



Case Series

Left iliac fossa mini-incision sigmoidectomy for treatment of sigmoid volvulus. Case series of six patients from Qatar



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ABSTRACT

BACKGROUND: Midline laparotomy is the definitive treatment for sigmoid volvulus after initial colonoscopic detorsion. We successfully adopted another technique at our center on 6 patients, treating sigmoid volvulus by left iliac fossa mini-incision.

PRESENTATION OF CASES: We report our experience of six non-consecutive cases of sigmoid volvulus treated by left iliac fossa mini-incision. The cases were a 33 year old Egyptian female, a 21 year old Bangladeshi male, a 58 year old Qatari male, a 30 year old Ethiopian male, a 36 year old Ugandan male, and a 58 year old Indian male. The six cases are unique in the surgical technique employed in their management. This is possibly the second case series of left iliac fossa mini-incision for sigmoid volvulus in the Middle East and North Africa Region.

DISCUSSION: All patients underwent initial colonoscopic detorsion followed by sigmoidectomy and anastomosis. The procedure was successful in treating the volvulus in five patients with no complication or recurrence over a mean follow up of 8 months (range: 1–36 months). One patient required further laparotomy and resection with anastomosis due to incompletely removed sigmoid colon.

CONCLUSIONS: Left iliac fossa mini-incision for sigmoid volvulus is safe, feasible, cosmetically appealing and with low morbidity.

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1. Background

Sigmoid volvulus is the most common form of volvulus, representing 3%–5% of all acute intestinal obstructions [1]. It occurs when a redundant long sigmoid colon twists around an elongated narrow mesentery. There is debate as to whether sigmoid volvulus is congenital, acquired, or a combination of both [2]. However, a high-fiber diet, advanced age, chronic constipation, previous surgery, neurologic or psychiatric conditions and megacolon have all been identified as predisposing factors [2–4].

Most (85%) colonic volvulus present as an acute obstruction [5], with about half the patients reporting a similar episode in the past [6]. After initial colonoscopic detorsion, midline laparotomy with sigmoidectomy and primary anastomosis is the standard definitive management [1]. Recently, the laparoscopic approach emerged as a

minimally invasive option. However, it has its technical limitations due to the distended bowel, intolerance of pneumoperitoneum in comorbid patients, increased costs, and it is not readily available, particularly in lower income countries [7]. In order to aid the reduction of morbidity, a left iliac fossa mini-incision was first described in 2014 [8], associated with significant cost saving, cosmetically appealing scar, potentially improved recovery and less pain. We adopted this mini-incision technique at our hospital in 2016, and since then we have operated on 6 cases of sigmoid volvulus at a single colorectal surgery center.

We report these six retrospective non-consecutive cases at a single centre due to the uniqueness of the mini-incision surgical technique and its findings, and in order to debate the possible advantages of this technique. This case series is in line with the updated consensus-based case series (PROCESS) guidelines [9].

2. Case presentations

Table 1 depicts the summary of characteristics of the six patients.

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Table 1
Summary of characteristics of the six patients.

Characteristic	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Demographics						
Age (years)	33	21	58	30	36	58
Gender	Female	Male	Male	Male	Male	Male
BMI (kg/m ²)	24.9	21.32	23.35	22.15	23.54	28.67
Country	Egypt	Bangladesh	Qatar	Ethiopia	Uganda	India
Presentation	Elective, 3 months post delivery	Emergency	Emergency	Emergency	Emergency	Emergency
History						
Comorbidities	Nil	Nil	Epilepsy, mental retardation, cataract, hypertension, dyslipidemia	Nil	Nil	Hypertension
Previous surgery	3 cesarean sections	Nil	Nil	Nil	Nil	Nil
Previous episode/recurrent abdominal pain	Recurrent abdominal pain	Volvulus 5 months earlier	Nil	Nil	Nil	Volvulus 7 months earlier
Pre-operative CT findings	All patients had successful colonoscopic detorsion and decompression with rectal tube insertion					
Operative Procedure	Left iliac fossa mini-incision and sigmoidectomy was technically feasible in all patients					
Operative time (min)	120	90	160	90	90	100
Blood loss (ml)	20	30	50	20	30	20
Length of hospital stay (days)	4	4	4	4	5	5
Post-operative Complication/s	Nil	Nil	Persistent volvulus*	Nil	Nil	Nil
Mortality	No mortality across all patients, with mean follow up of 8 ± SD 27 months (range: 1–36 months)					

* Persistent volvulus (after 5 days, during same admission) due to incomplete removal of the redundant sigmoid colon.

2.1. Case 1

A 33 year old Egyptian female who was 33 weeks pregnant, presented to the emergency department at our institution (Hamad General Hospital, largest tertiary care hospital in Qatar) with abdominal pain, constipation and abdominal distention 2 days. Past history was remarkable for recurrent abdominal pain for around 5 years and previous cesarean sections. No relevant family history. Upon examination, she was hemodynamically stable, with distended abdomen. Blood investigations were unremarkable. Abdominal X-ray showed severely dilated colon with the coffee bean sign of sigmoid volvulus. She was admitted, successfully underwent sigmoidoscopy, detorsion and decompression and was discharged home after 3 days. Then, after delivery of the child, she started having intermittent abdominal pain again, and 3 months following the first attack, she was admitted electively and underwent left iliac fossa mini-incision sigmoidectomy and was discharged on post-operative day 5. At one month follow up after the procedure, there were no post-operative complications noted.

2.2. Case 2

A previously healthy 21 year old Bangladeshi male presented to the emergency department at our institution with abdominal pain for two days associated with constipation and vomiting. Past history revealed that he had an attack of sigmoid volvulus 5 months prior to this presentation. No past history of surgery, and no relevant family history. Upon examination, he was hemodynamically stable, with distended abdomen but non peritonitic. Blood investigations were unremarkable. Preoperative CT of the abdomen showed dilated colon with the whirlpool sign, features impressive of sigmoid volvulus. He underwent sigmoidoscopy, detorsion and decompression with rectal tube. On day 5 post detorsion, he underwent sigmoidectomy via left iliac fossa mini-incision and was discharged on post-operative day 5. There were no post-operative complications upon follow up to 36 months.

2.3. Case 3

A 58 year old Qatari male living in a residential home with medical history of mental retardation, cataract, hypertension, dyslipidemia, and epilepsy controlled by medication. The patient had past history of chronic constipation which was usually relieved by rectal enema. History taken from the accompanying nurse indicated that he had constipation and progressive abdominal distention for three days. Over the 2 days prior to the admission to our hospital, the patient had become irritable and uncooperative, and this was attributed to his abdominal pain. His blood investigations were unremarkable. Preoperative CT of the abdomen showed dilated colon with twisted mesentery and the whirlpool sign, features remarkable of sigmoid volvulus. He underwent sigmoidoscopy, detorsion and decompression with rectal tube. Eight days post detorsion, he underwent sigmoidectomy via left iliac fossa mini-incision. Post operatively, although he did not pass motions or flatus, he was started on surgical fluid, after which he developed gradual abdominal distention over postoperative days 3 and 4. Hence a postoperative CT of the abdomen was undertaken and again showed features of sigmoid volvulus. A rectal tube was inserted and the distention partially improved. However, he again developed distension and constipation for which he underwent exploratory midline laparotomy on post-operative day 5. Intraoperatively, there was dilated colon distal to the anastomotic site, with a band discovered extending from left colon to the small bowel mesentery around which the remaining sigmoid was twisted. This band was divided, and sigmoidectomy of the remaining sigmoid and primary anastomosis were done. The patient had a smooth post-operative course with open bowel and was started on regular diet on post-operative day 4. On follow up, he was well until 29 months post-surgery, after which he presented again with abdominal distension and constipation but passing flatus. CT of the abdomen showed dilated colon and small intestine with transient point at the anastomotic site. He underwent colonoscopy and a stricture was found at the anastomotic site which was treated endoscopically with serial CRE™ Balloon dilatation in three intervals up

to 16.5 cm. On follow up, to date, he was well and passing motion on bulk laxative intermittently.

2.4. Case 4

A 30 year old Ethiopian male with no medical illness presented to our emergency department with colicky abdominal pain and constipation for 3 days. No past history of surgery, and no relevant family history. Upon examination, he was hemodynamically stable with distended abdomen. Blood investigations were unremarkable. Preoperative CT of the abdomen showed distension of colon with the whirlpool sign, features remarkable of sigmoid volvulus. On the same day he underwent sigmoidoscopy, detorsion and decompression with rectal tube. On day 3 post detorsion, he underwent sigmoidectomy via left iliac fossa mini-incision and was discharged on post-operative day 4. At one month follow up, there were no post-operative complications.

2.5. Case 5

A 36 year old Ugandan male presented to our emergency department with colicky abdominal pain for one day associated with vomiting and passage of loose motions for 3 days. No history of medical illness or previous surgery, and no relevant family history. Upon examination, he was hemodynamically stable with distended abdomen. Blood investigations were unremarkable. Preoperative CT of the abdomen showed twisting of the sigmoid around its mesentery with the whirlpool sign, and a massively distended proximal colon with an air-fluid level. On the same day, he underwent sigmoidoscopy, detorsion and decompression with rectal tube. On day 5 post detorsion he underwent sigmoidectomy via left iliac fossa mini-incision and was discharged on post operative day 5. At two months follow up, there were no post-operative complications.

2.6. Case 6

A 58 year old Indian male with presented to our emergency department with abdominal pain and abdominal distention that developed gradually over the past week. He had history of sigmoid volvulus 7 months prior to this presentation, medical history of hypertension controlled with medication, and no relevant family history. Upon examination, he was hemodynamically stable with distended abdomen. Blood investigations were unremarkable. Pre-operative CT of the abdomen showed twisting of the vessels and mesentery of the sigmoid colon, consistent with whirlpool sign. On the same day, he underwent sigmoidoscopy, detorsion and decompression with rectal tube. On day 5 post detorsion, he underwent sigmoidectomy via left iliac fossa mini-incision and was discharged on post-operative day 5. At seven months follow up, there were no post-operative complications.

3. Surgical technique: left iliac fossa mini-incision sigmoidectomy

After initial colonoscopic detorsion and decompression with insertion of rectal tube, patients were restarted on oral fluids. Once patients can tolerate oral fluids, all patients should have mechanical bowel preparation and full colonoscopy to check for any pathology. Once confirmation is available that there is no pathology in the colon other than the volvulus, left iliac fossa mini-incision sigmoidectomy and primary anastomosis is undertaken later.

The procedures were performed by consultants with experience in colorectal surgery of at least 5 years. Under general anesthesia, the patient in supine position, a left iliac fossa skin incision of about 5 cm was undertaken (mirror image of McBurney incision) (Fig. 1).

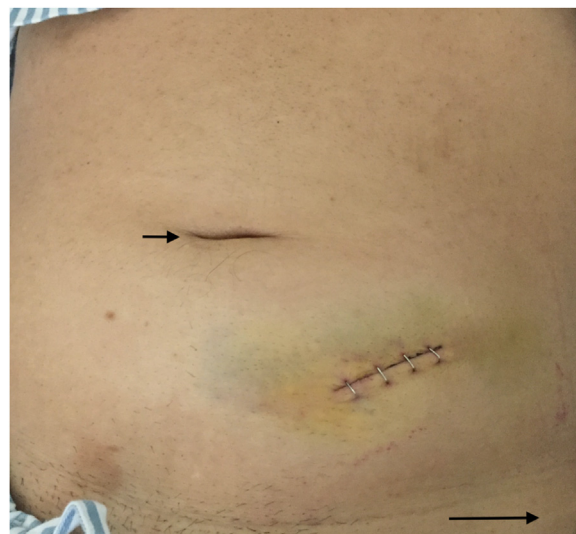


Fig. 1. Left iliac fossa mini-incision on post operative day 4 (Short arrow: umbilicus, Long arrow left anterior superior iliac spine).

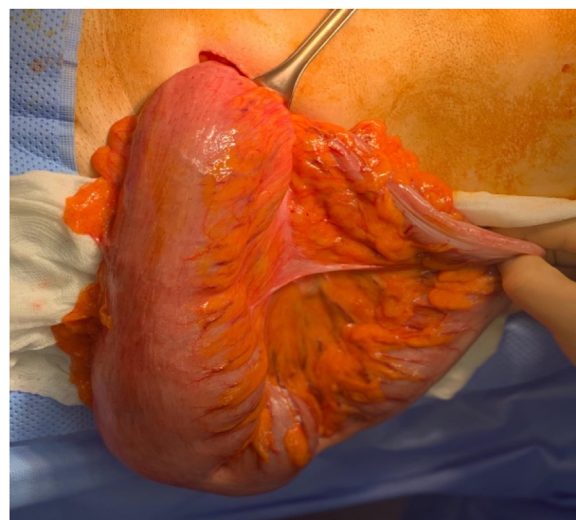


Fig. 2. Exteriorization of the sigmoid colon showing the mini-incision in left iliac fossa.

The external oblique aponeurosis was divided along its fibers and the muscles were separated. The peritoneum was carefully opened with scissors. The dilated redundant colon was exteriorized and carefully inspected for viability (Fig. 2). A critical step was to ensure the retrieval of the whole redundant colon proximally and distally until the rectosigmoid junction, in order not to leave any redundant colonic segment which could later predispose to recurrence of the volvulus (Fig. 3). Once the sigmoid was exteriorized, the mesentery was then divided in a V shape manner, and colonic resection of the redundant sigmoid colon was undertaken leaving a well vascularized proximal and distal part of the colon for anastomosis. Re-establishment of the intestinal continuity was done by side to side anastomosis using GIA linear stapler 80 [8].

4. Discussion

The initial assessment of sigmoid volvulus comprises an appraisal of signs of perforation, gangrene or peritonitis. For patients with signs of perforation or gangrene, an immediate mid-line laparotomy should be performed [10]. For patients without

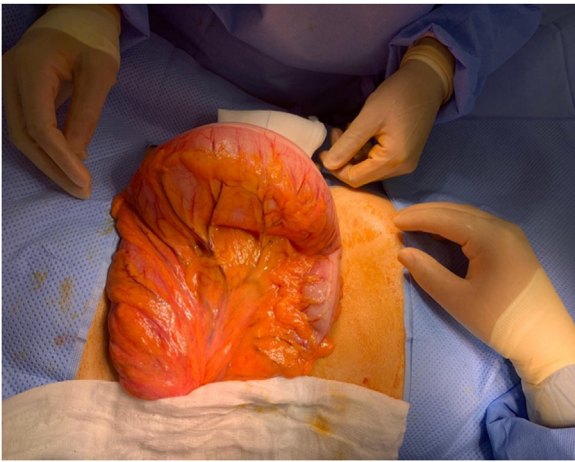


Fig. 3. Exteriorization of the whole redundant sigmoid colon.

peritonitis, primary therapy is colonoscopic detorsion using a flexible endoscope, where successful detorsion is achieved in up to 80–90% of cases [4,6], and maintained with the insertion of a rectal tube and concomitant resuscitation of the patient. Detorsion and decompression alone is frequently followed by a significant recurrence rate [4,10]. Hence, definitive early surgery should be performed.

Definitive surgical management of patients without peritonitis following successful endoscopic decompression is controversial. The classical definitive surgical approach has been midline laparotomy and sigmoid colectomy with primary anastomosis [10]. But such approach has the disadvantage of colonic resection and possible anastomotic leakage. Hence, non-resectional surgical approaches, aimed at decreasing such morbidity have also been described. These include open, laparoscopic or endoscopic sigmoidopexy, as well as extraperitonealization of the sigmoid or meso-sigmoidoplasty [11–14]. These three alternatives have been used with variable successes, but such approaches have a major drawback in terms of higher recurrence rate of the volvulus [15]. To date, no large randomized controlled trials have been conducted to compare the effectiveness of sigmoid colectomy with primary anastomosis vs sigmoidopexy, extraperitonealization of the sigmoid or meso-sigmoidoplasty.

The laparoscopic approach has been increasingly described for sigmoid volvulus and is generally associated with improved morbidity [16–19]. However, some authors claim that laparoscopy for sigmoid volvulus is unwarranted as it is technically difficult and too costly [7,18]. In order to simplify the technical difficulties of laparoscopic colectomy in sigmoid volvulus, it was proposed that laparoscopy be used only to help exteriorize the sigmoid colon through a mini-incision without preliminary dissection [17].

However, in our experience, we observed that there is no need for either a long incision or laparoscopy, as in patients with volvulus, the sigmoid colon is quite long, redundant and rather easily brought out of the abdominal cavity. Hence, we agree with others [8] that left iliac fossa mini-incision without laparoscopy is sufficient. In our initial experience with six patients during the past 2.5 years, the procedure was straight forward, and technically less challenging than the laparoscopic approach. In agreement, others have supported that that left iliac fossa mini-incision without laparoscopy has excellent results and could also be undertaken under local anesthesia [8,20,21]. Furthermore, in the rare event of failed exteriorization (e.g., in obese patients) of which we did not encounter any, the procedure could be converted to the open or laparoscopic approach.

Our six patients who underwent left iliac fossa mini-incision sigmoidectomy and primary anastomosis for treatment of sigmoid volvulus were all satisfied and pleased with the small incision that was cosmetically appealing. From the surgeons' side, there was minimal blood loss, decreased length of hospital stay and post-operative analgesia which minimized the costs. We observed no complications with this mini-incision surgical approach, in contrast to midline laparotomy which generally carries a 10–30% risk of incisional hernia as a late complication [22–26].

One of our patients (Case 3) had to be re-operated 4 days after the index procedure by a midline laparotomy, due persistence of the volvulus because the redundant sigmoid colon was not completely resected. Here, we highlight the critical step of retrieving the whole redundant proximal and distal colon. This is an important point in the learning curve of the procedure.

5. Conclusion

In this case series, we highlight sigmoidectomy for sigmoid volvulus by left iliac fossa mini-incision as a possible alternative to the classical midline laparotomy. It is safe, feasible, cost effective, has low morbidity, and cosmetically appealing. Although the majority of our patients were young, sigmoidectomy for sigmoid volvulus by left iliac fossa mini-incision could be even more advantageous for older patients with multiple morbidities as it can be undertaken under local anesthesia. We encourage the practice of such technique, however there is a need for head to head rigorous comparisons with midline laparotomy and laparoscopy.

Declaration of Competing Interest

The authors report no declarations of interest.

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Nothing to declare.

Ethical approval

Approved by Medical Research Center, Hamad Medical Corporation reference number (MRC-01-20-086).

Consent

It was not possible to obtain written informed consent from the patients. Most patients probably travelled out of the country after surgery. The head of our surgical team has taken responsibility that exhaustive attempts have been made to contact the patients or their families and that the paper has been sufficiently anonymized not to cause harm to the patients or their families. A copy of a signed document stating this is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Mahmood Al Dhaheri: Conceptualization, Data curation, Investigation, Project administration, Writing- original draft, Writing - review & editing. Mohamed Abu Nada: Data curation, Investigation, Methodology, Writing - review & editing. Walid El Ansari: Data curation, Methodology, Writing- original draft, Writing - review & editing. Mohamed Kurer: Data curation, Investigation, Methodology, Writing - review & editing. Ayman Abdelhafiz: Data curation, Methodology, Validation, Writing- original draft, Writing - review & editing, Writing - review & editing. All authors read and approved the final manuscript.

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