

RECTOSIGMOIDIAN RESECTION IN CHILDREN. A COMPARATIVE STUDY BETWEEN LAPAROSCOPIC AND OPEN TECHNIQUE

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Abstract

Background Minimal invasive surgery, particularly laparoscopy has dramatically changed the treatment options in congenital megacolon, facilitating the diagnostic and considerably reducing the operative trauma. The paper presents a comparative analysis between two groups of patients with rectosigmoidian resection and abdominoperineal pull through, performed by the same surgical team using laparoscopic or open transabdominal approach. **Methods** A number of 43 patients diagnosed with Hirschsprung's disease or chronic constipation were operated on between 2002 and 2013. 7 patients (medium age 2y 9m) were operated on using Duhamel technique. One of these patients needed a surgical correction after an insufficient resection performed by the same technique. 36 patients (medium age 4y 2m) were operated on performing laparoscopic rectosigmoidian resection. In 15 cases the diagnostic was confirmed by the full thickness laparoscopic colic biopsy. We performed this as an initial surgical stage during the laparoscopic resection in 7 patients. The diagnostic approach, the operative trauma, immediate and long term postoperative outcome became the criteria in our comparison between these two clinical series. The main criteria regarding the therapeutic success were a regular and spontaneous bowel movement without anal incontinence phenomenon. **Results:** We noticed a prolonged operative time during our initial laparoscopic procedures, but an important decrease in the quantity of the analgesic and antibiotic drugs. There was also a reduced period of intensive care unit and general hospitalization stay in the laparoscopic series. Oral intake was possible in 36 hours for the laparoscopic series and in 72 hours for the open surgery series. First bowel movement was noticed in 1 to 3 days in case of the laparoscopic series, versus 3 to 5 days in case of the Duhamel technique. Medium hospitalization period was 23 days in case of the open technique series compared to 9 days for the minimal invasive surgery series. We registered one death in case of the open technique series after 6 months from surgery. There was a redo surgery performed in laparoscopic series in order to correct an insufficient resection at the time of the first surgery. We also used the minimal invasive surgery for this procedure. In this series were noted two cases of anastomotic leak and one case of

anastomotic stenosis. Long term follow-up did not revealed patients with constipation or the need for supplementary therapeutic measures. In the laparoscopic series 4 patients presented soiling with favorable response to medical treatment. **Comments:** Evaluation of the surgical technique, immediate postoperative outcome and long term results reveal that laparoscopic rectosigmoidian resection represents a superior method of treatment compared to the open technique, especially to the retrorectal transanal pull through with perineal excess bowel segment as in our series. In laparoscopic series enterocolitis and soiling are clinical manifestation of limited results, compared to rectal stump impaction in open technique.

Key words: rectosigmoidian resection, pulthrough laparoscopy, Hirschsprung's disease

Background

Resection of the aganglionic bowel and restoration of the intestinal continuity with sphincteric structures preservation was first applied as the treatment of choice for Hirschsprung's disease in 1948 by Orvar Swenson.(1) Swenson technique represents a low rectal resection performed by combined abdominal and perineal approach presenting potential risks for genito-urinary and sphincteric complications. B. Duhamel (1956) and F. Soave (1964) introduced a surgical technique in clinical practice which maintains total or partial aganglionic rectum in transit.(2,3) Surgical technique analysis shows similar general results, with variable success rate and postoperative complications specific to each surgical technique. Facilitating the specimen collection for the histologic examination and diminishing the intraoperative trauma, the laparoscopy has dramatically changed the surgical approach for congenital megacolon. (4) In 1994 K. Bax reproduced the Duhamel technique using laparoscopic approach. The approach proposed in 1995 by K. Georgeson, which is now currently used in practice, reproduces the Swenson technique borrowing surgical stage from Soave technique. (5,6) Rectosigmoidian resection and rectocolic biopsy using laparoscopic approach have been used in our surgical team since 2002. This paper reveals the applicability of this surgical method and evaluates clinical results.

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Fig.1. Congenital megacolon.
Acute intestinal obstruction.



Fig.2. Enema of a neonatal
congenital megacolon.

	Every 1-2 days	Every 3-4 days	Every 5-7 days	Over 8 days
Spontaneous	30 pt	20 pt	10 pt	5 pt
Need for medical therapy	5 pt	10 pt	15 pt	20 pt
Soiling	5 pt	10 pt	15 pt	20 pt
Not continent	0 pt			

Table 1. Analytic score of rectal evacuation.

	Laparoscopy	Open surgery	Re do lap	Re do open
Total cases	36	7	1	1
Excellent	23	4		
Good	6	2		
Fair	5	1		
Poor	2	none		

Table 2. Comparative stooling score

Materials and methods

There were 43 patients operated on between 2002 and 2013 diagnosed with congenital megacolon and chronic constipation. In 7 cases (6 boys and 1 girl) aged between 7 months and 10 years, (medium age 2y 9m) we practiced abdominoperineal pull through according to Duhamel technique, preserving an excess colic segment at the perineum. One case was a redo surgery for an initial insufficient resection practiced according to the same procedure. A number of 6 from 7 patients were diagnosed with chronic intractable constipation. There was only one patient presenting acute bowel obstruction syndrome, admitted as an emergency case. Diagnostic methods were plain abdominal X ray combined with contrast enema confirmed by the intraoperative histologic examination.

Mean intraoperative time was 160 minutes (between 130 and 200 minutes), excluding the waiting time for the histologic exam. Bowel resection was done proximal from the dilated colon in order to avoid transitional zone. According to the standard procedure used in our Clinique at that moment, each case was finalized abandoning an excess colic segment in the perineum after the retrorectal and transanal abdominoperineal pull through. After 14 days, we practiced the excision of the exteriorized bowel and applied a forceps on the common rectocolic septum, which was detached after 19-26 days (medium 22 days). We allowed clear liquid intake after 3 days, depending on the return to normal bowel function. The patients from this surgical series were released from the hospital in approximately 23 days (medium period). There were follow-up visits monthly in the first 3 months, every 3 months in the first year and every 6-8 months in the next 3 years. The following were evaluated: frequency of the spontaneous bowel movements, continence, sense of fullness, tendency to constipation, episodes of enterocolitis, perianal erosions. We performed laparoscopic rectosigmoidian resection in case of 36 patients aged between 13 days and 17 years (medium 4y 2m). Six of these patients (2 neonates) were admitted with acute intestinal obstruction syndrome and the others presented chronic constipation syndrome. The diagnostic was made using plain abdominal X-ray and contrast enema. Multiple colic biopsies were taken using laparoscopic approach before the definitive surgery in 15 cases for which the diagnostic was confirmed. We usually take samples for histologic exam at the time of colostomy/ileostomy (10 cases) or intraoperative when we performed the definitive pull through. When the patient presents a colostomy prior to definitive surgery we usually keep it during laparoscopic dissection for the benefit of colonic "suspension" at the abdominal wall with a good mesocolon exposure.

Mean time of surgery in laparoscopic cases is of 240 minutes (175 minutes and 300 minutes), excluding the waiting time for histologic examination. Oral intake of liquids is allowed from the day of surgery and solid food after 36 hours. We usually keep the patients in the intensive care unit until the return of the digestive functions (medium 3 days) and we release the patients from the hospital in 9 days (medium) with a prolonged period for the neonates and infants (14 days). We settled the follow-up visits once a

month in the first 3 months after surgery, every 3 months for the first year and in every 6-8 months for the next 3 years. The follow-up criteria were the same: frequency of the spontaneous bowel movements, continence, sense of fullness, tendency to constipation, episodes of enterocolitis and the appearance of the perianal erosions.

Results

We noticed a prolonged operative time during our initial laparoscopic procedures, but an important decrease in the quantity of the analgesic and antibiotic drugs. There were also a reduced period of intensive care unit and general hospitalization stay in the laparoscopic series. Recovery of the intestinal bowel movement was noticed 3-5 days after surgery in the laparoscopic series, versus to 3-5 days in the open Duhamel technique. Mean hospitalization period was 23 days in open series versus to 9 days in laparoscopic series. Due to repeated episodes of bowel adhesions which necessitated 3 redo operations we registered 1 death at 6 months after surgery in open series. There was the need for a redo laparoscopy to correct an insufficient bowel resection. We registered 2 cases of anastomotic fistula, one of which requiring colostomy and one rectal anastomotic stenosis due to a partial anastomotic leakage. Anastomotic stenosis was treated with rectal dilatations. None of patients presented constipation or the need for special therapeutic measures long time after surgery. There was a higher frequency (2-6 stool/day) of bowel movement 4 to 6 months after surgery in laparoscopic series. This was a limited condition with special diet, but in 5 cases we had to administer Loperamid for 2-4 months. We registered 3 cases of repeated postoperative enterocolitis. One patient has been requiring nutritional therapy during 3 years after surgery. Intermittent soiling was noticed in 4 cases from laparoscopic series and 2 of these patients showed favorable response to medical treatment. The postoperative results regarding spontaneous rectal evacuation and anal continence were evaluated according to a personal clinical score (table 1 and 2).

Discussions

Evaluation of the surgical technique, immediate postoperative outcome and long term results reveal that laparoscopic rectosigmoidian resection represents a superior method of treatment compared to the open technique, especially to the retrorectal transanal pull through with perineal excess bowel segment as in our series. Preoperative multiple full-thickness intestinal biopsy is an excellent definitive diagnostic method. Suction rectal biopsy, which is the most used method, offers only a confirmation of the disease, not an extension of the lesion, so it must be accompanied by intraoperative biopsy. The mean operative time for laparoscopic procedures is increased compared to the open technique: 240 min vs. 160 min. Increased operative time may be attributed to rectal dissection and anastomosis but we must consider that in open technique this operative time represents another scheduled surgery, after 14 days. Patients are admitted in the intensive care unit until the recovery of the general status and digestive functions. This period consists of 3 to 5

postoperative days in case of the laparoscopic surgery group compared to 18 days in case of the open technique group. They also need close supervision of the exteriorized bowel segment and necessitate a large amount of analgics and antibiotic drugs. If we talk about laparoscopic surgery, the shorter period of hospitalization after an important surgical intervention comes from the diminished intraoperative trauma. The absence of parietal incision, atraumatic manipulation of the bowel segments, fine dissection of the structures due to magnification are technical details which favor this decreased intraoperative trauma. Laparoscopic rectosigmoidian resection with coloanal anastomosis is, in fact, a Swenson technique although the rectal mucosal dissection plane for a variable (2-4cm) length represents a technical element of the Soave technique. Promoting a better control of the rectal dissection, avoiding the main genitourinary trauma, laparoscopy avoids the main complication of the Swenson technique. Better postoperative results after laparoscopic approach has been reported also for the initial series, during the learning curve.(10) Evaluation of the patients after surgery did not reveal any case of constipation. Limited results consist of

soiling and episodic enterocolitis in laparoscopic series vs. rectal stump impaction in open series. It is assumed that soiling after surgery is due to excessive exposure of the anal canal during the endoanal dissection, but we have to notice that Duhamel technique consists also of a perineal stage with exposure of the anal canal, and soiling is not reported as a complication after surgery. If we talk about the results in Hirschsprung's disease, we have to notice a permanent search for better results which goes parallel with more detailed pathogenic knowledge and more diagnostic methods: histochemistry and immunohistochemistry. Continuous studies and progresses regarding neuroenteric pathology discovered new entities such as neurointestinal dysplasia and chronic intestinal pseudoobstruction, entities which are difficult to document in current clinical practice. Their symptoms are superposed on the Hirschsprung's disease so this may be the explanation for limited postoperative results. "I would like to conclude that definitive surgery in the sense of a cure for Hirschsprung does not exist. So let us stop talking about perfect results"... N.Bax(9).

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