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A Clinical Study Of Acute Large Gut Obstruction With Special Reference To Its Surgical Management

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Abstract:
Introduction: Acute large gut obstruction is a common emergency condition mainly affecting older age group with male predominance. Whatever may be the cause the management of acute large gut obstruction is a challenging one. Primary resection of the obstructing lesion without immediate anastomosis or with primary anastomosis are the options of which last one being a more popular approach recently.

Materials and methods: The cases were studied with a suitable proforma maintaining the records of detailed history, clinical examination, ancillary investigations as per as possible to reach a pre operative diagnosis of acute large gut obstruction, operative details and post operative complications.

Results: Most common cause of acute large gut obstruction is volvulus, and then comes carcinoma and lastly tuberculosis. Primary anastomosis in selected patients gives more satisfactory results then multiple staged procedures.

Conclusion: Right sided colonic obstruction can be managed by resection of obstructing lesions with primary anastomosis as a standard procedure, except in very poor risk patients. For left sided colonic obstruction surgeon should be aware of the controversies and consensus in its management.

Keywords: Acute large gut obstruction, Carcinoma colon, Volvulus

INTRODUCTION

In abdominal surgery acute large gut obstruction is a common surgical emergency and a frequently encountered problem [1,2]. It constitutes a major cause of morbidity around the world [3] and a significant cause of admissions in hospitals [2,4]. It is both medical and surgical emergency and prompt diagnosis and treatment should be done [5,6]. Intestinal strangulation should be diagnosed early to decide modes of intervention either surgical or non-surgical [7,8, 9]. Correct etiology identification is utmost important for proper treatment [5,6,9-11]. The clinical picture, however, of these patients[6,12,13] along with the etiology of obstruction[1,3,11,14-16] and prevalence of strangulation are variable[8,17,18], while a lot of controversies are there regarding appropriate treatment[1-3,10,17,19].
Worldwide primary or secondary metastatic carcinomas are responsible for more than 90% of large gut obstruction. In developing countries, with the people living on higher fibre diet up to 50% cases of acute large gut obstruction is due to volvulus.
Whatever may be the cause the management of acute large gut obstruction is a challenging one. At laparotomy having ascertained the nature and level of obstruction, the classical approach a surgeon

usually takes, is performing a proximal diverting enterostomy. Primary resection of the obstructing lesion without immediate anastomosis or with primary anastomosis are the other options of which last one being a more popular approach recently. The decision-making depends on various factors like site of obstruction, the nature of underlying pathology, the degree of peritoneal contamination, the age and general condition of the patient, any co-existing medical illness and the experience of the surgeon.
Over last few decades the operative strategy in patients with acute large gut obstruction has been shifting from conventional multistage surgery to primary resection with single stage definitive surgery in selected good- risk patients.

For right sided obstruction, nowadays, the opinion is right colectomy and primary anastomosis. But for the left colon and rectum, controversy remains. The single stage procedure offers the patient:
- No stoma related morbidity.
- Single operation with single hospitalisation
- Shorter hospital stays.

In staged surgery stoma care definitely increases morbidity. Particularly in developing countries, where specialized stoma care is merely possible careful selection of cases and technical precision can offer comparable outcome of single stage definitive surgery to multistage surgical procedures.

MATERIALS AND METHODS

The present study was undertaken on a series of 30 patients admitted in Department of General Surgery, Assam Medical College & Hospital with a diagnosis of acute large gut Obstruction during the study period. Complete large gut obstruction was diagnosed in patients presenting with absolute constipation, abdominal pain and distension constituting an acute abdomen requiring urgent resuscitation & surgical intervention, confirmed by distension of gut at laparotomy according to different level of obstruction in large gut.
The cases were studied with a suitable proforma maintaining the records of detailed history, clinical examination, ancillary investigations as per as possible to reach a pre operative diagnosis of acute large gut obstruction.

Resuscitation and simultaneous evalution of the patients were done to reach at an operative decision to suit each case according to its merit.

After preliminary preoperative resuscitation the said 30 patients were undergone laparotomy under general anaesthesia through mid line incision.

At laparotomy after the site and macroscopic pathological nature of obstruction being ascertained, the resection of affected segment of large gut with primary anastomosis were performed wherever possible depending on the pathology, site of obstruction, condition of gut wall, vascularity, level of faecal contamination, intraoperative haemodynamic stability and general condition of the patient.

Primary anastomosis was done in a meticulous single layer mucosa inverting technique by using ‘0-0’ delayed absorbable suture material preferably of braided coated polyglycolic acid material in interrupted fashion. Drains were placed in all cases.

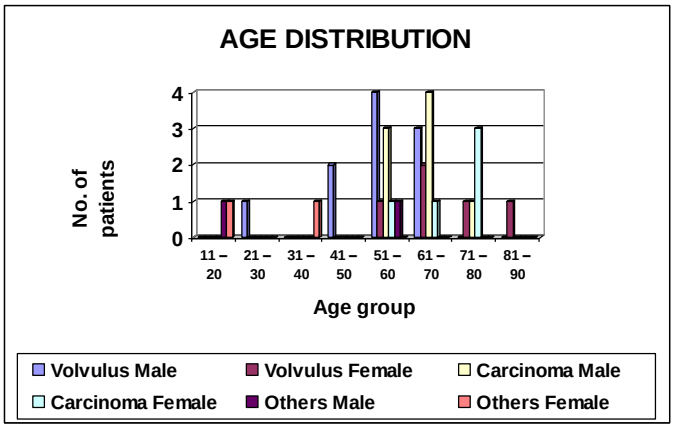
Proximal loop colostomy by using sigmoid colon or transverse colon according to level of obstruction or proximal end colostomy with distal mucus fistula or proximal end colostomy with Hartmann’s pouch were performed where primary anatomists may not be possible according to criteria stated earlier.

All wounds were irrigated before closure and abdomen was closed in mass fashion by using No.1 polypropylene suture.

Thorough post operative monitoring of the vitals with particular importance to water and electrolyte imbalance and correction of haemoglobin and serum albumin level as well as prevention and management of early complications were done meticulously.

RESULTS AND ANALYSIS

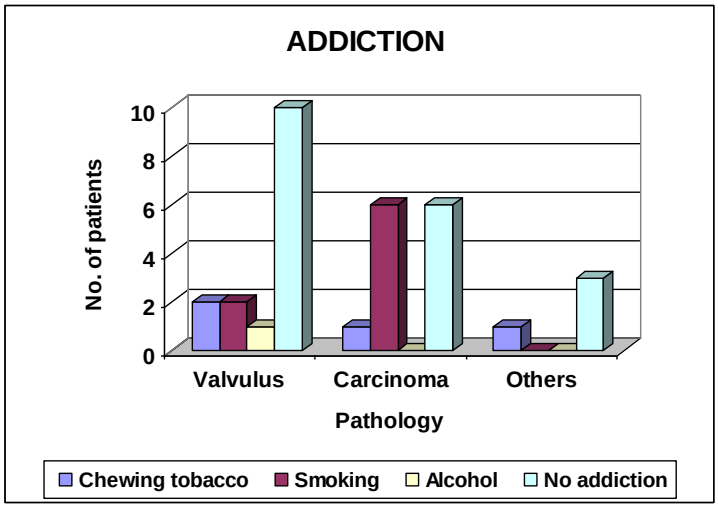
In the study it is seen that maximally affected age group in this study was 51 – 60 years and 61-70 years of age groups (both 31.25%each). Almost 80% cases of acute large gut obstruction occurred between 51 to 80 years of age.



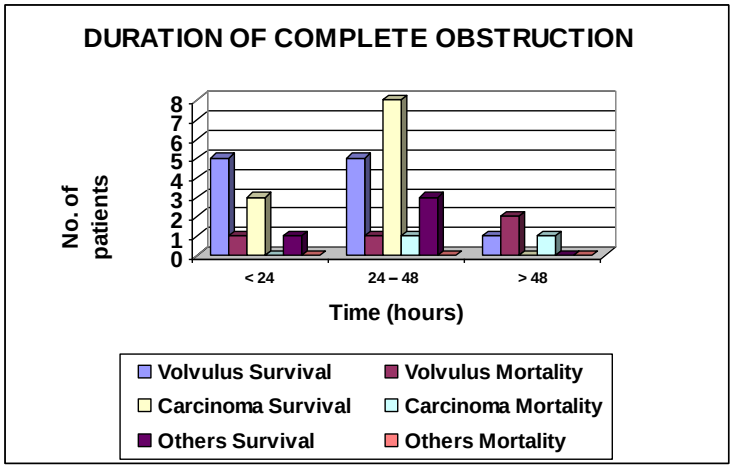
20 out of 32 cases were male (62.5%) and rest (37.5%) were female. In 15 cases of volvulus 10 cases were male (66.67%) and 5 were female (33.33%). In 13 cases of carcinoma 8 cases were male (61.53%) and 4 cases were female (38.47%).
In the present study we observed that 53.12% cases were Hindu and 46.88% of cases were Muslim. Among the 15 cases of volvulus. 10 cases (66.67%) are Hindu and 5 cases (33.33%) are Muslim. Among 13 cases of carcinoma 7 cases (53.84%) are Hindu and 6 cases (46.16%) are Muslim.

Socio-economic analysis of the study group revealed that 12.5% patients were from higher class, 43.75% from both middle and lower classes. Among 15 cases of volvulus 10 cases (66.67%) were from lower class, 4 cases (26.67%) from middle class and only 1 case (6.67%) from higher class, whereas among 13 cases of carcinoma, only 1 case (7.69%) was from lower class, 9 cases (69.23%) were from middle class and 3 cases (23.07%) from higher class. So higher incidence of volvulus occurred in lower socioeconomic group and that of carcinoma in middle to higher socioeconomic group.

In the present study it was observed that 12.5% patients had addiction of tobacco chewing, 25% were smokers and 3.12% were alcoholic. 59.37% patients had no addiction. 10 (66.67%) out of 14 cases of volvulus had no addiction whereas 7 cases (53.84%) out of 13 cases of carcinoma were addicted either to chewing tobacco or smoking.



When we studied duration of obstruction it was observed that 31.25% cases came with features of complete obstruction for < 24 hours duration, 56.25% for 24 – 8 hours duration and 12.5% for > 48 hours duration. Among the 10 cases, coming with features of complete obstruction for <24 hours 1 died. So, mortality in first group was 10%. Likewise, mortality in 2nd group (24 -48 hours duration of complete obstruction) was 11.11% and that of last group (>48 hours duration of complete obstruction) was 75%.



In the present study it was observed that 9.37% cases were presented with pulse rate <80/min, 46.87% with 80 – 100 /min and 43.75% with >100/min.Among 3 cases, presenting with pulse rate <80 min all (100%) survived. Among 15 cases of second group (pulse rate 80 – 100min) 2 cases (13.33%) died and among 14 cases of third group (pulse rate >100/min) 4 cases (28.57%) died. Over all among 6 causalities 2 cases (33.33%) were for second group and 4 cases (66.67%) were from third group.

In the present study it was observed that 25% cases were presented with MABP of >90 mm of Hg, 65.62% cases with 80 – 90 mm of Hg and 9.38% cases with <80 mm of Hg. Among the 8 cases of first group (MABP >90 mm of Hg) mortality was 0%. In the second group (MABP -80-90 mm of Hg), among 21 cases 5 cases (23.81%) died. In the last group among 3 cases 1 (33.33%) died.
In was also observed that 90.62% cases were presented with abdominal distension, 59.37% with abdominal colic, 21.87% with vomiting 21.87% with loss of weight, 9.37% with lump in abdomen and 31.25% with haematochezia. Among the 15 cases of volvulus the occurrence of abdominal distension was 86.67%, abdominal colic 60%, vomiting 13.3%, loss of weight 0%, lump in

abdomen 0% and haematochezia 0%. Among 13 cases of carcinoma the percentages were 100%, 46.15%, 15.38%, 30.76%, 15.38% and 69.23% respectively.

TABLE INDICATING SITE OF OBSTRUCTION

Site of Obstruction	Pathology			Total	Percentage
	Volvulus	Carcinoma	Others		
Caecum	0	2	2 (TB)	4	12.5%
Ascending colon	0	0	1 (Duplication cyst)	1	3.12%
Transverse colon	0	1	1 (TB)	2	6.25%
Descending colon	0	2	0	2	6.25%
Sigmoid colon	15	3	0	18	60%
Rectum	0	5	0	5	15.62%
Total	15	13	4	32	100%

Etiologic analysis revealed that in the present study was observed that in 46.87% cases presenting with acute large gut obstruction were due to volvulus. Resectable and unresectable carcinoma affected. 34.37% and 6.25% cases respectively. 3 cases (9.37%) were due to tuberculosis and 1 case (3.12%) was due to duplication cyst.

In the present study it was observed that mortality rates from both, single stage surgery and staged surgical procedure were almost equal (15% and 16.67% respectively). Among 15 cases of volvulus, in 9 cases single stage surgery was performed and among 13 cases of carcinoma in 7 cases single stage surgery was performed. In all other type of cases single stage surgery was performed.

We had also observed that 13 cases had their post operative blood haemoglobin level $\geq$ 10 gm%, of which 9 cases were with single stage surgery and 4 cases with staged surgical procedure and there was no mortality irrespective of type of surgery. 19 cases had their post-operative blood haemoglobin level <10 gm%, of which in 11 cases single stage surgery was undertaken with 3 mortality (27.27%) and in rest 8 cases staged surgical procedure was under taken with 3 mortality (37.5%).

In the present study we observed that 14 cases had their post operative serum albumin level > 3 g% and there was no mortality irrespective of surgical procedures undertaken. 13 cases were with post operative serum albumin level of 2 - <3 gm%, of which in 7 cases single stage surgery had been undertaken with 2 mortality (28.57%) and in 6 cases staged surgical approach had been undertaken with 1 mortality (16.67%). 5 cases revealed with post operative serum albumin level <2 gm%, of which in 1 case single stage surgery had been undertaken with 100% mortality and in rest 4 cases staged surgical procedure had been undertaken with 2 mortality (50%).

This study also indicated varied outcome in terms of mortality with presence of different post operative complications in respect to single stage surgery and staged surgical procedure. As in this study we observed that 3 out of 4 cases of anastomotic leakage had died (mortality rate 75%). With single stage surgery, out of 5 patients complicated by intra peritoneal abscess, 3 (60%) died.

The study also demonstrated the different mortality rate in different pathology of acute large gut obstruction with different surgical procedures. With single stage surgical procedure there were 22.22%, 14.28% and 0% mortality in cases with volvulus, carcinoma and other group (3 cases of tuberculosis and one case of duplication cyst) respectively. With staged surgical procedure there were 33.33% and 16.67% mortality rate in cases with volvulus and carcinoma respectively. There was overall 18.75% mortality in the present study.

It was further observed that 4 cases of volvulus were for second stage surgery in which operation was done in each case with 1 mortality (25%). Out of 5 cases of carcinoma prepared for second stage surgery, 1 case refused further operation and another 1 case was proved to be inoperable .3 cases were undergone second stage surgery with 1 mortality (33.33%).

HISTOPATHOLOGICAL EXAMINATION

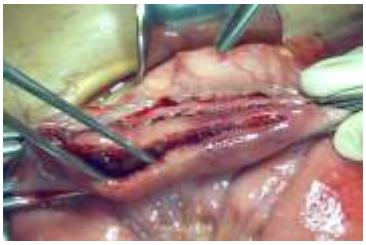
In all cases, except for volvulus, specimens in formalin were sent for histopathological examination. Specimens of 12 cases revealed adeno carcinoma of different grades, 3 cases tuberculosis and 1 case duplication cyst.

PHOTOGRAPHS:


DILATED LOOP OF SIGMOID COLON IN A CASE OF MALIGNANT STENOSING GROWTH IN THE SIGMOID COLON (PATIENT NO. 5)
LEFT COLONIC OBSTRUCTION (PATIENT NO. 19).


SIGMOID VOLVULUS (ARROW) (PATIENT NO. 4).
MACROSCOPIC APPEARANCE OF RECTAL CARCINOMA PRODUCING INTESTINAL OBSTRUCTION (PATIENT NO. 6).


DISTENDED COLON DUE TO VOLVULUS (PATIENT NO. 12)
FAECAL FISTULA IN A POSTOPERATIVE PATIENT WITH CARCINOMA OF ASCENDING COLON (PATIENT NO. 29)




ILEOTRANSVERSE ANASTOMOSIS (FIRST AND SECOND LAYERS) IN A PATIENT WITH INOPERABLE ASCENDING COLON MALIGNANCY (PATIENT NO. 29).


ILEOTRANSVERSE ANASTOMOSIS (THIRD AND FOURTH LAYERS) IN A PATIENT WITH INOPERABLE ASCENDING COLON MALIGNANCY (PATIENT NO. 29).

DISCUSSION

This study included 32 cases of acute large gut obstruction admitted in Department of General Surgery, Assam Medical Collage & Hospital during the study period from September, 2009 to August, 2010.

AGE

80% of cases of acute large gut obstruction were from 6^{th} to 8^{th} decade of life. Maximum cases of volvulus occurred in 6^{th} and 7^{th} decade and that of carcinoma being nearly equally distributed in 6^{th}, 7^{th} and 8^{th} decade of life. Though acute large gut obstruction was a disease of higher age, in our study it was 58.09 years, probably due to short number of cases and also due to occurrence of tubercular obstruction which usually affected younger age group.

SEX

Overall, 62.5% cases of acute large gut obstruction were found to be male, rest were (37.5%) female. So male - female ratio of acute large gut obstruction in this study was 1.66:1. This ratio was more or less equally applicable for both cases of volvulus and carcinoma. Tuberculosis, as a case of acute large gut obstruction showed, equal sex distribution. So, from this study we can see acute large gut obstruction had male prevalence.

RELIGION

Overall, 53.12% cases were found to be Hindu and 46.88% Muslim. In case of volvulus the Hindu-Muslim ratio was 2:1 and in case of carcinoma the ratio was 1.16:1. All of the cases of tubercular obstruction and one case of duplication cyst were Muslim.

SOCIOECONOMIC STATUS

Volvulus mainly affected patients from lower socio-economic group, whereas carcinoma affected middle to higher socio-economic group. Maximum cases of tubercular obstruction (2 out of 3) came from lower socio-economic group. Lower socio-economic group consume higher fiber diet and volvulus is common in this group. Carcinoma usually affects middle to higher economic group having a food consisting of >20% of fat.

ADDICTION

59.37 % of total cases had no addiction. 53.84% cases of carcinoma were addicted either to smoking or chewing tobacco. But no strong correlation was observed between addiction to tobacco and acute large gut obstruction.

DURATION OF COMPLETE OBSTRUCTION

Acute large gut obstruction is an emergency condition and as the duration of obstruction increases, also rises the rate of complications as well as adverse postoperative outcome. From this study it was revealed that higher duration of obstruction was clearly related to higher mortality and morbidity. This is because, larger the duration of obstruction there are higher vascular compromise of obstructed gut and higher intraluminal bacterial proliferation with increased risks of systemic dissemination.

PULSE RATE AT PRESENTATION

Higher pulse rate at presentation indicates haemodynamic instability, questioned viability of gut, possible systemic absorption of endoluminal bacterial toxins, strangulation or even perforation. Our finding in this study showed close relation to the said matter as we observed higher mortality in the group of patients presented with higher pulse rate (>100/min).

MEAN ARTERIAL BLOOD PRESSURE AT PRESENTATION

Mean arterial blood pressure (MABP) at presentation is more informative about the homodynamic condition of the patient than pulse rate at presentation and therefore a good prognostic indicator. In this study we can see there were no mortality in the group of patients presented with >90 mm of Hg MABP whereas 50% mortality in the group of patients with <80 mm of Hg MABP at presentation. So lower mean arterial blood pressure at presentation is associated with adverse outcome.

MAJOR CLINICAL FEATURES:

Patients with acute large gut obstruction were presented with absolute constipation, abdominal distension, colicky abdominal pain and vomiting. Of these features absolute constipation was present in 100% of cases, abdominal distension in 90.62% cases, abdominal colic in 59.37% cases and vomiting in 21.87% cases. These were the features encountered at presentation. As for example >80% of cases had history of abdominal colic from the onset of acute obstruction, but at presentation only 56.67 % cases had abdominal colic.

SITE OF OBSTRUCTION:

In our study most common site of obstruction was sigmoid colon (60%). We found all cases of volvulus (15 out of 15) to be of sigmoid colon origin. Our finding of 100% sigmoid volvulus was probably due to short number of cases. In our study all the lesions were obstructing in nature and their incidences were 38.46%, 23.07% and 15.38% respectively. So our finding was more or less comparable to above study. 3 cases were due to tuberculosis, of which in 2 cases the site of obstruction was caecum and in 1 case, transverse colon. In one case the cause of obstruction was pressure effect by a duplication cyst situated in vicinity of ascending colon and proximal 1/3 rd of transverse colon, obstructing ascending colon.

OPERATIVE PROCEDURE AND PER OPERATIVE PARAMETERS:

Primary resection and anastomosis is the mainstay of surgical management of right sided colonic obstruction. In the present study all of 4 cases of right sided colonic obstruction had undergone resection with primary anastomosis without any diversion, resulting in fair results and thus reaffirmed the satisfying gold standard procedure. No comparison of outcome could be done as no staged procedure was performed in right sided colonic obstruction.

Comparison came in cases of left sided colonic obstruction. Primary, resection of obstructing resectable lesion with primary anastomosis, except in very poor risk patients, is now accepted and practiced by many authors. In our present study, out of 15 cases of sigmoid volvulus, 9 cases were undergone resection with primary anastomosis with 2 mortality (22.22%) and 6 cases were undergone staged procedure with 2 mortality (33.33%) after first stage of operation. In case of carcinoma the percentage is 16.67% in both groups. Out of total 28 cases of left sided obstruction single stage procedure was performed in 16 cases with 3 mortality (18.75%) and staged surgical procedure was undertaken in 12 cases with 3 mortality (25%) after first stage operation. So outcome of single stage surgery was comparable to staged procedure or even found to be better.

The out come of second operation in cases of staged surgical procedure was considered only in terms of mortality in this study. In cases of volvulus all the cases of staged procedure were undergone second stage surgery with 1 mortality (25%) and in cases of carcinoma only 3 patients out of 5 cases of staged procedure were undergone second stage surgery with 1 mortality. This result being added to previous one, the original outcome would stand heavily against staged procedure.

A very much important intra operative parameter is intraoperative hypotension which adversely affects the outcome of a primary anastomosis. Primary anastomosis done in face of intraoperative hypotension in our study (2 in number) resulted in 100% mortality. Duration of operation is also important as per operative complications increase with increase in duration of operation. In our study we observed 50% mortality in those cases where operation had taken > 3 hours.

POST OPERATIVE HAEMOGLOBIN LEVEL AND SERUM ALBUMIN LEVEL

In our study we found no mortality in 13 patients having their post operative haemoglobin level ≥10 gm%. In patients with post operative haemoglobin level <10 gm% we routinely arranged blood or preferably packed cell transfusion to reduce complications.

In our present study we observed no anastomotic leakage and mortality in the cases having post operative serum albumin level ≥3 gm%. Poor nutritional status affects anastomotic healing and serum albumin is a good indicator of nutritional status.

Resection of obstructing lesion with primary anastomosis shows comparable outcome to staged surgical procedures and as longterm morbidity is known to be higher with staged surgical procedure primary anastomosis after resecting obstructing lesions should be advocated in all but very poor risk patients with colonic obstruction at any site.

So, what is needed, is a model of risk assessment. On the basis of current literature, the predictors of anastomotic healing include – age of the patient, duration of complete obstruction, nutritional status, perioperative haemodynamic status, coexisting medical illness, vascularity of gut wall, degree of peritoneal contamination, surgical techniques and some other yet unidentified variables.
This study had some drawbacks. These were –
- Short duration of study (1 year)
- Small number of cases.
- No randomisation
- No standardization for experience of operating surgeon.
- Short duration of follow up.

Large bowel obstruction accounting for about 20% of total obstruction cases[9,20,21]. Our results, even though some differences are noticed, are in accordance with the literature[6,12,13,22,23].

Adhesions, volvulous and large bowel cancer constitute the most frequent causes of obstruction[3,4,9,11,14,16,17,20,21,24-30]. The vast majority (65%-90%) of the patients with adhesive obstruction have undergone previous abdominal operations[6,13,14,18,19,26,28,29]. Among the surgical operations appendectomies, gynecological operations, cholecystectomies, and large bowel cancer resections were more prevalent. This is also in accordance with the literature[2,18,19,28,29]. In most patients of adhesive obstruction non-surgical treatment may be attempted[2,3,9,12,16-19,24,28-30].

CONCLUSION

Acute large gut obstruction is a common emergency condition mainly affecting older age group with male predominance. Most common cause of acute large gut obstruction in third world nation is volvulus, and then comes carcinoma and lastly tuberculosis. Volvulus mainly affects lower socio economic group consuming high fiber diet. Right sided colonic obstruction can be managed by resection of obstructing lesions with primary anastomosis as a standard procedure, except in very poor risk patients. For left sided colonic obstruction surgeon should be aware of the controversies and consensus in its management. Careful selection of cases with left sided obstruction, depending on meticulous assessment of preoperative and peroperative vitals, and technical precision offer better outcome with single stage definitive surgery than staged surgical procedure.

The author has declared that no competing interests exist.

Human Ethics

Consent was obtained or waived by all participants in this study. Ethical Review Committee, Assam Medical College, Dibrugarh, Assam.

Animal Ethics

The author has confirmed that this study did not involve animal subjects or tissue.

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