The Outcome of Sigmoid Volvulus Cases: A Single Centre Experiences Over 8 Years

Arif Jamal Azmi¹, Hasmali Mohamad², Ahmad Ashraf Ghani³, Fadliyazid Ab Rahim³

¹Hospital Pengajar Universiti Sultan Zainal Abidin, Terengganu, Malaysia
²Fakulti Perubatan, Universiti Sultan Zainal Abidin, Terengganu, Malaysia
³Hospital Sultanah Nur Zahirah, Terengganu, Malaysia

Corresponding author: hasmalimohamad@unisza.edu.my

Received: 24th May 2023    Accepted: 3rd July 2023    Published: 20th October 2023

Abstract

Sigmoid volvulus is one of the causes of large bowel obstruction. Its management can be challenging because of its prevalence in high-risk individuals. This study was designed to review the management and outcome of all patients admitted with sigmoid volvulus. A retrospective review of all patients admitted at Hospital Sultanah Nur Zahirah, Terengganu, for Sigmoid Volvulus from January 2015 to December 2022 was performed. The data was extracted from the Hospital Information System (HIS) and analyzed using SPSS 27. Twenty-four patients were admitted, totaling 41 admissions for sigmoid volvulus during the study periods. Most patients (n=16, 66.7%) were male and (n=8, 33.3%) were female. Seven (29.2%) patients underwent emergency surgery on the presentation, and three (12.5%) patients died on admission due to septic shock. The remaining 14 (58.3%) were managed by endoscopic decompression. 13 (92.9%) patients had successful decompression procedures, and one patient (7.1%) failed, which required emergency surgery. About seven patients (53.8%) were readmitted for recurrence of sigmoid volvulus after successful decompression on initial admission, which subsequently required emergency surgery. The remaining six (46.2%) did not experience any recurrence episodes, and three (50%) underwent subsequent elective surgery. In our series, three patients died on initial presentation due to perforation and septic shock without any intervention, two died after emergency surgery due to septic shock and multi-organ failure, and one died due to covid 19 pneumonia. There was no mortality after elective surgery. Sigmoid volvulus is a surgical emergency in which most (58.3%) can decompress non-operatively successfully. Emergency surgery in these patients is associated with 13.3% mortality in our series. Elective definitive surgery is suggested given the high recurrence rate (>50%) and considerable risk of emergency surgery.

Keywords
Sigmoid Colon, Volvulus, Obstruction

Introduction

Sigmoid volvulus is a common surgical emergency that occurs due to the twisting of the redundant sigmoid colon upon its mesentery. This subsequently could cause bowel obstruction and, if left untreated, would lead to bowel ischemia, perforation, peritonitis, and septic shock. The incidence of colonic volvulus causing large bowel obstruction was about 10% to 15% in the United States and Western Europe, meanwhile, worldwide incidence is variable whereby the incidence was recorded higher in India, Africa, and the Middle
East regions. Although volvulus can occur at any segment in the large bowel, it commonly affects the sigmoid (60% - 75% of all cases) and caecum (25% - 40% of all cases).

Sigmoid volvulus more commonly affects the younger population, males more than females with a ratio of 4:1, and less commonly affects the elderly population but it has a devastating clinical outcome given the presence of multiple medical comorbidities with aging. The etiology of colonic volvulus can be multifactorial such as narrow mesenteric base, chronic constipation, and frequent usage of laxatives.

A patient who has been diagnosed with sigmoid volvulus generally needs prompt assessment of the general condition and the viability of the bowel and subsequently, immediate intervention which could be an endoscopic decompression of the colon or an upfront colectomy. The main objective of this study was to illustrate the presentation, management, and outcome of all patients with sigmoid volvulus in our institution.

Methods
A retrospective study of all patients admitted at Hospital Sultanah Nur Zahirah (HSNZ) Terengganu, for Sigmoid Volvulus from January 2015 to December 2022. HSNZ is a tertiary referral hospital that covers the whole state of Terengganu and it has 1127 bed capacity. The study included all patients diagnosed with sigmoid volvulus and admitted to the surgical ward who underwent conservative management with endoscopic decompression, urgent surgery, or elective surgery. No exclusion criteria were applied.

The patient’s data was collected and extracted from the Hospital Information System (HIS) into the data collection form. These collected data were coded, cleaned, and analyzed descriptively using SPSS version 27 in percentage. Data collected included the gender, length of hospital stay, clinical presentation, radiological evaluation, perioperative outcomes, and 6-month survival rate. The ethical issue of this study was approved by the ethical committee of HSNZ. Privacy and confidentiality of the patient were maintained during data collection.

Results
During the study period, 41 admissions involving 24 patients were admitted for sigmoid volvulus. Most patients (n=16, 66.7%) were male and (n=8, 33.3%) were female. The mean length of stay for all patients was 6.04 days. The patients treated with endoscopic decompression had a shorter duration of stay (mean of 3.8 days, range 3 - 5 days) compared to those who underwent emergency surgery (mean 8.1 days, 5-20 days). Table 1 below illustrates various characteristics of the study group.

Table 1: Characteristic of 24 patients admitted for sigmoid volvulus according to the treatments.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No. of patients</th>
<th>Percentage(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>16</td>
<td>66.7</td>
</tr>
<tr>
<td>Female</td>
<td>8</td>
<td>33.3</td>
</tr>
<tr>
<td>Length of hospital stay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 5 days</td>
<td>15</td>
<td>62.6</td>
</tr>
<tr>
<td>5-10 days</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>&gt; 10 days</td>
<td>2</td>
<td>8.4</td>
</tr>
<tr>
<td>Presenting symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>19</td>
<td>79.2</td>
</tr>
<tr>
<td>Abdominal distension</td>
<td>17</td>
<td>70.8</td>
</tr>
<tr>
<td>Obstipation</td>
<td>13</td>
<td>54.2</td>
</tr>
<tr>
<td>Digestive bleeding</td>
<td>2</td>
<td>8.3</td>
</tr>
<tr>
<td>Septic shock</td>
<td>3</td>
<td>12.5</td>
</tr>
</tbody>
</table>
In our study, most of the patients complained of abdominal pain (79.2%), abdominal distension (70.8%), obstipation (54.2%), digestive bleeding (8.3%), and septic shock (12.5%) on clinical presentation. Abdominal x-ray was performed on 23(95.8%) of these patients with a diagnostic accuracy of sigmoid volvulus in 10(43.4%) of them showing characteristic coffee bean or omega signs. CT scan was performed in 2(8.3%) of the study population.

Three patients (12.5%) presented with peritonitis and septic shock on admission and subsequently died. Seven (29.2%) patients underwent emergency surgery on initial presentation due to acute abdomen four (57.1%) of them underwent sigmoid colectomy, and three (42.9%) underwent Hartman’s procedure. All patients that went through emergency Hartman’s procedure were alive in the 6-month survey period postoperatively with no complication, while for those that went through sigmoid colectomy, one patient died due to anastomotic leak and sepsis, two (50%) were alive 6-month post-operative with no complication, and one patient had no subsequent follow up medical data.

The remaining 14 (58.3%) patients had their condition initially managed conservatively through endoscopic decompression. 13 (92.9%) of these patients had successful colonic decompression, and one (7.1%) failed conservative decompression procedure due to tight stricture and subsequently emergency surgery was advised. This patient underwent an emergency Hartman’s procedure. However, the post-operatively patient did not survive given sepsis with multi-organ failure.

The recurrence of sigmoid volvulus was observed in seven (53.8%) of patients who had successful initial endoscopic decompression. All of them were advised of emergency surgery upon second admission due to recurrence, where four were subjected to emergency Hartman’s procedure, and three underwent sigmoid...
colectomy and primary anastomosis. Among those who were subjected to Hartman’s procedure, two were alive in the six-month post-operative survey period with no complication, one succumbed to death due to coronavirus 19 infections unrelated to sigmoid volvulus and one had no subsequent follow-up medical data.

Among those who had successful endoscopic decompression, six (46.2%) of them did not experience any recurrence episode. Three agreed to elective surgery, and the remaining refused any further surgical intervention. No mortality is observed in these patients who underwent elective procedures, while for those who refused surgery, one was alive in the six-month post-operative survey period, while two had no follow-up medical data. The 6-month mortality rate of the study population that was subjected to emergency surgery was 13.3% (2/15). The overall 6-month survival rate of all subjects was 54.2% (13/24). Figure 1 below shows the flowcharts of all 24 patients who were admitted for sigmoid volvulus in our center.

Discussion
Sigmoid volvulus causes large bowel obstruction due to an abnormal twist of the sigmoid colon on its mesenteric axis. It has been widely reported to be common among frail elderly patients with neurological disorders, nursing home residents, or mental retardation1–2. Other risk factors include congenital redundancy of sigmoid colon with a narrow base, male gender, high residue diet, post-operative intraabdominal adhesion, and certain medications3–5. Examples of these medications were anti-parkinsonian, antipsychotics, and tranquilizers which cause chronic constipation3,6.

The typical symptoms of sigmoid volvulus include abdominal pain, obstipation, abdominal distension, and digestive bleeding, and few come with septic shock2,7. Abdominal tenderness, guarding, and per rectal bleeding should raise suspicion for bowel ischemia, gangrene, and perforation3,6,7. Diagnosis of sigmoid volvulus must be prompt and early for optimal management. A plain abdominal x-ray would typically demonstrate a dilated sigmoid colon or multiple small or large intestinal air-fluid-filled levels with famous radiological signs such as omega, coffee bean, or horseshoe sign3,6,8. In our study, the accuracy of plain abdominal X-rays was 43.4% among our patients compared to other series or literature where the accuracy was around 63.4%-63.9%3,8.

Patients diagnosed with sigmoid volvulus tend to develop shock; therefore, they must be treated with effective resuscitation, adequate fluid electrolyte replenishment, respiratory support, and antibiotic therapy followed by conservative or surgical intervention8–11. The first line management of sigmoid volvulus cases without signs of peritonitis or gangrene is endoscopic decompression with flexible sigmoidoscopy with or without rectal tube placement followed by elective surgery due to high recurrence rate (43-75%)2,12,13. An endoscopic examination could detect the presence of ischemic or gangrenous mucosa which mandates urgent surgery in addition to detecting other causes of colonic obstruction, especially colon cancer9. In other case series, endoscopic treatment was successfully achieved in 87.8% of patients, however, 47.2% experienced repeated endoscopic decompression due to recurrence, and 11.1% underwent emergency surgery2. In our series, we were able to achieve a successful endoscopic decompression rate of approximately 92.9% with 53.8% recurrence, and all of them were subjected to emergency surgery. Elective surgical intervention is recommended following endoscopic detorsion as recurrent sigmoid volvulus associated with approximately 40% mortality rate1,2,12,13.
Figure 1: Outcome of 24 patients with sigmoid volvulus

Emergency surgery was advocated for patients who presented with signs of peritonitis, perforation, or unsuccessful endoscopic detorsion and early recurrence\(^2,3,9\). The choice of surgical intervention varies depending on the condition of the patient, to treat complications, and to prevent recurrence. In literature reviews, sigmoid colectomy with primary anastomosis was advocated in both viable and non-viable bowel whenever possible. However, Hartman's procedure is considered a sound and safe option for saving
patient's lives because of the risk of anastomotic leak especially in hemodynamically unstable and unfavorable patients especially those with hemodynamic instability, shock, peritonitis, perforation, advanced age, and medical comorbidities. Emergency surgery carries higher mortality rates compared to elective surgery ranging from 17.3% to 20.2%. In our study, the mortality rate of emergency surgery was approximately 13.3%.

Based on the clinical practice guidelines provided by the American Society of Colon and Rectal Surgeons (ASCRS) regarding the management of colonic volvulus and acute colonic pseudo-obstruction, it is generally recommended that hemodynamically stable patients, without peritonitis or evidence of perforation, undergo lower endoscopy. This procedure evaluates the sigmoid colon's viability, untwisting the anatomic obstruction and relieving colonic distension. Urgent sigmoid resection is indicated if endoscopic detorsion of the sigmoid colon proves unsuccessful or if there is evidence of non-viability or perforation.

Notably, this hospital’s practice is to perform elective sigmoid colectomy as early as possible rather than as part of the initial admission, deviating from the guidelines. This variation in approach likely contributes to the higher recurrence rate observed.

Complications may arise following surgery such as anastomotic leak, ileus, wound infection, and dehiscence. In our series, one patient suffered from anastomotic leaks which subsequently succumbed to death, and another patient complicated with ileus but subsequently improved. In another series, these high post-operative complications are probably attributed to high comorbidities among study populations especially medical comorbidities like respiratory and cardiac complications. Nonetheless, our case study has several limitations where the series of patients were admitted to a single institution and our sample was small compared to other large studies which induced a loss of statistical power.

Conclusion
Sigmoid volvulus is a surgical emergency in which the majority (58.3%) can be successfully decompressed non-operatively. Emergency surgery in these patients is associated with 13.3% mortality in our series. Elective definitive surgery is suggested because of the high recurrence rate (>50%) and considerable risk of emergency surgery.

References
15. (WSES consensus guidelines on sigmoid volvulus management, 2023)