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## Surgical treatment of inertia coli

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Inertia coli is a clinical-pathological affection that shows an overlapping with functional constipation defined according to Rome IV criteria (*Gastroenterology vol150, Issue 6, May, 2016*). Nevertheless, these parameters are not sufficient to define it clearly. The first definition was given in 2004 by G. Bassotti et al. [1]. Inert literally means “inactivity or modest or absent motion” and inertia coli was defined as: severe functional constipation according to Rome criteria; absence of outlet obstruction; delayed colonic transit with markers distributed throughout the colon; manometric and/or electromyographic documentation of absent or almost absent colonic motor activity; no response to pharmacologic stimulation during colonic motility recording.

Conversely, J.A. McCoy et al. [2] defined inertia coli as “The inability of the colon to modify stool to an acceptable consistency and move the stool from the cecum to the rectosigmoid area at least once every three days”. In this paper the Authors also gave recommendations for a comprehensive diagnostic work-up: history of the patient, physical examination, laboratory exams, anatomic study (barium enema or colonoscopy), transit study and the balloon expulsion test.

Even though its variegated definitions, till now the pathophysiology of the disease is not fully elucidated and therefore a targeted-therapy is not available.

Patients with colonic inertia who do not respond to medical treatment and whose quality of life is severely affected could be candidates for surgery. Several procedures have been attempted to treat colonic inertia in the past. At first, total colectomy was considered to be the gold standard, but this procedure was abandoned due to the high risk of complications. Colonic resection with cecorectal anastomosis was attempted in order to preserve the ileocecal valve but with poor results, given the complications caused by cecal distension. Another attempt was colonic resection with sigmoid preservation; however this was found out to predispose patients to postoperative constipation. Up to 50% of patients who underwent this procedure required additional resection surgery.

The diffusion of laparoscopic techniques since the 1980s, has led to laparoscopic total colectomy with ileorectal anastomosis becoming the gold standard, as supported by extensive literature showcasing good results in terms of bowel frequency per day [3][4][5][6].

Given the general consensus on the most effective surgical treatment, I thought it would be interesting to find out what is the long-term outcome of surgery in patients who underwent a total colectomy for colonic inertia.

One of the longest follow-up available was reported by A.J.Pikarsky et al. [7] in 2001 and included fifty-four patients (of which thirty-nine females) with an average age when undergoing surgery of 49 years old (range 17-78). All 54 patients were laxative dependent. All patients underwent physiologic assessment, including anal manometry, pudendal nerve terminal

motor latency, and cinedefecography. Finally, colonic motility was measured by colonic transit time study. Patients ingested between 20 and 24 radiopaque markers in a capsule, with abdominal radiographs taken after 72 and 120 hours. Colonic inertia was defined as retention of at least 20 percent of the markers in the colon on the fifth day after ingestion.

Functional Results After Total Abdominal Colectomy

	Before Surgery	27 Months	106 Months
Bowel frequency per day (range)	1.8 (3/week-1/month)	3.7 (1-10)	2.5 (1-6)
Stool consistency			
Hard	54	0	0
Semisolid	0	40 (74)	30 (100)
Liquid	0	14 (16)	0
Incontinent episodes	0	13 (24)	5 (17)
Antidiarrheal medication use	0	9 (17)	2 (6)
Laxative use	54 (100)	1 (2)	1 (3)
Enemas	25 (46)	0	1 (3)
Bloating	31 (62)	NS	7 (23)

NS = not stated.

Figures are number and (percentage) unless otherwise specified.

As shown in the table above, at 27 months from surgery the bowel frequency per day increased from 1.8 to 3.7 and only one patient still needed laxatives. Thirteen of the patients experienced incontinent episodes and nine had to use antidiarrheal

medication. At 106 months only thirty patients were available for follow up. Out of these, five experienced incontinent episodes, two kept on using antidiarrheal medication, one had to use laxatives and seven experienced bloating.

Complications After Total Abdominal Colectomy

Complication	27 Months	106 Months
Bowel obstruction		
Conservative treatment	5 (10)	6 (20)
Surgical treatment	3 (6)	3 (10)
Mortality*	2 (4)	3 (6)

Figures are number and (percentage).

\* Not related to total abdominal colectomy or ileorectal anastomosis.

The most interesting thing is to analyse the complications after total colectomy. At 106 months there were six (20%) bowel obstructions, three (10%) of which required surgical treatment. It is also interesting to see that no anastomotic leak occurred in these patients.

In a review on outcomes of colectomy for colonic inertia by C.H. Knowles et al. postoperative morbidity rates of small bowel obstruction (with or without reoperation), varied from 2% to 71% (median 18%); this resulted in reoperation in 0% to 50% of patients (median 14%).

Functional outcomes measures (as shown in the table below) were often poorly documented in the works analysed. The percentage incidence of incontinence varied from 0% to 52%, median 14%. Rates of recurrent constipation varied from 0% to 33%, median 9%. The percentage of patients who still had abdominal pain varied from 0% to 90%, median 41%. As a result of poor functional outcome, in particular diarrhoea and incontinence or recurrent constipation, a permanent ileostomy was performed in up to 28% of patients (median 5%, range 0% to 28%). Mortality rates varied from 0% to 6%. [8]

Table 5. FUNCTIONAL OUTCOME

Author	Year	Number	Bowel Habit/Day (median/range)	Incontinence (%)	Diarrhea (%)	Recurrent Constipation (%)	Pain (%)	Stoma (%)
Hughes	1981	17	NS	NS	NS	NS	NS	20
Preston	1984	21	3	37/0*	44/0*	31/100*	50	10
Leon	1987	13	0.1 to 3	38	46	NS	31	7
Walsh	1987	19	58% normal	NS	6	17	NS	18
Akervall	1988	12	NS	NS	NS	33	33	25
Kamm	1988	44	50% normal	14	39	11	71	14
Vasilevsky	1988	51	2.8	2	NS	NS	NS	2
Zenilman	1989	12	2.7	17	0	0	NS	0
Beck	1989	14	2	0	0	NS	NS	0
Yoshioka & Keighley	1989	40	3	NS	33	NS	39	15
Pemberton	1991	38	2-4	0	0	0	NS	0
Wexner	1991	16	3.5	NS	NS	NS	NS	0
Rex	1992	14	1.3	13	6	6	NS	6
Sunderland	1992	18	4	NS	NS	NS	NS	5
Piccirillo	1995	54	3.7	24	NS	2	10	0
Redmond	1995	34	3/0.7	NS	5/20	5/80	0/70	5/5†
de Graaf	1996	44	NS	14	14	18/29	90	7
Lubowski	1996	52	4	12	14	2	52	2
Pluta	1996	24	2.6	NS	33	NS	17	0
Platell	1996	96	5	52	NS	NS	55	9
Christiansen & Rasmussen	1996	12	NS	8	17	17	25	0
Ghosh	1996	21	NS	NS	NS	NS	90	14
Ho	1997	24	2.4	0	0	NS	NS	0
Nyam	1997	74	4/2‡	1	<10	0	NS	0
Hasegawa	1998	76	NS	NS	NS	NS	NS	28
You	1998	40	NS	NS	0	8	NS	0
Bernini	1998	106	2.1/2.8§	20	15	38/4§	43	NS
27 studies	n =		20 (14¶)	16	16	15	14	26
	median =		2.9/day	14%	14%	9%	41%	5%
	range =		1.3-5	0-52%	0-46%	0-33%	0-90%	0-28%

NS, not stated.

\* Figures for IRA/left hemicolectomy, respectively.

† Figures for patients without or with GID, respectively.

‡ Figures for IRA without or with pelvic floor disorder & biofeedback.

§ Figures for patients with or without nonrelaxing puborectalis, respectively.

¶ Number of studies where median bowel habit is documented.



A more recent systematic review, published in 2017 on Colorectal Disease, by the Pelvic Floor Society showed that surgical morbidity remains a concern for all types of colectomies for inertia coli. The meta-analysis estimated total complications to be 24.4% (15.5% for laparoscopic total colectomy) with a range from 7% to 54%. Aside from the incidence of anastomotic leaks and other more general complications (which were found to be high even in some recent series from expert centres and including 6 fatalities in 1568 patients: 0.4%) the incidence of prolonged post-operative ileus and early small bowel obstruction were found to be disproportionately high for patients undergoing colectomy for colonic inertia when compared to other indications. Post operative ileus and small bowel obstruction were estimated to be 9.7% with a range from 0% to 33%. Long-term rates of small bowel obstruction were 15.2% with a range from 0% to 71% and re-operation rates were 13.3% with a range from 0% to 45%. Individual symptom outcomes highlighted the problems of post-operative diarrhoea

(9.8%), incontinence (7.4%), recurrent constipation (18.2%), persistent or worsened abdominal pain (39.3%) and persistent or worsened bloating (23.9%). Poor functional outcomes lead to further resection or permanent stoma with a median of 5% (range from 0% to 28%) [9].

Despite the excellent success rate of laparoscopic total colectomy in the treatment of inertia coli, postoperative morbidity remains a discouraging problem. The most frequent complication reported in literature is small-bowel obstruction. Another issue deserving discussion is the incidence of postoperative pain and bloating, as reported in past studies; these complaints are less likely to subside after colectomy. Some follow-up studies showed a significant deterioration in continence years after surgery. It is suggested to inform patients, before colectomy, of all these long-term complications since they are usually still young when undergoing this procedure and because surgery does not solve all the symptoms of the disease.



## References

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