WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.074
Volume 7, Issue 19, 1343-1352. Research Article ISSN 2277– 7105

PATTERN OF SIGMOID COLON VOLVULUS IN ABDOMINAL SUPINE RADIOGRAPHY

Esmaeil Hajinasrollah MD*[1], Mostafa Dasgiry MD[2], Hadi Mirhashmei MD[3], Bahador Oshidar MD[2] and Fariborz Rashno MD[3]

[1]Professor of General Surgery Shahid Behshti University of Médical Science Loghman Médical Center.

[2]Resident of General Surgery Shahid Behshti University of Médical Science Loghman Médical Center.

[3]Assistant Professor of General Surgery Shahid Behshti University of Médical Science Loghman Médical Center.

Article Received on
21 Oct. 2018,
Revised on 09 Nov. 2018,
Accepted on 30 Nov. 2018
DOI: 10.20959/wjpr201819-13282

***Corresponding Author**
Dr. Esmaeil Hajinasrollah MD
Professor of General Surgery Shahid Behshti University of Médical Science Loghman Médical Center.

ABSTRACT

Introduction: In Asia, Africa, and less-developed regions, Volvulus of the sigmoid colon can account for 20 to 50% of intestinal obstruction. Classic findings on radiology include the "bent inner tube" or "coffee bean" signs, which show a massively distended colon and it's thought to be specific for the diagnosis of sigmoid volvulus. **Objective:** The purpose of this study was to evaluate the most common location of "coffee bean" sign in Abdominal Supine Radiography of patients. **Methods:** Abdominal Supine Radiography of 40 case of sigmoid volvulus (at the recent 3 years in Loghman Hakim Hospital) were reviewed to understand that the "Coffee Been Sign" is located in the RUQ or LUQ. **Results:** From that 40 patients, in 35 patients (87.5%) the Coffee Been Sign in supine abdominal radiography was significantly seen in LUQ, In 4 other patients (10%) the Coffee Been Sign was in Midline and only In 1 patient (2.5%) the Coffee Been Sign was significantly in RUQ. **Conclusion**: Despite the popular belief that the location of "coffee bean" sign classically is in the right upper quadrant including the text of Schwartz Principles of Surgery, in our study there are the highest number of sigmoid volvulus located on LUQ.

INTRODUCTION

Volvulus of the sigmoid colon is the most common form of volvulus in the United States and Western Europe, though overall it is a rare form of colonic obstruction.[1,2] In other parts of the world, including Asia, Africa, and less-developed regions, it can account for 20 to 50% of intestinal obstruction.[3-9,47] Lower percentages of obstruction related to sigmoid volvulus in the Western world compared with other locations could be due to the low-fiber diet. Also, high-fiber diets consumed in other parts of the world can lead to elongation of the colon. This can be a predisposing factor for volvulus.[11,12]

The sigmoid colon, with attachments in close proximity at its junction with the descending colon and rectum, make it a prime location for twist when elongated.[10] In addition, an elongated mesentery can also be a predisposing factor.[13,14]

Given the increased longevity in the Western world, and low-fiber diet, it is often a disease of the elderly[2], and often those in institutions.[19] Chronic constipation is common.[15-18] Previous abdominal surgery and its subsequent adhesions, laxative abuse, and diabetes have also been cited.[19,47,49] In the younger population, sigmoid volvulus is more often associated with megacolon and its etiologies.[20-25,47] In children, age of presentation can range from 4 hours to 18 years, more commonly in boys.[17,26,27,50] Symptoms can be acute or chronic, and generally are manifested by abdominal pain, distention, and vomiting.[28] Adult patients will typically present with abdominal pain and distention. But as mentioned previously, the typical patient is in the hands of caregivers, who will remark that the patient has not had a bowel movement, appears distended, or is obtunded.[29] On physical exam, the patient will be grossly distended, with or without peritoneal signs.[30,48]

Classic findings on radiology include the “bent inner tube” or “coffee bean” signs, which show a massively distended colon.[16,28] In the presence of an incompetent ileocecal valve, there will also be distention of the small bowel.

The incidence of cecal volvulus is reported to range from 2.8 to 7.1 per million people per year.[31,32] Presentation is marked by either intermittent or acute obstruction. Distention may occur. Patients will often have pain, obstipation, nausea, and vomiting.[31-38,57-62] If a patient's clinical presentation is suspicious for cecal volvulus, diagnosis can be ascertained with plain abdominal films. As in sigmoid volvulus, the classic finding is the “coffee bean” sign—an axial view of dilated cecum with air and fluid generally pointing to the left upper

quadrant, is present in roughly half of patients.[56,63] Treatment is Right colectomy with primary anastomosis.[64,65] Transverse colon and splenic flexure volvulus have rarely been recorded.[19,66]

In this study we decided to reviewed abdominal Supine Radiography of Patients who had undergone emergency resection for acute sigmoid volvulus to understand the location of "Coffee Been Sign" that thought to be specific for the diagnosis of sigmoid volvulus.

METHODS

Patients who had undergone emergency resection for acute sigmoid volvulus between 1393 and 1396 at a large government teaching hospital (Loghman Hakim Training and Research Hospital, Tehran, Iran) were reviewed in the study. Abdominal Supine Radiography of 40 case of sigmoid volvulus (all of sigmoid volvulus case at the recent 3 years in Loghman Hakim Hospital) were reviewed to understand that the "Coffee Been Sign" is located in the RUQ or LUQ.

RESULTS

There were 40 patients with sigmoid volvulus that undergoing Abdominal Supine radiography. Most of them were men (26 of 40 = 65%) **[Chart 1]** with two Age peaks in 50-59 and 70-79 years old **[Chart 2]**; it suggest that sigmoid volvulus is more predominance in men, and usually occurs in age 50-59 and 70-79 that should confirms by some other studies with larger database.

From that 40 patients, in 35 patients (87.5%) the Coffee Been Sign in supine abdominal radiography was significantly seen in LUQ, In 4 other patients (10%) the Coffee Been Sign was in Midline and only In 1 patient (2.5%) the Coffee Been Sign was significantly in RUQ.**[Chart 3 and 4].**

The results also suggests the peak age of sigmoid volvulus for females is 80-89 and for men is 50-59 that also has to confirm by other studies with larger database. **[Chart 5].**

Charts:

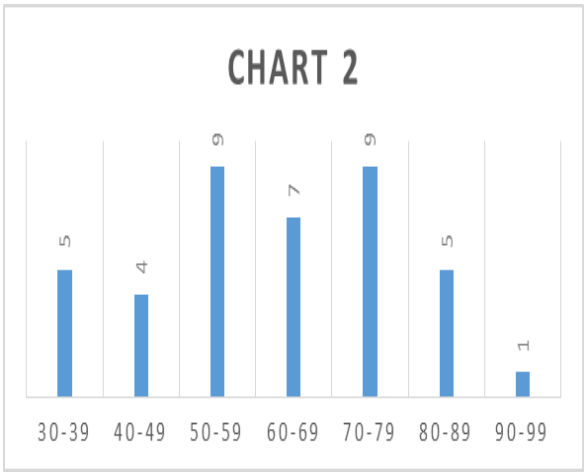

Chart 1: The incidence of sigmoid volvulus by age.

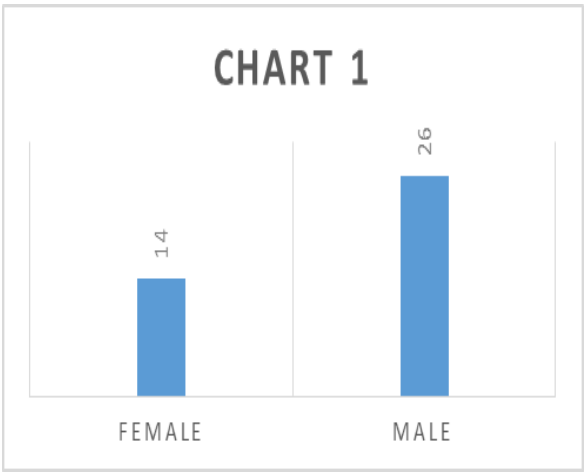

Chart 2: The incidence of sigmoid volvulus by sex.

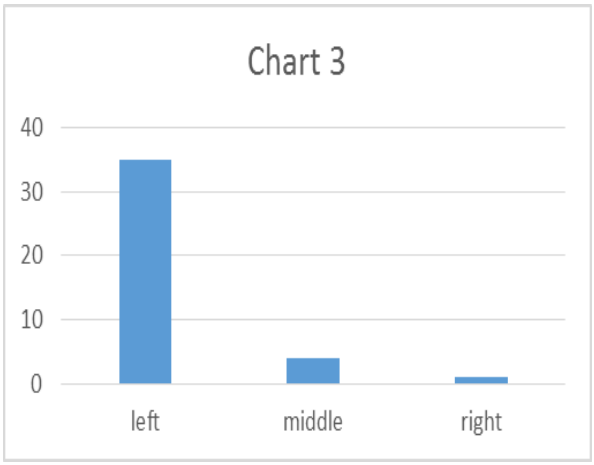

Chart 3: The location of Coffee Been Sign in supine abdominal radiography.

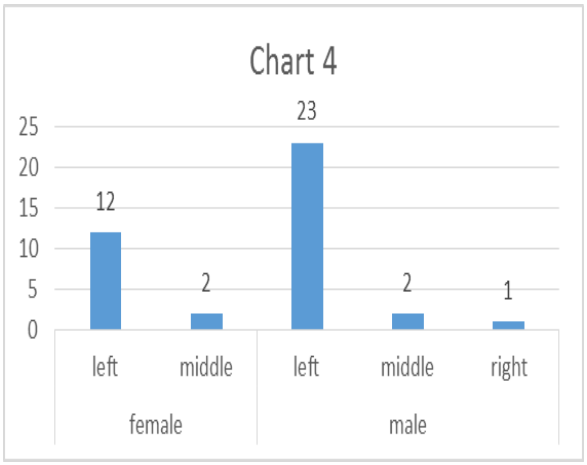

Chart 4: The location of Coffee Been Sign in supine abdominal radiography by sex.

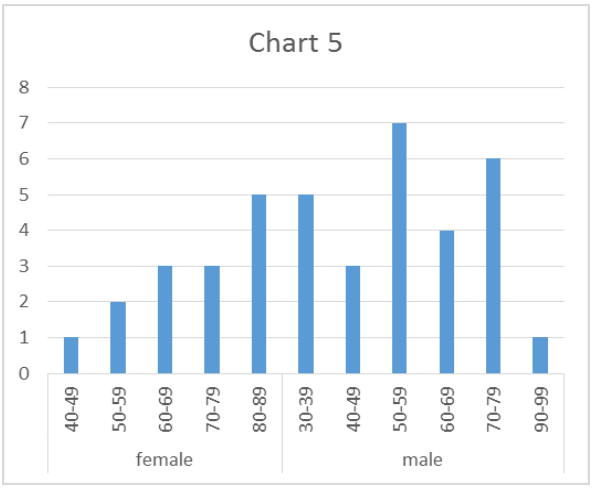

Chart 5: The age of sigmoid volvulus incidence by sex.

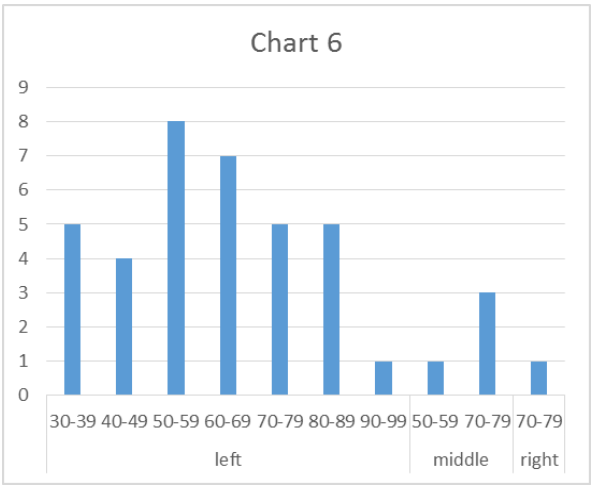

Chart 6: The location of Coffee Been Sign in different ages.

DISCUSSION

The coffee bean sign is thought to be specific for the diagnosis of sigmoid volvulus.[67] This sign was identified in all of patients in our series and may be the best initial feature suggesting sigmoid volvulus. The location of the apex of the loop, however, does not significantly contribute to the diagnosis despite the popular belief that sigmoid volvulus classically points toward the right upper quadrant. In our study There are the highest number of sigmoid volvulus located on LUQ (in Abdominal Supine Radiography). This may explain that athwart the text of Schwartz Principles of Surgery, the most location of sigmoid volvulus are located in LUQ.

If additional radiologic studies are necessary, computed tomography (CT) scan or barium enema may be obtained.[39-42] Barium enema along with plain films can increase diagnostic accuracy.[42] As the appearance of dilated colon on radiographs can also be indications of neoplasm or megacolon, such diagnoses need to be ruled out.[51] Subsequent endoscopic decompression can identify neoplasms Endoscopic detorsion has become the primary therapeutic modality.[43-45] Detorsion can be performed via barium enema, rigid proctoscopy, flexible sigmoidoscopy, or colonoscopy.[19] Some reports reveal better results with a flexible approach.[46,52] It has been reported that 24% of sigmoidoscopic approaches will not find the site of torsion, encouraging the use of colonoscopy.[19,53] Overall, decompression has been found to be successful in 70 to 80% of cases.[47] If gangrenous bowel is encountered, the patient should be brought for emergent exploration and resection. If detorsion is successful and no ischemia or gangrenous bowel is encountered, a rectal tube is left and elective resection is scheduled. Care should be taken in the selection of patients for endoscopic detorsion. Patients with signs and symptoms of sepsis, fever, leucocytosis, and peritonitis should be taken directly to the operating room (OR) for exploration.[47]

The patient should then be resuscitated, as many will be dehydrated and perhaps have electrolyte abnormalities. No time to resection has been standardized, but 48 hours for bowel preparation and resuscitation have been found to be safe.[54] A formal colonoscopy should be performed to rule out malignancy, and the patient taken to the OR for resection. Most evidence suggests recurrence is common and occurs in up to 90% of patients after endoscopic detorsion.[55] Standard surgical practice has been exploration, with resection of the sigmoid colon.[19]

Patients who fail endoscopic decompression, have gangrenous bowel identified on endoscopy, or who exhibit signs and symptoms of sepsis should be prepared for surgery in an expeditious fashion. The patient should be resuscitated, started on broad-spectrum antibiotics, and ingest nothing orally. If the patient is hemodynamically unstable, no further imaging or tests should be ordered and the patient should go to the OR.[56]

REFERENCES

1. Ballantyne GH, Brandner MD, Beart RW Jr, Ilstrup DM. Volvulus of the colon. Incidence and mortality. Ann Surg, 1985; 202: 83.
2. Halabi WJ, Jafari MD, Kang CY, et al. Colonic volvulus in the United States: trends, outcomes, and predictors of mortality. Ann Surg, 2014; 259: 293.
3. Asbun HJ, Castellanos H, Balderrama B, et al. Sigmoid volvulus in the high altitude of the Andes. Review of 230 cases. Dis Colon Rectum, 1992; 35: 350.
4. Astini C, Falaschi CF, Mariam M, Desta A. The management of sigmoid volvulus: report of 39 cases. Ital J Surg Sci., 1988; 18: 127.
5. Gama AH, Haddad J, Simonsen O, et al. Volvulus of the sigmoid colon in Brazil: a report of 230 cases. Dis Colon Rectum, 1976; 19: 314.
6. Schagen van Leeuwen JH. Sigmoid volvulus in a West African population. Dis Colon Rectum, 1985; 28: 712.
7. Udezue NO. Sigmoid volvulus in Kaduna, Nigeria. Dis Colon Rectum, 1990; 33: 647.
8. Bagarani M, Conde AS, Longo R, Italiano A, Terenzi A, Venuto G. Sigmoid volvulus in West Africa: a prospective study on surgical treatments. Dis Colon Rectum, 1993; 36: 186—90.
9. Raveenthiran V, Madiba TE, Atamanalp SS, De U. Volvulus of the sigmoid colon. Colorectal Dis., 2010; 12: 1—17.
10. Shepherd JJ. The epidemiology and clinical presentation of sigmoid volvulus. Br J Surg, 1969; 56: 353.
11. Madiba TE, Aldous C, Haffajee MR. The morphology of the foetal sigmoid colon in the African population: a possible predisposition to sigmoid volvulus. Colorectal Dis., 2015; 17: 1114.
12. Michael SA, Rabi S. Morphology of Sigmoid Colon in South Indian Population: A Cadaveric Study. J Clin Diagn Res., 2015; 9: AC04.

13. Akinkuotu A, Samuel JC, Msiska N, Mvula C, Charles AG. The role of the anatomy of the sigmoid colon in developing sigmoid volvulus: a case-control study. Clin Anat, 2011; 24: 634—7.
14. Margolin DA, Whitlow CB. The pathogenesis and etiology of colonic volvulus. Semin Colon Rectal Surg, 2007; 18: 79—86.
15. Rosenthal MJ, Marshall CE. Sigmoid volvulus in association with parkinsonism. Report of four cases. J Am Geriatr Soc, 1987; 35: 683.
16. Mangiante EC, Croce MA, Fabian TC, et al. Sigmoid volvulus. A four-decade experience. Am Surg, 1989; 55: 41.
17. Baker DM, Wardrop PJ, Burrell H, Hardcastle JD. The management of acute sigmoid volvulus in Nottingham. JR Coll Surg Edinb, 1994; 39: 304.
18. Oren D, Atamanalp SS, Aydinli B, et al. An algorithm for the management of sigmoid colon volvulus and the safety of primary resection: experience with 827 cases. Dis Colon Rectum, 2007; 50: 489.
19. Gingold D, Murrell Z. Management of colonic volvulus. Clin Colon Rectal Surg, 2012; 25: 236—44.
20. Krupsky S, Halevy A, Orda R. Sigmoid volvulus in adolescence. J Clin Gastroenterol, 1987; 9: 467.
21. Mellor MF, Drake DG. Colonic volvulus in children: value of barium enema for diagnosis and treatment in 14 children. AJR Am J Roentgenol, 1994; 162: 1157.
22. Sroujieh AS, Farah GR, Jabaiti SK, et al. Volvulus of the sigmoid colon in Jordan. Dis Colon Rectum, 1992; 35: 64.
23. Atamanalp SS, Yildirgan MI, Başoğlu M, et al. Sigmoid colon volvulus in children: review of 19 cases. Pediatr Surg Int., 2004; 20: 492.
24. Ton MN, Ruzal-Shapiro C, Stolar C, Kazlow PG. Recurrent sigmoid volvulus in a sixteen-year-old boy: case report and review of the literature. J Pediatr Surg, 2004; 39: 1434.
25. Northeast AD, Dennison AR, Lee EG. Sigmoid volvulus: new thoughts on the epidemiology. Dis Colon Rectum, 1984; 27: 260.
26. Påhlman L, Enblad P, Rudberg C, Krog M. Volvulus of the colon. A review of 93 cases and current aspects of treatment. Acta Chir Scand, 1989; 155: 53.
27. Isbister WH. Large bowel volvulus. Int J Colorectal Dis., 1996; 11: 96.
28. Retraction. Clinical presentation and diagnosis of sigmoid volvulus: outcomes of 40-year and 859-patient experience. J Gastroenterol Hepatol, 2009; 24: 1154.

29. Avots-Avotins KV, Waugh DE. Colon volvulus and the geriatric patient. Surg Clin North Am, 1982; 62: 249.
30. Raveenthiran V. Emptiness of the left iliac fossa: a new clinical sign of sigmoid volvulus. Postgrad Med J., 2000; 76: 638.
31. Katoh T, Shigemori T, Fukaya R, Suzuki H. Cecal volvulus: report of a case and review of Japanese literature. World J Gastroenterol, 2009; 15: 2547.
32. Consorti ET, Liu TH. Diagnosis and treatment of caecal volvulus. Postgrad Med J., 2005; 81: 772.
33. Lee SY, Bhaduri M. Cecal volvulus. CMAJ, 2013; 185: 684.
34. Ballantyne GH, Brandner MD, Beart RW Jr, Ilstrup DM. Volvulus of the colon. Incidence and mortality. Ann Surg, 1985; 202: 83.
35. Habre J, Sautot-Vial N, Marcotte C, Benchimol D. Caecal volvulus. Am J Surg, 2008; 196: e48.
36. Swenson BR, Kwaan MR, Burkart NE, et al. Colonic volvulus: presentation and management in metropolitan Minnesota, United States. Dis Colon Rectum, 2012; 55: 444.
37. Hashimoto Y, Shigemoto S, Nakashima A, et al. Successful preoperative diagnosis of a rare bowel obstruction: cecal volvulus. J Gastrointest Surg, 2008; 12: 202.
38. Anderson JR, Welch GH. Acute volvulus of the right colon: an analysis of 69 patients. World J Surg, 1986; 10: 336.
39. Atamanalp SS. Treatment of sigmoid Volvulus: a single-center experience of 952 patients over 46.5 years. Tech Coloproctol, 2013; 17: 561—9.
40. Atamanalp SS, Ozturk G. Sigmoid volvulus in the elderly: outcomes of a 43-year, 454-patient experience. Surg Today, 2011; 41: 514—9.
41. Levsky JM, Den EI, DuBrow RA, Wolf EL, Rozenblit AM. CT findings of sigmoid volvulus. AJR Am J Roentgenol, 2010; 194(1): 136–143.
42. Gore RM, Levine MS. Textbook of gastrointestinal radiology. 3rd ed. Philadelphia, Pa:Saunders/Elsevier, 2008.
43. Grossmann EM, Longo WE, Stratton MD, Virgo KS, Johnson FE. Sigmoid volvulus in department of veterans affairs medical centers. Dis Colon Rectum, 2000; 43: 414—8.
44. Oren D, Atamanalp SS, Aydinli B, et al. An algorithm for the management of sigmoid colon volvulus and the safety of primary resection: experience with 827 cases. Dis Colon Rectum, 2007; 50: 489—97.
45. Turan M, Sen M, Karadayi A, et al. Our sigmoid colon volvulus experience and benefits of colonoscope in detortion process. Rev Esp Enferm Dig., 2004; 96: 32—5.

46. Ghazi A, Shinya H, Wolfe WI. Treatment of volvulus of the colon by colonoscopy. Annals of Surgery., 1976; 183(3): 263-265.
47. Hellinger MD, Steinhagen RM. Colonic volvulus. In: Beck DE, Rombeau JL, Stamos MJ, Wexner SD, eds. The ASCRS Textbook of Colon and Rectal Surgery. 1st ed. New York: Springer, 2009; 286–298.
48. Ballantyne GH, Brandner MD, Beart RW Jr, Ilstrup DM. Volvulus of the colon. Incidence and mortality. Ann Surg, 1985; 202(1): 83–92.
49. Friedman JD, Odland MD, Bubrick MP. Experience with colonic volvulus. Dis Colon Rectum, 1989; 32(5): 409–416.
50. Salas S, Angel CA, Salas N, Murillo C, Swischuk L. Sigmoid volvulus in children and adolescents. J Am Coll Surg, 2000; 190(6): 717–723.
51. Chung YF, Eu KW, Nyam DC, Leong AF, Ho YH, Seow-Choen F. Minimizing recurrence after sigmoid volvulus. Br J Surg, 1999; 86(2): 231–233.
52. Turan M, Sen M, Karadayi K, et al. Our sigmoid colon volvulus experience and benefits of colonoscope in detortion process. Rev Esp Enferm Dig, 2004; 96(1): 3.
53. Brothers TE, Strodel WE, Eckhauser FE. Endoscopy in colonic volvulus. Ann Surg, 1987; 206(1): 1–4.
54. Mangiante EC, Croce MA, Fabian TC, Moore OF III, Britt LG. Sigmoid volvulus. A four-decade experience. Am Surg, 1989; 55(1): 41–44.
55. Hines JR, Geurkink RE, Bass RT. Recurrence and mortality rates in sigmoid volvulus. Surg Gynecol Obstet, 1967; 124(3): 567–570.
56. Rakinic J. Colonic volvulus. In: Beck DE, Rombeau JL, Stamos MJ, Wexner SD, eds. The ASCRS Textbook of Colon and Rectal Surgery. 2nd ed. New York: Springer, 2011: 395–406.
57. Tejler G, Jiborn H. Volvulus of the cecum. Report of 26 cases and review of the literature. Dis Colon Rectum, 1988; 31(6): 445–449.
58. Montes H, Wolf J. Cecal volvulus in pregnancy. Am J Gastroenterol, 1999; 94(9): 2554–2556.
59. Alinovi V, Herzberg FP, Yannopoulos D, Vetere PF. Cecal volvulus following cesarean section. Obstet Gynecol, 1980; 55(1): 131–134.
60. Anderson JR, Spence RA, Wilson BG, Hanna WA. Gangrenous caecal volvulus after colonoscopy. Br Med J (Clin Res Ed), 1983; 286(6363): 439–440.
61. Radin DR, Halls JM. Cecal volvulus: a complication of colonoscopy. Gastrointest Radiol, 1986; 11(1): 110–111.

62. Rogers RL, Harford FJ. Mobile cecum syndrome. Dis Colon Rectum, 1984; 27(6): 399–402
63. Rabinovici R, Simansky DA, Kaplan O, Mavor E, Manny J. Cecal volvulus. Dis Colon Rectum, 1990; 33(9): 765–769.
64. Madiba TE, Thomson SR, Church JM. The management of cecal volvulus. DCR, 2002; 45(2): 264–267.
65. Tuech JJ, Becouarn G, Cattan F, Arnaud JP. Volvulus of the right colon. Plea for right hemicolectomy. Apropos of a series of 23 cases. J Chir (Paris), 1996; 133(6): 267–269.
66. Ballantyne GH. Review of sigmoid volvulus: history and results of treatment. Dis Colon Rectum, 1982; 25(5): 494–501.
67. Burrell HC, Baker DM, Wardrop P, Evans AJ. Significant plain film findings in sigmoid volvulus. Clin Radiol, 1994; 49: 317 –319.