

# Emergency subtotal/total colectomy in the management of obstructed left colon carcinoma

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## Abstract

*Background:* Subtotal colectomy with ileosigmoid or ileorectal anastomosis is one of the standard procedures for obstructed tumors of the left colon. Traditionally, left sided acute bowel obstruction is treated by a staged procedure because immediate resection and anastomosis in a massive distended and unprepared colon carries a high complication rate. One of the arguments for subtotal colectomy is that this procedure will remove synchronous proximal neoplasms and reduce the risk of subsequent metachronous tumor. The purpose of this study was to evaluate the procedure of subtotal colectomy in the management of acute obstructed carcinoma of the left colon as a single stage operation.

*Methods:* From January 2009 to December 2011, this study included 60 consecutive patients who underwent emergency operations for obstructing primary left colorectal cancers with ileosigmoid or ileorectal anastomosis according to tumor position.

*Results:* The site of left colon obstruction was the rectosigmoid in 24 patients (40%), sigmoid colon in 28 patients (46.6%), descending colon in 3 patients (5%), and the splenic flexure in 5 patients (8.3%). The histopathology was Dukes B2 in 15 patients (25%), Dukes C in 25 patients (41.66%), Dukes D in 20 patients (33.33%). Fifty six patients (93.33%) had an obstructing cancer. Four patients (6.66%) had synchronous tumors (caecum in two patients; hepatic flexure in one patient and transverse colon in one patient).

*Conclusion:* This study has shown that patients who present with left sided colonic obstruction may be safely treated by primary resection and anastomosis with satisfactory outcomes.

*Key words:* Intestinal obstruction, colorectal cancer, ileosigmoid, ileorectal anastomosis.

## Introduction:

Colorectal cancer (CRC) is the second most common cause of cancer mortality among men and women in the United States. Although surgery is the first therapeutic option for CRC under elective conditions, a small percentage of CRC present as a surgical emergency. Over 15% of colorectal cancers present as acute colonic perforation or obstruction, despite cancer screening programs and routine endoscopy.<sup>2,3</sup> For patients presenting with colorectal cancer as a surgical emergency, the prognosis is poorer as compared to patients presenting under elective admissions, with higher morbidity and mortality of up to 15%.<sup>4,5</sup> Factors contributing to mortality and morbidity in these patients are old age, co-morbid conditions, diminished vascularity of obstructed bowel, fecal loading, intraoperative contamination, and technical difficulties in

handling the distended colon, and therefore the treatment of acutely obstructed carcinoma of the left colon still represents a matter of controversy.<sup>6</sup>

During recent years, extended right hemicolectomy or subtotal colectomy and ileal-sigmoid or rectal anastomosis has been applied for the treatment of obstructed carcinoma of the left colon and recto-sigmoid region. The procedure has the advantage of resolving the problem in one operative stage, while offering a low post-operative morbidity as a result of immediate removal of the distended, ischemic and full of virulent content colon.<sup>7,8</sup> However, when the obstructed tumor is located at the recto-sigmoid junction and removal of the upper rectum is mandatory, a small rectal stump with reduced capacity usually result in increased daily bowel motions and, possibility of faecal incontinence.<sup>8</sup>

Traditionally, left sided acute bowel obstruction is treated by a staged procedure because immediate resection and anastomosis in a massive distended and unprepared colon carries a high complication rate, with a mortality rate of 8.2% after an emergency operation.<sup>9-12</sup> Additionally, patients undergoing a one-stage emergency curative operation for obstructing tumors will have a lower survival probability than patients with non-obstructing lesions.<sup>13</sup> In some cases, improved outcome after emergency surgery for colorectal cancer has been reported.<sup>14</sup> Elderly patients undergoing elective surgery have a more favorable prognosis than age matched patients having emergency surgery.<sup>15</sup> In evaluating risk factors for patients presenting as surgical emergencies due to CRC, emergency patients had more advanced tumors, were older, and were much more likely to be widowed.<sup>16</sup> Emergency bowel surgery in the elderly is significantly affected by delayed admission, nature and extent of bowel disease, pre-existing cardiopulmonary disease, presence of generalized peritonitis, requirement of bowel resection and procedure choice.<sup>17</sup>

Increasingly, studies have been published advocating the advantages of primary resection with immediate anastomosis, the potential benefits include shorter hospital stay, reduced mortality and morbidity rates, and avoidance of stoma.<sup>18-21</sup> One of the arguments for subtotal colectomy is that this procedure will remove synchronous proximal neoplasms and reduce the risk of subsequent metachronous tumor development compared with segmental resection.<sup>22-24</sup>

A two-stage procedure, involving segmental resection of obstructed bowel followed by either Hartmann's closure of the distal stump, or exteriorization of the stump as a mucous fistula with proximal bowel exteriorized as an end stoma, is popular because it is quick, does not risk anastomotic leakage, and is technically less demanding than a single-stage operation. The main disadvantages are that up to 60% of stomas are never reversed, the expense and morbidity of the takedown procedure are significant, and patients have to make physical and psychological adjustments to live with a stoma.<sup>25</sup> Primary resection and anastomosis with a proximal diverting stoma is an alternative

two-stage procedure that may be adopted in high risk anastomosis, on the other hand the classic three-stage operation is usually challenged because of its high cumulative mortality and morbidity rates and compromised long term survival resulting from delay in resection of the tumor.<sup>26,27</sup> This procedure is rarely performed any more except in very poor risk patients.

The purpose of this study was to evaluate the procedures of subtotal colectomy in the management of acute obstructed carcinoma of the left colon as a single stage operation.

### **Methods:**

From January 2009 to December 2011, 60 consecutive patients who underwent emergency operations for obstructing primary left colorectal cancers in the Department of Surgery, Alexandria Main University Hospital, were included in this study. These patients had clinical features of acute, or sub-acute intestinal obstruction, and the abdominal x-rays showed dilated colon or small bowel with multiple fluid levels. These patients were admitted through the Emergency Department and underwent emergency operations. Computed tomography (CT) was done for all patients to evaluate the possible cause, site of obstruction, relation and stage of the tumor. In those patients with colonic cutoff on abdominal x-rays and without clinical signs of peritonitis, lower gastrointestinal endoscopy was performed whenever possible to investigate the site and nature of the obstruction. This was performed without per-oral bowel preparation.

After initial fluid resuscitation, correction of electrolyte disturbances, appropriate medical consultations, and optimization of medical conditions; informed consent was taken and surgery was arranged. Prophylactic antibiotics were given at the time of induction of anesthesia and continued. In fact, during this period, one-stage resection and anastomosis (subtotal colectomy) were often used in this series because past experience and publications favored this procedure, therefore subtotal colectomy was performed for every patient regardless of age or gender except for those patients who were hemodynamically unstable or had general peritonitis.

Laparotomy was most often performed through a midline incision. The site and nature of left colon obstruction was confirmed, and when necessary, obstructed large bowel was decompressed by insertion of a needle attached to a suction apparatus. Gaseous decompression of colon allowed access to the rest of the intra-abdominal organs, which were examined. The choice of resection was determined by the following: synchronous pathology, fecal load, colonic perforation, serosal tears of the cecum, and massive cecal distension with ischemia. The presence of these features in a hemodynamically stable patient without diffuse

peritonitis strongly favored subtotal colectomy with ileorectal anastomosis.

The colon, after mobilization, was resected from the terminal ileum down to a minimum distance of 5 cm distal to the tumor (Figures 1,2). If a portion of the sigmoid colon was preserved for distal anastomosis, the origin of the inferior mesenteric artery would be preserved and the left colic artery would be ligated and divided at its origin. The inferior mesenteric vein was ligated and divided near the duodenum, thereby permitting a generous removal of mesenteric lymph node.



(A)



(B)



(C)

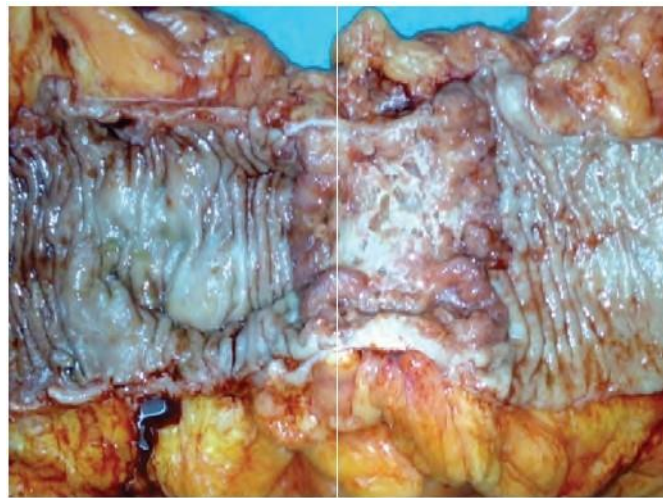
Figure (1): Total colectomy for cancer sigmoid.



(A)



(B)



(C)

Figure (2): Obstructing sigmoid cancer.

### Results:

A total of 60 patients were treated surgically for left sided malignant colonic obstruction; 38 (63.33%) were females and 22 (36.67%) were males. Average age was 47.5 (38- 67) years. Absolute constipation was the primary complaint of 56 patients with a median time from onset of obstructive symptoms to presentation of 8 days (range 12 hours to 2 weeks), 4 patients presented with infrequent passage of flatus. Other presenting symptoms included abdominal colicky pain and distension. All patients had used laxatives to treat their constipation. The site of left colon obstruction was the rectosigmoid in 24 patients (40%), sigmoid colon in 28 patients (46.6%), descending colon in 3 patients (5%), and the splenic flexure in 5 patients (8.3%). The histopathology was Dukes B2 in 15 patients (25%), Dukes C in 25 patients (41.66%) and Dukes D in 20 patients (33.33%).

Fifty six patients (93.33%) had an obstructing cancer. Four patients (6.66%) had synchronous tumors (cecum 2; hepatic flexure 1; transverse colon 1). No patients presented with peritonitis as a result of bowel perforation.

All patients underwent a one-stage procedure with resection and primary anastomosis. Of those who underwent primary resection and anastomosis, 52 patients (86.66%) had subtotal colectomy with ileorectal anastomosis, while 8 patients (13.33%) had ileosigmoid anastomosis. Median time taken to complete operation was 186 minutes (range 120 to 330 minutes). Operative blood loss was estimated at a median of 500 mL (range 100 to 1800 mL). Thirty five patients (58.33%) required blood transfusion of 1 to 3 units.

Forty four patients (73.33%) required fresh frozen plasma and human albumin transfusion. Median hospital stay for the entire group was 10 days (range 6 to 30 days).

Three postoperative anastomosis leak occurred (5%), the first one was male (subtotal colectomy with ileorectal anastomosis) with leak of intestinal content in the fifth post operative day that failed to close with conservative management. Ultrasound abdomen revealed intra-abdominal collection that required reoperation, exploration revealed disruption of the lateral angle of the ileorectal anastomosis that was treated by repair with proximal ileostomy. The patient improved well and ileostomy was closed successfully after three months. The second one was female with ileorectal anastomosis, with smooth post operative recovery. The patient was discharged from hospital, one month later; she developed fever, tachycardia, with abdominal distension and tenderness over the left iliac and lumbar regions. CT abdomen revealed large cystic localized collection, mostly abscess, ultrasound guided aspiration with insertion of pig-tail catheter for drainage was done. Three days later, intestinal content came out instead of pus and the patient became toxic. Abdominal exploration revealed the presence of the drainage tube in a loop of ileum about 80 cm proximal to the site of anastomosis that showed a minute defect as well; repair of the anastomotic defect was done and the injured loop was brought out as an ileostomy. The patient's condition improved and received adjuvant therapy for one year. CT abdomen later was done and revealed no recurrence nor metastasis, and ileostomy was closed.

The last one was female with ileorectal anastomosis, 40 days after discharge from hospital; she developed discharge of intestinal content from the site of left-sided drain, she was admitted where ultrasound abdomen revealed no collection. Conservative management with correction of albumin level for two weeks was done and she was discharged from hospital totally free.

One mortality (1.66%) was encountered one year post operatively, as a result of multiple liver deposits and brain metastasis.

Post operative morbidity were encountered either as a complication of surgery itself in the form of wound infection in 6 patients (10%), or systemic complication in the form of basal lung collapse with pneumonia in 2 patients (3.33%).

## Discussion:

Colorectal cancer presenting as a surgical emergency can represent a problem to all surgeons involved in management of these patients. Initial assessment and management of the patient should be focused on the patient as a whole, taking into consideration comorbidities, risk factors, physical condition, and stage of disease.<sup>28</sup> Emergency surgery for colorectal cancer is associated with a longer median hospital stay than for elective cases.<sup>29</sup> Physical status at presentation is the principal determinant of outcome after emergency admission given the poor conditions of emergency patients.<sup>29</sup> The type of surgical procedure for colorectal cancer depends primarily on the location of the lesion and the ability of a given patient to tolerate a specific procedure.

Resection with anastomosis is not frequently considered for obstructive lesions of the colon, especially in left colon obstruction. Instead, most patients in this situation are traditionally handled by a diverting stoma or resection with a stoma, which necessitates a second or even a third operation in the future for bowel continuity to be restored. However, one-stage resection and anastomosis have several advantages, including the following: saving of time and reduction in hospital costs; avoidance of the risk of a second operation; elimination of the waiting period because of a second operation; avoidance of the trouble and embarrassment resulting from a temporary colostomy; offering a better quality of the remaining life for patients with incurable malignancies.<sup>30</sup>

Subtotal colectomy for colorectal cancers presenting as a surgical emergency has been described for use in a number of studies.<sup>31-34</sup> The rationale for use of this procedure is based on the fact that the terminal ileum has a rich blood supply.<sup>34</sup> The other rationale is based on the fact there may be synchronous lesions of colorectal cancer at the time of presentation. In a series by Arnaud et al there were 6.8% synchronous colorectal cancers at the time of acute presentation.<sup>34</sup> Thus, the advantages of this procedure includes the lack of necessity for a colostomy, and that the operation deals with any synchronous tumors and minimizes future colonic tumors.<sup>31,33,34</sup> Subtotal

colectomy achieves relief of bowel obstruction and ensures restoration of gut continuity. The removal of the right colon is based on the premise that the proximal colon when distended and filled with liquid feces, often has dubious viability and signs of impending variability<sup>34,35</sup> Subtotal colectomy was previously thought to require the intervention of an experienced surgeon and this concept has been reiterated.<sup>35,36</sup>

One of the major functional issues with subtotal colectomy has been frequency of bowel movements, which average 2-4 bowel movements per day.<sup>32-35</sup> In our study, patients with subtotal colectomy with ileorectal anastomosis experienced 3-4 bowel motions per day which was in concordance with this result. After subtotal colectomy with ileosigmoid anastomosis which were done for 8 patients (13.33%), nearly all patients were able to pass 1-2 bowel motion per day.

Our data showed no post-operative mortality, only mortality was encountered in one patient one year after operation as a result of metastatic deposits. No difference in resection rate, anastomotic leak rate (3 patients, 1 major leak, 2 minor leak, one of them was converted to major leak as a result of injury at the time of insertion of beg tail to drain intra-abdominal abscess) and morbidity (13.33% in the form of wound infection in 6 patients, and pneumonia in 2 patients) are encountered between our results and those in literatures. Moreover, operative time, operative blood loss, or length of hospitalization encountered in the literature even after segmental resection, or resection for obstructing tumor in the right side were in concordance with our results.<sup>30-37</sup>

There were multiple associated procedures during colectomy, but none of them were associated with significant morbidity, so they were not likely to be correlated with mortality. Although albumin levels were always determined, many operations were performed before data on the albumin level were available. Thus, the decision of whether anastomosis can be performed was not dependent on albumin level. There was no direct correlation between albumin level with complications and mortality. It should be stressed that a safe colorectal

anastomosis depends on appropriate judgment, a good blood supply, a tensionless anastomosis, and meticulous technique, but it does not depend on a well prepared colon. One stage resection and anastomosis is feasible in most patients with acute obstruction of the right and left colon, except in those patients who are hemodynamically unstable or who have severe peritonitis<sup>38</sup>

In conclusion, this study has shown that patients who present with left sided colonic obstruction may be safely treated by primary resection and anastomosis with satisfactory outcomes, more over synchronous lesions of colorectal cancer at the time of presentation, or colonic polyps that present in other sites of the colon were removed at the time of operation. Factors that likely contribute to these results include adequate resuscitation, correction of albumin level, correction of associated anaemia, and the presence of an experienced surgical team with adequate assistance. However, elderly patients require careful preoperative evaluation before surgical intervention to minimize mortality related to associated disease.

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