

# Laparoscopic treatment of chronic slow transit constipation

## Report of three cases and review of literature



*Ann. Ital. Chir.*, 2012 83: 113-117  
Published online 29 Dicembre 2011  
([www.annitalchir.com](http://www.annitalchir.com))

Giovanni Conzo, Alfredo Allaria\*, Francesco Stanzione, Gianluca Rossetti\*, Giancarlo Candela, Claudio Mauriello, Landino Fei\*, Luigi Santini

*Seconda Università degli Studi di Napoli, Facoltà di Medicina e Chirurgia, Napoli  
Dipartimento di Scienze Anestesiologiche, Chirurgiche e dell'Emergenza,  
VII Divisione di Chirurgia Generale (Direttore: Prof. L. Santini)  
\*Chirurgia gastroenterologica (Direttore: Prof. L. Fei)*

### Laparoscopic treatment of chronic slow transit constipation. Report of three cases and review of literature

**INTRODUCTION:** *The Authors present their experience with laparoscopic total or subtotal colectomy (TC or SC) in three patients operated for intractable chronic slow transit constipation (STC), together with a review of literature.*

**MATERIAL AND METHODS:** *From July 2005 to July 2009 three young patients affected by STC, after meticulous preoperative instrumental work-up and after failure of medical treatment, were submitted to laparoscopic TC and Ideo Rectal Anastomosis (IRA) in two cases and to laparoassisted SC followed by Ceco Rectal Anastomosis (CRA) in one case. Number of daily bowel motions, urgency soiling, incontinence, abdominal pain, bloating with special regard to patient's quality of life, were analyzed.*

**RESULTS:** *All the interventions were completed via laparoscopic approach. No postoperative morbidity or mortality were observed. After twelve months, the patients referred two-three daily evacuation of soft stool, with a good continence and disappearance of abdominal pain and other relatives symptoms. They reported excellent satisfaction with the surgical results and a significant improvement of their quality of life.*

**DISCUSSION:** *TC with IRA and CRA after SC represent the most effective and widely used surgical operations in the treatment of STC, in well selected patients, after failure of conservative treatment. According to Literature data, and in our experience, no significant differences in terms of postoperative morbidity or mortality neither in quality of life were observed between the two operations. It is well demonstrated the feasibility of the laparoscopic approach in 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 finally a better cosmesis.*

**CONCLUSIONS:** *Laparoscopic TC and IRA and CRA after laparoassisted SC represent efficacious operations in the treatment of STC offering a good postoperative quality of life and reduced morbidity compared to open surgery.*

**KEY WORDS:** Cecorectal anastomosis, Colonic inertia, Ileorectal anastomosis, Laparoscopic total colectomy, Laparoscopic subtotal colectomy, Slow transit constipation.

### Introduction

The large diffusion of laparoscopic surgery in the last decade has demonstrated the feasibility of laparoscopic

colorectal resections and in the literature various laparoscopic, laparoassisted or hand assisted total or subtotal colectomy (TC or SC) for slow transit constipation (STC) are reported, demonstrating well known advantages in comparison to "open" surgery.<sup>1,2</sup> The mechanical cecorectal or ileorectal anastomosis (CRA or IRA) after SC or TC are the most effective and widely used surgical operations, after failure of conservative treatment.<sup>3-6</sup> Together with a review of literature, the Authors describe their experience in the treatment of three young patients affected by STC and submitted to laparoscopic TC or SC.

*Pervenuto in Redazione Settebbre 2011 Accettato per la pubblicazione Ottobre 2011*

*Correspondence to: Dr. Giovanni Conzo, Dipartimento di Scienze Anestesiologiche, Chirurgiche e dell'Emergenza - VII Divisione di Chirurgia Generale - Facoltà di Medicina e Chirurgia - Seconda Università degli Studi di Napoli, Via Generale G. Orsini 42, 80132 Napoli (e-mail: [giovanni.conzo@unina2.it](mailto:giovanni.conzo@unina2.it)).*

## Materials and Methods

### CASE REPORT N. 1

In January 2005 a 20 years old male patient came to our observation; when he was a child he was submitted to sphincteromyotomy for an erroneous diagnosis of Hirschsprung's disease. The patient complained of untreatable constipation, encopresis, nausea, abdominal pain and bloating, paradoxical diarrhoea with a poor quality of life. Preoperative instrumental work-up included a barium enema showing a redundant colon; a pancolonoscopy with colo-rectal biopsies, excluding Hirschsprung's disease; an anorectal manometry indicating a marked rectal hypo sensibility; an oesophageal manometry with normal values. A colonic transit time, according to Chaussade <sup>7</sup>, showed a colonic total slow transit constipation with retention of about all markers in the whole colon on the fifth day after ingestion

In May 2005, in accordance with the gastroenterologist, the patient was submitted to laparo-assisted subtotal colectomy with extracorporeal end to end anisoperistaltic mechanical cecorectal anastomosis according to Sarli procedure <sup>8</sup>. The postoperative course was uneventful and after an Rx gastrographin enema in 8th postoperative the patient was discharged. After about 3 weeks the patient reported 3 daily evacuations of soft faeces. After 3 months a new colonic transit time study was performed and showed a regular transit and after 6 months the patient reported 2 daily evacuations, in absence of nausea, abdominal pain and bloating and excellent satisfaction with the surgical results with a normal faecal continence, no urgency and a significant improvement of his quality of life.

### *SURGICAL TECHNIQUE (SC with CRA)*

Mechanical bowel preparation started 3 days before the operation. At anaesthesia induction 2gr of ceftazidima (Glaxidim®,-GlaxoSmithKline Verona Italy) and 500 mg of metronidazole (Metronidazolo, Bioindustria-Novi Ligure Italy) were administrated intravenous. Patient was catheterized and placed in a supine Trendelenburg position of about 30°, with legs abducted. This position was hold during the entire operation with a mild lateral rotation (to the right during left colon dissection and to the left during right colon dissection). A pneumoperitoneum with intrabdominal pressure of 12 mmHg was established according to an "open technique" with an Hasson trocar (Bluntport plus,-Autosuture Tyco Corporation). A 30° camera was utilized. Four ten mms trocars-2 in the left and right flanks, 1 in supraumbilical and one in sovrapubic, where a minilaparotomy of about 7 cm was performed - were utilized.

The dissection was performed by an electrothermal bipolar vessel sealing device- Atlas Ligasure®, (Tyco Corporation), and not absorbable clips were utilized on

the branches of the middle colic vessels. A laparoassisted subtotal colectomy from "left to right" was performed preserving superior rectal and ileocolic vessels. The operation started with mobilization of sigmoid and left colon, the operating surgeon standing on the right side of the patient. During the dissection of the splenic flexure the patient was hold in a Trendelenburg position and the operating surgeon on the left side of the patient to ultimate the separation of colic flexure from the spleen. After dissection of great omentum from transverse colon and mesocolon following by a complete mobilization of the right colon with identification of the right ureter and gonadic vessels, a longitudinal minilaparotomy of about 7 cm was performed. After the extraction of the entire colon out of the abdominal cavity, protecting the abdominal wall by a plastic ring drape, appendectomy and colonic section preserving about 10 cm of right colon from ileocecal valve was performed. The rectum was transected at the level of promontory and the head of a 34 mm circular stapler (EEA p 34®, Autosuture Tyco Corporation) was fixed to the rectal stump by a manual purse string. Finally, introducing the stapler from the section line of the cecum, an end to end mechanical CRA was performed. The cecal stump was closed by a reloadable 90 GIA. The abdominal cavity was drained from port sites and a 24 ch Foley transanal catheter for anastomotic decompression was utilized. Operation's time was 220 minutes.

### CASE REPORT N. 2

The second patient, a 28 years-old woman, came to our observation in February 2008: she referred constipation refractory to pharmacological treatment, with evacuation of solid stool each almost 7-10 days. Also she complained of chronic abdominal pain, nausea and bloating. The preoperative work-up consisted of barium enema, total colonoscopy, anorectal manometry and study of intestinal transit time. No relevant abnormality was relieved at these instrumental examines except for the last one which demonstrated a slow colonic transit time with retention of all markers in the colon on the 10<sup>th</sup> day after ingestion. In September 2008 the patient underwent laparoscopic TC with IRA. No postoperative complications occurred and the patient resumed oral alimentation on 4<sup>th</sup> postoperative day and was discharged home on the 7<sup>th</sup> post operative day. At 6 months clinical follow-up after 6 months from the operation the patient reported excellent outcome with two daily evacuations of soft stool and disappearance of chronic abdominal pain and other related symptoms.

### CASE REPORT N. 3

The third patient, a 26 years-old woman was observed at our department on March 2009; the referred symp-

tomatology was the same as for the second patient with a similar frequency of evacuations. Analogue was the preoperative work-up with a clearly pathologic radiologic study of colonic transit time. In July 2009 the patient was operated and underwent a laparoscopic TC with IRA. Postoperative course was uneventful and the patient returned home on 6<sup>th</sup> postoperative day. At 6 months clinical follow-up after 6 months the patient referred good satisfaction with 2-3 evacuations of soft stool per day and only mild occasional abdominal pain and flatulence.

#### SURGICAL TECHNIQUE (TC with IRA)

Bowel mechanical preparation and surgical technique utilized in case 2 and in case 3 was similar to that reported in case 1. The operations consisted in a “left to right” laparoscopic total colectomy by an electrothermal bipolar vessel sealing device – Atlas Ligasure® (Tyco corporation)- and by five trocars – one paraumbilical, two in the left and right subcostal space, one in the left iliac fossa and one in the right iliac fossa where a minilaparotomy was performed. Vascular control was obtained by Atlas Ligasure in a pericolic dissection plane. The mobilisation of colonic flexures was typically performed with patient in 30° antiTrendelenburg position and a mild lateral rotation (to the right during left colon dissection and to the left during right colon dissection). After section of the colon at the sigmoid rectal junction by disposable laparoscopic 60 endoGIA® (Johnson & Johnson), the whole colon was extracted out the abdominal cavity and the terminal ileum was extracorporeally transected; after closure of minilaparotomy, an intracorporeal transuteral end to end mechanical ileorectal anastomosis by EEAp 25® (Johnson & Johnson) was per-

formed (double-stapling technique). In every case an intraoperative endoscopic anastomotic control was performed and abdominal cavity was drained from port sites. Operation's time was 190 minutes and 235 minutes respectively in case 2 and in case 3.

#### Discussion

Chronic slow transit constipation (STC) represents a disabling syndrome characterized by untreatable constipation with an higher incidence in young female patients<sup>9,10</sup>. The pathophysiology is still unclear and a visceral neuropathy of the mioenteric plexus is supposed<sup>11-13</sup>, together with abnormalities of neuroendocrine peptides levels<sup>14,15</sup>. Less than 10% of the patients require surgical management, in case of failure of conservative treatment and only after meticulous preoperative investigations<sup>16,17</sup>. In each case a multidisciplinary team is requested comprising gastroenterologist, nutritionist, psychiatrist and surgeon. A total colectomy (TC) followed by ileorectal anastomosis (IRA) is the most common effective and widely performed surgical operation with a success rate of approximately 90%<sup>17-19</sup>, also if it is associated with a significant postoperative morbidity in terms of diarrhoea, number of daily bowel motions, soiling, faecal incontinence and postoperative adhesions<sup>3</sup>. In 1955 Lillehei and Wangsteen first described the use of mechanical cecorectal anastomosis (CRA) after SC<sup>20</sup>. The original technique consists in an end to end CRA after a 180° rotation of the cecum; after this, several modifications of such technique were described in order to avoid the possible vascular torsions<sup>21,22</sup>. A current operative technique, as first reported by Mouiel<sup>23</sup> and by Sarli<sup>8</sup>, so called Sarli procedure, creates an anisoperi-

TABLE I - Results of laparoscopic operations for slow transit constipation

Authors	Pts	Approach	Technique	Morbidity	Mortality	Conversion	Success
Ho (2)	24	VL 7 Open 17	TC+IRA	43% 23%	0	0	96%
Athanasakis(24)	4	VL	TC+IRA	25%	0	0	100%
Sarli (25)	2	VL	SC+CRA	0	0	0	100%
Pokala (26)	20	VL 10	TC+IRA	–	–	–	?
Sample (27)	14	VL	SC+CRA	7.1%	0	7.1%	91%
Iannelli (28)	4	VL	SC+CRA	0	0	0	100%
Marchesi (1)	22	VL 5 Open 17	SC+CRA	9.3%	0	0	88%
Hsiao (29)	44	Handassisted	TC+IRA	4.5%	0	0	88.6%

SC=subtotal colectomy; CRA=Cecumrectal anastomosis; TC= total colectomy; IRA=ileorectal anastomosis; VL= video-laparoscopic

staltic end to end mechanical anastomosis avoiding visceral rotation.

The diffusion of laparoscopic surgery gave great impulse to this kind of operations and in the last 15 years some authors published their results that are summarized in Table I.

As it can be observed in the table 1, excellent or good outcome were reported after TC or SC, with comparable morbidity and mortality, also if, because of the little number of patients affected by STC candidates to surgery, the series are very limited<sup>1,2,24-31</sup>. However, the debate regarding therapeutic choice is still open. Some Authors support the SC because the preservation of terminal ileum, ileocecal valve and cecum, allows the reabsorption of electrolytes, biliary salts, B12 vitamin and about 2 liters of water per day, preventing the occurrence of biliary and renal stones with a reduced number of daily bowel motions and without faecal incontinence<sup>1,32,33</sup>. Furthermore, independently from the operative technique (iso-anisoperistaltic), the cecum seems to fill well the pelvis reducing the risk of postoperative obstructions or adhesions of the small bowel compared to TC and IRA<sup>1,8,28,34,35</sup>. Nevertheless in the Author's experience, in the patients submitted to TC + IRA a disabling diarrhoea, incontinence or urgency was not observed at 6 months clinical follow up after 6 months from operation and after 12 months, the functional results of SC+CRA were similar to those observed after TC+IRA with an excellent quality of life. Furthermore, after a mean follow up of 43 months (range 23-73), a subocclusive crisis due to adhesive syndrome was never observed.

In our opinion, also if our experience is limited, the two operations can give similar excellent results, without significant differences in terms of morbidity and mortality. We believe also that the increasing diffusion of "one port" laparoscopy (SILS) will allow more and more diffusion also for this kind of challenging operation<sup>36,37</sup>.

## Conclusion

Laparoscopic TC and SC represent efficacious and interesting operations in the treatment of STC, offering a good postoperative quality of life and a reduced morbidity compared to "open" surgery. Laparoassisted or total laparoscopic operation allows reduced postoperative pain and ileus, a shorter hospitalisation, a faster return to social activities along with a better cosmetic result and good medium-long term functional results.

## Riassunto

Gli Autori presentano i risultati funzionali della colectomia totale laparoscopica con ileo-retto-anastomosi e della colectomia subtotale laparoassistita con cieco-retto-anastomosi in tre pazienti affetti da stipsi cronica da ral-

lentato transito. Tra il luglio del 2005 ed il luglio 2009, tre giovani pazienti affetti da stipsi cronica da ritardato transito sono stati sottoposti a colectomia totale laparoscopica ed ileo-rettostomia in due casi ed a colectomia subtotale seguita da cieco-rettostomia laparoassistita (intervento di Sarli) in un caso dopo fallimento del trattamento medico. Ad un follow up medio di 3 anni sono stati esaminati diversi fattori – numero di evacuazioni quotidiane, soiling, incontinenza, dolore addominale, bloating – in relazione alla qualità di vita. A dodici mesi i pazienti riferivano due-tre evacuazioni al giorno di feci morbide, con buona continenza e scomparsa del dolore addominale, ritenendosi notevolmente soddisfatti del risultato chirurgico. La colectomia totale seguita da ileo-rettoanastomosi e la colectomia subtotale seguita da cieco-rettoanastomosi rappresentano gli interventi più diffusi per il trattamento della stipsi cronica da rallentato transito, in pazienti selezionati e dopo fallimento del trattamento medico conservativo. Dall'analisi della Letteratura emerge che la colectomia totale seguita da ileo-retto-anastomosi è largamente preferita con una percentuale di successo del 90%, anche se in circa il 30% dei casi è gravata da diarrea disabilitante o da stipsi persistente. La colectomia subtotale con conservazione del cieco e della valvola ileociecale è seguita da migliori risultati in termine di numero di evacuazioni quotidiane, "soiling", incontinenza fecale e sindromi aderenziali postoperatorie. L'approccio laparoscopico alle patologie coloretali offre i tipici vantaggi di una chirurgia meno invasiva con rispetto parietale, minore dolore ed ileo postoperatori, minore insorgenza di aderenze, una ridotta ospedalizzazione ed infine un migliore risultato estetico rispetto alla chirurgia open. Nell'esperienza degli Autori due diversi interventi laparoscopici hanno consentito risultati funzionali simili a lungo termine, con notevole miglioramento della qualità di vita.

## References

1. Marchesi F, Sarli L, Percalli L, Sansebastiano GE, Veronesi L, Di Mauro D, Porrini C, Ferro M, Roncoroni L: *Subtotal colectomy with antiperistaltic cecorectal anastomosis in the treatment of slow-transit constipation: Long-term impact on quality of life*. World J Surg, 2007; 31:1658-664.
2. Ho YH, Tan M, Eu KW, Leong A, Choen FS: *Laparoscopic-assisted compared with open total colectomy in treating slow transit constipation*. Aust N Z J Surg, 1997; 67(8):562-65.
3. Piccirillo MF, Reisman P, Wexner SD: *Colectomy as treatment for constipation in selected patients*. Br J Surg, 1995; 82:898-901.
4. Costalat G, Garrigues JM, Didelot JM, Yousfi A, Boccasanta P: *Colectomie subtotale avec anastomose caecorectale pour constipation sévère idiopathique: Alternative à la colectomie totale réduisant les risques de séquelles digestives*. Ann Chir, 1997; 57:248-55.
5. Yalcin S, Yalcin B, Gecim IE: *Surgical interventions in patients with chronic constipation refractory to intensive medical treatment*. Bratisl Lek Listy, 2009; 110(1):35-37.

6. El-Salhy M: *Chronic idiopathic slow transit constipation: Pathophysiology and management*. Colorectal Disease, 2003; 5:288-96.
7. Chaussade S, Roche H, Khyari A, Outurier D, Guerre J: *Mesure du temps de transit colique (TTC): Description et validation d'une nouvelle technique*. Gastroenterol Clin Biol, 1986; 10:385-89.
8. Sarli L, Costi R, Sarli D, Roncoroni L: *Pilot study of subtotal colectomy with antiperistaltic cecoproctostomy for the treatment of chronic slow-transit constipation*. Dis Colon Rectum, 2001; 44(10):1514-519.
9. Candelli M, Nista EC, Zocco MA, Gasbarrini A: *Idiopathic chronic constipation. Pathophysiology, diagnosis and treatment*. Hepato-Gastroenterology, 2001; 48:1050-57.
10. Wald A: *Constipation*. Med Clin North Am, 2000; 84:1231-246.
11. Bassotti G, Chiarioni G, Imbimbo B, et al.: *Impaired colonic response to cholinergic stimulation in patients with severe chronic idiopathic (slow transit type) constipation*. Dig Dis Sci, 1993; 38(6):1040-45.
12. He C-L, Burgart L, Wang L, et al.: *Decreased interstitial cell of Cajal volume in patients with slow transit constipation*. Gastroenterology, 2000; 118:14-21.
13. Bassotti G, Stanghellini V, Chiarinoni G, et al.: *Upper gastrointestinal motor activity in patients with slow transit constipation. Further evidence for an enteric neuropathy*. Dig Dis Sci, 1996; 41(10):1999-2005.
14. Knowles CH, Scott SM, Lunniss PJ: *Slow transit constipation: a disorder of pelvic autonomic nerve?* Dig Dis Sci, 2001; 46:389-401.
15. Schouten WR, ten Kate FJW, de Graaf EJR, Gilberts ECAM, Simons JL, Kluck P: *Visceral neuropathy in slow transit constipation: An immunohistochemical investigation with monoclonal antibodies against neurofilament*. Dis Colon Rectum, 1993; 36:1112-117.
16. Stewart WF, Liberman JN, Sandler RS et al.: *Epidemiology of constipation (EPOC) study in the United States: Relation of clinical subtypes to sociodemographic features*. Am J Gastroenterol, 1999; 94:3530-540.
17. Nyam DC, Pemberton JH, Ilstrup DM, Rath DM: *Long term results of surgery for chronic constipation*. Dis Colon Rectum, 1997; 40:273-79.
18. Mollen RM, Kuijpers HC, Claassen T: *Colectomy for slow-transit constipation: Preoperative functional evaluation is important but not a guarantee for a successful outcome*. Dis Colon Rectum, 2001; 44(4):577-80.
19. Pemberton JH, Rath DM, Ilstrup DM: *Evaluation and surgical treatment of severe chronic constipation*. Ann Surg, 1991; 214(4):403-11.
20. Lillehei RC, Wangenstein OH: *Bowel function after colectomy for cancer, polyps, and diverticulitis*. JAMA, 1955; 59:163-70.
21. Deloyers L: *La bascule du colon droit permet sans exception de conserver le sphincter anal après les colectomies étendues du transverse et du colon gauche (rectum y compris), Technique Indications Resultats immédiats et tardifs*. Lyon Chir, 1964; 60:404-13.
22. Ryan J Jr, Oakley WC: *Cecoproctostomy*. Am J Surg, 1985; 149:636-39.
23. Mouiel J: *Anastomose caeco-rectale et colectomie presque totale*. In: Welter R, Petel JC (eds): *Chirurgie mécanique digestive* Paris, Masson; 252.
24. Athanasakis H, Tsiaoussis J, Vassilakis JS, Xynos E: *Laparoscopically assisted subtotal colectomy for slow-transit constipation*. Surg Endosc, 2001; 15:1090-92.
25. Sarli L, Iusco D, Costi R, Roncoroni L: *Laparoscopically assisted subtotal colectomy with antiperistaltic cecorectal anastomosis*. Surg Endosc, 2002; 16(10):1493.
26. Pokala N, Delaney CP, Senagore AJ, Brady KM, Fazio VW: *Laparoscopic vs open total colectomy. A case-matched comparative study*. Surg Endosc, 2005; 19:531-35.
27. Sample C, Gupta R, Bamehriz F, Anvari M: *Laparoscopic subtotal colectomy for colonic inertia*. J Gastrointest Surg, 2005; 9(6):803-808.
28. Iannelli A, Fagiani P, Mouiel J, Gugenheim J: *Laparoscopic subtotal colectomy with cecorectal anastomosis for slow-transit constipation*. Surg Endosc, 2006; 20:171-73.
29. Hsiao KCW, Jao SW, Wu CC, Lee TY, Lai HJ, Kang JC: *Hand-assisted laparoscopic total colectomy for slow transit constipation*. Int J Colorectal Dis, 2008; 23:419-24.
30. Inoue Y, Noro H, Komoda H, Kimura T, Mizushima T, Taniguchi E, Yumiba T, Itoh T, Ohashi S, Matsuda H: *Completely laparoscopic total colectomy for chronic constipation: Report of a case*. Surg Today, 2002; 32(6):551-54.
31. Kessler H, Hohenberger W: *Laparoscopic total colectomy for slow-transit constipation*. Dis Colon Rectum, 2005; 48(4):860-61.
32. Jiang CQ, Qian Q, Liu ZS, Bangoura G, Zheng KY, Wu YH: *Subtotal colectomy with antiperistaltic cecoproctostomy for selected patients with slow transit constipation-from Chinese report*. Int J Colorectal Dis, 2008; 23:1251-256.
33. Levitan R, Fordtran SJ, Burrows BA, Ingelfinger FJ: *Water and salt absorption in humane colon*. J Clin Invest, 1962; 41:273-79.
34. Sarli L, Iusco D, Donadei E, et al.: *The rationale for cecorectal anastomosis for slow transit constipation*. Acta Biol Med, 2003; 74:74-79.
35. Costi R, Roncoroni L, Violi V, Sarli L: *Subtotal colectomy with antiperistaltic cecoproctostomy for slow-transit constipation*. Int J Colorectal Dis, 2009; 24:1117-118.
36. Leblanc F, Makhija R, Champagne BJ, Delaney CP: *Single incision laparoscopic total colectomy and proctocolectomy for benign disease-initial experience*. Colorectal Dis, 2011; 13(11):1290-93.
37. Fichera A, Zoccali M, Gullo R: *Single incision ("scarless") laparoscopic total abdominal colectomy with end ileostomy for ulcerative colitis*. J Gastrointest Surg, 2011; 15(7):1247-51.

