

# Surgical management of colonic volvulus during same hospital admission

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## ABSTRACT

**الأهداف:** لدراسة الديموغرافية، طرق التشخيص، والمعالجة لمرضى إنفنتال القولون، مع وضع خطة لتدبير هؤلاء المرضى.

**الطريقة:** تمت مراجعة ملفات المرضى الذين تم تشخيصهم بالإصابة بإنفنتال الأمعاء الغليظة في مجمع الرياض الطبي - الرياض - المملكة العربية السعودية، خلال الفترة مابين عام 2000م وحتى 2007م، ودراستها من الناحية الديموغرافية، السريرية، الإمبراضيات المرافقة، طرق التشخيص، الأنماط التشريحية، والتدبير والنتائج.

**النتائج:** تمت مراجعة ملفات 42 مريضاً بإنفنتال الأمعاء الغليظة، وقد شكلت نسبة (8.5%) من مرضى الانسداد المعوي المعالجين في تلك الفترة، كانت الأغلبية مصابة بإنفنتال القولون السيني (83%)، وتحت عمر الـ 60 عاماً، ومعظمهم من الذكور. كانت عوامل الخطورة موجودة في 12 (29%) من الحالات. تم الاشتباه بالتشخيص عن طريق الصورة البسيطة للبطن في 28 مريضاً (69%) على الرغم من تواجد العلامات الوصفية للإنفنتال وهي: علامة اوميغا أو حبة القهوة، شوهدت في 16 مريضاً فقط. هناك 8 مرضى تطلبت حالتهم معالجة جراحية إسعافية، بينما تم معالجة 34 مريضاً بتنظير القولون وإزالة الضغط، وتبعت بالمعالجة الجراحية النهائية في 24 مريضاً. رفض 7 مرضى الخضوع لعملية جراحية، 3 منهم تم قبولهم مرة أخرى بسبب إنتكاس الإنفنتال وتم إجراء العملية الجراحية لهم، هناك 3 مرضى لا يمكنهم تحمل العملية الجراحية، وكان هناك 3 وفيات.

**خاتمة:** يعتبر إنفنتال الأمعاء الدقيقة غير شائع في هذه المنطقة، آلام البطن المصاحبة للتمدد، الإمساك، وتمطد التمدد الغازي على الصورة الإشعاعية للبطن، يمكن أن تساعد على التشخيص في معظم الحالات. إزالة الضغط عبر تنظير القولون يمكن إجراؤها في معظم حالات إنفنتال القولون السيني، متبوعة بالجراحة خلال فترة التنويم في المستشفى. أما إنفنتال الأعور فهي عادة تتطلب معالجة جراحية إسعافية.

**Objectives:** To study the local patient profile, diagnostic methods, and treatment outcome in patients with large bowel volvulus to recommend a management plan.

**Methods:** A retrospective study of patients record with a final diagnosis of large bowel volvulus treated at King Saud Medical Complex, Riyadh, Saudi Arabia between January 2000 and December 2007 were performed for patient demography, clinical presentations, co-morbidity, diagnostic methods, anatomical types, management, and outcome.

**Results:** Forty-two patients with large bowel volvulus were reviewed. They represented 8.5% of all intestinal obstructions treated. Most had sigmoid volvulus (83%), were less than 60 years of age, and were male. Recognized risk factors were present in 12 (29%) patients. Diagnosis was suspected on plain abdominal x-ray in 28 patients (69%), although the characteristic signs of 'omega' and 'coffee bean' were seen in only 16 patients. Eight patients required emergency surgery. Endoscopic decompression was successful in 34 patients, followed by a definitive surgery in 24 patients. Seven patients refused surgery; 3 of them were readmitted with recurrence and were operated. Three patients were unfit for surgery. There were 3 deaths.

**Conclusion:** Large bowel volvulus is uncommon in this area. Abdominal distension with pain, constipation, and characteristic gas pattern in plain x-ray can help diagnose most cases. Decompression can be achieved in most patients with sigmoid volvulus, followed by surgery during the same hospital admission. Transverse colon and cecal volvulus usually need emergency surgery.

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**L**arge bowel volvulus (LBV) is an uncommon cause of bowel obstruction. Volvulus develops when a bowel loop and its mesentery twists on a narrow fixed point at the base. The LBV can occur at several sites. The sigmoid colon is the most common site for volvulus. Less common sites include the cecum, transverse colon, descending colon, and splenic flexure. The torsion in the bowel results in a closed loop obstruction accompanied by compromised blood supply. This may lead to bowel ischemia and gangrene if treatment is delayed. Therefore, early recognition of the condition is crucial in reducing mortality. Poor diagnosis remains a problem, particularly in less prevalent areas.<sup>1</sup> Little has been reported on the incidence and the patient profile of LBV from Saudi Arabia.<sup>2,3</sup> We did not find any systematic review on LBV in a literature search. This prompted us to analyze our experience in dealing with this condition at a large teaching hospital in Riyadh, Saudi Arabia. The aim of this study was to describe the local patient demography, diagnostic methods, and suggest a treatment plan.

**Methods.** In this retrospective study, the records of patients with a diagnosis of LBV were withdrawn from those treated for intestinal obstructions at King Saud Medical Complex (formerly Riyadh Medical Complex), Riyadh, Saudi Arabia between January 2000 and December 2007. Only patients with a final diagnosis of one of the types of LBV were included in the study. Patients who were admitted several times with recurrent episodes were counted only once. Patients profile, clinical presentations, co-morbid factors, diagnostic methods, anatomical types of LBV, management, and outcome were recorded on a prepared proforma. Ethical approval was obtained from the hospital's research committee prior to commencement of the study.

**Results.** A total of 42 patients with a final diagnosis of LBV, which was 8.5% of intestinal obstructions treated during this period, were studied. There were 37 (88%) Saudi and 5 (12%) non-Saudi patients, most (69%) being male. The mean age was 43.5 (range 13-90 years), 69% were of <60 years. Table 1 shows their clinical presentations. Abdominal distension was the most common presenting symptom. The full 'triad' of large bowel obstruction-abdominal distension, abdominal pain, and absolute constipation were seen in only half (n=22) of these patients. Ten patients had history of previous volvulus, 6 of them were readmitted more than once during the study period. Table 2 presents the co-morbid factors present in these patients. All patients had plain abdominal x-ray on admission. This helped the diagnosis in 28 patients (69%). However, the classical 'omega sign' of sigmoid volvulus (SV) was present in 15 patients, and the 'coffee bean sign'

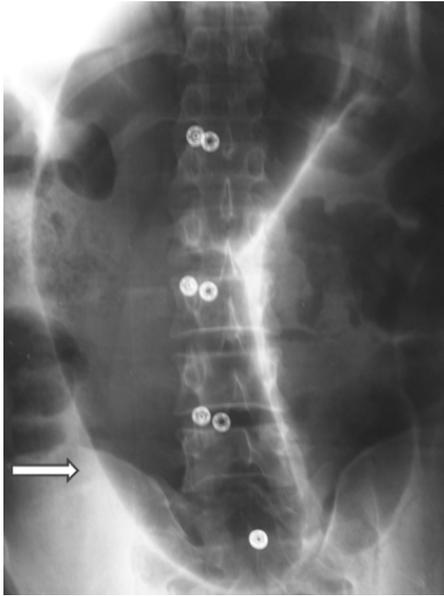
of cecal volvulus (CV) was present in only one patient (Figures 1 & 2). Massive large bowel distension was the main diagnostic feature of volvulus in the other 13 patients. Plain x-rays were considered indeterminate in the remaining 13 patients. Those with equivocal presentations needed further evaluation. Water-soluble contrast enema (n=4) demonstrated SV in 3 patients (Figure 3), and obstruction in the ascending colon in one patient. This last patient was subsequently proved to be a case of CV at surgery. Abdominal ultrasonography (n=4) was the least helpful investigation. It showed free peritoneal fluid in one patient, which was later found at surgery to be due to gangrenous CV with an ileal perforation. A CT scan of abdomen (n=5) helped establish the diagnosis in all. Management was based on the presence or absence of peritonitis in these patients. Those with peritonitis (n=5), after initial resuscitation, were taken for laparotomy. Sigmoid colectomy and Hartmann's procedure (SC+H) for gangrenous SV (n=3), right hemicolectomy and ileostomy (RHC+I) for gangrenous CV with perforated ileum (n=1), and transverse colon colopexy (n=1) for ischemic but viable transverse colon volvulus (TCV) after detorsion, were performed. Those without features of peritonitis (n=37) were submitted to endoscopic decompression. It was successful in 34 patients (92%), and included 32 SV, and one each of CV and TCV. Definitive surgery (n=24), SC with primary anastomosis on 23 patients and right

**Table 1** - Clinical presentation (n=42).

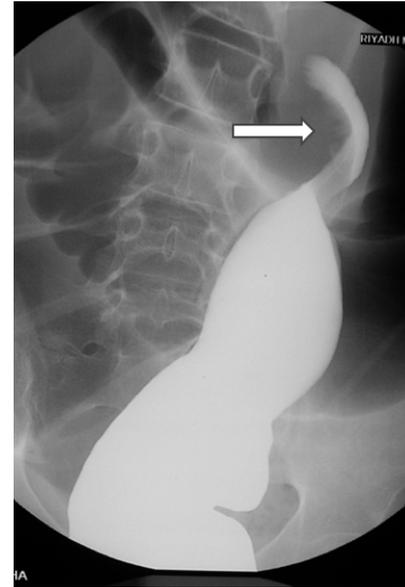
| Presentation          | n  | (%)    |
|-----------------------|----|--------|
| Abdominal distension  | 37 | (88.1) |
| Absolute constipation | 30 | (71.4) |
| Abdominal pain        | 26 | (61.9) |
| Vomiting              | 21 | (50.0) |
| Diarrhea              | 1  | (2.4)  |
| Shock                 | 1  | (2.4)  |
| Fever                 | 1  | (2.4)  |
| Hematemesis           | 1  | (2.4)  |

**Table 2** - Comorbidity factors (n=42).

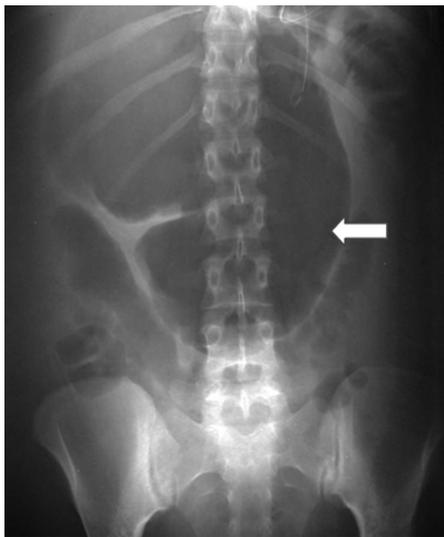
| Comorbidity                         | n | (%)    |
|-------------------------------------|---|--------|
| Mental retardation                  | 8 | (19.0) |
| Hypertension/ischemic heart disease | 8 | (19.0) |
| Diabetes                            |   | (9.5)  |
| Previous abdominal surgery          | 2 | (4.8)  |
| Cerebrovascular accident            |   | (4.8)  |
| Inflammatory bowel disease          | 1 | (2.4)  |



**Figure 1** - Plain abdominal x-ray showing omega sign (arrow) of sigmoid volvulus.



**Figure 3** - Contrast x-ray- bird's beak sign of sigmoid volvulus (arrow).



**Figure 2** - Plain x-ray showing coffee bean sign of cecal volvulus (arrow).

**Table 3** - Morbidity factors.

| Morbidity                       | Emergency<br>n (%) | Elective<br>n (%) |
|---------------------------------|--------------------|-------------------|
| Anastomotic leak (n=3)          | 1 (12)             | 2 (7)             |
| Intra-abdominal abscess (n=2)   | 1 (12)             | 1 (3.5)           |
| Abdominal wall dehiscence (n=1) | 1 (12)             |                   |
| Wound infection (n=8)           | 3 (38)             | 5 (18)            |

hemicolectomy in one patient, were performed during the same admission. Seven patients refused surgery. Three of them were readmitted with recurrent volvulus and agreed to SC after re-decompression. Three patients were unfit for surgery due to associated comorbidities. One of them died of myocardial infarction 2 days after decompression. Endoscopic decompression was unsuccessful in 3 patients (2 CV and one TCV). They were urgently operated, and right hemicolectomy and transverse colectomy with primary anastomosis were performed. Overall in this series, there were 35 (83%) patients with SV, 4 patients with CV, and 3 patients with TCV. Emergency surgery was performed on 75% of CV patients, 67% of TCV patients, and only 9% of SV patients. Complications seen in patients operated urgently and on an elective basis are presented in Table 3. Three patients died, 2 of them after surgery. They died of pulmonary embolism and septicemia. The third patient died of acute myocardial infarction 2 days after decompression. All colostomies/ileostomy (n=6) were closed within 8 months. No recurrent volvulus was seen in the surgically treated patients over 6 months to 5 years follow-up.

**Discussion.** Large bowel volvulus is common in Africa, India, Eastern Europe, and South America where it is responsible for up to 50% of bowel obstructions, whereas in Western countries only up to 5% of bowel obstructions are due to this condition.<sup>4-8</sup> The Middle East has been described as a volvulus belt.<sup>9</sup> However, in this study only 8.4% of all bowel obstructions treated at a major hospital in Riyadh were due to LBV. It may not

represent the true incidence of LBV in Saudi Arabia, but does indicate a low prevalence in this area. Similarly, others have also reported a low incidence from this region.<sup>9</sup> Sigmoid volvulus is the most common form of LBV.<sup>7,9,10</sup> A similar pattern was observed in this study. In a Mayo clinic series,<sup>11</sup> however, CV was the most common form (52%). Patients are generally younger in areas of high incidence. A mean age of 47 years is reported in one series from India.<sup>12</sup> Most of our patients were of less than 60 years, with a mean age of 43.5. Patients in most Western series are older.<sup>7,8</sup> A male preponderance, like most series, was also noted in this study.<sup>1,9,12</sup> Anatomic predisposition, a high fiber diet, chronic constipation, previous abdominal surgery, neurologic or psychiatric illness, pregnancy, high altitude, and megacolon have all been identified as risk factors.<sup>13</sup> An earlier histological study indicating that SV is related to loss of ganglion cells,<sup>14</sup> has not been proven in a subsequent study.<sup>15</sup> Some known risk factors such as mental retardation, CVA, previous abdominal surgery were noted in 29% of patients in this study. However, the retrospective nature of this study limited our ability to fully evaluate other risk factors such as dietary habit, constipation, or other bowel irregularity among our patients. Distension is the most common presenting feature.<sup>1,7,16,17</sup> The diagnosis of SV is usually suspected when a patient presents with huge asymmetrical abdominal distension, more marked on the left side with features of large bowel obstruction. However, the presentation of CV is subtle, more like a small bowel obstruction. Plain abdominal radiographs are important adjuncts in the diagnosis of LBV. The classical sign in plain x-ray, such as 'omega' sign for SV or 'coffee bean' sign for CV are not always present. Only 16 patients (38%) in this series had those classical signs. Low incidence of these classical signs on plain x-ray has also been observed in other series.<sup>1</sup> However, the diagnosis can be reached in up to 75% by clinical presentation and plain x-ray.<sup>1,7</sup> The LBV was strongly suspected in 29 patients (69%) in this study after plain abdominal x-ray. A CT scan and water soluble contrast study in indeterminate cases can further help in the diagnosis.<sup>1,7</sup> We could establish diagnosis with the help of CT abdomen, contrast study, and endoscopy in all equivocal patients, except 2.

Endoscopic decompression is a safe and effective initial treatment. It was successfully employed in 92% of our patients. Pre-operative decompression allows improvement of patient's fitness for surgery. Fit patients should undergo definitive surgery during the same hospital admission. This policy can minimize the risk of recurrence. Amongst our patients, following initial decompression, 24 (70.5%) were operated during the same hospital admission. However, emergency sigmoid resection for SV with primary anastomosis has been

reported with good results.<sup>17,18</sup> Many authors believe this policy would eliminate patient's unwillingness for a definitive surgery after decompression.<sup>17</sup> Sigmoid resection, sigmoidopexy, and mesosigmoidopexy have all been used to treat SV. Sigmoid fixation has a very high recurrence rate.<sup>5</sup> Only one patient in this study with a TCV had colopexy. His general condition did not allow a longer surgical procedure. A prospective randomized study has demonstrated the superiority of sigmoid resection over mesosigmoidopexy.<sup>5</sup> Sigmoid or transverse colon resection for volvulus and right hemicolectomy for CV is an accepted current treatment.<sup>7,16</sup> With increasing use of laparoscopic technique in colorectal surgery, laparoscopic assisted sigmoidectomy for SV has been reported with good results.<sup>19</sup> The laparoscopic technique was not used during this study. Subtotal colectomy has been recommended for recurrence after sigmoid resection or concomitant megacolon at initial surgery.<sup>16</sup>

Intestinal obstruction due to LBV is less prevalent in this area. Familiarity with this entity can help early diagnosis and reduce morbidity and mortality. Endoscopic decompression can be achieved in most patients with SV, which should be followed by definitive surgery during the same hospital admission. Transverse colon volvulus or CV will usually need emergency surgery. However, the number of TCV and CV was too small to draw this conclusion confidently.

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