Management of acute sigmoid volvulus in a provincial centre—a 20-year experience

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Sigmoid volvulus is associated with a high rate of recurrence with non-operative treatment and conservative management has been associated with high mortality with recurrent sigmoid volvulus. Furthermore, delays greater than two days to treatment after decompression are not associated with improved outcomes. Consequently, early surgical intervention is expected to improve outcomes but despite significant geographical variation in the presentation of volvulus, local research from New Zealand and Australasia is lacking. Published local data indicates in the absence of ‘prohibitive comorbidities’ early surgical intervention should be encouraged. Yassaie et al warned that conservative management was associated with a high rate of recurrence with a significant proportion needing emergency surgery on representation in that series. In the last few decades a strong trend towards decompression with flexible endoscopy has been adopted for the treatment of sigmoid volvulus, despite rates of decompression with rigid sigmoidoscopy being similar. The main advantage of the flexible endoscopy is the improved visualisation of the colon to assess for ischaemia, however this requires an endoscopy slot and the additional associated staffing and the potential delay to decompression that goes along with this. This issue of requiring an endoscopy slot is exacerbated in the provincial centre and especially in evenings and weekends when urgent endoscopy slots are unavailable and the case needs to be performed in theatre.

ABSTRACT

AIM: At our institution there has been a long-standing early operative approach to large bowel volvulus as well as initial decompression with rigid sigmoidoscopy. The primary aim of this study was to investigate the safety and efficacy of this approach on reducing readmissions and complications. Secondary aims were to investigate the safety and efficacy of bedside rigid sigmoidoscopy in decompression of sigmoid volvulus and investigate the sensitivity of abdominal x-ray in the diagnosis of acute large bowel volvulus.

METHOD: A retrospective study was conducted on all patients presenting with acute obstruction due to large bowel volvulus between 1 January 1998–1 January 2018.

RESULTS: Thirty-four patients with acute sigmoid volvulus were identified that met the inclusion criteria with a median age of 81 years. The majority of patients 27/34 (79%) were booked for surgery on the first admission. Readmissions were reduced in the index operative group 1/20 (5%) vs the non-operative decompression group 3/4 (75%) RR 0.07 (CI 0.01–0.49 P=0.01).

CONCLUSION: Early sigmoid colectomy was associated with low morbidity and found to be safe in the elderly, and the results suggest that early surgery is associated with reduced readmissions and a low complication rate, with index surgery preferable to urgent elective surgery. Rigid sigmoidoscopy is a safe method of decompression as a bridge to index surgery and was not associated with any complications in this series.
Aim
At our institution there has been a long-standing early operative approach to large bowel volvulus as well as initial decompression with rigid sigmoidoscopy. Patients with signs of perforation or systemic toxicity were treated primarily with emergency surgery. Patients presenting with sigmoid volvulus had attempted decompression via rigid or flexible sigmoidoscopy and, unless there were significant comorbidities precluding surgery, were offered surgery on the same admission or as an urgent elective in the majority of cases.

The primary aim of this study was to investigate the safety and efficacy of this approach on reducing readmissions and complications. Secondary aims were to investigate the safety and efficacy of bedside rigid sigmoidoscopy in decompression of sigmoid volvulus, and investigate the sensitivity of abdominal x-ray in the diagnosis of acute large bowel volvulus.

Method
A retrospective review was conducted and included all patients presenting with acute obstruction due to large bowel volvulus between 1 January 1998–1 January 2018 in the Taranaki region. Data was collected with ICD-10 codes for volvulus, strangulation of colon or intestine, torsion of intestine or colon, and twist of colon or intestine. All cases presenting to hospital with acute sigmoid volvulus were included. Primary elective surgical cases were excluded, as were cecal volvulus, small bowel and gastric volvulus. Age, date of first admission for volvulus, subsequent readmissions for volvulus, date of surgery, surgical approach and type of surgery, subsequent admissions post-surgery, attempts at rigid decompression, attempts at flexible decompression, complications, deaths, x-ray report on admission were recorded from a combination of computer and paper-based records.

Results
Thirty-four patients with sigmoid volvulus were identified that met the inclusion criteria with a median age of 81 years. The majority of patients 27/34 (79%) were booked for surgery on the first admission. The majority of patients 27/31 (87%) were offered surgery. In our series, 20 patients with sigmoid volvulus had surgery on index admission, six were booked as an urgent elective from the first admission, one patient declined surgery, four were managed conservatively and three were managed palliatively at the patients'/EPOAs' request. Only 4/31 (13%) of patients had non-operative decompression as the intended treatment plan (see Figure 1).

Primary outcome
Readmissions
Readmissions were reduced in the index operative group 1/20 (5%) vs the non-operative decompression group 3/4 (75%) RR 0.07 (CI 0.01–0.49 P=0.01). Readmission was also less likely with index surgery than urgent elective 1/19 (5%) vs 2/6 (33%) RR 0.08 (CI 0.01–0.55 P=0.01). No patients received non-resective surgery. The only readmission in the post-operative group was a patient requiring later subtotal colectomy for megacolon.

In the surgery group 20/27 (74%) were operated acutely and 6/27 (22%) were operated on as an urgent elective (two of which were readmitted, with one requiring acute surgery) (see Figure 1).

Four patients were managed non-operatively (three of the four patients were readmitted, with one patient requiring emergency surgery; one patient was readmitted and discharged and died within one year of discharge in the community and one patient was readmitted and discharged twice and died within one year of discharge in the community; one patient was not readmitted)

Complications
There were three inpatient deaths during this series, but all were palliated at patient or families request. There were two out-of-hospital deaths within one year of discharge after successful decompression of unknown cause. There was one anastomotic leak in the operative group requiring return to theatre and formation of stoma.

Secondary outcomes
Rigid sigmoidoscopy was performed in 22 of 34 (65%) of patients with sigmoid volvulus and significantly improved distension in 19 of 22 (86%); with immediate complete
Figure 1: Summary of outcomes.

Figure 2: Approach to acute sigmoid volvulus in the absence of toxicity or shock.
decompression in 13 of 19 (68%). There were no recorded complications associated with rigid decompression in this series. Flexible endoscopic decompression was used sparingly in only five of 34 (15%). There was one perforation associated with endoscopic decompression in this series. Abdominal plain film was ordered uniformly but was very insensitive and was positively diagnosed on the x-ray report in 16/34 (47%) of patients with acute volvulus. In contrast, 92% (13/14) of CT scans correctly identified volvulus preoperatively. Six patients were diagnosed with a combination of x-ray and barium enema with an accuracy of 83% (5/6).

**Discussion**

Early sigmoid colectomy was associated with low morbidity and found to be safe in the elderly (patients over 70), and the results suggest that early surgery is associated with reduced readmissions and a low complication rate, with index surgery being the ideal approach. The majority of patients 27/31 (87%) were offered surgery, which is in contrast to data previously published in New Zealand in which 55% of patients were initially treated conservatively. The only readmission in the post-operative group was a patient requiring later subtotal colectomy for megacolon, which is a risk factor for recurrence. It has been argued that elderly patients over 70 years represent a high risk of mortality and non-operative detorsion should be considered. Larger series have shown that elderly patients present with higher percentage of recurrent volvulus, serious comorbidity, late admission, toxicity and shock. Our series shows good safety in the elderly as the median age in the operative group was 81 years old. It should be noted however, that the very elderly were much more likely to receive conservative management or decline surgery with 4/6 (83%) of the non-operative group being >85 years or older. The accuracy of abdominal plain film was similar to other series and is an insensitive test for volvulus and uncertainty regarding the diagnosis should be confirmed on CT. Due to the retrospective nature of this study and the expected bias towards performing primary anastomosis on younger, fitter patients,
we cannot make any recommendations on the use of primary anastomosis, however another recently published large series of over 2,500 patients shows safety in emergent cases with a low anastomotic leak rate.8 Our proposed approach to sigmoid volvulus for a patient presenting with sigmoid volvulus in the absence of shock or systemic toxicity is provided in Figure 2 above, and the favoured method of treatment is initial decompression (ideally immediate with rigid sigmoidoscope) followed by a sigmoid colectomy and primary anastomosis via a sigmoid colectomy and primary anastomosis via a left lower quadrant transverse incision when surgically feasible. In non-toxic patients we advocate an LLQ mini incision after sigmoidoscopic decompression for sigmoid volvulus as the redundancy of the bowel and mesentery allows it to project easily outside of the abdominal wound (see Figure 3). Therefore, the usual advantages seen in a laparoscopic mobilisation are not as pronounced in these patients15 and this mini-incision approach has shown reasonable long-term results.16 The authors believe rigid sigmoidoscopy is an effective and safe method of decompression that can be performed in the ED and was not associated with any complications in this series. Although flexible sigmoidoscopy is undoubtedly superior for the purposes of visualising ischaemia,10,11 rigid sigmoidoscopy acts as a useful bridge to surgery and is expected to reduce the need for acute theatre or endoscopy slots, and importantly reduce the time to decompression. Furthermore, index surgery partly obviates the limitations in regard to missed bowel ischaemia with rigid decompression.

Although this analysis suffers from the low patient numbers associated with a single-centre experience of an uncommon condition, this series illustrates the potential benefits of early operative management. The authors attribute the low readmission rate compared to other local series9 to the high rate of index operation. Furthermore, the higher rates of readmissions in the urgent elective group suggests the need to try to operate on these patients as early as possible, ideally on the index admission if feasible. We believe early sigmoid resection on the same admission can be an effective treatment that may lead to lower readmission rates for sigmoid volvulus, and has low morbidity and mortality in both our series and other larger series.10

Competing interests:
Nil.

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