

## The management of the slow transit constipation in the laparoscopic era

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**SUMMARY: The management of the slow transit constipation in the laparoscopic era.**

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*The slow transit constipation (STC) is a functional bowel pathology with slow total gut transit time with normal calibre colon in addition to a variety of other systemic symptoms. Patients with an abnormal colonic motility refractory to conservative treatment are regarded as appropriate candidates for surgery.*

*Laparoscopic total colectomy with ileum-rectum anastomosis represents the commonest surgical operation in the treatment of STC, in well*

*selected patients, after failure of conservative treatment.*

*From 2012 to 2016, 8 patients suffering constipation according to Roma III criteria and diagnosed as STC were submitted to a total colectomy in our O.U.*

*We evaluated the long-term post-operative quality of life and the bowel function, specifically the persistence of constipation and the number of daily bowel movements.*

*Based on our results, we consider that the use of minimally invasive total colectomy with an ileum-rectal anastomosis is the procedure of choice in patients with colonic inertia, and should be performed by experts in laparoscopic colorectal surgery offering a satisfying post-operative quality of life with low morbidity and mortality rates.*

KEY WORDS: Slow transit constipation - Laparoscopic total colectomy - Functional colon disease.

### Introduction

The management of patients suffering constipation is complex task even for diagnosis than for treatment.

The Rome criteria define constipation as straining at bowel movements, lumpy/hard stools, a sensation of incomplete evacuation, a sense of ano-rectal blockage, less than three bowel movements per week, and the need for manual manoeuvres to aid evacuation (Table 1).

Unfortunately, these criteria don't allow a differentiation between the three major types of constipation: normal transit, slow transit, and obstructed defecation (3, 4).

The term "Slow transit constipation" (STC) was firstly used in 1986, for a group of women who all displayed slow total gut transit time with a normal calibre colon in addition to a variety of other systemic symptoms (5).

Patients with an abnormal colonic motility who are refractory to conservative treatment are considered appropriate candidates for surgery (6).

Historically, the first description of surgical treatment for STC with a subtotal colectomy and ileum-rectal anastomosis was proposed by Arbuthnot Lane in 1908 (1, 2). This is now considered as the common surgical approach for STC showing better results compared to segmental colonic resection or ileum-sigmoid and cecum-rectal anastomosis (7, 8).

Even if, although a number of studies reported success rates up to 90%, the functional outcomes of colectomy is still debated (9, 10).

The use of functional scoring systems can aid in this evaluation.

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TABLE 1 - ROME 3 CRITERIA FOR FUNCTIONAL CONSTIPATION.

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1. Must include two or more of the following
    - Straining during  $\geq 25\%$  of defecations
    - Lumpy or hard stools  $\geq 25\%$  of defecations
    - Sensation of incomplete evacuation for  $\geq 25\%$  of defecations
    - Sensation of anorectal obstruction/blockage for  $\geq 25\%$  of defecations
    - Manual maneuvers to facilitate  $\geq 25\%$  of defecations (E.G. digital evacuation, support of the pelvic floor)
    - Fewer than defecation per week
  2. Loose stools are rarely present without the use of laxatives
  3. There are insufficient criteria for irritable bowel syndrome
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\*Criteria fulfilled for the last 3 months with symptom onset  $\geq 6$  months prior to diagnosis

### **Physiopathology**

Colonic motility disorders are present in STC but their aetiology is still poorly understood.

Many theories exist involving lack of fibers, autonomic neuropathy and disorders of both the enteric nervous system and the neuroendocrine system (12). The interstitial cells of Cajal, the colonic pacemaker cells, are required for normal colonic motility and they aid in the transfer of signals between nerves and muscles (13, 14).

Some studies have shown that patients with STC have a decreased number of these cells (13, 15).

Several studies have found impaired colonic contractile response to both laxatives and neurotransmitters (11, 14).

An electrophysiological study demonstrated significantly weaker or absent electrical activity in the colon of subjects with colonic inertia (25).

High-amplitude propagated contractions, responsible for colonic mass migration, have also been found to be decreased in number and duration in STC (12, 18).

It has also been observed that these patients have other associated motility/transit disorders of the oesophagus, stomach, small bowel, gallbladder, and anorectum (19, 20-22) leading more support to the theory of the involvement of a dysfunctional enteric nervous system at the origin of slow transit constipation.

The role of the neuroendocrine system in STC has been investigated and the results have been conflicting. The level of the pancreatic polypeptide hormone family (pancreatic polypeptide, peptide YY, and neuropeptide Y), serotonin, serotonin receptors,

and serotonin cell density, vasoactive intestinal peptide, substance P, and cholecystokinin have all been measured and found to be either elevated or decreased (23, 24); showing that neuroendocrine system is almost always abnormal.

### **Patients and methods**

From January 2012 to January 2016, 8 patients suffering constipation according to Roma III criteria and diagnosed as STC were selected for surgical treatment.

Patients were recruited from the coloproctology and laparoscopic surgery outpatient clinic of the General and Urgent Surgery O.U. of the Policlinico "P. Giaccone" of Palermo that attends yearly approximately 500 new patients.

Conservative treatment was firstly proposed to all constipated patients, its failure required an instrumental work-up consisting in colonic transit studies with radiopaque markers (positive when 20% or more of the markers were localized in the colon after 108 hours) defecography, manometry.

Patients with obstructive defecation were treated with biofeedback and excluded from the study (37).

The sub-total colectomy was proposed to the patients diagnosed as STC.

Eight patients accepted the surgical management. All operations were performed by a colorectal surgeon using a laparoscopic approach.

The patients' records were retrospectively reviewed and a phone interview to evaluate functional results at follow-up was done.

Demographical data on age, number and modality of deliveries for women, comorbidities, previous pelvic-perineal surgeries, symptoms duration, BMI, ASA score were recorded. Data on perioperative management including bowel preparation, antibiotic and thromboembolic prophylaxis were collected too. Data on surgical technique and duration of the operation were analysed as well as post-operative therapies, first bowel movement, complications, and length of hospital stay. We have analyzed postoperative data on 8 consecutive patients. Bowel function and quality of life of the patients were investigated with the validated Wexner score, the ODS score and the SF 36 QoL score.

## **Results**

### ***Pre-operative data***

8 patients suffering constipation according to Roma III criteria and diagnosed as STC were submitted to a sub-total colectomy in our department from 2012 to 2016. The patients were 6 female and 2 male, the mean age was 48 years. The 50% of patients had already undergone previous colo-rectal surgery for defecation disorders (Laparoscopic left emicolectomy for STC in one patient; Delorme operation for mucosal rectal prolapse in one patient; mucopexy for mucosal prolapse in one patient; left colectomy with a 3 port techniques because of a colonic transit study that showed slow transit only in the left colon) (33, 34).

### ***Peri-operative management***

Detailed written informed consent was obtained from all subjects after a full explanation of the procedure and possible complications. In the peri-operative period a nose-gastric tube was positioned and removed in second post-operative day (PO). Patients were nourished with parenteral nutrition until the first bowel movement or until the fourth PO. Antibiotic prophylaxis with a regimen of ciprofloxacin 500 mg/bid and metronidazole 500 mg three times a day was administered. Pain control drugs were administered. Patients were mobilized since the first POD (35, 36).

### ***Surgical technique***

The laparoscopic sub-total colectomy was performed with the positioning of five trocars: a periumbilical 10/12 mm. camera port, two 10 mm op-

erative ports in the left ipocondrium and in the right iliac fossa, respectively, and two 5 mm ports respectively located in the left iliac fossa and right ipocondrium (26-28). Ultrasonic coagulation shears were used for the colonic dissection. A careful evaluation of the entire bowel was firstly performed. Then the mobilization of the entire colon was performed; the right colonic vessels were closed while the left branches were spared and the mesenteric resection done lies to the colon wall with a distal vascular ligation in order to preserve the superior rectal vessels. The resection of the colon was performed at the recto-sigmoid junction with a laparoscopic linear stapler (32). The anastomosis was performed in a side to end fashion using a n.25 circular stapler. A hydro-pneumatic test to verify the sealing of the anastomosis was done in all patients. Usually a drain was left in the Douglas pouch and removed in the fourth to sixty post-operative days. All the surgical operations were accomplished with laparoscopic approach.

The average operative time was 5.4 hours and the average hospital stay was 8 days. We didn't observe any local complication such as anastomotic leak, bleeding, bowel perforation and no postoperative morbidity or mortality was observed.

### ***Follow-up***

We performed an outpatient clinic visit in all patients six month after surgery to evaluate the bowel function, specifically the persistence of constipation and the number of daily bowel movements, and the patient's quality of life. Among the treated patients four referred two to three daily evacuation of soft stool with a good continence; two persist with difficulty in evacuation while two claims 10/12 evacuations die of liquid stools. Four patients reported an improvement of their quality of life while in the others the pre and post QoL score was unchanged (Table 2).

## **Discussion**

Total colectomy with ileum-rectum anastomosis represents the commonest surgical operation in the treatment of STC, in well selected patients, after failure of conservative treatment. However, literature data offer contrasting results regarding the technique (26, 27).

The feasibility of the laparoscopic approach in

TABLE 2 - PRE-OPERATIVE AND PERI-OPERATIVE DATA.

Age	Sex M/F	Previous colo- rectal surgery	Type of operation	Next rectum colonic surgery	Operating time (hours)	Post- operative hospital stay days	Complication
33	F	Rectal mucosal prolapse resection (Delorme resection)	Laparoscopic total colectomy with ileo-rectum anastomosis with EEA 25		5	11	None
54	F	Mucosal prolapse	Laparoscopic total colectomy with ileo-rectum anastomosis with EEA 25		5.30	10	None
40	F	No	Laparoscopic total colectomy with ileo-rectum anastomosis with EEA 25	STARR	6	6	None
33	F	Endoscopic derotation of volvulus			4	6	None
49	F	Laparoscopic left emicolectomy	Laparoscopic total colectomy with ileo-rectum anastomosis with EEA 25		6	6	None
62	M	Anal abscess	Laparoscopic total colectomy with ileo-rectum anastomosis with EEA 25		6	12	None
55	M	No	Laparoscopic total colectomy with ileo-rectum anastomosis with EEA 25		5	7	None
58	F	No	Laparoscopic total colectomy with ileo-rectum anastomosis with EEA 25		6	6	None

treatment of colorectal pathologies with typically advantages of less invasive surgery, respect of parietal integrity, less postoperative pain and ileus, fewer postoperative adhesions, a reduced hospitalisation and better cosmetic results is well known. Unfortunately, the difficulty in the management of STC is due to the nature of the disorder that being functional leads to uncertain results in symptoms resolution after treatment. Some case series reported intolerable number of reoperations, complications and mortality after colectomy for STC in spite of meticulous preoperative investigations, and the fact that all operations were performed by dedicated and highly experienced colorectal surgeons (28, 29). In contrast, another case series showed an improvement in associated symptoms such as abdominal distention, pain and vomiting, without the presence of fecal incontinence. Both the number of evacuations

per week and the number of laxatives used daily were improved by the procedure. 88% of patients recommended this surgery 1 year after the procedure, and observed an improvement in all parameters regarding their quality of life (31). A review concluded that due to the high variability of outcomes after colectomy for STC, surgery for this condition should probably be considered only in a highly selected group of patients who fulfill certain clinical and physiologic criteria (30).

Based on our results, we consider that to propose a minimally invasive treatment with a sub-total colectomy with an ileum-rectal anastomosis performed by experts in laparoscopic colorectal surgery is a possible choice in patients with colonic inertia. This can offer low morbidity and mortality rates with satisfying post-operative quality of life.

As in all functional disorders patients have to

know that the resolution of the problem is not always accomplished for all the patients and that possible adverse effect can be related.

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