

A Study of Clinical Presentation and Outcome of Emergency Resection of Sigmoid Volvulus

Saqib Ali Awais, Syed Riffat Naqvi, Khuram Sarfraz Bajwa, Mohammad Hanif Abassi*, Mohammad Tayab Malik, Fahad Rashid

Department of General Surgery, Combined Military Hospital, Rawalpindi/National University of Medical Sciences (NUMS) Pakistan, *Department of General Surgery, Combined Military Hospital, Kohat/National University of Medical Sciences (NUMS) Pakistan

ABSTRACT

Objective: To determine the clinical presentation and outcome of emergency resection of sigmoid volvulus among patients attending the Emergency Department of Combined Military Hospital, Rawalpindi, Pakistan.

Study Design: Analytical cross-sectional.

Place and Duration of Study: Emergency Department, Combined Military Hospital, Rawalpindi, Pakistan, from Aug 2021 to Jan 2022.

Methodology: Patients aged 30 years and above, belonging to either gender, who were managed for large bowel obstruction due to acute sigmoid volvulus were enrolled and clinical symptoms, such as medical comorbidities, previous episodes of gross distension, previous abdominal surgeries, and whether bed-bound at time of admission, were noted. The outcomes, such as wound infection, intra-abdominal abscess, anastomosis leakage, bleeding from surgical site, retraction, prolapse, and/or stenosis were observed.

Results: The study enrolled 87 patients, with mean age found to be 58.24±10.81 years. There were 58(66.70%) males and 29(33.30%) females in the study sample. Resection and Hartman's procedure (n=31, 35.60%) and resection and primary anastomosis with transverse colostomy (n=23, 26.40%) were the most commonly performed operative procedures. Previous episodes of gross distention were reported by 28(32.20%) patients and previous abdominal operation by 17(19.50%) patients while bed-bound status at the time of admission was noted in 14(16.10%) patients. Wound infection was the most common complication seen in 30(34.50%) patients, followed by bleeding in 12(13.80%) patients.

Conclusion: The findings highlight the high morbidity burden of emergency management in this cohort and advocate for preventive strategies and optimized preoperative care, to mitigate risks in high-burden tertiary-level settings.

Keywords: Clinical presentation, Emergency resection, Outcome, Sigmoid volvulus.

How to Cite This Article: Awais SA, Naqvi SR, Bajwa KS, Abassi MH, Malik MT, Rashid F. A Study of Clinical Presentation and Outcome of Emergency Resection of Sigmoid Volvulus. *Pak Armed Forces Med J* 2026; 76(1): 126-129. DOI: <https://doi.org/10.51253/pafmj.v76i1.8244>

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Sigmoid volvulus is the wrapping of the sigmoid colon around itself and its mesentery,¹⁻³ causing an abdominal emergency, particularly in the elderly with a high mortality rate.⁴ Clinical manifestations vary with disease progression, but typically a triad of constipation, progressive abdominal distension, and severe abdominal pain are reported with plain-film x-ray abdomen showing a coffee-bean or "omega loop" sign with typical whirl-sign on computed tomography (CT) scan also observed in sigmoid and intestinal volvulus.⁵ A lengthy, redundant sigmoid colon with an extended mesentery prone to twisting on itself is a major risk factor for sigmoid volvulus with fast-emptying of the terminal feces column section triggering the twisting of the sigmoid colon, which is maximally distended by fecal impaction in constipated individuals.⁶ The treatment of sigmoid volvulus is still controversial as, according to various studies, the best

treatment for sigmoid volvulus in uncomplicated patients is nonsurgical reduction followed by elective surgery, whereas emergency surgery is required in patients with acute abdominal findings, bowel gangrene and failed nonsurgical reduction.^{6,7} The rationale of the current study is that due to the dearth of evidence currently available regarding the clinical presentation and management outcome from Pakistan, identification of presenting characteristics either sociodemographic or clinical, as well as the outcome among Pakistani population, will assist surgeons in effective management. This will ultimately help patients not only in the early recognition but better prognosis as well. Thus, the objective of this study was to determine the clinical presentation and outcome of emergency resection of sigmoid volvulus among patients attending the Emergency Department of Combined Military Hospital, Rawalpindi.

METHODOLOGY

This analytical cross-sectional study was conducted at the Emergency Department of Combined Military Hospital, Rawalpindi, Pakistan, from August

Correspondence: Dr Saqib Ali Awais, Department of General Surgery, Combined Military Hospital, Rawalpindi Pakistan
Received: 25 Feb 2022; revision received: 18 May 2022; accepted: 19 May 2022

2021 to January 2022. Ethical approval was obtained from the institute prior to the conducting of the study (IERB #: 244/2/22). Signed informed consent forms were also obtained from all the eligible study participants or their relatives prior to their enrolment in the study using non-probability consecutive sampling. The sample size was calculated using Epi Info sample size calculator with confidence interval of 95%, and anastomosis leakage of 6%,⁸ and margin of error 5%, after which estimated sample size came out to be 87.

Inclusion Criteria: Patients aged 30 years and above, belonging to either gender, who were managed for large bowel obstruction due to acute sigmoid volvulus were included in the study.

Exclusion Criteria: Patients who had other causes of intestinal obstruction such as tuberculosis, obstructed inguinal hernia, volvulus of the small intestine, cecal volvulus, colon/rectal cancer, or postoperative adhesion were excluded from the study.

A thorough clinical and per-rectal investigation was done along with detailed clinical history. All patients underwent emergency laparotomy after pre-operative care (intravenous hydration, antibiotics, and catheterization). The type of operative procedure performed during emergency laparotomy was determined based mostly on patients' general health and the status of sigmoid volvulus intraoperatively. Clinical presentation of the patients, such as the presence of comorbidities, previous episodes of gross distension and abdominal operations, and whether bed-bound at admission, was noted along with outcome of the operative procedure, such as wound infection, intra-abdominal abscess, anastomosis leakage, bleeding, retraction, prolapse, and stenosis. Statistical Package for Social Sciences (SPSS) version 24 was used to analyze the data. Age, weight, height, and body mass index (BMI) were all reported as mean and standard deviation while for qualitative variables such as gender and American Society of Anesthesiologists (ASA) status, frequency and percentages were calculated and Chi-square test was used to determine the association between baseline, clinical features, post-operative problems, and the type of operational technique used. Additionally, the One-Way ANOVA test was used to determine the mean difference of quantitative factors such as age, weight, height, and BMI with operating techniques where a *p*-value of ≤ 0.05 was considered to be significant.

RESULTS

On analysis of 87 patients, the mean age was found to be 58.24 ± 10.81 years, with 58(66.70%) patients being male and 29(33.30%) being females while mean BMI was 26.98 ± 4.06 kg/m². Hypertension was the most common comorbidity observed in 50(57.50%) patients, followed by diabetes mellitus (n=44, 50.60%), renal disease (n=26, 29.90%), and dyslipidemia (n=23, 26.40%). ASA Status II was observed in 62(71.30%) patients while gangrenous sigmoid volvulus was observed in the majority (n=80, 92.00%) of patients. Resection and Hartman's procedure was the most commonly performed operative procedure (n=31, 35.60%), followed by resection and primary anastomosis with transverse colostomy (n=23, 26.40%). Previous episode of gross distention was reported by 28(32.20%) patients, previous abdominal operation by 17(19.50%) patients, while 14(16.1%) patients were noted to be bed-bound at the time of admission. Post-operative complication of wound infection was observed in 30(34.50%) patients and bleeding in 12(13.80%) patients while, of 15 patients, in whom primary anastomosis was performed, anastomosis leakage was observed in 7(50.00%). Detailed comparison of baseline characteristics with operative procedure is shown in Table-I in which weight (*p*-value=0.01) and BMI (*p*-value=0.01) were the only baseline characteristics which were found to be statistically significant while intraabdominal abscess as a post-operative complication was found to be significantly associated with resection with primary anastomosis with covering colostomy (*p*-value=0.01) as shown in Table-II. The majority of the patients had gangrenous sigmoid volvulus (n=80, 92.00%). Gangrene was observed in the majority of the patients who had resection and Hartman's procedure (n=28, 35.00%), followed by resection with primary anastomosis with covering colostomy in 20(25.00%) patients as shown in Table-III.

DISCUSSION

The emergency management strategy for sigmoid volvulus is still debatable as non-operative reduction is becoming more common as a way to prevent emergency surgery in patients who are ill-prepared, however, it is not a cure, and recurrences with a high risk of mortality have been observed.⁹⁻¹¹ Patients with intestinal gangrene, perforation, or peritonitis, as well as other diagnostic issues, require emergency surgical therapy.^{10,12} In the current study, resection and

Emergency Resection of Sigmoid Volvulus

Table-I: Comparison of Baseline Characteristics with Operative Procedure (n=87)

| Variables | Resection and Hartman's Procedure (n=31) | Resection with Primary Anastomosis with Covering Colostomy (n=23) | Resection and Primary Anastomosis (n=15) | Resection with Double Barrel Colostomy (n=18) | p-value |
|---------------------------------------|--|---|--|---|---------|
| Age, (years) | 58.19 ±8.01 | 57.01 ±12.25 | 59.13 ±13.42 | 59.16 ±11.48 | 0.91 |
| Gender | | | | | |
| Male | 19(32.80%) | 14(24.10%) | 13(22.40%) | 12(20.70%) | 0.33 |
| Female | 12(41.40%) | 9(31.00%) | 2(6.90%) | 6(20.70%) | |
| Height (m) | 1.56 ±0.05 | 1.54 ±0.04 | 1.54 ±0.05 | 1.56 ±0.03 | 0.68 |
| Weight (kg) | 67.93 ±13.72 | 59.61 ±6.87 | 68.73 ±9.44 | 64.50 ±4.46 | 0.01 |
| BMI (kg/m ²) | 27.95 ±5.43 | 24.93 ±3.19 | 28.70 ±2.91 | 26.47 ±1.08 | 0.01 |
| ASA Score II | 10(40.00%) | 6(24.00%) | 5(20.00%) | 4(16.00%) | 0.85 |
| ASA Score III | 21(33.90%) | 17(27.40%) | 10(16.10%) | 14(22.60%) | |
| Comorbidities | | | | | |
| Diabetes Mellitus | 19(43.20%) | 10(22.70%) | 9(20.50%) | 6(13.50%) | 0.21 |
| Hypertension | 22(44.00%) | 13(26.00%) | 9(18.00%) | 6(12.00%) | 0.09 |
| Dyslipidemia | 8(34.80%) | 5(21.70%) | 6(26.10%) | 4(17.40%) | 0.60 |
| Renal Disease | 13(50.00%) | 7(26.90%) | 4(15.40%) | 2(7.70%) | 0.15 |
| Previous Episodes of Gross Distension | 12(42.90%) | 7(25.00%) | 6(21.40%) | 3(10.70%) | 0.39 |
| Previous Abdominal Operations | 5(29.40%) | 2(11.80%) | 6(35.30%) | 4(23.50%) | 0.11 |
| Bed-bound at Time of Admission | 7(50.00%) | 3(21.40%) | 3(21.40%) | 1(7.10%) | 0.43 |

*BMI: Body Mass Index, ASA: American Society of Anesthesiologists

Table-II: Association of Postoperative Complications with Operative Procedure (n=87)

| Complications | Total | Resection and Hartman's Procedure (n=31) | Resection with Primary Anastomosis with Covering Colostomy (n=23) | Resection and Primary Anastomosis (n=15) | Resection with Double Barrel Colostomy (n=18) | p-value |
|------------------------|-------|--|---|--|---|---------|
| Wound Infection | 30 | 11(36.70%) | 6(20.00%) | 7(23.30%) | 6 (20.00%) | 0.63 |
| Intraabdominal Abscess | 6 | 0(0.00%) | 5(83.30%) | 1(16.70%) | 0 (0.00%) | 0.01 |
| Anastomosis Leakage | 7 | 1(14.30%) | 0(0.00%) | 4(57.10%) | 2 (28.60%) | 0.02 |
| Bleeding | 12 | 2(16.70%) | 3(25.00%) | 2 (16.70%) | 5 (41.70%) | 0.22 |
| Retraction | 4 | 1(25.00%) | 1(25.00%) | 0 (0.00%) | 2 (50.00%) | 0.46 |
| Prolapse | 4 | 3(75.00%) | 1(25.00%) | 0 (0.00%) | 0 (0.00%) | 0.33 |
| Stenosis | 6 | 1(16.70%) | 2(33.30%) | 0 (0.00%) | 3 (50.00%) | 0.21 |

Table-III: Association of Postoperative Complications with Operative Procedure (n=87)

| Variables | Total | Resection and Hartman's Procedure (n=31) | Resection with Primary Anastomosis with Covering Colostomy (n=23) | Resection and Primary Anastomosis (n=15) | Resection with Double Barrel Colostomy (n=18) | p-value |
|----------------|-------|--|---|--|---|---------|
| Gangrenous | 80 | 28(35.00%) | 20(25.00%) | 14(17.50%) | 18(22.50%) | 0.48 |
| Non-Gangrenous | 7 | 3(42.90%) | 3(42.90%) | 1(14.30%) | 0(0.00%) | |

Hartman's method were the most generally performed operational procedures, followed by resection and primary anastomosis with transverse colostomy and resection with double-barrel colostomy. Single-stage resection and primary anastomosis are a reliable contemporary therapeutic technique for such emergency surgical therapy of sigmoid volvulus with minimal adverse outcomes as this procedure eliminates the need for on-table colonic lavage and proximal de-functioning colostomies.¹³ In one study, 45 patients underwent sigmoid resection with Hartmann colostomy, and 91 underwent sigmoid resection with primary anastomosis,¹⁴ while resection plus Hartmann's operation was performed in the majority of sigmoid volvulus patients in another

study.⁸ One author reported reported that due to the high recurrence rate, emergency endoscopic decompression should be viewed as a temporary remedy as surgical techniques are not acceptable in clinically unstable patients because of the high risk of perioperative morbidity and death, making endoscopic colopexy an intriguing option.¹⁵ Wound infection as a post-operative complication was reported in the majority of the patients in this study, followed by bleeding, anastomosis leakage, intra-abdominal abscess, stenosis, and retraction and similar findings were reported in previous studies as well.¹⁶ In Pakistan, comparable incidence of wound infection and pelvic abscess was reported.¹⁷ The mean age of the patients who presented with emergency sigmoid

volvulus in the current study was approximately sixty years where males were more as compared to females. Similar findings were reported in existing literature.^{9,18,19} Evidence suggests that the severity and acuity of clinical presentation varies, with younger persons having the more severe form and abdominal distension is often an early and progressive symptom that may be accompanied by hiccough and retching, followed by vomiting.^{8,10,20} Though in the current study, mortality was not reported due to limited sample size, a study from Pakistan reported a lower mortality rate.⁸

LIMITATIONS OF STUDY

This was a cross-sectional study, therefore, any temporal association could not be determined, while certain important clinical parameters, such as radiological and laboratory profile with long-term clinical outcomes including health-related quality of life and mortality were not reported. Despite these limitations, the current study has reported findings of emergency resection of sigmoid volvulus as there is a limited number of studies on the topic from Pakistan.

CONCLUSION

These findings underscore the substantial morbidity burden associated with emergency resection for sigmoid volvulus in this cohort, where wound infection affected over one-third of patients and other complications like surgical site bleeding compounded postoperative recovery. This aligns with regional patterns of delayed presentation, exacerbated by prior unreduced episodes and comorbidities, highlighting the limitations of operative interventions in unstable emergencies. Preventive strategies must be advocated alongside optimized preoperative.

Conflict of Interest: None.

Funding Source: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

SAA & SRN: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

KSB & MHA: Conception, data analysis, drafting the manuscript, approval of the final version to be published.

MTM & FR: Data acquisition, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

REFERENCES

1. Atamanalp SS. Sigmoid volvulus: An update for Atamanalp classification. *Pak J Med Sci* 2020; 36: 1137-1139. <https://doi.org/10.12669/pjms.36.5.2320>

2. Baiu I, Shelton A. Sigmoid volvulus. *JAMA* 2019; 321: 2478. <https://doi.org/10.1001/jama.2019.2349>
3. Bauman ZM, Evans CH. Volvulus. *Surg Clin North Am* 2018; 98: 973-993. <https://doi.org/10.1016/j.suc.2018.06.005>
4. Moro-Valdezate D, Martín-Arévalo J, Pla-Martí V, García-Botello S, Izquierdo-Moreno A, Pérez-Santiago L, et al. Sigmoid volvulus: outcomes of treatment and predictors of morbidity and mortality. *Langenbecks Arch Surg* 2022; 407: 2503-2512. <https://doi.org/10.1007/s00423-022-02428-5>
5. Kajihara Y. Sigmoid volvulus: Coffee bean sign, whirl sign. *Cleve Clin J Med* 2020; 87: 81-82. <https://doi.org/10.3949/ccjm.87a.19064>
6. Harkins JM, Sajjad H. Anatomy, abdomen and pelvis, sigmoid colon. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK499927/>
7. Emna T, Atef M, Sarra S. Management of acute sigmoid volvulus: A Tunisian experience. *Asian J Surg* 2022; 45: 148-153. <https://doi.org/10.1016/j.asjsur.2021.04.004>
8. Ahmad M, Alam S, Amer S, Khan N, Shah LA, Sadiq MU, et al. Various surgical options for emergency management of sigmoid volvulus. *J Postgrad Med Inst* 2012; 26: 317-323.
9. Pattanaik SK. Emergency management of sigmoid colon volvulus in a volvulus belt population and a review of literature. *Indian J Surg* 2018; 80: 599-605. <https://doi.org/10.1007/s12262-017-1674-0>
10. Kim EM, Kang BM, Kim BC, Kim JY, Park JH, Oh BY, et al. Clinical outcomes of sigmoid volvulus and risk factors for its recurrence: a multicenter study in Korea. *Int J Colorectal Dis* 2020; 35: 1841-1847. <https://doi.org/10.1007/s00384-020-03526-w>
11. Fagan PV, Stanfield B, Nur T, Henderson N, El-Haddawi F, Kyle S. Management of acute sigmoid volvulus in a provincial centre—a 20-year experience. *N Z Med J* 2019; 132: 38-43.
12. Easterday A, Aurit S, Driessen R, Person A, Krishnamurty DM. Perioperative outcomes and predictors of mortality after surgery for sigmoid volvulus. *J Surg Res* 2020; 245: 119-126. <https://doi.org/10.1016/j.jss.2019.07.038>
13. Naseer A, Ahmad S, Naeem M, Safirullah. One stage emergency resection and primary anastomosis for sigmoid volvulus. *J Coll Physicians Surg Pak* 2010; 20: 307-309.
14. 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: 421-426. <https://doi.org/10.1016/j.amjsurg.2006.08.077>
15. Bruzzi M, Voron T, Douard R. Management of the sigmoid volvulus. *Hepatogastroenterology* 2016; 23: 1005-1013.
16. Mulugeta GA, Awlachev S. Retrospective study on pattern and outcome of management of sigmoid volvulus at district hospital in Ethiopia. *BMC Surg* 2019; 19: 107. <https://doi.org/10.1186/s12893-019-0561-1>
17. Nasir M, Khan IA. Resection and primary anastomosis in the management of acute sigmoid volvulus. *Pak J Surg* 2008; 24: 95-97.
18. Firat N, Mantoglu B, Ozdemir K, Muhtaroglu A, Akin E, Celebi F, et al. Endoscopic detorsion results in sigmoid volvulus: single-center experience. *Emerg Med Int* 2020; 2020: 1473580. <https://doi.org/10.1155/2020/1473580>
19. Tankel J, Gilshtein H, Neymark M, Zuckerman M, Spira R, Yellinek S et al. Sigmoidectomy following sigmoid volvulus: who is at risk of anastomotic failure? *Tech Coloproctol* 2021; 25: 1225-1231. <https://doi.org/10.1007/s10151-021-02508-6>
20. Kolbeinsson HM, Ingudottir Andresdottir BD, Hannesson PH, Valsdottir EB, Moller PH. Sigmoid volvulus at the University Hospital of Iceland 2000-2013. *Laeknabladid* 2018; 104: 391-394. <https://doi.org/10.17992/lbl.2018.09.196>