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Original Research Article.

Modified Mesocoloplasty for Volvulus of the Sigmoid Colon

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ABSTRACT

Introduction: Our aim of this study was to review our surgical experience in pelvic colon volvulus with special emphasis on our time-tested surgical procedure in the form of mesocoloplasty and to analyze its advantages and disadvantages.

Methods: In our 9 years (from 2010 to 2019) follow-up report of a modified mesocoloplasty operation carried out in 92 patients for volvulus of the sigmoid colon is presented. In an untwisted and decompressed viable sigmoid loop the peritoneum over the mesocolon is incised vertically and sutured horizontally as described below.

Results: Successful outcome with no recurrence till date with only three mortality.

Conclusion: Procedure seems to be easy, time-saving and suitable for emergency conditions. Adhesions occurring over the suture line in mesocolon appear to be only complication.

Keywords: Volvulus, Intestinal Obstruction, Large Bowel Obstruction, Mesocoloplasty.

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INTRODUCTION

The term volvulus is taken from the Latin word *volvere* means "to twist". Volvulus occurs when a loop of intestine twists around itself and the mesentery that supports it, resulting in acute, subacute, or chronic intestinal obstruction.[1,2]

Volvulus of the colon has been reported as the third common cause of large bowel obstruction in the developed world. It is followed by colorectal cancer and diverticulitis of colon.[3] Many a times volvulus is a surgical emergency. The pelvic colon or sigmoid colon is most frequently involved in this rotation or twisted volvulus. Some of the factors contributory to it are (a) a long pelvic mesocolon (b) a narrow attachment of the sigmoid mesocolon, (c) fibrous adhesions binding the two limbs of the colon closer together at the base than usual, (d) overloaded pelvic colon, (e) a band of adhesions at the top of the loop providing a fulcrum for rotation.

The main aim of the treatment is to release the intestinal obstruction, prevent ischemia and gangrene, and prevent future recurrence. The operative technique we adopted in our study had been published many times with good results.[4,5]

MATERIALS AND METHODS

In our series we did a retrospective study of 92 patients with sigmoid colon volvulus operated at a tertiary level hospital, Rajendra institute of Medical Sciences, Ranchi, Jharkhand, India, during last nine years.

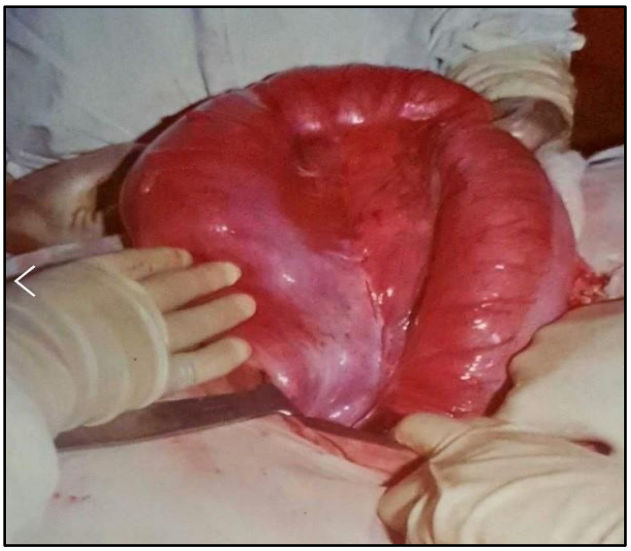
Inclusion Criteria: All patients admitted from RIMS emergency for pelvic colon or sigmoid colon volvulus.

Exclusion criteria: Patients with gangrenous or non-viable gut.

Clinical Material

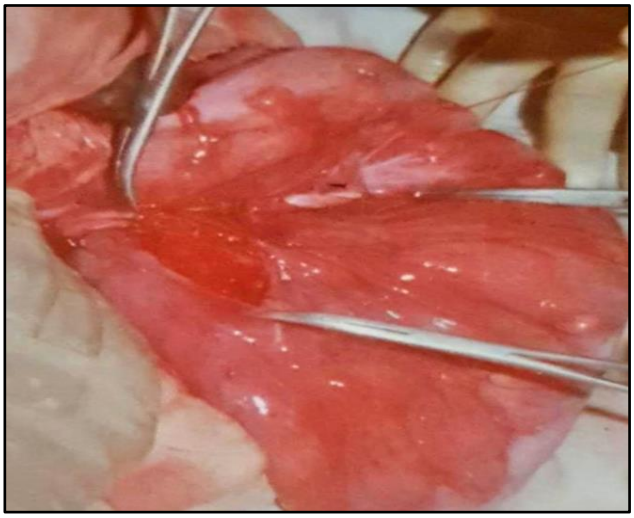
Between January 2010 and December 2019, 92 surgical cases of volvulus of the sigmoid colon were admitted in our unit. Among these 92 cases only 74 (51 males and 23 females) were found to be suitable for modified mesocoloplasty. The remaining 18 patients had non-viable gut with sign of gangrene required resection, colostomy or anastomosis. In 58 of these 74 cases, emergency laparotomy and derotation were done followed by mesocoloplasty. In the rest, 16 cases either the volvulus deflated itself or was deflated by a flatus tube. Modified mesocoloplasty was done thereafter an interval varying from three days to a week.

OPERATIVE TECHNIQUE



Step 1: A lower midline incision provides the best exposure. The distended sigmoid loop is delivered and untwisted. Its viability especially at its base is conclusively established.

Step 2: The peritoneum over the inner aspect of the mesocolon is incised in the middle. Taking care not to damage the vessels underneath, the incision is extended vertically downward to as near the base as possible and above to the top of the loop. Now the two flaps of the peritoneum are raised gently from the underlying structures for some distance laterally.



Step 3: The sigmoid colon is deflated by a flatus tube put from anus to rectum and finally to sigmoid colon. The vertically raised peritoneal flaps are now sutured transversally by continuous suture using vicryl. This, in effect, shorten the pelvic mesocolon by bringing the top of the loop closer to its base and to some extent also broadens it. The abdomen is closed in the usual way. The rest of the post-operative management is the same as for any other laparotomy case.

OBSERVATIONS AND DISCUSSION

It is a common observation that almost all cases of Volvulus of the pelvic colon have an abnormally long pelvic mesocolon. This can be due to chronic constipation and high rice and roughage content of the diet.

Volvulus of the sigmoid colon is the most common large bowel volvulus; it occurs in ~70 to 80% of cases.[6] The age of the patient ranges from 30 to 81 years (mean of 56 years). It is more common in the elderly.[7] Male vs female ratio was 2.2:1.[8] Modified mesocoloplasty was successful in almost all patients without any recurrence. Main Symptoms were abdominal pain, gaseous distension, vomiting, absolute constipation, and/or bloody stools. The triad of abdominal distension, crampy lower abdominal pain with constipation, and vomiting which is usually a late symptom are all the common presenting features of volvulus.[9] The onset of symptoms may be acute or gradual. Sometimes mesentery becomes so tightly twisted that blood supply is cut off, resulting in intestinal ischemia or gangrene.

Sigmoid volvulus has a typical radiographic finding as the “bent inner tube” with the point usually directed to the right upper quadrant.[10]

In the haemo-dynamically stable patient without peritoneal signs, nonoperative procedures like flatus tube, enema or instrumentation is successful in many of (70%) cases with a low mortality rate.[11] But in such cases, recurrence rates are again very high, so definitive surgical procedures are recommended for such patients. Delayed management can result in complications associated with closed-loop obstruction, bowel ischemia and hypovolemic shock.[4,12]

Many operative procedures have been described for a viable sigmoid colon; but they are not suitable under certain circumstances such as patients' low condition, loaded proximal bowel, etc.[5,13] The original operation of mesocoloplasty was developed by Tiwary and Prasad.[14] They however later noted that the vertical incision and the transverse suture of mesocolon on one side alone were as effective as the removal of the mesocolic fibrous band and transverse suturing on both sides.[14] We, therefore, wish to describe this modified procedure of mesocoloplasty for volvulus of the sigmoid colon.

During the 09 years follow-up period in this series, most common postoperative complications was surgical site infection (9 patients), next was cutaneous sinus formation in two of our patients with gradual self-healing. The only major complications observed were adhesions of the intestinal loops and its mesentery to the suture line in the mesocolon in three cases, who required laparotomy for intermittent obstructions. All the three of above patients belong to the emergency laparotomy group. 6 other patients' complaint of occasional mild pain for one to three months and were managed conservatively.

There were three deaths in the emergency laparotomy group, occurring within 24 hours. First was 74 years elderly with CKD, had an acute history of pain abdomen, received in really bad shape, died in OR itself. Rest two were elderly (57 and 65 years respectively) became hypotensive during the operation. Post-operatively, they required dopamine infusion for maintaining a pulse pressure of 40 mm hg, and a gradually increasing dose of dopamine was required till their death.

COMMENTS

Modified mesocoloplasty was successfully performed in all patients. No patient had any recurrence till date. The advantage of this operation seems to be: (a) the bowel is not opened (b) the minimum time is required for the entire surgery (45 $\pm$ 10 minutes) and (c) can be efficiently done in an emergency by any in-trainee surgeon.

The only major complications observed were adhesions of the intestinal loops and its mesentery to the suture line in the mesocolon. This emphasizes the unpredictable nature of the adhesion per se and it should not be regarded as a complication peculiar to the modified mesocoloplasty. As the modified version is simpler and less time consuming with equal efficacy, we have continued to practice it.

CONCLUSION

Modified mesocoloplasty is now time tested, non-resective, recurrence-free procedure for the management of viable sigmoid colon volvulus.[4] The modified procedure seems to be easy, time-saving, and suitable for emergency conditions, with good safely margin and less expertise demanding so acceptable even in high risk patients, with acceptable low morbidity and mortality.

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