

“STUDY OF LARGE BOWEL OBSTRUCTION IN ADULTS”

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ABSTRACT: AIM: To study the Incidence, Etiology, Clinical features, Investigations undertaken to arrive at Diagnosis, Treatment and Post-operative outcomes of large bowel obstruction in adults.

METHODS: This is a prospective observational study of large bowel obstruction in adults and was carried out from Nov 2010 to Oct 2012. **RESULTS:** A total of 211 cases of intestinal obstruction were diagnosed out of these 25(11.85%) cases were of large bowel obstruction. Maximum patients 8(32%) cases belonged to age group 51-60yrs and 15(60%) cases were males. Obstipation seen in 25(100%), pain 22(88%), distension 21(84%), tenderness 22(88%) and increased bowel sounds 21(84%). X-ray and ultrasonography was useful in 21(84%) cases while CT scan was used in only 7 cases and proved 100% effective. 13(52%) cases were of sigmoid volvulus, 1(4%) of caecal volvulus and 9(36%) cases of malignancy. 15(60%) cases underwent primary resection anastomosis and 10(40%) cases had a decompressive colostomy. 8(32%) patients developed immediate wound complication, 3(12%) cases had anastomotic leak, 1(4%) case developed burst abdomen and 6(24%) cases had septicaemia. Mortality of the study was 6(24%) cases. **CONCLUSION:** Patients with large bowel obstruction in adults form a small percentage of patients. Commonest causes are sigmoid volvulus and obstructing colorectal malignancies. X-ray abdomen, Ultrasound of abdomen and Computerized Tomography of abdomen are very helpful in diagnosing. Single stage resectional procedure without colostomies can be done in patients even in emergency surgeries and Proximal diverting colostomies may be safely performed in patients with pre-existing sepsis, shock, gangrene of large bowel and excessively loaded colon with reversal of colostomies and a definitive procedure may be performed later, after stabilisation of patients. Post-operative complications are more because of late presentation associated with comorbidities and large bacterial load of colon during resectional procedure large bowel obstruction carries an increased rate of mortality because of its presentation in old age with associated comorbid factors requiring major resectional procedures.

INTRODUCTION: Intestinal obstruction accounts for one of the most common surgical emergencies resulting into high morbidity and if timely aid isn't provided mortality sets in. The incidence of this condition has not changed though a different etiological pattern is present from place to place and time to time over the last century. The mode of presentation is same in all but certainly with varied causes.

With time, better understanding of pathophysiology, improvement in radiological techniques of diagnosis, high degree of refinement in correction of fluid and electrolyte imbalance, introduction of antibiotics with effective bacteriological control, introduction of techniques in

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gastrointestinal decompression, new surgical principles as in large bowel obstruction introduction of on table lavage and resection and primary anastomosis, has replaced staged procedures and number of days in hospital stay has helped in better management of patients. Improvement in field of anesthesia has all contributed to lowering the morbidity and mortality. Thus a multi modal approach has revolutionized our surgical methods. The dictum of never let the sun set or rise in bowel obstruction has made early surgical intervention for intestinal obstruction¹. This in turn has reduced the incidence of strangulation of bowel, which was major cause of mortality in already ill patient.

Success in treatment of patient with intestinal obstruction depends largely upon early diagnosis, skillful management and appreciation of importance of treating the pathological effects of obstruction just as much as the cause itself. Our hospital being situated at a strategic place favoring not only natives but also suburb population the inflow is overwhelming. Considering all these circumstances and with the facilities available a prospective study of large bowel obstruction in adults was carried out. The various facets of the disease in the form of causes, clinical features etc. were studied and appropriate management using available imaging modalities and surgical procedures were done.

MATERIALS AND METHODS: This prospective study of large bowel obstruction in adults was carried out at Medical College and Hospital. The study was carried out from Nov 2010 to Oct 2012. During this tenure around 211 cases of intestinal obstructions were reported. 25 cases of large bowel obstruction were selected after they were confirmed on clinical, investigative and explorative grounds. Cases admitted on emergency basis which required surgical intervention and further confirmed as large bowel obstruction were included. The patients were informed about this study prior to inclusion into it and when they were duly convinced they were included into the study after signing of the consent forms. All patients in the age group between 18-80 years were included in the study. All patients in <18 years and > 80 years were excluded from this study. Patients who did not give consent for inclusion in the study were excluded. Patients of pseudo-obstruction were not considered in the study. As most of the patients presented in an emergency situation with few patients in shock; intravenous fluid replacement was started immediately. Thus after primary stabilization of patient by IV fluids and inotropic supports, patients were prepared for operation. All patients underwent plain X-ray abdomen with both domes of diaphragm in erect position, X-ray chest PA view and ultra-sonography of abdomen and CT scan wherever required. Routine investigations like complete blood count, kidney function tests, liver function tests, blood group, HIV and HbsAg status were done in each and every patient. Diagnosis of large bowel obstruction was thus made on History, Clinical examination and presence of characteristics signs on X-ray along with findings on ultra-sonography and further confirmed intraoperatively. In cases where malignancy was a suspicion an emergency CT scan was done prior taking the patient to operation. All the cases were surgical emergencies and were operated within few hours of admission after primary stabilization of patient.

All patients were explored under general anaesthesia. In cases of sigmoid volvulus and caecal volvulus primary resection with end to end anastomosis was done except for three cases of gangrene of sigmoid colon in which considering their general condition a Hartmann's procedure was performed and reversal was achieved later. Obstructing colorectal malignancies that were

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diagnosed on USG and CT scan were dealt with diverting colostomies and later elective resection anastomosis i.e. staged procedure was performed. Intraoperatively diagnosed cases of obstructing malignancies were treated with diverting colostomy and second stage procedure later on. As facilities for colonoscopic stenting of obstructing colorectal malignancy were not available at our institute, it was not performed. On table colonic lavage^{15, 16, 17} was done prior to resection and anastomosis or performing colostomies in most of the cases. In on table colonic lavage a Foleys catheter no18 was introduced after doing an appendicectomy and all the faecal contamination is removed which is followed by irrigation with warm saline. After performing the operative procedure abdominal drains were kept and abdomen was closed in layers. Post operatively the patients were kept nil by mouth till the return of their bowel activity, up till then they were given intra-venous fluid, injectable antibiotics with broad spectrum coverage and injectable analgesics and shifted to oral antibiotic therapy accordingly. Post operatively patients of obstructive colorectal malignancy were subjected to Colonoscopy/ Sigmoidoscopy and biopsy specimens were taken and were send for histopathological examination. Post-operatively patients were evaluated for complications in the form of infection, burst abdomen, fever, leak from anastomosis, septicaemia and other co-morbidities. Patients were discharged after removal of sutures. Operative mortality was defined as death occurring during the hospital stay of patient. Patients with obstructing colorectal malignancies were started on Chemotherapy and Radiotherapy after consultation with medical and radiation oncologist. All patients were followed up after discharge on 2 weeks, 1 month, 3 and 6 months.

RESULTS: In this study total 25 cases of adult large bowel obstruction were present. Out of total 211 cases, 25 cases accounted for 11.85%. So the incidence of large bowel obstruction in this study comes out to be 11.85%. Maximum patients were seen between 51-60 years of age with total 8(32%) cases. This was followed by age groups between 31-40years and 41-50 years with 5(20%) cases in each group. The mean age of presentation was 51 years with a standard deviation of ± 13.53 with a range in between 28 – 78 years. The present study showed that out of the total 25 cases, 15(60%) were males and 10(40%) were females. The male to female ratio comes out to be 1.5:1. Maximum 19(76%) cases reported after 72 hours of onset of complaints. Only 4(16%) cases reported at 48-72 hours and 2(8%) cases reported between 24-48 hours. None of the cases reported within 24hours of onset of complaints. 25(100%) patients had constipation i.e. they had not passed stools and flatus. 22(88%) cases had a complaint of pain in abdomen. Distension was seen in 21(84%) patients. Other symptoms were seen less frequent which included nausea and vomiting in 7(28%) patients, hematochezia in total 5(20%) patients, weight loss in 6(24%) patients and anorexia in 5(20%) patients. 14(56%) patients had pallor at the time of presentation. Tenderness was present in total 22(88%) cases while distension was seen in 21(84%) cases. Other symptoms like guarding and rigidity were seen in 4(16%) cases each. Increased bowel sounds were seen in around 21(84%) cases. Per rectal examination was positive in 7(28%) cases out of which 3(12%) cases had palpable rectal mass and rest 4(16%) patients had bloody discharge on the examining glove. 2(8%) patients presented in shock with less than 90-100 mm of Hg systolic Blood pressure. Pre-operatively only 3(12%) patients who were diagnosed of having obstructive colorectal malignancy by radiological examination had a serum marker assay done for malignancy in the form of Serum CEA levels which was found raised in all of them. X ray Chest PA view, X ray abdomen erect

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and USG was done in all 25(100%) patients. CT abdomen was done in 7(28%) patients who were diagnosed by ultrasonography and needed confirmation. This was done prior taking patient for operative intervention. X ray abdomen erect revealed bent inner tyre tube appearance in 13(52%) cases suggestive of sigmoid volvulus. 1(4%) case showed a distended colon with multiple small bowel air fluid levels which suggested intestinal obstruction but was not confirmed. 1(4%) patient known case of pulmonary Koch's had multiple air-fluid levels with a distended right colon. Other 7(28%) cases showed dilated large bowel peripherally with multiple air fluid levels. X ray of 1(4%) patient was normal. Ultrasonography was done in all cases which revealed distended bowel loops. It confirmed the findings of sigmoid volvulus in 13(52%) cases. 1(4%) case that later was diagnosed with caecal volvulus, 2(8%) case that later was diagnosed as Carcinoma sigmoid colon and other 1(4%) case who later was diagnosed with stricture in hepatic flexure colon we're not conclusive on USG. Other patients 1(4%) with ileocolic intussusception, 3(12%) cases of colonic cancer with palpable rectal mass and 4(16%) non diagnosed cases of colonic cancer were identified with features consistent with carcinoma on USG. A growth/mass was evident on USG in 7(28%) cases with additional information like regional spread, lymph node involvement, spread to liver etc. CT scan was done in total 7(28%) cases in which the diagnosis required further information and evaluation. All the 7 patients were cases of malignancy and preoperative CT scan was thus helpful in guiding the management. Out of the 4 cases one was of Carcinoma at hepatic flexure colon, two case of descending colon carcinoma and lastly a case of growth in hepatic flexure of colon. In the rest 3cases were diagnosed as a case of carcinoma rectum and other 2 cases were diagnosed with growth intraoperatively.6(24%) cases were diagnosed cases of hypertension and 3(12%) showed raised blood pressure in casualty, 4(16%) for diabetes mellitus and 2(8%) for bronchial asthma. 1(4%) patient had already been treated for pulmonary tuberculosis. 5(20%) cases already showed features of COPD. 7(28%) cases presented with sepsis with tachycardia, tachypnea, raised temperature and TLC.13(52%) cases of sigmoid volvulus out of which 5(20%) had developed gangrene, 1(4%) case of mass at the splenic flexure of colon, 1 case of ileocolic intussusception, 3(12%) cases had rectal growth, 4(16%) cases had mesenteric lymphadenopathy, 1(4%) case of stricture at the hepatic flexure of colon which was proved histopathologically to be secondary to abdominal tuberculosis,1(4%) case of mass in the hepatic flexure of colon, 1(4%) case of caecal volvulus with small bowel obstruction and 2(8%) case of mass in the sigmoid colon and 2(8%) cases of mass in descending colon. Primary sigmoid resection and anastomosis was performed in 15(60%) cases and Decompressive colostomies done in 10(40%) cases. Total 8(32%) patients developed minor wound infection in the form of pus discharge. These wounds were taken care by local wound care in the form of daily dressings. 3(12%) patients developed anastomotic leak out of which 2(8%) were managed conservatively with spontaneous closure of this low output fecal fistula while the third patient died. 1(4%) patient developed burst abdomen but died during the course of treatment. 6(24%) patients developed septicaemia. Out of this, 3 already had pre-op septicaemia which did not control and ultimately they died. 1(4%) patient with acute renal failure and acute respiratory distress syndrome died during the course of treatment. 2(8%) cases developed lower respiratory tract infection but recovered with high antibiotic coverage. 1(4%) developed MODS and died during treatment. The average stay of patients, excluding the dead was 14.52 +/- 4 days. It prolonged for the morbid patients who showed post-operative complications. Mortality was defined as death occurring during the hospital stay of patients. 3(12%) cases that died of septicaemia, 2 cases had sigmoid

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volvulus with gangrene and 1(4%) case of carcinoma rectum who presented with septicaemia on admission. 1(4%) case of anastomotic leak in operated case of sigmoid volvulus died due to generalized debility with superadded leak. 1(4%) patient died due to burst abdomen and presence of comorbidities was also a case of carcinoma rectum and 1(4%) patient died of Multi-organ dysfunction syndrome who had carcinoma sigmoid colon. The follow up was carried out at 2 weeks, 1 month, 3 and 6 months from date of discharge. Out of the total 19(76%) patients, 3(12%) patients were lost at the end of follow up of 1 month. All these 3(12%) patients were operated case of volvulus. The patients, who had been treated with diverting colostomies, excluding the patients who died, were followed and reversal procedure for benign large bowel obstruction was done at the end of 6 weeks while for malignant large bowel obstruction reversal was done after few days. Out of this 6(24%) patients Hartmann's reversal done in 2(8%) patients, abdomino-perineal resection was done in 1(4%) cases of low lying malignancy of Carcinoma rectum with a permanent end colostomy, anterior resection was done in 1(4%) cases of Carcinoma sigmoid colon with end colostomy and radical extended left hemicolectomy with closure of transverse colostomy with transverse-sigmoid anastomosis was done in the rest 2(8%) cases of Carcinoma descending colon. At the end of 6th month of follow up only 1(4%) case (operated case of mass in splenic flexure) reported hepatic metastasis and was given chemotherapy after consultation with oncologist. No case of any type of carcinoma showed recurrence or distant spread. 1 patient who had a pre-op Serum CEA levels done had a significant reduction in its levels on repeat examination of Serum CEA levels.

DISCUSSION: Chakraborty et al. (1979)² reported an incidence of 27.8% of large bowel obstruction in their study of intestinal obstruction. Their study reported total 114 cases out of 410 cases they scrutinized. Phillips et al. (2005)³ studied total 713 cases of malignant large bowel obstruction out of total 4583 cases they studied. An incidence of 15.55% was noted in their study. Markogiannakis H et al. (2007)⁴ reported an incidence of 24% of large bowel obstruction in their study. This study reported total 36 cases of large bowel obstruction out of 150 cases they studied. AZ Sule et al. (2011)⁵ reported an incidence of 13.85% of large bowel obstruction in their study. Their study was a prospective study which reported 50 cases of large bowel obstruction out of total 361 cases. Our study noted a total of 25 cases of large bowel obstruction out of 211 cases of intestinal obstruction. An incidence of 11.85% was found. Chakraborty et al. (1979)² reported a male: female ratio of 3:1 with a mean age of 58 years in an age group of 51-60 years. Fuzan M et al. (1991)⁶ in their study reported a male: female ratio of 2:1 with a mean age of 56 years. Souvik Adhikari et al. (2010)⁷ reported a male: female ratio of 4:1 with an age incidence of patients between 51-60 years followed by 31-40 years of age. AZ Sule et al. (2011)⁵ reported a mean age of 49 years which is matching with the present study. The male: female ratio of their study came out to be 3:1. The maximum patients of this study belonged to age group 41-50 yrs followed by 51-60 yrs. This could be well explained by the fact that the cases reported in the present study are less and also the reporting of female cases in our country is poor. Our study showed a male preponderance with 60% of cases accounting for a male: female ratio of 1.5:1. The mean age of presentation was 51 years with maximum 8(32%) cases in between 51-60 yrs followed by 31-40 yrs and 41-50 yrs showing 5(20%) cases each. Chakraborty et al. (1979)² reported that out of total 27.8% of cases of large bowel obstruction 55.8% cases belonged to sigmoid volvulus while colon cancer accounted for 15.1%. Thus this also clearly supports that sigmoid volvulus is a predominant etiology for acute large bowel obstruction followed by colon cancer which is followed by other causes. Doumi EA et al. (2006)⁸ reported in their study of

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intestinal obstruction, considering the total cases of large bowel obstruction maximum cases belonged to sigmoid volvulus accounting for 57.5% and colon cancer accounted for 40%.this is in accordance with the present study. AZ Suleet al. (2011)⁵ reported, around 72% of cases belonged to sigmoid volvulus and 24% were of colon cancer. Thus it clearly supports to the present study as sigmoid volvulus with the most common occurrence. The most common cause in our study of acute large bowel obstruction in adults with 52% cases followed by obstructing colo-rectal malignancies forming 36% of cases and other less common causes like intussusception, tubercular stricture and caecal volvulus forming 12% of cases. Out of the total obstructing colo-rectal malignancies 32% cases were of obstructing left colo-rectal malignancies while obstruction due to malignancy is very less in right colon i.e. only 4%. Markogiannakis H et al(2007)⁴ in their study where they evaluated 36 cases of large bowel obstruction showed that pain (74%), constipation (90%) and distension (96%) formed the chief complaints of patients while the major signs included tenderness (66%), distension (66%) and increased bowel sounds (66%). Palpable rectal mass (5%), guarding and rigidity (14.6%) etc. had a lesser occurrence. AZ Sule et al (2011)⁵ showed the following in which pain (100%), constipation (96%) and distension (96%) formed the chief complaints while nausea and vomiting (66%), anorexia (22%), weight loss (20%) formed the less important complaints. Tenderness (98%), distension (96%) and increased bowel sounds (92%) formed the major signs while to a lesser extent other signs like rectal mass (10%), guarding and rigidity (20%) were found. Our study of large bowel obstruction in adults showed that pain (88%), constipation (100%) and distension (88%) formed the chief complaints. Other complaints like nausea and vomiting (28%), weight loss (24%), anorexia (20%) and hematochezia (20%) were evident in only few patients. Tenderness (88%), distension (88%) and increased bowel sound (84%) formed the major signs. Other signs were present to a lesser extent of which included palpable rectal mass (12%), guarding and rigidity (4% in each) etc. N. G. B. Richardson et al. (1998)⁹ in their study showed that abdominal sonography had a sensitivity, specificity and accuracy of detection of colonic tumours considered to be consistent with a colonic carcinoma was 96, 67 and 91 per cent respectively. Thus this study is in concordance with the study. Chapman AH et al. (1992)¹⁰ in their study showed that the accuracy of X-ray in detection of large bowel obstruction was 84% which is matching with the present study. It also showed that a contrast enema is more useful in comparison than plain radiograph but contrast enema was not performed in the study. Frager et al. (1994)¹¹ compared diagnoses after clinical evaluation combined with plain abdominal radiography or CT. In patients with a complete obstruction, CT demonstrated a sensitivity of 100% compared with 46% after plain abdominal radiography. Of the 61 patients who underwent surgery, 52 patients were confirmed to be correctly diagnosed preoperatively (85%) based on CT findings. The exact location of the obstruction was correctly diagnosed in 50 of 53 patients (94%) on CT. present study did not compare plain radiograph with CT scan but definitely wherever CT was used it showed a 100% result which matches with the study by Frager et al (1994)¹¹ although the results with x-ray don't match with their study. Martinez-Ares D. et al. (2005)¹² showed that abdominal sonography presents a sensitivity of 80% and a specificity of 92% in the diagnosis of colon cancer. This study matches with the study. Van Randen A et al. (2011)¹³ in their study showed before subjecting the patient to an X-ray if a proper clinical evaluation is done than it is possible to detect obstruction in 74% cases and the diagnosis was correct in 66% cases. Their study concluded that the sensitivity of a clinical evaluation combined with a score card for clinical signs/symptoms proved to be similar to a clinical evaluation combined with plain abdominal radiography. This is

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nearer to the study. Gatsoulis N et al (2004)¹⁴ in their study of management of large bowel obstruction showed that they carried out primary resection and anastomosis in 67% of their patients and required colostomies and a second procedure in 33% of their cases which is in concordance of the study. AZ Sule et al.(2011)⁵ reported that they performed primary resection and anastomosis in maximum of their patients accounting to 90%.and performed colostomies in only 4% patients. Markogiannakis H et al. (2007)⁴ in their study showed a complication rate of 28%. They also suggested that in general the complication rate lies between 6-47%. AZ Sule et al. (2011)⁵ in their study of large bowel obstruction showed that anastomotic leak was found in 3.2% of cases while wound infection developed in 21.8% of cases. This can be considered comparable with the present study as the sample size being large. The findings of this study are comparable with the studies of Markogiannakis H et al.⁴ and AZ Sule et al.⁵ This study showed a higher rate of complication owing to late presentation of patients and due to preexisting comorbidities like chest infection, shock etc. Gatsoulis N et al (2004)¹⁴ showed a mortality rate of 14% in their study. Phillips et al (2005)³ showed a mortality rate of 23% in their study. AZ Sule et al. (2011)⁵ showed a mortality rate of 12% in their study. This study revealed a mortality rate of 24% out of the total 25 cases studied and operated it was high due to presence of comorbid conditions and late presentation of patients.

CONCLUSION: Patients with large bowel obstruction in adults form a small percentage of patients. Commonest causes are sigmoid volvulus and obstructing colorectal malignancies. X-ray abdomen, Ultrasound of abdomen and Computerized Tomography of abdomen are very helpful in diagnosing. Single stage resectional procedure without colostomies can be done in patients even in emergency surgeries and Proximal diverting colostomies may be safely performed in patients with pre-existing sepsis, shock, gangrene of large bowel and excessively loaded colon with reversal of colostomies and a definitive procedure may be performed later, after stabilisation of patients. Post-operative complications are more because of late presentation associated with comorbidities and large bacterial load of colon during resectional procedure large bowel obstruction carries an increased rate of mortality because of its presentation in old age with associated comorbid factors requiring major resectional procedures.

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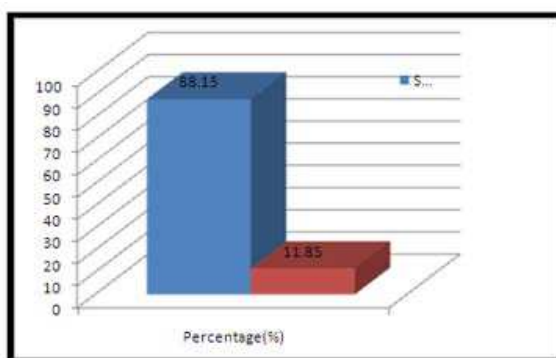
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Table1: Showing Incidence of LBO

Cause	No of cases	Percentage (%)
SBO	196	88.15
LBO	25	11.85
TOTAL	211	100

Where SBO – small bowel obstruction LBO – large bowel obstruction



Graph1: Showing Incidence of LBO

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Table 2: Age wise distribution of patients

Age Group(years)	No of patients	Percentage (%)
18-20	0	0
21-30	2	8
31-40	5	20
41-50	5	20
51-60	8	32
61-70	3	12
70-80	2	8
Total	25	100
Mean Age(Years)	51.00	
SD	13.53	
Range	28-78	

Graph 2: Age wise distribution of patients

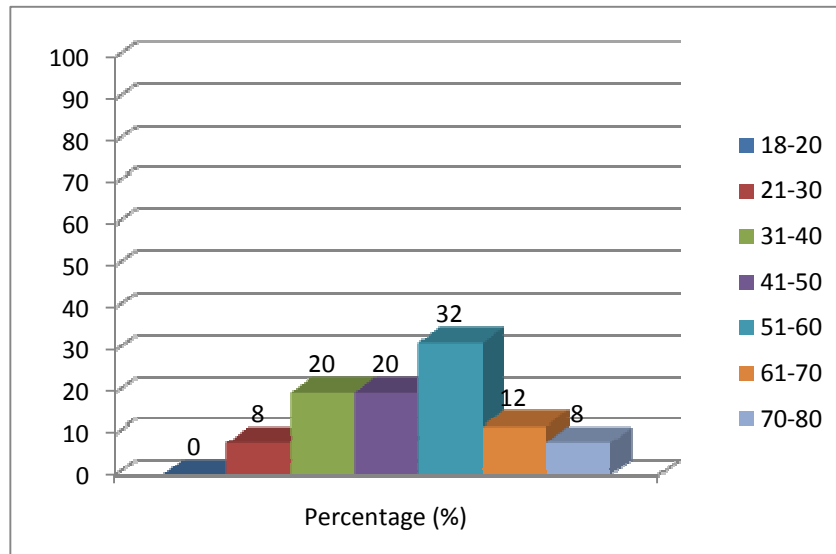


Table 3: Gender wise distribution of patients

Gender	No of patients	Percentage (%)
Male	15	60.00
Female	10	40.00
Total	25	100

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Graph 3: Gender wise distribution of patients

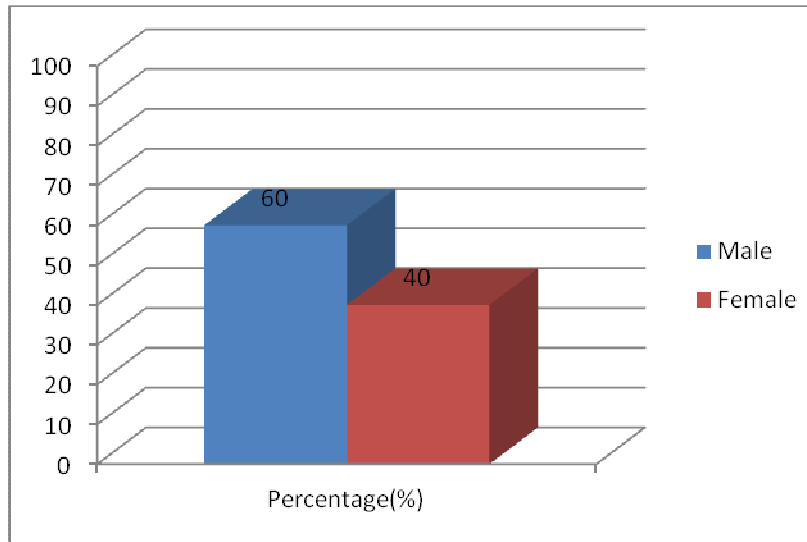
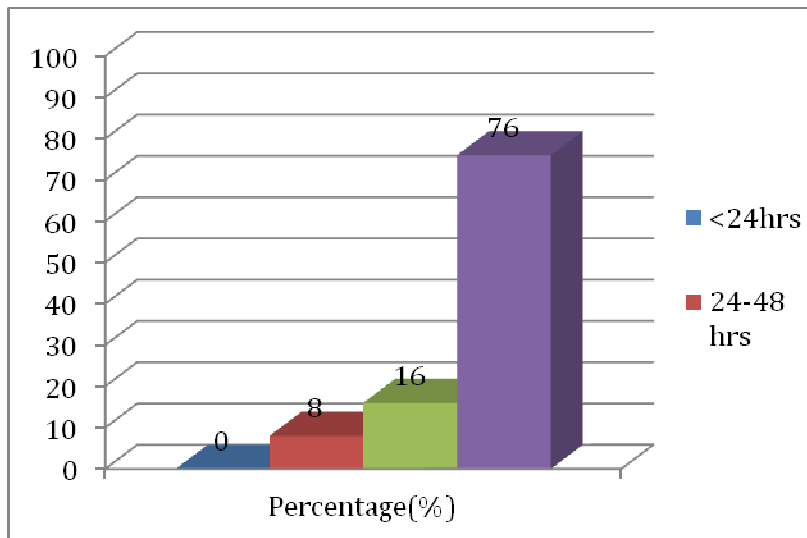


Table 4: Time of presentation

Time of presentation	No of patients	Percentage (%)
<24hrs.	0	0
24-48 hrs.	2	8
48-72hrs.	4	16
>72 hrs.	19	76
Total	25	100

Graph 4: Time of presentation



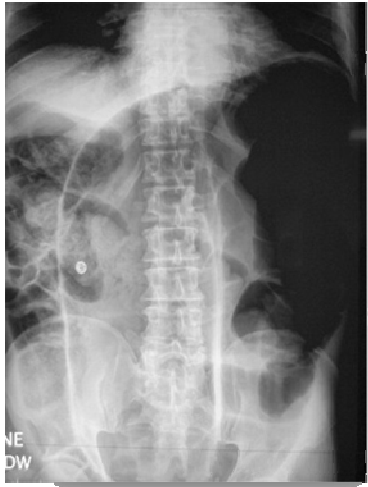


Photo 1: showing X-ray abdomen erect in a case of sigmoid volvulus.



Photo 2: Intraoperative photograph showing gangrenous sigmoid colon



Photo 3: Intraoperative photograph showing dilated colon with mesenteric lymphadenopathy in a case of mass at splenic flexure of colon

