

## CIRUGÍA ESPAÑOLA

www.elsevier.es/cirugia



## Original articles

## Caecal volvulus: presentation of 18 cases and review of literature

Jaime Ruiz-Tovar,\* Purificación Calero García, Vicente Morales Castiñeiras, and Enrique Martínez Molina

Servicio de Cirugía General y del Aparato Digestivo, Hospital Universitario Ramón y Cajal, Madrid, Spain

## ARTICLE INFORMATION

## Article history:

Received April 29, 2008

Accepted September 5, 2008

## Keywords:

Caecal volvulus  
Bowel obstruction  
Caecostomy  
Caecopexy

## A B S T R A C T

**Introduction:** Caecal volvulus is the second most frequent location of colonic volvulus after sigmoid colon. It usually shows up as bowel obstruction.

**Material y method:** We review our experience of 18 cases of cecal volvulus treated in our centre between 1987 and 2007.

**Results:** We studied 8 males (44.4%) and 10 females (55.6%), with a mean age of 63.3 years. As an associated factor it was noted that 10 patients (55.6%) were bedridden. The most common clinical signs were abdominal distension and tenderness, constipation, and vomiting. Simple abdominal x-rays have a low diagnostic accuracy, though they reveal a bowel obstruction. Only 1 patient underwent elective surgery. In 10 patients (55.6%) a right hemicolectomy was performed, in 3 (16.8%) cecostomy, in 3 caecopexy, and in 2 (11.2%) devolvulation only. There were complications in 3 patients (16.8%), 2 prolonged ileus, and 1 wound infection. There were no recurrences.

**Conclusions:** Caecal volvulus is an emergency pathology, requiring surgical treatment. Right hemicolectomy is the treatment of choice both in viable and gangrenous colon.

Caecostomy is an alternative treatment in the high risk patient with a viable colon.

© 2008 AEC. Published by Elsevier España, S.L. All rights reserved.

## Vólvulo de ciego: presentación de 18 casos y revisión de la literatura

## R E S U M E N

**Introducción:** El vólvulo de ciego es la segunda localización más frecuente de vólvulos de colon tras el colon sigmoide. Produce habitualmente un cuadro de obstrucción intestinal.

**Material y método:** Revisamos nuestra experiencia de 18 casos diagnosticados y tratados de vólvulo de ciego desde 1987 hasta 2007.

**Resultados:** Estudiamos a 8 varones (44,4%) y 10 mujeres (55,6%), con una media de edad de 63,3 años. Como factor relacionado encontramos que 10 (55,6%) pacientes tuvieron un encamamiento prolongado. Las manifestaciones clínicas más frecuentes fueron dolor y distensión abdominal, vómitos y ausencia de deposición y ventoseo. La radiografía de

## Palabras clave:

Vólvulo de ciego  
Obstrucción intestinal  
Cecostomía  
Cecopexia

\*Author for correspondence.

E-mail address: jruiztovar@gmail.com (J. Ruiz-Tovar).

abdomen tiene poca rentabilidad diagnóstica, aunque orienta a un cuadro de obstrucción intestinal. Sólo 1 paciente fue intervenido de forma programada. En 10 (55,6%) pacientes se realizó una hemicolectomía derecha; en 3 (16,8%), cecostomía; en otros 3, cecopexia y en 2 (11,2%), desvolvulación simple. Aparecieron complicaciones en 3 (16,8%) pacientes, 2 íleos prolongados y 1 infección de herida. No hubo recidivas.

**Conclusiones:** El vólvulo de ciego es una afección urgente, que suele requerir tratamiento quirúrgico. La hemicolectomía derecha es la técnica de elección tanto cuando el colon es viable como cuando está gangrenado. La cecostomía es una técnica alternativa en pacientes con alto riesgo quirúrgico y colon no isquémico.

© 2008 AEC. Publicado por Elsevier España, S.L. Todos los derechos reservados.

## Introduction

Caecal volvulus is the axial rotation of the caecum, accompanied by a twisting of the mesentery and of its vessels, that usually produces the clinical symptoms of an intestinal blockage. It is the second most frequent location of colonic volvulus following sigmoid volvulus. Its frequency varies, depending on the age and race, but they may account for up to 20%–40% of all colonic volvuli.<sup>1,2</sup> The purpose of this study is to analyse the experience gained in our centre during the past 20 years in diagnosing and treating caecal volvulus.

## Material and method

Eighteen patients were included in the study corresponding to all the caecal volvulus cases diagnosed and treated from 1987 to 2007 in Hospital Universitario Ramón y Cajal, Madrid. The patient data were obtained from a review of clinical histories. We analysed the age, sex, personal background, clinical symptoms, diagnostic tests performed, preoperative diagnosis, surgical findings and the technique used, surgical morbidity-mortality rates, and the percentage of recurrences.

For the statistical study, the SPSS 12.0 for Windows was used. The Gaussian quantitative variables were defined by the average and interval of the values, using the mean in variables that failed to follow a normal distribution. The qualitative variables were defined by percentages and the number of cases.

## Results

A total of 18 patients were diagnosed with caecal volvulus, 8 males (44.4%) and 10 females (55.6%), with an average age of 63.3 (17.3) (interval, 29–92) years. As personal background of interest, 6 patients (33.3%) had previously undergone abdominal surgery and 1 (5.6%) had hypothyroidism. As a related factor, we found that 10 (55.6%) patients had been bedridden for considerable periods, 6 (33.3%) of these due to their advanced age, 1 (5.6%) due to cerebral palsy, 1 due to a side effect of surgery for meningioma, and 1 due to a mal-formative syndrome (Smith-Leni-Ostzi).

The most frequent clinical symptoms and diagnostic tests used are summarised in Table 1 and Table 2. Preoperative

**Table 1 – Clinical Symptoms**

	No. (%)
Abdominal pain	13 (72.2)
Abdominal swelling	10 (55.6)
Absence of depositions and/or flatulence	10 (55.6)
Vomiting	9 (50)
Bleeding of rectum	1 (5.6)

**Table 2 – Diagnostic Tests**

	No. (%)	Diagnostic Usefulness, %
x-ray of abdomen	18 (100)	5.6
CAT scan of abdomen	5 (27.8)	100
Opaque enema	2 (11.2)	100
Colonoscopy	1 (5.6)	100

diagnosis for caecal volvulus was obtained in 8 (44.4%) patients; in 9 (50%) the diagnosis was intestinal blockage; and 1 (5.6%) was diagnosed with acute abdomen.

Seventeen (94.4%) emergency laparotomies were performed and 1 (5.6%) was programmed for surgery due to a recurring intestinal blockage condition. The surgical findings were viable colon in 13 (72.2%) patients and gangrenous right colon in 5 (27.8%). In 10 (55.6%) patients, a right haemicolectomy was performed, in 7 (38.8%) of them with primary anastomosis, and in 3 (16.8%) leaving an ileostomy and mucous fistula. Three (16.8%) were submitted to a caecostomy; a further 3 to a caecopexy; and 2 (11.2%), a simple devolvulation. The sample was divided into 2 groups depending on the period of study, and we observed that these techniques were performed in the group that was treated between 1987 and 1997. Postoperative complications arose in 3 (16.8%) patients, 1 infection of the surgical wound following right haemicolectomy, and 2 cases of prolonged post-surgical ileum, 1 following right haemicolectomy, and 1 following caecopexy, all of which were resolved with conservative treatment. No deaths occurred. Following an average follow-up of 74 (5–183) months, no recurrences were observed.

---

## Discussion

The majority of patients with caecal volvulus present a complete axial rotation that produces twisting of the mesentery and its vessels, affecting caecal vascularisation.<sup>3</sup> In approximately 10% of cases, the caecum and ascending colon bend in the cephalic direction, which is termed caecal bascule. Although the caecal bascule does not produce twisting of the mesentery and its vessels, it may produce ischaemia due to the swelling of the caecum.<sup>4</sup> Caecal volvulus usually occurs in patients with a mobile caecum or a right colon that is not properly secured to the parietal peritoneum. Diverse factors have been associated with the development of caecal volvuli, such as postsurgical adhesions, congenital malformations, Hirschsprung's disease, or pregnancy.<sup>5</sup> Congenital malformation and previous abdominal surgery with the eventual formation of adhesions are factors that have been observed in our series. Likewise, we also observed in our patients that a high number (50%) have been bedridden for prolonged periods, mainly due to their advanced age. However, literature mentions that unlike the sigmoid volvulus, which develops in elderly persons with reduced mobility, caecal volvulus usually develops in younger patients and more often in women<sup>6</sup>; the average age of the patients in our study was 63 years and there is hardly any difference between the number of women and men (10 vs 8).

The clinical symptoms of caecal volvuli are similar to those of blockage of the small intestine. The most frequent symptoms are constant abdominal pain with colic-like exacerbations due to intestinal peristalsis, nausea, vomiting, and constipation, and the clinical examination reveals that the abdomen is swollen, which all coincide with the findings in our series. A high temperature and signs of peritoneal irritation or low blood pressure may indicate intestinal gangrene.<sup>1,7</sup>

The most beneficial complementary tests for diagnosing caecal volvulus are the image explorations. In a simple x-ray of the abdomen an image of a mass can be seen, extending throughout the whole upper left quadrant, but it is more habitual to see swollen loops of the small intestine with the absence of gas in the distal colon, which are the typical symptoms of a blockage of the small intestine. The usefulness of the diagnosis for opaque enema and abdominal CAT scan is around 90%,<sup>8</sup> which confirms in our series that both tests were diagnosed in all the patients. Given that caecal volvulus normally develops as a pathology for the emergency service, in which the CAT scan is widely available, its generalised use would be recommended on all patients suspected of having this condition.

Colonoscopy may devolvulate the caecum, but revolvulation often occurs and also leads to a high risk of perforation.<sup>1</sup> Therefore, most patients with caecal volvulus will need emergency surgery. The preferred treatment for a gangrenous colon is resection, usually a right haemicolectomy. The decision to perform a primary anastomosis or ileostomy depends on the patient's condition and the situation of the colon at the time of surgery.<sup>1,5,9</sup> An ileostomy was performed only in 3 of our patients subjected to a right haemicolectomy, those who were haemodynamically unstable or in a septic condition.

The greatest controversy lies in knowing the most recommendable technique in cases in which the colon is viable. Simply devolvulating the caecum is not recommended according to many authors, since it is associated with recurrences of between 20% and 75% in those cases.<sup>1,7,9-11</sup> However, there were no recurrences in those 2 patients of our study who were subjected to this procedure. Caecopexy consists of securing the caecum to the parietal peritoneum, which reduces the risk of recurrence by reducing its mobility. Cases of caecopexy have been described using the laparoscopic technique.<sup>12</sup> Caecopexy is a safe procedure with a low mortality rate but has the disadvantage of a recurrence rate of between 0% and 40%, depending on the series.<sup>1,7,11</sup> Caecostomy consists of placing a tube in a small hole in the caecal wall, often the hole of the appendicular stump following an appendectomy; the caecum is fixed to the anterior abdominal wall and led to the exterior through the tube in the ileum by means of a small incision in the skin. This technique has the advantage of decompressing the swollen loops, securing the caecum, and can be made through a small incision. However, caecostomy is associated with serious complications such as gangrene, caecal necrosis, intraperitoneal leakage of faeces, greater mortality than with caecopexy, and a recurrence rate of 2%–14%.<sup>7,9,13</sup> The right haemicolectomy is the technique most often used nowadays. Since it is more aggressive, it has historically been associated with greater morbidity and mortality; however, with the improvements in the surgical technique and postoperative care, it now has morbidity and mortality rates similar to caecopexy, without the risk of recurrence. In our series far more resections were practised than caecostomies and caecopexies, and no recurrences were observed with any of the techniques. The decision to adopt one technique or another in cases with viable colon depended mainly on the surgical risk of the patient.

Given the similar mortality rates and complications, the right haemicolectomy seems to be the preferred technique, since it has less risk of recurrence. Caecopexy, in theory, could be indicated in cases of a healthy caecal wall with a normal thickness, in which securing it to the wall may offer guarantees and avoid opening up a colon that is not prepared and converting clean surgery into a different, contaminated one. However, personally speaking, we have doubts about its indication. Caecostomy would be reserved for patients with a great degree of co-morbidity who are unable to tolerate a laparotomy, as the volvulus can be decompressed through a small incision with local anaesthesia and with the intraoperative certainty of a viable colon.<sup>1,5</sup>

---

## Conclusions

Caecal volvulus is an emergency condition that usually requires surgery. The right haemicolectomy is the preferred choice both if the colon is viable and if it is gangrenous. Caecostomy, caecopexy, or simple devolvulation may be therapeutic alternatives after personalising treatment depending on the patient's history, the clinical symptoms, the surgical findings, and the surgeon training in the different techniques.

## R E F E R E N C E S

1. Madiba TE, Thompson SR. The management of cecal volvulus. *Dis Colon Rectum*. 2002;45:64-7.
2. Hiltunen KM, Syrja H, Matikainen M. Colonic volvulus. Diagnosis and results of treatment in 82 patients. *Eur J Surg*. 1992;158:607.
3. Cózar Ibáñez A, Medina Cuadros M, del Olmo Escribano M. Vólvulo cecal en el síndrome de Cornelia de Lange. *Rev Esp Enferm Dig*. 2004;96:85-6.
4. Pousada L. Cecal bascule: an overlooked diagnosis in the elderly. *J Am Geriatr Soc*. 1992;40:65.
5. Tuech JJ, Becouarn G, Cattani F, Arnaud JP. Volvulus du colon droit. Plaidoyer pour l'hémi-colectomie droite. A propos d'une série de 23 cas. *J Chir (Paris)*. 1996;133:267-9.
6. Pirro N, Corroller LE, Solari C, Merad A, Sielezneff I, Sastre B. Cecal volvulus. Anatomical bases and physiopathology. *Morphologie*. 2006;90:197-202.
7. Rabinovici R, Simansky DA, Kaplan O, Mavor E, Manny J. Cecal volvulus. *Dis Colon Rectum*. 1990;33:765-9.
8. Hashimoto Y, Shigemoto S, Nakashima A, Murakami Y, Sueda T. Successful preoperative diagnosis of a rare bowel obstruction: cecal volvulus. *J Gastrointest Surg*. 2008;12: 202-4.
9. Reilly PM, Jones B, Bulkley GB. Volvulus of the colon. En: Cameron JL, editor. *Current surgical therapy*. St Louis: Mosby; 1992. p. 170-4.
10. Friedman JD, Odland MD, Bubrick MP. Experience with colonic volvulus. *Dis Colon Rectum*. 1989;32:409-16.
11. Theuer C, Cheadle WG. Volvulus of the colon. *Am J Surg*. 1991;57:145-50.
12. Tsushimi T, Kurazumi H, Takemoto Y, Oka K, Inokuchi T, Seyama A. Laparoscopic cecopexy for mobile cecum syndrome manifesting as cecal volvulus: report of a case. *Surg Today*. 2008;38:359-62.
13. Frizelle EA, Wolff BG. Colonic volvulus. *Adv Surg*. 1996; 29: 131-9.