MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2023.829.832

OPEN ACCESS

Key Words
Intestinal volvulus, laparoscopy, sigmoid, outcome

Corresponding Author
Pinakin Khemchandbhai Sutariya
Department of General Surgery, GMERS Medical College, Vadnagar, Gujarat, India

Author Designation
[1,2,3]Assistant Professor
[4]Associate Professor

Received: 25 July 2023
Accepted: 8 August 2023
Published: 10 August 2023

Citation: Bhaumik Bipinchandra Patel, Jimitkumar H. Patel, Lomesh Ashokkumar Prajapati and Pinakin Khemchandbhai Sutariya, 2023. Laproscopic Assisted Sigmoidectomy for Sigmoid Volvulus: An Outcome Study. Res. J. Med. Sci., 17: 829-832, doi: 10.59218/makrjms.2023.829.832

Laproscopic Assisted Sigmoidectomy for Sigmoid Volvulus: An Outcome Study

[1]Bhaumik Bipinchandra Patel, [2]Jimitkumar H. Patel, [3]Lomesh Ashokkumar Prajapati and [4]Pinakin Khemchandbhai Sutariya

[1,2,3,4]Department of General Surgery, GMERS Medical College, Vadnagar, Gujarat, India

ABSTRACT

This study aimed to delineate the outcomes associated with the utilization of elective laparoscopic sigmoidectomy in the successful resolution of sigmoid volvulus. A total of 14 patients were diagnosed with sigmoid colon volvulus and among them, four individuals underwent surgical intervention utilizing the elective laparoscopic sigmoidectomy technique. Among the cohort, there were three male patients and one female patient, with respective ages of 54, 44, 61 and 64 years. The diagnosis of volvulus was ascertained through a combined assessment of clinical and radiological findings, which did not reveal any indicators of severity. Subsequent to the diagnosis, the patients underwent detorsion via rectal probe insertion and elective laparoscopic sigmoidectomy was performed during the same hospitalization. The mean duration of the surgical procedures was 105, 95, 88 and 110 min, respectively. The estimated average blood loss amounted to 115.6 cubic centimeters. Notably, one patient presented with postoperative fever. The average duration of postoperative hospitalization was 5.75 days. Importantly, there were no recorded instances of mortality. Our study posits that elective laparoscopic sigmoidectomy presents a compelling and advantageous approach in the surgical management of sigmoid volvulus, yielding successful outcomes devoid of detorsion-associated complications.

INTRODUCTION

Within the spectrum of acute intestinal obstructions, sigmoid volvulus is frequently observed at the sigmoid level, constituting approximately 63% of cases[1,2]. It represents a relatively uncommon clinical scenario, accounting for 3-5% of all instances of acute intestinal obstructions. The conventional surgical approach for its management typically involves a median laparotomy, entailing sigmoidal resection and contingent upon the condition of the colon, either primary or delayed anastomosis[2]. However, recent advancements in surgical techniques have introduced alternative approaches, including elective mini-laparotomy, laparoscopic-assisted endoscopic sigmoidopexy and laparoscopic-assisted elective sigmoidectomy[3-5]. Building upon the success achieved in procedures such as cholecystectomy, appendectomy and laparoscopic hernia repair, there has been a progressive expansion of the application of minimally invasive techniques to encompass colectomies.

Nevertheless, it is imperative to acknowledge that the practice of laparoscopic colectomy in developing nations encounters formidable challenges, principally emanating from the limited availability of essential surgical consumables and a scarcity of highly specialized professional skills.

In this vein, we present a study encompassing four instances of the elective laparoscopic sigmoidectomy. The primary objective of this study was to elucidate the outcomes and implications of employing this surgical technique. In doing so, we intend to contribute to the discourse surrounding the potential advantages of laparoscopic sigmoidectomy, underscored by an appraisal of relevant literature.

MATERIALS AND METHODS

A retrospective study was conducted at a tertiary care hospital in India. The study encompassed all patients who underwent surgical intervention for pelvic colon volvulus, specifically sigmoid volvulus, employing laparoscopic surgery. Patients subjected to colonic volvulus management via laparotomy were excluded from the study. Following the diagnosis of sigmoid colon volvulus, a comprehensive workup was undertaken, including a full blood count (FBC), C-reactive protein (CRP) assessment and blood ionogram analysis, complemented by an abdominal CT scan to discern any indicators of severity. Subsequently, patients were offered a colonic decompression/detorsion procedure using a rectal probe. In cases where this maneuver proved successful, a colonic preparation was performed, involving betadine and normal saline, followed by an elective laparoscopic sigmoidectomy.

The variables scrutinized in this study encompassed patient age, gender, the technique employed for detorsion, the surgical approach adopted, procedure duration, morbidity, mortality rates and the duration of hospitalization.

Surgical procedure adhered to the following protocol: patients were positioned supine in the gynecological position under general anesthesia with oro-tracheal intubation. In all cases, an open laparoscopy was executed. The exploration was initiated through an 11 mm umbilical optical trocar (30°), with additional operating trocars (5 mm) introduced under visual supervision, specifically at the left flank and left hypochondrium. The laparoscopy setup encompassed a double-screen storz column. Surgical instrumentation encompassed two grasping forceps, a pair of laparoscopic scissors, bipolar forceps, a suction-irrigation system, a needle holder, clip forceps and LigaSure forceps.

RESULTS

In this study, we present four patients, consisting of three males and one female who were managed for sigmoid colon volvulus via elective laparoscopic sigmoidectomy. These patients were admitted to the emergency department due to the manifestation of a pronounced occlusive syndrome, characterized by abdominal pain, cessation of feces and gas cessation, occurring over a period of 24-48 hrs. Physical examination upon admission revealed asymmetric abdominal distension and tympanic resonance. Diagnostic confirmation was achieved through plain abdominal X-ray, which depicted a characteristic hoop-shaped image indicative of sigmoid volvulus. Additionally, abdominal CT scans were conducted for all four cases, corroborating the presence of mesenteric-axial sigmoid volvulus without any signs of severity. A comprehensive summary of the clinical, laboratory and surgical interventions performed on these patients is presented in Table 1.

In cases where clinical and laboratory indicators did not suggest severity, the initial therapeutic approach encompassed detorsion utilizing a rectal probe. This procedure resulted in the expulsion of gas and stool, accompanied by a reduction in abdominal distension and alleviation of pain. Subsequently, a catheter was secured and retained for three days prior to removal. On the first day following detorsion, a follow-up abdominal X-ray was performed. In preparation for surgical intervention, colonic irrigation with normal saline was executed one day before the surgery. Laparoscopic exploration of the abdominal cavity was followed by meticulous dissection, hemostasis of the mesentery using the LigaSure device and exteriorization of the redundant sigmoid colon

Table 1: Clinical, laboratory, radiological and operative variables of laproscopic sigmoidectomy patients

Parameters	Patient 1	Patient 2	Patient 3	Patient 4
Age (years)	54	44	61	64
Gender	Female	Male	Male	Male
Height (cm)	156	163	165	160
Weight (kg)	68	75	63	72
T (°C)	36.7	37.2	36.8	37.1
Pulse (beats min^{-1})	98	107	65	76
BP (mm Hg)	130/72	138/88	102/60	125/70
WHO score	II	I	II	I
Blood group	O+	B+	A+	AB+
Hemoglobin (g dL^{-1})	14.8	13.2	12.9	13.6
Hematocrit (%)	44.7	38.1	34.2	39.5
WBC (cells CU^{-1} mm)	8000	9200	5500	8900
Platelets (cells CU^{-1} mm)	360,000	290,000	210,000	330000
Na+ (umol L^{-1})	135	138	141	137
K+ (umol L^{-1})	2.5	2.3	2.7	2.4
Creatinine (mg L^{-1})	10.5	9.3	11.4	10.1
C reactive protein (mg L^{-1})	8.1	22.3	47.7	15.3
Abdominal CT scan (mesenteric-axial volvulus with caecal diameter, in mm)	94	87	95	91
Time of detorsion (day of evolution)	Day 3	Day 2	Day 4	Day 3
Post-detorsion intervention time	Day 8	Day 5	Day 7	Day 6
ASA score	II	I	II	I
Operating duration (min)	105	95	88	110
Hospital stay (days)	5	7	6	5
Intraoperative blood loss (cc)	115	110	120	116
Postoperative complications	Fever	None	None	None

through a 4 cm mini laparotomy situated in the left iliac fossa. Extracorporeal resection of the sigmoid colon was then undertaken. A primary colo-colic end-to-end anastomosis was fashioned using 3/0 Vicryl suture material.

Postoperatively, the patients received treatment comprising paracetamol (60 mg kg^{-1} day^{-1}), amoxicillin clavulanic acid (80 mg kg^{-1} day^{-1}), metronidazole (30 mg kg^{-1} day^{-1}) and prophylactic heparin therapy. The resumption of normal gastrointestinal transit in the form of gas passage was noted 48 hrs postoperatively in two patients and these individuals progressively resumed oral feeding from the third day onwards. However, one patient experienced postoperative morbidity, characterized by a fever of 38.7°C and delayed recovery of gastrointestinal transit. Blood culture results were negative. Nonetheless, this patient's condition improved under medical management.

Histological examination of the resected surgical specimen revealed findings consistent with inflammatory colitis, without any histological evidence of malignancy. Importantly, there were no reported mortalities during the three-month follow-up period.

DISCUSSIONS

The emergency surgical management of sigmoid volvulus necessitates a judicious approach contingent upon the manifestation or absence of clinico-biological indicators of gravity. In instances where patients exhibit signs of severity, encompassing ischemia, perforation, or peritonitis, a prompt intervention via median laparotomy is imperative due to the unfavorable prognosis associated with these conditions. Conversely, for patients devoid of complications, an expeditious detorsion procedure is indicated. This detorsion maneuver is effectively executed employing a flexible endoscope, yielding success rates ranging from 70-90% as reported by various authorities[1,2].

In our clinical study, we resorted to detorsion via a rectal probe performed blindly. This alternative technique was necessitated by the unavailability of therapeutic endoscopy within our facility. The adoption of the rectal probe as a modality for decompression/detorsion has been documented in the literature by several scholars[2]. It emerges as a straightforward, facile, rapid and cost-effective method fraught with a diminished risk of iatrogenic colonic perforation.

The definitive course of action subsequent to a successful detorsion remains a subject of debate. Multiple therapeutic approaches have been delineated in the medical literature, encompassing meso-sigmoidoplasty, open sigmoidopexy, endoscopic or laparoscopic procedures and elective sigmoidectomy, which can be conducted through a median laparotomy or total laparoscopic or laparoscopic-assisted techniques[1,2].

In a comprehensive systematic review and meta-analysis conducted by Ndong A in 2022, encompassing 30,810 patients with 29,874 cases of volvulus, it was revealed that laparoscopic surgery was only administered in 7% of cases (N = 2,089)[3]. Several options are available concerning this surgical approach, including sigmoidectomy, sigmoidopexy and stoma inversion. In our study, we opted for elective laparoscopic sigmoidectomy, particularly beneficial in elderly patients with significant comorbidities. Notwithstanding its costliness, technical intricacies and

potential constraints arising from the presence of a volvulus dolico megacolon, this technique has gained prominence for the successful management of decompressed volvulus[3,4].

Some scholars advocate for laparoscopic intracorporeal anastomotic resection followed by the natural transanal extraction of the specimen[1,6]. Alternatively, extracorporeal resection via a mirror McBurney incision, succeeded by manual or mechanical anastomosis, is a viable option[6]. In resource-limited settings where mechanical forceps are financially prohibitive and inaccessible, the traditional anastomotic approach is preferred.

Relative to conventional surgery, the laparoscopic approach is associated with a protracted operative duration, with the literature reporting an average range of 100-150 min, contingent upon the surgical team's expertise[7-10]. Laparoscopic surgery, however, presents favorable outcomes with low recurrence rates (below 2%), limited occurrence of anastomotic fistulas (5.25%), parietal suppurations (3.27%), an average blood loss of 78.25 mL and a brief hospital stay of 7.3 days[3,7,10]. Moreover, the laparoscopic approach affords advantages such as reduced postoperative pain, swift resumption of gastrointestinal transit and oral feeding, expeditious recovery and enhanced cosmetic outcomes when juxtaposed with the conventional open approach[10].

CONCLUSION

Laparoscopy offers significant advantages in the surgical management of uncomplicated sigmoid volvulus cases. While it is a well-established technique in developed countries, its adoption remains challenging in resource-limited settings. However, it is a safe, reproducible approach that reduces hospitalization duration, postoperative pain and morbidity/mortality rates.

REFERENCES

1. Dhaheri, M.A., M.A. Nada, W.E. Ansari, M. Kurer and A.A. Ahmed, 2020. Left iliac fossa mini-incision sigmoidectomy for treatment of sigmoid volvulus. case series of six patients from Qatar. Int. J. Surg. Case Rep., 75: 534-538.
2. Ifversen, A.K.W. and D.W. Kjaer, 2014. More patients should undergo surgery after sigmoid volvulus. World J. Gastroenterol., 20: 18384-18389.
3. Sow, O., R. Saidy, M.L. Gueye, K. Ibrahima and M. Dieng, 2023. Elective sigmoidectomy laposcopic assisted for sigmoid volvulus in a rural setting. J. Surg., Vol. 8, No. 11. 10.29011/2575-9760.001828
4. Gordon-Weeks, A.N., B. Lorenzi, J. Lim and M. Cristaldi, 2011. Laparoscopic-assisted endoscopic sigmoidopexy: A new surgical option for sigmoid volvulus. Dis. Colon Rectum, 54: 645-647.
5. Peschaud, F., A. Alves, S. Berdah, R. Kianmanesh and C. Laurent *et al*., 2006. Indications de la laparoscopie en chirurgie générale et digestive: Recommandations factuelles de la Société Francaise de Chirurgie Digestive (SFCD). J. Chirurgie, 143: 15-36.
6. Dieme, E.G.P.A., M. Faye, B. Ndiaye, A.M. Cisse, M. Mboup, I. Sall, O. Fall and A. Sow, 2021. Adult sigmoid volvulus in west Africa: Management and outcome at principal hospital of Dakar. Int. J. Surg. Sci., 5: 32-37.
7. Nguyen, S.H., K. Tavares, A. Chinn, D. Russell, S. Gillern and C. Yheulon, 2022. Is laparoscopy underutilized for sigmoid volvulus? Surg. Laparoscopy, Endoscopy Percutaneous Tech., 32: 564-570
8. Ndong, A. and B. Patel, 2022. Safety and efficacy of laparoscopic surgery in the management of sigmoid volvulus: A systematic review and meta-analysis. Surg. Open Digestive Adv., Vol. 6. 10.1016/j.soda.2022.100052
9. Seow-En, I., S.C. Chang, T.W. Ke, M.Y. Shen, H.C. Chen and W.T.L. Chen, 2021. Uncomplicated sigmoid volvulus is ideal for laparoscopic sigmoidectomy with transrectal natural orifice specimen extraction. Dis. Colon. Rectum., 64: e90-e-93.
10. Gök, M,A., M.T. Kafada and V. Öter, 2017. Early-term elective laparoscopic resection after endoscopic detorsion in cases with sigmoid colonic volvulus. J. Clin. Anal. Med., 8: 492-495.