Cumhuriyet Tıp Derg 2013; 35: 221-225
Cumhuriyet Med J 2013; 35: 221-225

Original research-Orijinal araştırma *http://dx.doi.org/10.7197/1305-0028.1527*

Our experience with sigmoid colon volvulus

Sigmoid kolon volvulus deneyimimiz

Metin Şen, Mustafa Turan*, Ömer Topçu, Ayhan Koyuncu, Kürşat Karadayı, Cengiz Aydın

Department of General Surgery (Prof. M. Şen, MD, Prof. M. Turan, MD, Prof. Ö. Topçu, MD, Prof. A. Koyuncu, MD, Prof. K. Karadayı, MD, Prof. C. Aydın, MD), Cumhuriyet University School of Medicine TR-58140 Sivas

Abstract

Aim. The aim of this retrospective study is to assess the mortality and morbidity after different types operations for sigmoid volvulus. **Method.** The results of surgical treatment of our patients with sigmoid volvulus were analyzed retrospectively. The patients were divided into two groups: Group-1: Single Stage Surgery (SSS) and Group-2: Hartmann's Procedure (HP). **Results.** Total 51 patients aged 65.9 years in average (between 22-88 years) were included. In comparing the morbidity rates of SSS group to the HP group, it revealed no statistically significant differences. All died patients (12/51, 25.5%) were above 70 years old and had comorbidities. Overall, there were 12 patients (12/51, 23.52%) with sigmoid colon necrosis at exploratory laparotomy. While 4 of them were in SSS group, 8 of them were in HP group. Three of four (75%) sigmoid colon necrosis patients in SSS group, and 4 of 8 sigmoid colon necrosis patients in (50%) HP group were died. **Conclusion.** We want to notice that, there would be a high risk of complication, if the situation accompanies a sigmoid colon necrosis at laparotomy. Late admisson and patient's negative general condition also play an important role in anastomosis safety.

Keywords: Sigmoid volvulus, Hartmann's procedure, single stage surgery.

Özet

Amaç. Bu retrospektif çalışmanın amacı sigmoid volvulus tedavisinde gerçekleştirilen iki farklı yaklaşımın mortalite ve morbide üzerine farklılıklarını değerlendirmektir. **Yöntemler.** Sigmoid volvulus tedavisi uygulanan hastaların sonuçları retrospektif olarak irdelendi. Hastalar Grup-1: Tek aşamalı cerrahi ve Grup-2: Hartmann Yöntemi (HY) olmak üzere iki gruba ayrıldı. **Bulgular.** Yaş ortalaması 65.9 yıl (22-88 yıl) olan toplam 51 hasta çalışmaya dahil edilmiştir. Grup-1 ile Grup-2'nin morbidite ve mortalite sonuçlarının karşılaştırılması sonucunda istatistiksel olarak anlamlı bir sonuç çıkmamıştır. Kaybedilen tüm hastaların (n=12, %25,5) yandaş problemleri vardır ve yaşları 70 ve üzeridir. Hastaların 12'sinde (%23,52) laparotomide sigmoid kolon nekrozu ile karşılaşılmış ve bu hastaların 7'si (%58) kaybedilmiştir. **Sonuç.** Bu çalışmada vurgulamak istediğimiz en önemli şey laparotomide sigmoid kolon nekrozu ile karşılaşılmış ise komplikasyon oranının yüksek olacağı şeklindedir. Hastanın hastaneye başvuruda gecikmesi ve eşlik eden sorunlar anastomoz güvenliğinde önemli faktörlerdir.

Anahtar sözcükler: Sigmoid volvulus, Hartmann Yöntemi, tek aşamalı cerrahi

Geliş tarihi/Received: May 01, 2012; **Kabul tarihi/Accepted:** April 15, 2013

***Correspondending author:**

Dr. Mustafa Turan, Genel Cerrahi Anabilim Dalı, Cumhuriyet Üniversitesi Tıp Fakültesi, TR-58140 Sivas. E-mail: mturan9@gmail.com

Introduction

The term volvulus, derived from the Latin word volvere meaning "to turn," describes the abnormal twisting of the bowel [1]. This twisting usually occurs along the mesenteric axis of the bowel, resulting in venous obstruction and eventually arterial compromise [2]. The

two properties essential to the formation of a volvulus are redundancy and non-fixation. The ascending and descending segments of the colon are fixed, but the sigmoid colon, caecum, and transverse colon are mobile within the peritoneum. This mobility allows volvulus to occur at these locations. The trigger factor causing the twisting of the sigmoid colon, maximally distended by the faecal impaction in constipated patients, is a quick emptying of the terminal faecal column portion in the sigma-rectum [3].

Sigmoid volvulus is the most common colonic volvulus, and this condition is responsible for approximately 8% of all intestinal obstructions [4]. There are diferent opinions in treatment procedures of sigmoid volvulus. Because patients are generally admitted to hospitals in debilitated and emergency situations and most of them also have multiple accompanying problems. So, treatment approaches can be harmful in these patients and multiple hospital admissions are necessary.

The aim of this retrospective study is to assess the mortality and morbidity of our cases with sigmoid volvulus after two different types operations.

Material and methods

Between the years January 1999 to January 2010, total 60 patients were admitted to Cumhuriyet University Hospital Emergency Department with volvulus. One patient with transvers colon volvulus, 2 with caecal volvulus and one who refused the operations after colonoscopic detorsion and 5 patients due to poor general condition (American Society of Anesthesiologist grade IV), were excluded from this study [5]. Herein, the hospital records of 51 patients with sigmoid volvulus were retrospectively reviewed.

All patients underwent clinical and laboratory examination. After the diagnostic examinations, we first tried to devolvulate endoscopically. If we were successful, elective surgery was performed before discharging from the hospital. When the detorsion procedure is unsuccessful, with a median laparotomy, detorsion is performed and viability of the colon is checked. After decompression of the proximal dilated colon and resection of the mesosigmoid, either Single Stage Surgery (SSS) (Resection of volvulated sigmoid colon and primary anastomosis) or Hartmann's Procedure. An intestinal derotation with colopexy was not performed.

The number and type of complications and mortality were studied in both groups.

Statistical analysis

SPSS 12 program was used for statistical analyses. We tested the data from the analysis for statistical significance using the Mann-Whitney U Test. A p-value less than 0.05 was considered significant.

Results

In this retrospective study, a total of 51 patients (38 male and 13 female) with a mean age of 65.9+5 years (between 22-88 years) were reported.

If attempt to detorse the volvulus is unsuccessful [17 of 51 patients (33%)], the patient was taken for laparotomy. If colonoscopic detorsion is successful [34 of 51 patients (66%)], resection of the sigmoid colon was advised to the patients before discharging from the hospital. After successful colonoscopic detorsion, 5 patients refused the operation and were discharged from the hospital. Four of these 5 patients come back in a mean of 69 days (15 days - 6 months). After an unsuccessful colonoscopic detorsion, all of these patients (n=4) were operated on emergency situations. Patients were divided into two groups. There were 34 patients in Group-1 (single stage surgery (SSS) Group) and 17 patients in Group-2 (Hartmann's Procedure(HP) Group) (Table-1). There were 31 postoperative major and minor complications in SSS Group and 14 in HP Group 16 (Table-2).There was not any statistically significant difference between the SSS and HP groups when the morbidity rates of the patients were compared($p > 0.05$).

In the SSS group, mortality rate was 23.5% (8 of 34) (Table-3). Two from myocardial infarction within the postoperative 24 hours at intensive care unit, one pulmonary embolism and five septic complications. All of the patients with mortality were above 70 years old and in ASA grade III.

In HP group, 4 of 17 patients (23.4%) died. Major cause of mortality were one from myocardial infarction, one pulmonary embolus, one pulmonary infection and the other due to septic complications. Also in this group, all of the patients with mortality were above 70 years old, in ASA grade III.

Overall, there were 12 patients (12/51, 23.52%) with sigmoid colon necrosis at exploratory laparotomy. While 4 of them were in SSS group, 8 of them were in HP group. Three of four (75%) patients in SSS group, and 4 of 8 patients in (50%) HP group died. (Table-3).

Table 1. Demographic distrubution of patients.

	Group-1 (SSS) (n=34)	**Group-2 (HP) (n=17)**
Male (74.5%)	24	14
Female (25.5%)	10	3
Mean Age (years)	65.88+5 (22-88)	68.46 (50-84)
Mean Hospital Stay (days)	21 (6-34)	19 (6-45)

Table 2. Postoperative complications after surgery for sigmoid volvulus.

Complications	**SSS Group (n=34)**	**HP Group (n=17)**	
Abdominal dehiscence	5 (15%)	3(17%)	NS
Urinary tract infection	10 (29%)	5(29%)	NS
Pulmonary infection	7 (20.6%)	4 (23%)	NS
Myocardial infarction	2 (6%)	1 (6%)	NS
Pulmonary embolism	2 (5.8%)	1(6%)	NS
Anastomotic dehiscence	5 (14%)	0	*
Total	31	14	

NS, not significantly different, Mann-Whitney U Test.
•This complication could not be compared statistically because of the difference in operative techniques

Table 3. Mortality and sigmoid colon vitality in groups.

	Group-1 (SSS) (n=34)	**Group-2 (HP) (n=17)**
Mortality	8 (23.5%)	4 (23.4%)
Patients with sigmoid colon necrosis	4 (11.7%)	8 (46 %)
Dead patients with sigmoid colon necrosis	3 (75%)	4 (50%)

Discussion

Sigmoid volvulus is the most common colonic volvulus [6]. It often occurs in the elderly patients, and accounts for approximately 8% of all intestinal obstructions [4]. In one retrospective study of 827 cases over a 38-year period, 83.0% of the patients with sigmoid volvulus were male [7]. In this study 74.5% of the patients were male. Mean age was found as 65.9 +5 (22-88) years. But the percentage of patients above 40 years were 90.83(47/52). So, sigmoid volvulus is frequently seen in old ages and in male patients.

Healing of the left colon anastomosis consists of several factors: an empty decompressed bowel with adequate lumen, an antibiotic-depressed colon bacterial flora, assured blood supply, healthy bowel wall and absence of anastomotic tension. But in emergency conditions some of these factors are not in ideal form. Therefore there is a great dilemma of which kind of colonic operations must be done in emergency conditions.

Today, the initial treatment of sigmoid volvulus is sigmoidoscopy with decompression and detorsion. Unfortunately endoscopic detorsion is not always successful. In Western countries a 30% failure has been reported [8-10]. In this study colonoscopic detorsion was unsuccessful in 19 of 51 (37%) patients.

A 71% recurrence rate was reported among patients managed with colonoscopic decompression who survived [11]. Therefore, definitive surgery is recommended during the same hospitalization after initial colonoscopic decompression, due to a high recurrence rate of sigmoid volvulus [11, 12]. In this serie, after a successful colonoscopic detorsion, 5 patients refused the operation and were discharged from the hospital. All of these 5 patients had come back in a mean of 69 days (15 days - 6 months).

The optimal interval between decompression and operation is still unclear. A 2-day interval seems adequate for bowel preparation and optimization of the patient's condition [13]. Early resection seems to prevent the risks of necrosis and recurrence, and to have a good prognosis for survival [14].

Colonic resection for non-gangrenous sigmoid volvulus has an acceptably low rate of complications, particularly when it is done as a semi-elective procedure, i.e., subsequent to endoscopic detorsion and deflation [15], but, the management in elderly debilitated patients are accompanied by multiple problems.

There is also still debate regarding treatment of sigmoid volvulus using a single-stage resection and anastomosis versus a two-stage approach. If a Hartman's procedure had been performed the second stage procedure (colostomy closure) generally can not be performed for a variety of reasons. Besides this, colostomy closure is not a mortality free procedure. Over the past two decades, in suitable cases, resection and primary anastomosis has emerged as the preferable treatment in managing sigmoid volvulus [12, 16]. Single-stage surgery can be performed with acceptable mortality and morbidity rates and patients require a shorter hospital stay than those who undergo two-stage operations [17-19].

In this study, we could not find a statistically significant difference between the morbidities of the SSS group and the HP group. But patient selection is very important in performing this kind of operation. For example, the mortality rate ranges from 1% to 9% for viable colon and 25% for gangrenous volvulus [9, 20-22]. The mortality rates associated with sigmoid volvulus are 20-25%, depending on the interval between when the diagnosis is made and treatment is rendered.

In this study, mortality rate of the SSS group was 23.5% (8 of 34) and 23.4% in the HP group. All of the dead patients in both groups were above 70 years old and in ASA grade 3. Overall, there were 12 patients (12/51, 23.52%) with sigmoid colon necrosis at exploratory laparotomy. While 4 of them were in SSS group, 8 of them were in HP group. Three of four (75%) patients in SSS group, and 4 of 8 patients in (50%) HP group died.

Therefore, we want to notice that, there would be a high risk of complication, if the situation accompanies a sigmoid colon necrosis at laparotomy. Late admisson and patient's negative general condition also play an important role in anastomosis safety. Higher rate of anastomosis morbidity has been detected in those with malnutrition, metabolic abnormalities, sepsis, or shock. Because of the aforementioned facts, we preferred to choose the surgical method based on each patient's condition. In suitable cases SSS can be preferred, but in risky situations Hartman's procedure can be a suitable choice.

In conclusion, the mortality of the patients with sigmoid volvulus is related to the sigmoid colon vitality and patient's functional status (comorbidities). Early diagnosis and early management is important.

References

1. Cozart JC, Clouse RE. Gastric Volvulus as a Cause of Intermittent Dysphagia. Dig Dis Sci 1997; 43: 1057-60.
2. Yaseen ZH, Watson RE, Dean HA, Wilson ME. Case report: transverse colon volvulus in a patient with Clostridium difficile pseudomembranous colitis. Am J Med Sci 1994; 308: 247-50.
3. Jones IT, Fazio VW. Colonic volvulus. Etiology and management. Dig Dis 1989; 7: 203-9.
4. Oludiran OO, Osime OC. Emergency one-stage resection without mechanical bowel preparation for acute sigmoid volvulus. J Med Biomed Res 2004; 3: 86-90.
5. Jones HJ, de Cossart L. Risk scoring in surgical patients. Br J Surg 1999; 86: 149-57.
6. Madiba TE, Thomson SR. The management of cecal volvulus. Dis Colon Rectum 2002; 45: 264-7.
7. Oren D, Atamanalp SS, Aydinli B, Yildirgan MI, Başoğlu M, Polat KY, Onbaş O. An algorithm for the management of sigmoid colon volvulus and the safety of primary resection: experience with 827 cases. Dis Colon Rectum 2007; 50: 489-97.
8. Sinha RS. A clinical appraisal of volvulus of the pelvic colon with special reference to aetiology and treatment. Br J Surg 1969; 56: 838-40.
9. Mishra SB, Sahoo KP. Primary resection and anastomosis for volvulus of sigmoid colon. J Indian Med Assoc 1986; 84: 265-8.
10. Faranisi CT. An approach to the management of volvulus of the sigmoid colon. Cent Afr J Med 1990; 36: 31-3.
11. Larkin JO, Thekiso TB, Waldron R, Barry K, Eustace PW. Recurrent sigmoid volvulus - early resection may obviate later emergency surgery and reduce morbidity and mortality. Ann R Coll Surg Engl 2009; 91: 205-9.
12. Safioleas M, Chatziconstantinou C, Felekouras E, Stamatakos M, Papaconstantinou I, Smirnis A, Safioleas P, Kostakis A. Clinical considerations and therapeutic strategy for sigmoid volvulus in the elderly: a study of 33 cases. World J Gastroenterol 2007; 13: 921-4.
13. Tsai MS, Lin MT, Chang KJ, Wang SM, Lee PH. Optimal interval from decompression to semi-elective operation in sigmoid volvulus. Hepatogastroenterology 2006; 53: 354-6.
14. Cirocchi R, Farinella E, La Mura F, Morelli U, Trastulli S, Milani D, Di Patrizi MS, Rossetti B, Spizzirri A, Galanou I, Kopanakis K, Mecarelli V, Sciannameo F. The sigmoid volvulus: surgical timing and mortality for different clinical types. World J Emerg Surg 2010; 5: 1.
15. Degiannis E, Levy RD, Sliwa K, Hale MJ, Saadia R. Volvulus of the sigmoid colon at Baragwanath Hospital. S Afr J Surg 1996; 34: 25-8.
16. Jumbi G, Kuremu RT. Emergency resection of sigmoid volvulus. East Afr Med J 2008; 85: 398-405.
17. Akcan A, Akyildiz H, Artis T, Yilmaz N, Sozuer E. Feasibility of single-stage resection and primary anastomosis in patients with acute noncomplicated sigmoid volvulus. Am J Surg 2007; 193: 421-6.
18. Ağaoğlu N, Yücel Y, Türkyilmaz S. Surgical treatment of the sigmoid volvulus. Acta Chir Belg 2005; 105: 365-8.
19. Belgerden S , Taviloğlu K, Caglıkülekci M, Ertekin C, Kurtoglu M. Immediate resection and anastomosis in sigmoid colon volvulus (analysis of 32 cases). Turkiye Klinikleri J Med Res 1994; 12: 78-82.
20. De U. Sigmoid volvulus in rural Bengal. Trop Doct 2002; 32: 80-2.
21. Suleyman O, Kessaf AA, Ayhan KM. Sigmoid volvulus: long-term surgical outcomes and review of the literature. S Afr J Surg 2012; 14; 50: 9-15.
22. Osiro SB, Cunningham D, Shoja MM, Tubbs RS, Gielecki J, Loukas M. The twisted colon: a review of sigmoid volvulus. Am Surg 2012; 78: 271-9.