

Late surgical complications of subtotal colectomy with antiperistaltic caeco-rectal anastomosis for slow transit constipation

A critical analysis



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Late surgical complications of subtotal colectomy with antiperistaltic caeco-rectal anastomosis for slow transit constipation. A critical analysis.

PURPOSE: *Despite a good percentage of success, mainly related to the amelioration of patient selection, surgery for slow transit constipation still presents failures and late complications, often unpredictable, and sometimes related to technical variants. The aim of the study is to critically analyze late surgical complications of subtotal colectomy with caeco-rectal anastomosis (SCCRA), examining the peculiar risks of the procedure and possible prevention measures.*

METHODS: *Follow-up data of 43 compliant patients submitted to SCCRA at our Institution were reviewed. Patients undergoing further surgery for a complication clearly related to SCCRA at our centre were included.*

RESULTS: *We identified three late surgical complications (7%): a caecal distension, an ileo-caecal volvulus and an ileal volvulus. All patients were successfully treated. An evident predisposing condition was found only in the first case.*

CONCLUSIONS: *Peculiar long term complications related to the presence of a dysfunctional or mobile caecal stump may be prevented by careful patient selection and surgical technique.*

KEY WORDS: Constipation, Complication, Caecal distension, Ileo-caecal volvulus, Subtotal colectomy.

Introduction

Over the last decades, after a period of caution and concern, severe slow-transit constipation (STC) has been definitively recognized as a potentially surgical condition¹, and new surgical procedures²⁻⁴ have been proposed in order to maximize the risk-benefit balance for the patients.

In our experience^{5,6} laparoscopic subtotal colectomy with caeco-rectal anastomosis (SCCRA) represents a safe and effective alternative to total colectomies, possibly reduc-

ing postoperative urgency and incontinence by preserving the ileo-caecal valve.

On the other hand, the preservation of a possibly malfunctioning colonic segment (the caecum) has been advocated as a potential "recurrence" factor⁷, as well as a source of surgical late complications (caecal dilation, volvulus).

Taking into account that slow transit constipation includes a wide spectrum of functional syndromes, in which gut dysmotility can involve not only the colon, it is evident that patient selection and the choice of procedure could result as being extremely complex.

Moreover, the utilization of many technical variants, with new and less invasive approaches, on an extremely "variably responding" group of patients, could lead the surgeon to face complications difficult to interpret, prevent and manage.

We present a series of uncommon late complications following 46 consecutive SCCRA for STC, with the aim of analyzing the potential risks of the procedure and identifying possible prevention measures.

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Materials and Methods

We reviewed a series of 46 SCCRA for STC performed at our Institution from 1991 to 2014. The vast majority of the patients were women (96%) with a mean age of 43.9. Patient selection was extremely stringent and particular attention was paid to the assessment of failure of medical and rehabilitative therapy. Preoperative evaluation included a transit study with radio-opaque markers, a complete colonoscopy, a defecography, an anorectal manometry, an electromyography (if indicated) and a psychiatric evaluation performed by a team of dedicated specialists.

SCCRA was performed through a midline incision (15) or through a 5 trocar videolaparoscopic technique (31); as previously described^{5,6}, in the laparoscopic approach the specimen is extracted through a Pfannenstiel incision, and a Knight and Griffen intracorporeal antiperistaltic caeco-rectal anastomosis is performed with a 33 mm circular stapler.

Since 1998 each patient submitted to the procedure had been prospectively entered in a follow-up database, aiming at completing at least one clinical control and 1 telephonic interview per year, assessing clinical and functional outcome (outlet function, gastro-intestinal symptoms, quality of life) and 1 instrumental examination every 3 years, all carried out by independent observers. In particular, quality of life being a basic criterion for patient selection as well as the most important endpoint of surgery, a specific test (the Gastro-Intestinal Quality of Life Index⁸) was administered also preoperatively, and score variation prospectively collected⁶.

For this study we specifically examined surgical late complications of the procedure.

Results

Three patients were lost at follow-up. Among the other 43, we identified 3 late surgical complications (7%). One more case, among the patients lost at follow-up, operated on for bowel obstruction and caecal distension at another centre, was not included in the series, owing to the lack of adequate clinical data.

CASE 1 (A.K.)

In 2014, a 77-year-old woman, submitted to videolaparoscopic SCCRA for STC at our Institute in 2007 after ineffective sacral neuromodulation at another centre, presented with recurrent severe constipation associated with progressively worsening diffuse abdominal pain and anorexia. Plane-abdominal radiographs showed a large caecal distension, confirmed by a double contrast barium enema and CT scan (Fig. 1). A defecography demonstrated a pelvic floor dyssynergy due to the



Fig. 1: CT scan showing a large caecal distension (case 1)

absence of rectal propulsion and to insufficient puborectalis muscle relaxation. A manometry showed a reduction in basal tone, voluntary contraction and rectal sensation, with impaired strain. On the basis of clinical, radiological and functional findings, the patient was submitted to laparoscopic exploration. A huge caecal stump was laparoscopically resected after an intraoperative endoscopic desufflation; the endoscope also helped to identify the anastomotic line. Finally, a latero-terminal ileo-rectal intracorporeal anastomosis was performed with a 29 mm circular stapler (Knight and Griffin technique). Histologic examination reported a marked reduction in muscular layer thickness.

The postoperative course was uneventful. After 3 months, the patient reported 2 bowel movements per day, with a considerable reduction in abdominal pain. Depending on functional tests results, scheduled at 6 months postoperatively, the patient will be possibly addressed to a biofeedback therapy.

CASE 2 (B.A.M.)

A 59-year-old woman presented with small bowel obstruction 2 years after a SCCRA for STC. Abdominal radiographs showed a small bowel distension with air-fluid levels and coprostitis. A laparotomy revealed an ileo-caecal volvulus with initial ischaemia: a derotation and caeco-ileo pexis was then performed. The postoperative course was uneventful. Three years later the patient was readmitted after repeated and worsening episodes of subocclusion with abdominal pain. Abdominal radi-



Fig. 2: CT scan showing a caecal distension and a whirl sign (case 2)

ographs showed a small bowel distension with air-fluid levels. A CT scan demonstrated an abnormal bowel distension associated with the “whirl” sign, suggestive of recurrent volvulus (Fig. 2). The patient was therefore submitted to laparotomy: a recurrent ileo-caecal volvulus was detected, with no ischaemia of the bowel wall. A derotation and ileo-caeco pexis was performed. The postoperative course was uneventful.

Two years later the patient was readmitted for right side abdominal pain with occlusion. A CT scan showed a caecal distension with coprostasis and a ventral hernia containing small bowel loops. Owing to clinical worsening, the patient was submitted to a new laparotomy. A 7 cm adhesive band occluding the caecum was found and dissected, and the ventral hernia was repaired by a retromuscular 30x17 cm mesh with the Rives technique⁹. The patient was discharged on postoperative day 5.

CASE 3 (T.C.)

A 54-year-old woman, submitted to videolaparoscopic SCCRA 4 years before for STC, presented with severe right side abdominal pain and vomiting. Plane abdominal radiographs showed small bowel distension with multiple air-fluid levels and coprostasis. The patient underwent a laparoscopic exploration which revealed the presence of small bowel volvulus, with necrosis, around an adhesive band corresponding to a previous drain scar. A small bowel resection with side-to-side intracorporeal anastomosis was performed. The postoperative course was uneventful and the patient was discharged on postoperative day 6. At 3-month follow-up, the patient reported 2 bowel movements per day and no pain.

Discussion

When performed on carefully selected patients and by experienced surgical teams, surgery for slow transit constipation has demonstrated good functional results and acceptable morbidity in most series^{10,11}, even though controversy still exists regarding the proper technique and outcome assessment¹⁰.

The development of minimally invasive approaches ameliorated the postoperative outcomes and made these procedures more “appealing”; however, the persistence of a not inconsiderable percentage of long term failures related to variable and unpredictable symptoms and complications makes this topic still controversial.

As previously reported, laparoscopic SCCRA represents the procedure of choice at our institution, combining a very high rate of constipation relief, typical of total colectomies, with potential functional benefits (i.e lower urgency and incontinence) due to the preservation of the ileo-caecal valve and the caecal reservoir^{5,6}. In our experience, indeed, incontinence and urgency are among the symptoms most negatively impacting on postoperative quality of life and satisfaction^{5,6}, along with recurrent constipation and abdominal pain, occasionally associated with obstructive episodes.

Recurrent constipation is uncommon after total colectomies for STC^{10,11}, although a great variability is recorded from one series to another, probably owing to the use of different evaluation systems¹⁰. While the preservation of long colonic segments in partial resections and hemicolectomies has been clearly demonstrated to be the source of a sizeable rate of recurrences¹⁰, the preservation of the caecum does not seem to compromise the effectiveness of SCCRA on constipation as compared with total colectomies, as also reported by other authors¹². In the normal population an isolated caecal distension is an uncommon and often dangerous clinical condition, being associated with mechanical obstructions or with rare conditions such as severe infections, volvulus or Ogilvie’s syndrome¹³. A moderate caecal distension (up to 8-10 cm) is a common radiologic finding at long term follow-up in our series (approximately 30%), although we did not find any statistical correlation with preoperative findings or with postoperative symptoms. According to Ogilvie’s syndrome pathogenesis, we can presume an association with gut dysmotility (abnormalities of the autonomic nervous system), although, possibly because of the limited number of the cases and the difficulties in preoperative assessment, no correlation has been found. On the other hand, the high rate of symptomatic distensions reported by isolated series¹⁰ could depend on technical aspects. From this point of view we believe that reducing the remnant volume, by dissecting the ascending colon in close proximity to the ileo-caecal valve, should be a mandatory preventive measure.

Case 1 patient represented a paradigmatic exception, the second case in our series needing further surgery (4 %)

(the other one had been operated on in another centre). The patient presented a serious relapse of constipation along with a severe and worsening abdominal pain, impairing normal activities; indication for surgery in this case was mandatory. By an "a posteriori" speculation two predisposing factors could be identified in this case: age and outlet dysfunction.

We normally operate on relatively young females; the presence of a severe STC in an older woman could be worsened by several age-related factors, and a caecal remnant after SCCRA could be presumed to be less functional owing to degeneration processes¹⁴ and/or the long lasting effect of constipation. From this point of view, although we did not set any age contraindication, a 65-year age limit could be considered as a reasonable cut-off.

Outlet dysfunctions surely represent an additional risk factor for post SCCRA caecal distension and constipation recurrence¹⁰. A thorough preoperative evaluation (ano-rectal manometry, defecography, electromiography) should distinguish primary outlet impairments, which should be primarily treated, and secondary alterations, which are presumed to ameliorate along with the restoration of a normal transit¹⁵. Our patient was previously unsuccessfully treated with a sacral neuromodulator for slow transit constipation at another centre and our preoperative evaluation seemed to exclude an outlet dysfunction: we cannot rule out that neuromodulation could have been a "confounding factor" in preoperative assessment and a coexisting pelvic floor dyssinergy could have been unrecognized. Indication for SCCRA could have been hazardous in this particular case and, at least, a well-timed pelvic floor rehabilitation could possibly have prevented procedure failure.

In the normal population caecal volvulus is quite a rare clinical condition (1% of adults intestinal obstructions) and is related to a congenital inadequate right colon fixation¹⁶. In patients submitted to SCCRA it represents a peculiar and unusual complication (case 2 represented the only clinical case in our series, 2%). An antiperistaltic caeco-rectal anastomosis, indeed, normally allows for a tension-free suture without any caecal mobilization, a caecal ptosis being quite normal in those patients. In the case of partial or complete mobilization, cecopexy should be mandatory, even though, as the case shows, it could be an insufficient measure. The patient was one of the last operated on by an open approach, which can involve a tendency to a more extensive mobilization, resulting as being easier, especially for the right colon. From this point of view any attempt to limit caecal mobilization should be encouraged.

Case 3 represented the only case of small bowel strangulation in our series (2%). As in other fields of surgery (i.e. bariatric surgery), a minimally invasive approach could represent a predisposing factor (loop motility) as well as a preventing factor (fewer adhesions)¹⁷. In this particular case the adhesive band was found at the site

of the postoperative drain. Going against the evidence of the literature^{18,19}, we routinely place drains in colonic resections, supported by our clinical experience (i.e. 2/3 cases of post SCCRA for STC leakage that healed without ileostomy). The only preventive measure we could suggest for those patients is an early drain removal.

Conclusions

In selected patients affected by severe STC, SCCRA demonstrated very good functional results with low risk of failure or complications. Peculiar long term complications related to the presence of a malfunctioning or mobile caecal stump could to some extent be prevented by careful patient selection and surgical technique. However, as in most constipation surgery, some functional failures cannot be predicted.

Riassunto

La stipsi grave da rallentato transito è stata negli ultimi anni definitivamente riconosciuta come una condizione potenzialmente chirurgica, e nuove varianti tecniche sono state proposte in alternativa alla colectomia totale con ileo-retto anastomosi con l'obiettivo di minimizzare il rapporto rischi-benefici per il paziente. In quest'ottica la colectomia subtotale con anastomosi ceco-rettale (SCCRA) rappresenta nella nostra esperienza una valida alternativa, riducendo, a parità di efficacia, l'incontinenza e l'urgency postoperatoria, grazie alla preservazione della valvola ileo-cecale e del reservoir cecale.

Tuttavia, a fronte di una buona percentuale di successi, legati soprattutto al miglioramento della selezione dei pazienti, la chirurgia della stipsi da rallentato transito presenta tuttora un non trascurabile numero di insuccessi e di complicanze tardive, spesso imprevedibili, e correlate alle varianti tecniche adottate.

Nello specifico caso della SCCRA, la preservazione di un segmento colico verosimilmente malfunzionante (il ceco) è stata imputata come possibile causa di recidiva di stipsi cosiccome origine di complicanze chirurgiche tardive (distensione cecale, volvolo). L'obiettivo di questo studio è di analizzare in maniera critica le complicanze tardive di SCCRA, esaminando i rischi specifici della procedura per identificare possibili misure di prevenzione. A tal fine sono stati valutati i dati di 43 pazienti aderenti al follow-up sottoposti a SCCRA presso il nostro Istituto. Sono stati inclusi i pazienti sottoposti a re-intervento per complicanza tardiva chiaramente correlata a SCCRA presso il nostro centro.

Sono state identificate 3 complicanze tardive (7%): una distensione cecale, un volvolo ileo-cecale, un volvolo ileale. Tutti i pazienti sono stati trattati chirurgicamente con successo. Solo nel primo caso è stata identificata una evidente condizione predisponente: la presenza di una

defecazione ostruita non risolta associata ad un'età avanzata può in questo caso aver contribuito a rendere severamente sintomatica una condizione (la distensione cecale) che nel resto dei pazienti è rara o comunque di modesta rilevanza clinica. Nel caso dei volvoli, la miglior misura preventiva è rappresentata da una tecnica chirurgica che miri ad una minor mobilizzazione possibile del moncone cecale.

In conclusione si può affermare che le complicanze tardive specifiche di SCCRA correlate alla presenza di un moncone cecale disfunzionale o mobile possono essere prevenute da una attenta selezione dei pazienti e da una corretta tecnica chirurgica.

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