence or absence of drain tube doesn't affect their re surgery rates whatever may be the cause.

*Duration of hospital stay in both groups –*

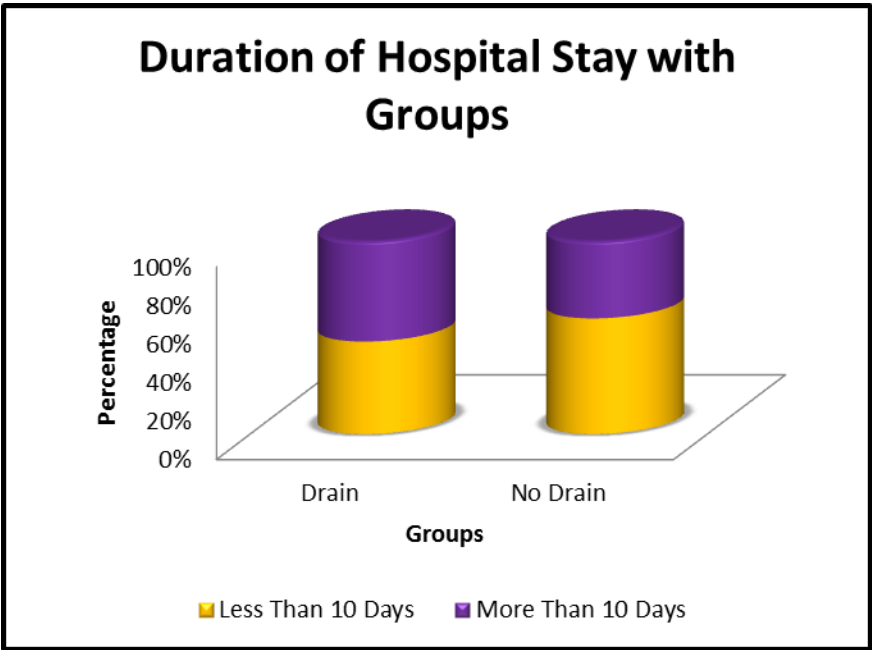


Fig – 18 :comparing both groups about duration of hospital stay

DURATION OF HOSPITAL STAY with GROUPS							
			Groups		Total	χ <sup>2</sup> - value	P-value
			DRAIN	NO DRAIN			
DURATION OF HOSPITAL STAY	LESS THAN 10 DAYS	Count	12	15	27	0.725	0.395 #
		%	48.0%	60.0%	54.0%		
	MORE THAN 10 DAYS	Count	13	10	23		
		%	52.0%	40.0%	46.0%		
Total		Count	25	25	50		
		%	100.0%	100.0%	100.0%		

# No Statistical Significance at P>0.05 level

Table – 9

We compared the duration of hospital stay between two groups that is the percentage of patients getting discharged within 10 days in both the groups. In drain placed groups

about 48% (n=12 out of 25) of patients are discharged within 10 days and in no drain tube groups about 60% (n=15 out of 25) patients are discharged within 10 days. The P value between both the groups is 0.395 which is a insignificant difference between both the groups. Though it seemed to be a great difference between two groups ( 48% and 60%) the P value is not less than 0.05

*Wound infection in both groups-*

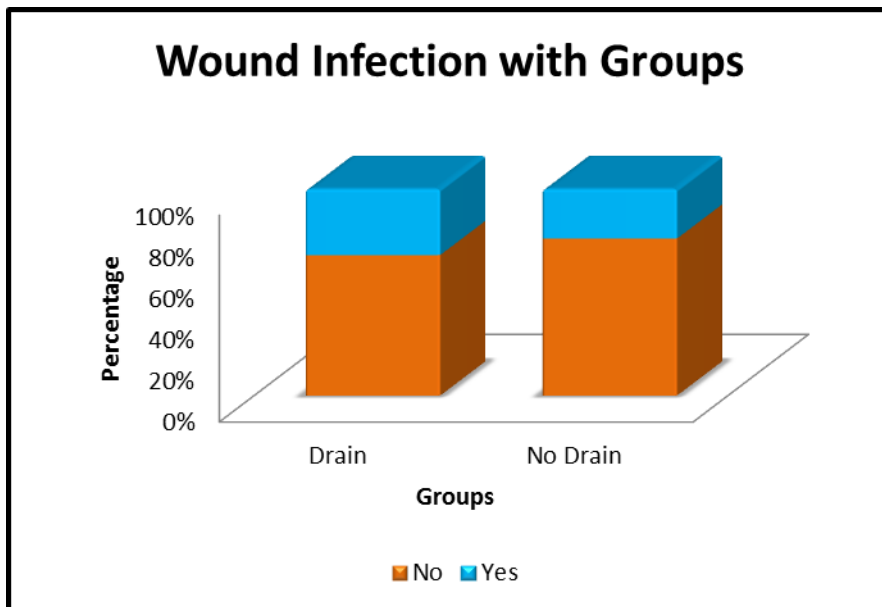


Fig – 19: percentage of patients having wound infection in both the groups.

In our study, in drain placed groups about 32% (n=8 out of 25) of patients developed post op wound infection. In non drained groups about 24% (n=6 out of 25) of patients

developed post op wound infection. The P value between both the groups is 0.754. this value shows that there is no difference between both the groups pertained to wound infection. All the patients who developed wound infection were managed conservatively with appropriate antibiotics according to culture and sensitivity report. Some patients required post op secondary suturing of wounds once the wound is fully healed.

WOUND INFECTION with GROUPS							
			Groups		Total	χ <sup>2</sup> - value	P-value
			DRAIN	NO DRAIN			
WOUND INFECTION	NO	Count	17	19	36	0.397	0.754 #
		%	68.0%	76.0%	72.0%		
	YES	Count	8	6	14		
		%	32.0%	24.0%	28.0%		
Total		Count	25	25	50		
		%	100.0%	100.0%	100.0%		
# No Statistical Significance at P>0.05 level							

**Table - 9**

**Complications post-operatively (DT unrelated)**

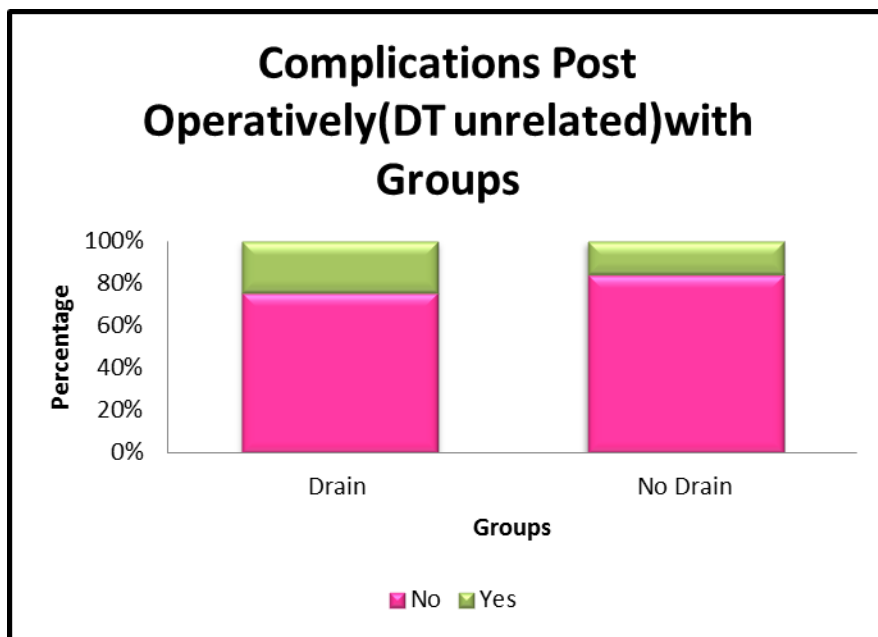


Fig – 20: percentage of patients developing DT unrelated complications in both the groups

COMPLICATIONS POST OPERATIVELY ( DT unrelated) with GROUPS							
			Groups		Total	χ <sup>2</sup> - value	P-value
			DRAIN	NO DRAIN			
COMPLICATIONS POST OPERATIVELY ( DT unrelated)	NO	Count	19	21	40	0.5	0.725 #
		%	76.0%	84.0%	80.0%		
	YES	Count	6	4	10		
		%	24.0%	16.0%	20.0%		
Total		Count	25	25	50		
		%	100.0%	100.0%	100.0%		
# No Statistical Significance at P>0.05 level							

Table – 10

In DT placed individuals, post-op complications like abscess, electrolyte imbalance, burst abdomen, etc occurred in 24% (n=6 out of 25) patients. In non-drained patients

complications like abscess, electrolyte imbalance and burst abdomen occurred in 16% (n=4 out of 25) patients. The P value obtained is 0.725 which shows that DT unrelated complications are equal in both the groups. All the complications are managed conservatively except burst abdomen which required surgery. Post op abscess formation is managed by open drainage or by guided pig tail drainage.

## ***DISCUSSION :***

The study was conducted in government stanley medical college and hospital over a period of 10 months. The topic was “a comparative study between patients of small and large bowel perforation managed by stomas with drains and without drains”. The study was intended to find the difference of post-op period of patients with drain tube and without drain tubes. Groups are allotted in a randomised manner and patients were observed post operatively. Factors monitored in both groups in the study are drain related complications, drain unrelated complications, mobility of patient, re surgery and duration of hospital stay. The observations are plotted in the above plotted graphs and tables. I shows there is no statistical difference in DT unrelated complications like wound infection, abscess, electrolyte imbalance and burst abdomen even though percentages between two groups vary. Also there is no statistical difference in mobility of patient, number of patients undergoing re surgery and duration of hospital stay between the two groups. But in drain tube patients a good number of drain related complications occur like DT site pain, DT site infection, DT site hernia and DT site omental prolapse. The drain tube site pain occurred in 60%, the drain tube site infection occurred in 16%, the drain tube site hernia occurred in 8% and the drain tube site omental prolapse in 4% patients. Even though the drain unrelated complications is not statistically significant



between two groups, the patients with drain tubes had drain related complications which affected the post op period without affecting other complications, mobility and duration of hospital stay. From this we understood that KEEPING A DRAIN for a small and large bowel perforative peritonitis patient managed by ostomy is of NO USE and in turn it causes less significant DT related complications which should be avoided. So surgical drains should be used as when needed.

## **CONCLUSION –**

In small bowel and large bowel perforation with peritonitis (excluding duodenal perforation) patients managed by ostomies (stoma) DRAIN TUBES DOESN'T play an important role in the post- operative period, instead it causes unnecessary drain related complications. The mobility of patient, rates of re surgery, drain unrelated complications and duration of hospital stay is NOT AFFECTED by drain tube.

# **ANNEXURES**

GOVT STANLEY MEDICAL COLLEGE, CHENNAI – 600001  
INFORMED CONSENT

- **DISSERTATION TOPIC: A COMPARITIVE STUDY OF POST OPERATIVE COMPLICATIONS BETWEEN PATIENTS OF SMALL BOWEL AND LARGE BOWEL PERFORATION IN WHOM OSTOMY IS DONE WITH DRAINS AND WITHOUT DRAINS**
- 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:



## **REFERENCES:**

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**MASTER CHART:**

S.NO	PATIENT NAME	AGE	SEX	IP.NO	DRAIN/ NO DRAIN	DT SITE PAIN	DT SITE INFE CTIO N	OM EN TAL PR OL APS E	DT SITE HER NIA	MOBILITY OF PATIENT	WOUND INFECTIO N
1	Ganesan	42	male	1877513	DRAIN	YES	NO	NO	NO	AMBULANT WITHIN ONE DAY	YES
2	Mani	51	male	1877645	DRAIN	YES	NO	NO	NO	AMBULANT AFTER ONE DAY	NO
3	Radha	35	female	1877777	NO DRAIN	---	---	---	---	AMBULANT WITHIN ONE DAY	YES
4	Murugan	55	male	1883474	DRAIN	NO	NO	NO	NO	AMBULANT WITHIN ONE DAY	YES
5	Babu	45	male	1885321	NO DRAIN	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
6	John	27	male	1889716	NO DRAIN	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
7	Malliga	42	female	1890540	NO DRAIN	---	---	---	---	AMBULANT AFTER ONE DAY	NO
8	Marthandam	39	male	1896708	DRAIN	NO	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO
9	Saraswathi	60	female	1897613	DRAIN	YES	YES	NO	YES	AMBULANT AFTER ONE DAY	YES
10	Kathir	21	male	1899125	DRAIN	YES	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO
11	Shalini	25	female	1901564	NO DRAIN	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
12	ram Prasad	29	male	1902789	DRAIN	YES	NO	YES	NO	AMBULANT WITHIN ONE DAY	NO
13	Senthil	44	male	1908403	NO DRAIN	---	---	---	---	AMBULANT WITHIN ONE DAY	YES
14	sagiya	50	female	1912245	NO	---	---	---	---	AMBULANT	NO

					DRAIN		---			WITHIN ONE DAY	
15	Arumugam	69	male	1915986	DRAIN	YES	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO
16	Mahalakshmi	30	female	1916389	DRAIN	NO	NO	NO	NO	AMBULANT AFTER ONE DAY	YES
17	Pazhani	49	male	1919684	DRAIN	YES	NO	NO	NO	AMBULANT AFTER ONE DAY	NO
18	Jessima	33	female	1920321	NO DRAIN	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
19	Chandran	72	male	1922447	NO DRAIN	---	---	---	---	AMBULANT WITHIN ONE DAY	YES
20	Durai	37	male	1922637	DRAIN	NO	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO
21	Sundari	58	female	1924968	NO DRAIN	---	---	---	---	AMBULANT AFTER ONE DAY	NO
22	Pannerselvam	53	male	1925347	NO DRAIN	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
23	Bobby	40	male	1926871	DRAIN	NO	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO
24	Sandhya	19	female	1928631	DRAIN	YES	YES	NO	NO	AMBULANT WITHIN ONE DAY	YES
25	Ponnammal	49	female	1939541	NO DRAIN	---	---	---	---	AMBULANT WITHIN ONE DAY	YES
26	Senthamilselvan	39	male	1945646	DRAIN	YES	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO
27	Marimuthu	28	male	1950120	NO DRAIN	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
28	Yacoob	64	male	1954392	DRAIN	YES	NO	NO	NO	AMBULANT WITHIN ONE DAY	YES
29	Sheriff	55	male	1956742	NO DRAIN	---	---	---	---	AMBULANT WITHIN 1	NO



30	Malar	25	femal e	1956899	DRAIN	NO	NO	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO
31	Muthula kshmi	42	femal e	1956345	DRAIN	NO	NO	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO
32	Babu	31	male	1957368	NO DRAIN	---	---	---	---	---	AMBULANT WITHIN ONE DAY	YES
33	Santhan am	54	male	1958602	NO DRAIN	---	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
34	Arjun	22	male	1960731	NO DRAIN	---	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
35	Mariyap pan	61	male	1961568	DRAIN	YES	YES	NO	YES	---	AMBULANT WITHIN ONE DAY	YES
36	Muthu veeran	57	male	1963454	DRAIN	YES	NO	NO	NO	---	AMBULANT WITHIN ONE DAY	NO
37	Sowbaka	30	femal e	1965722	NO DRAIN	---	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
38	Mariyam ma	43	femal e	1966662	DRAIN	NO	NO	NO	NO	---	AMBULANT WITHIN ONE DAY	NO
39	Sankar	47	male	1969830	NO DRAIN	---	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
40	Karthick	26	male	1970878	NO DRAIN	---	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
41	Nedunc hezhian	33	male	1974631	DRAIN	YES	NO	NO	NO	---	AMBULANT WITHIN ONE DAY	NO
42	Ponnusa my	52	male	1975426	DRAIN	YES	YES	NO	NO	---	AMBULANT AFTER ONE DAY	YES
43	Maruthu pandi	45	male	1976834	NO DRAIN	---	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
44	Lavanya	23	femal e	1976891	NO DRAIN	---	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
45	praveen raju	21	male	1978450	NO DRAIN	---	---	---	---	---	AMBULANT WITHIN 1	NO

46	Manohari	60	female	1979696	DRAIN	NO	NO	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO
47	Latha	39	female	1980147	NO DRAIN	---	---	---	---	---	AMBULANT AFTER ONE DAY	YES
48	Sankaran	55	male	1980258	DRAIN	YES	NO	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO
49	Ramados	41	male	1981423	NO DRAIN	---	---	---	---	---	AMBULANT WITHIN ONE DAY	NO
50	Suguna	33	female	1982369	DRAIN	NO	NO	NO	NO	NO	AMBULANT WITHIN ONE DAY	NO