



Original article

<https://doi.org/10.12980/jad.6.2017JADWEB-2016-0078>

©2017 by the Journal of Acute Disease. All rights reserved.

## Evaluation of the Primary Anastomosis Side Effects in Patients with Sigmoid Volvulus in Imam Hossein and Firoozgar Hospitals in 2014-2015

Mahdi Alemrajabi<sup>1</sup>, Mostafa Hosseini<sup>2</sup>, Behzad Nemati Honar<sup>3</sup>, Mahdi Kayyal<sup>4</sup>, Adnan Tizmaghz<sup>5</sup>, Amirmohsen Jalaefar<sup>6\*</sup>

<sup>1</sup>MD., Assistant Professor of colorectal surgery, Firoozgar Clinical Research Development Center (FCRDC), Iran University of Medical Sciences, Tehran, Iran.

<sup>2</sup>MD., Associate Professor of surgical oncology, Iran University of Medical Sciences, Tehran, Iran.

<sup>3</sup>MD., Assistant Professor of general surgery, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

<sup>4</sup>MD., Resident in general surgery, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

<sup>5</sup>MD., Resident in general surgery, Iran University of Medical Sciences, Tehran, Iran.

<sup>6</sup>MD., Assistant Professor of surgical oncology, Tehran and Shahid Beheshti University of Medical Sciences, Cancer Institute, Tehran, Iran.

### ARTICLE INFO

#### Article history:

Received 5 Dec 2016

Received in revised form 27 Dec 2016

Accepted 12 Mar 2017

Available online 18 May 2017

#### Keywords:

Sigmoid Volvulus

Colon Obstruction

Primary Anastomosis

### ABSTRACT

**Objective:** The term volvulus is derived from a Latin word *volvare* means to turn, twist which is mainly referred to as twisting of sigmoid and can lead to ischemia and gangrene. Nowadays, it is the 3rd most common reason of bowel obstruction mostly in the Middle East countries, Africa, India, and Russia where average age is younger compared to the west (about 40 to 50). **Methods:** In this study, patients who referred to Imam Hossein and Firoozgar Hospitals within 2014 and 2015 were included by the first impression of obstruction and finally diagnosis of sigmoid volvulus that were not in septic shock. After primary survey, routine lab profile, electrolyte correction and resuscitation if needed, the process of choices of patients and terms and conditions were explained for patients. They were prepared for operation after obtaining a written consent. During operation, those who are not necrotic sigmoid and do not have peritonitis undergone primary resection and anastomosis of intestine as suggested by surgeon. Anastomosis has given by 3-0 silk thread separately.

**Results:** Twenty-five patients, 7 females (28 %) and 18 males (72%), underwent primary resection and anastomosis whose age ranged from 18 to 84 (mean 61.5 years, variance 56, 25). Average leukocytes count for our patients once they entered the emergency ward was 8500 (with max level of 14/9 and min of 4/1). Two patients had fever after operation. Five patients experienced tachycardia within 24 hours after surgery and one patient experienced infectious wound and 2 cases passed away.

**Conclusions:** With regard to the obtained results, examining all aspects of patients is recommended to conduct primary anastomosis. Primary anastomosis is not recommended for patients with multiple underlying diseases considering the longer operation time.

## 1. Introduction

The term volvulus is derived from the Latin word “*volvare*” which means to turn. This term refers to colon twisting that usually happens in the sigmoid colon and it ultimately leads to ischemia and bowel gangrene.

Volvulus occurs when the intestine twists around itself and the

mesentery and results in bowel obstruction[1].

In western studies, in 1841, von Rokitansky for the first time mentioned volvulus as one of the causes of bowel strangulation[2]. Currently, volvulus is the third cause of large-bowel obstruction (LBO). The volvulus belt passes Africa, the Middle East, India and Russia where the average age of people is lower compared to western countries (40-50 years of age)[3-8].

In the United States, 10-15% of all bowel obstructions are because of volvulus[9]. Some obstructing agents are reported namely the history of volvulus, previous history of abdominal

\*Corresponding author: Amirmohsen Jalaefar, Tehran and Shahid Beheshti University of Medical Sciences, Cancer Institute, Tehran, Iran.

Tel: +989122705498

E-mail: jalaefar@gmail.com

The journal implements double-blind peer review practiced by specially invited international editorial board members.

operations, the history of hospitalization or nursing homes, diabetes, psychotropic medications, laxative abuse and chronic constipation[10-15].

In a study conducted on 546 patients, the most common part has been in sigmoid (60.9%), and then is cecum (34.5%), transverse colon (3.6%) and finally splenic flexure[1].

In ancient Greece, around 1550 B.C., volvulus was explained as bowel degeneration via a natural process[1]. In Hippocrates medicine, treatment of volvulus is mentioned using enema of a high volume of air via anus[1]. In addition, Hippocrates recommended using a suppository with a relative length of 10 fingers or 22cm to treat volvulus[1]. Early modern western treatments are reported by Gay using Reduction through anus on a corpse (1). In 1883, Atheron explained surgery by laparotomy and adhesiolysis[1]. Since half of the 20th century, surgery has been reported as the main therapy for volvulus. In 1947, Brusgaard suggested decompression by sigmoidoscopy and rectal tube insertion in patients without peritonitis. However, devolvulation without surgery followed 90% relapse along with 40% of mortality[9].

Currently, the common treatment in Iran in the case of lack of devolvulation in sigmoidoscopy includes laparotomy, devolvulation, resection of sigmoid and colostomy insertion.

In this study, with regard to the rate of morbidity, colostomy and high expenses of colostomy care along with the need for another surgery, it was decided to employ resection and primary anastomosis for sigmoid.

## 2. Materials and Methods

Considering that this is a descriptive study and prevalence of volvulus is not high, people referring the emergency ward of Imam Hossein and Firoozgar Hospitals within 2014-2015 because of large bowel obstruction included in this study diagnosed with volvulus sigmoid who were not in septic shock. After primary examinations and conducting routine tests in emergency ward as well as correction of electrolyte abnormalities, in the case of needing primary resuscitation, all conditions and choices of the patients as well as the side effects were explained to them. Patients are prepared for surgery after obtaining a written consent.

First, patients were undergoing rigid sigmoidoscopy and in the case of successful detortion, they were transferred to the ward for required measures before surgery. Patients without detortion

underwent laparotomy. Patients without sigmoid necrosis and peritonitis underwent resection and primary anastomosis and in case of the surgeon's discretion, intestinal anastomosis underwent as separate using 0-3 silk thread.

All patients in septic conditions with peritonitis or patients with necrosis and sigmoid perforation during surgery were excluded from the study.

Since this study was conducted as case series, only one group was investigated. During hospitalization in the ward after surgery, patients were checked daily in terms of evidence of tachycardia (pulse rate > 100), fever, surgical site infection, fascial dehiscence and evidence of anastomosis leakage. After starting the diet and patient's tolerance and ensuring gas and stool passage, the patients were discharged from surgical services.

## 3. Results

During this study, 25 cases of volvulus sigmoid were under resection and primary anastomosis. Of these 25 subjects, 7 (28%) were female and 18 (72%) were male. Average age of patients under study was 61.5 (maximum 82 years and minimum 18 years, variance 56.25).

Average leukocyte count of patients while entering emergency ward was 8500 leukocytes/ml (maximum 14.9, minimum 4.1, variance 5.1). Two patients (8%) experienced fever after surgery and five patients (20%) experienced tachycardia within 24 hours after surgery.

Of these patients, an 18-year-old boy who was a known case of CP, suffered from fever and tachycardia and acute abdominal symptoms and he underwent laparotomy again. Since we had no clear evidence of leakage, ileostomy was inserted for him. None of the patients suffered from surgical site infection. There were two cases of mortality, a 62-year-old man and a 74-year-old woman who both had ischemic heart disease and were treated with heart medications. They were hospitalized in ICU after surgery and finally passed away because of cardiac arrest due to heart problems. Another 74 year old woman suffered from surgical site infection whose wound was washed away. No fascial dehiscence was reported in this study.

## 4. Discussion

Since 1940, the primary treatment was to devolvulate using

endoscopic method and further bowel resection if required. Devolvulation is conducted using rigid flexible sigmoidoscopy using barium enema or colonoscopy[16]. In general, endoscopic devolvulation is successful in 70-80% of cases[1]. Rectal tube is inserted to prevent recurrence and the patient is prepared for definite procedure within 48 hours[17]. In the case of bowel gangrene or symptoms of peritonitis or devolvulation failure, the patient is prepared for surgery. Surgery will be conducted if there is an indication of volvulus resection. If the patient is in good hemodynamic conditions in terms of nutrition, enough blood supply, absence of tension, absence of fecal or suppurated peritonitis, primary anastomosis can be used. Otherwise, Hartmann's resection operation should be conducted[1].

In a study by Dr. Kuzu et al. on 106 patients, average age of patients under surgery for volvulus was 60.9 years. None of them underwent decompression before surgery or bowel preparation. Considering the conditions, 57 patients underwent resection and primary anastomosis and 49 patients underwent resection and Hartmann's operation with mortality rate of 6.6%. In the first group, 8 cases and in the second group 12 cases experienced surgical site infection. Intra-abdominal abscess rate was 1:7[18].

In a study by Dr. Rigio et al., 27 volvulus cases resulted in bowel obstruction and gangrene were investigated. Twenty-eight cases received primary anastomosis; in 3 cases, colostomy was inserted and in 1 case, sigmoidopexy was conducted. Average age of the population under study was 25.7 years. Only one case of anastomosis leakage and one case of fascial dehiscence was reported. One out of 3 cases of colostomy insertion passed away. Colostomy insertion was because of bad conditions of the patient[19].

In another study by Dr. Mulas et al. on 75 patients with average age of 72.5 years, 17 patients (22.4%) decompressed by rectal tube, 17 patients decompressed by colonoscopy and 41 patients (55.2%) were operated. Resection and primary anastomosis were the most common measures used for patients. 43% of patients experienced post-surgery complications the most common of which was surgical site infection. In the group who were not under surgery, 26% suffered from complications and volvulus recurrence was more and faster in these patients[20].

All these studies were retrospective and nothing is told about gender and pre-surgery examinations. No study reported the cause of patients' mortality and post-surgery complications. In most

studies conducted, patients with clear peritonitis and sigmoid necrosis underwent colostomy insertion.

In our study, only patients with volvulus sigmoid without clear necrosis and peritonitis underwent resection and primary anastomosis after obtaining written consent.

In one case, fever and tachycardia occurred 6 days after surgery. The patient was an 18-year-old boy with cerebral palsy and cachectic with no evidence of peritonitis. Both patients, who passed away, were known to have cardiac ischemia and were hospitalized in the ICU ward. They finally passed away because of heart problems.

With regard to this prospective study as well as its duration and prevalence of this disease, we only collected 25 patients. Cases diagnosed with volvulus were more, 4 of whom were detorted using sigmoidoscopy and 2 cases underwent Hartmann's operation considering conditions.

## 5. Conclusions

Conducting primary anastomosis prevents the imposition of psychological and economic burden on patients. With regard to absence of colostomy insertion and moral excuses of our society, patients escaped from the burden of high financial and mental expenditures of colostomy care. In addition, since there is no need to undergo laparotomy again for colostomy reversal, the imposition of expenditures to patients and medical system is prevented.

With regard to the obtained results, examining all aspects of patients is recommended to conduct primary anastomosis. Primary anastomosis is not recommended for patients with multiple underlying diseases considering the longer operation time.

This prospective study was conducted in 2 different medical universities and it was a successful experience of cooperation between two medical centers. It is hoped in the future more studies to be conducted with cooperation of authorities and by planning of the head of the department of surgery, larger studies to be conducted with the help of medical centers of universities.

## Conflict of interest statement

There is no conflict of interest to be declared.

## Consent

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this clinical trial.

## Ethical approval

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.'

## Acknowledgement

We thank all of the participants in this study for generously helping us in this research. We also thank all of the surgical residents, nurses, and other practice staff at Imam Hossein and Firoozgar Hospital who kindly assisted us by their care of the patients.

## References

- [1] Gingold D, Murrell Z. Management of Colonic Volvulus. *Clinics in colon and rectal surgery*. 2012;**25**(4):236.
- [2] Lou Z, Yu ED, Zhang W, Meng RG, Hao LQ, Fu CG. Appropriate treatment of acute sigmoid volvulus in the emergency setting. *World J Gastroenterol*. 2013 Aug 14;**19**(30):4979-83.
- [3] MichAel SA, RAbi S. Morphology of Sigmoid Colon in South Indian Population: A Cadaveric Study. *Journal of clinical and diagnostic research: JCDR*. 2015 Aug;**9**(8):AC04.
- [4] Obstruction. *Diseases of the Colon & Rectum*. 2016 Jul 1;**59**(7):589-600.
- [5] Atamanalp SS, Kisaoglu A, Ozogul B. Factors affecting bowel gangrene development in patients with sigmoid volvulus. *Annals of Saudi medicine*. 2013 Mar 1;**33**(2):144.
- [6] Jangjoo A, Soltani E, Fazelifar S, Saremi E, Afzal Aghaei M. Proper management of sigmoid colon volvulus: our experience with 75 cases. *International journal of colorectal disease*. 2010 Mar 1;**25**(3):407-9.
- [7] Atamanalp SS. Treatment of sigmoid volvulus: a single-center experience of 952 patients over 46.5 years. *Techniques in coloproctology*. 2013 Oct 1;**17**(5):561-9.
- [8] Tang SJ, Wu R. Endoscopic Decompression, Detorsion, and Reduction of Sigmoid Volvulus. *Video Journal and Encyclopedia of GI Endoscopy*. 2014 Apr 30;**2**(1):20-5.
- [9] Halabi WJ, Jafari MD, Kang CY, Nguyen VQ, Carmichael JC, Mills S, Pigazzi A, Stamos MJ. Colonic volvulus in the United States: trends, outcomes, and predictors of mortality. *Annals of surgery*. 2014 Feb 1;**259**(2):293-301.
- [10] Perrot L, Fohlen A, Alves A, Lubrano J. Management of the colonic volvulus in 2016. *Journal of visceral surgery*. 2016 Jun 30;**153**(3):183-92.
- [11] Raveenthiran V, Madiba TE, Atamanalp SS, De U. Volvulus of the sigmoid colon. *Colorectal Disease*. 2010 Jul 1;**12**(7Online):e1-7.
- [12] Osiro SB, Cunningham D, Shoja MM, Tubbs RS, Gielecki J, Loukas M. The twisted colon: a review of sigmoid volvulus. *The American Surgeon*. 2012 Mar 1;**78**(3):271-9.
- [13] Gordon-Weeks AN, Lorenzi B, Lim J, Cristaldi M. Laparoscopic-assisted endoscopic sigmoidopexy: a new surgical option for sigmoid volvulus. *Diseases of the Colon & Rectum*. 2011 May 1;**54**(5):645-7.
- [14] Chalya PL, Mabula JB. Sigmoid volvulus and ileo-sigmoid knotting: a five-year experience at a tertiary care hospital in Tanzania. *World Journal of Emergency Surgery*. 2015 Mar 8;**10**(1):1.
- [15] Barbieux J, Plumereau F, Hamy A. Current indications for the Hartmann procedure. *Journal of visceral surgery*. 2016 Feb 29;**153**(1):31-8.
- [16] Atamanalp SS, Atamanalp RS. The role of sigmoidoscopy in the diagnosis and treatment of sigmoid volvulus. *Pakistan journal of medical sciences*. 2016 Jan;**32**(1):244.
- [17] Deveney K. COLONIC PROBLEMS. *GASTROENTEROLOGY*. 2014 Nov 7;**28**(21).
- [18] Kuzu MA, A lar AK, Soran A, Polat A, Topcu Ö, Hengirmen S. Emergent resection for acute sigmoid volvulus. *Diseases of the colon & rectum*. 2002 Aug 1;**45**(8):1085-90.
- [19] Riogi B, Odhiambo K. Safe Resection and Primary Anastomosis of Gangrenous Sigmoid Volvulus. *Annals of African Surgery*. 2013;**10**(1)
- [20] Mulas C, Bruna M, García-Armengol J, Roig J. Management of colonic volvulus. Experience in 75 patients. *Revista Espanola de Enfermedades Digestivas*. 2010;**102**(4):239.