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***Acquired Megacolon***

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## INTRODUCTION

The surgical treatment of Chagasic (acquired) Megacolon has changed with the knowledge of its etiopathogenesis and physiopathology.<sup>1</sup>

Comparison of anatomic-pathological investigation and electromanometrics studies has contributed to establish the actual premise for surgery.<sup>2-5</sup>

The typical microscopic finding in Chagas' disease is the myenteric denervation due to a chronic inflammatory process that determinates the destruction of the ganglion cells: there is a characteristic degenerative alteration of both myenteric plexus observed in the entire gastrointestinal tract.

As a consequence of this plexus degeneration the gastrointestinal motility is altered compromising the muscular coordination; the degenerative alterations of the myenteric plexus are equally and universally distributed in the whole colon.<sup>4</sup>

When 80% of all the colic plexus is destroyed there is a considerable lack of coordination between the sigmoid, the rectum and the anal canal determining a sigmoid-rectal dyskinesia. This is shown by intra-rectal and intra-colic pressure studies.<sup>1,3,4,5,11</sup>

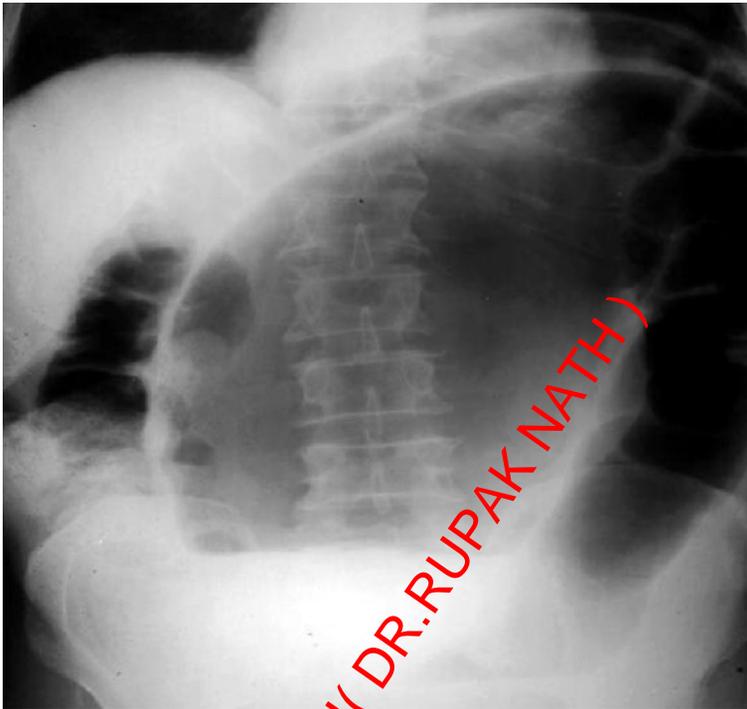
This deficiency in the recto-sigmoid synchronism blocks the progression and the expulsion of feces. The dyskinesia determines the hypertrophy of the muscular layer due to the over-reaction on contractility. There is an evident stop of feces inside the sigmoid and the rectum with subsequent colic dilatation.<sup>1,4</sup> The presence of solid fecal material is involved both in the origin of the Megacolon and in subsequent difficulties.

Electromanometrics studies revealed that the so-called "recto-sigmoid non-coordination (dyskinesia)" is the cause for the difficulty of fecal elimination and the main cause of enlargement of the rectum and the recto-sigmoid<sup>2,3</sup>(Fig. 9-1).

Therefore no surgical treatment for acquired Megacolon could result in cure of the constipation if this recto-sigmoid segment is not removed.<sup>1,6,7,8</sup> It must not be forgotten that, in the treatment of Chagasic Megacolon, we are dealing with a symptom-constipation, which is one of the many associated with the Chagas' disease.<sup>4</sup>

Only after 1953<sup>6</sup> the abdominal recto-sigmoidectomy was used for treatment of acquired Megacolon. However, the high incidence of complications, specifically the anastomotic leakage (35%), was a serious problem for its indication.<sup>7</sup>

Since 1960, however, the so-called "delayed colo-rectal anastomosis" has solved this problem of anastomotic complications and the *Cutait pullthrough*



**Fig. 9-1.** X-ray of acquired Megacolon. Dilatation of the rectum and the sigmoid.

technique has become one of the most important surgical procedures for the cure of the Chagasic Megacolon.<sup>7</sup>

Nevertheless the complications due to dehiscence decreased to almost 0%, the complications credited to pelvic dissection increased with this procedure.<sup>7</sup>

In 1963 Reis Neto<sup>6</sup> and Bernardes<sup>8</sup> introduced the technique of Duhamel for the treatment of acquired Megacolon.

The preliminary apprehension about this procedure was gradually overcome by the good results obtained. These results led to confidence in the treatment for acquired Megacolon.<sup>10,11,13-15</sup>

The use of stapling<sup>12,13</sup> and the introduction of video-laparoscopy have converted the procedure into the best indication for the treatment of acquired Megacolon.<sup>12-14</sup>

The Duhamel procedure offers the possibility of:

1. Resection of the recto-sigmoid, preserving pelvic and perineal portions of the rectum.
2. Restoration of fecal transit through a posterior colo-rectal anastomosis (stapled).
3. Retaining of rectal sensibility.
4. Perfect fecal continence.

The great advantage of the procedure is that it avoids the pelvic dissection and their possible complications.<sup>1,12-15</sup>

How does the residual rectal ampoule function?

Is it a giant diverticulum accumulating feces or simply a means to preserve continence?

In order to elucidate the function of the remaining rectum after the Duhamel procedure for acquired Megacolon a series of radiological studies was performed in 70 patients:

- 35 underwent barium enema examination.
- 35 underwent intestinal transit.

All of them were operated on of acquired Megacolon more than two years ago.

The barium enema showed an important involution (more than 60%) in size and volume of the remaining rectum in 37.2% of the patients. In some patients (5.7%) the barium enema revealed a large rectal ampoule; but none of them had permanent fecal stasis in the remaining rectum. In the previous volume of the rectum (before surgery) was considered, all of them had a decrease in the total area of the rectum (Fig. 9-2).

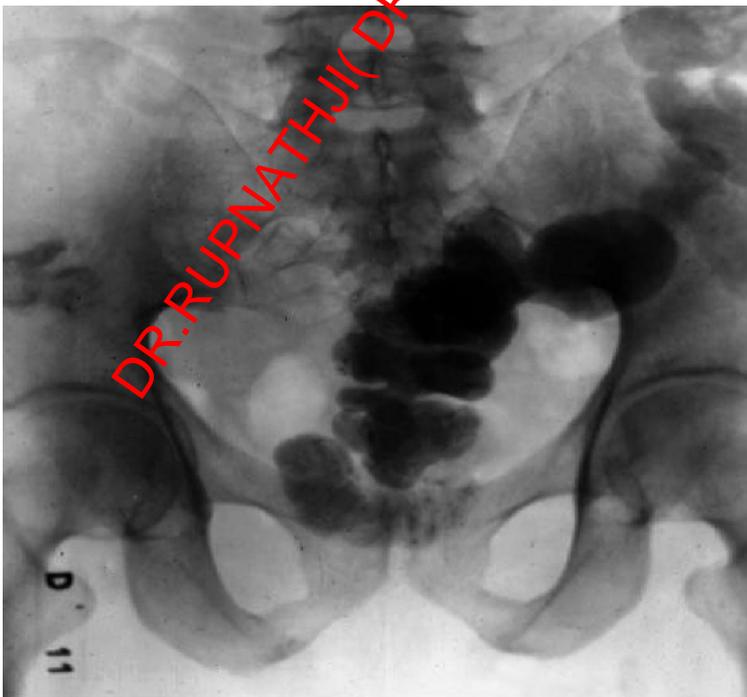


**Fig. 9-2.** X-ray of a patient operated on of acquired Megacolon by the Duhamel technique. This study was performed 10 years after the surgery.

The intestinal transit series was performed with the contrast material added to a regular meal, without previous bowel preparation. The contrast was followed during some days till the complete elimination of it. The remaining rectum was examined with amplification. This study showed that:

- In 79.3% of the patients the contrast entered the remaining rectum, but was completely eliminated (Fig. 9-3).
- In 61.4% of them, the contrast remained in the remaining rectum nearly eight days.
- In 20.7% of the patients the contrast was eliminated without entering the remaining rectal ampoule.
- In all the patients the colon was completely emptied leaving no residue.
- There was no compression of the colon by the remaining rectum in any patient.
- There was no recurrence of the colic dilatation.
- In 8.6% of the patients the retro-rectal colon showed a clear contractile movement, identical to a normal rectum.

It was not possible to demonstrate alterations of permeability of the colon-rectal anastomosis, which may have influenced the remaining rectal ampoule behavior.



**Fig. 9-3.** Intestinal transit, performed 10 years after surgery showing the contrast inside the remaining rectum. Notice the small size of the rectum.

**Table 9-1.** Complications of Duhamel procedure for acquired megacolon

<i>Complication</i>	<i>Percentage</i>
Mucosa ectropion	3,1
Stenosis	1,41
Presacal infection	0,7
Peritonitis	0,7
Fecaloma	0,7
Rectal abscess	0,3
Death	1,1

From 1962 to 2000, a total of 987 patients with acquired Megacolon were operated on by the Duhamel technique.

The incidence of complications is shown in Table 9-1.

The results obtained in 987 patients operated on Chagasic Megacolon by the Duhamel technique indicate the effectiveness of this procedure.

However, there are some very important aspects in the surgical technique that may be emphasized:

1. The use of stapling in the colon-rectal anastomosis facilitated the execution of the anastomosis and decreased the incidence of dehiscence.<sup>11,12</sup>
2. The rectum must be closed at the level of peritoneal reflection and not above or below it. A long remaining rectal ampoule leads to fecaloma formation and a shorter one increases the incidence of dehiscence.<sup>1</sup>
3. Precaution must be taken to avoid the contamination of the presacral space when closing the rectum.
4. The colon must be drawn down in a viable state and with no tension. To do this a detailed study of Drummond's marginal arcade is necessary.
5. Video-laparoscopic approach allows to perform a Duhamel procedure with no difficulty, fewer complications and the same curative results.<sup>12,13</sup>

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## Laparoscopic Colectomy for Megacolon

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Chagas' disease is very common, mainly the digestive form, in the northern, and central areas of Brazil.<sup>1</sup> The disease causes a reduction in the numbers of neurons in the myenteric plexus of Meisner and Auerbach. This denervation causes abnormalities in the gastrointestinal motility.<sup>2</sup> In the colon, is the distal rectum the most affected segment. Initially, hypertrophy and dilatation of the sigmoid are seen, although the entire colon can be involved.<sup>3</sup> Constipation of insidious onset is the main symptom, and it tends to be resistant to clinical treatment. Fecal impaction and sigmoid volvulus are the principal complication of the disease. The treatment of megacolon is mainly surgical. Hundreds of techniques were proposed, but knowledge of the pathophysiology, pull-through operations became the best option.<sup>4</sup> In our Department, since 1988 a variation of Duhamel operation with stapled colorectal anastomosis were performed. Basically, after resection of sigmoid loop, the rectum is dissected on the posterior aspect, closed at peritoneal reflection, and a colorectal stapled anastomosis is made on the posterior wall, above the anorectal ring. We begin to use laparoscopic colectomy for megacolon in 1994.

### OPERATIVE TECHNIQUE

All patients had mechanical bowel preparation, antibiotic prophylaxis, Foley catheter and nasogastric tube. The patient position is a modified lithotomy using stirrups. The hips are extended to prevent instrument clash against the patient right thigh. General anesthesia is our preference. The surgeon stands to the right of the patient, and the camera operator is to the left. The video monitor is positioned between the patient's legs. An open insertion using a normal cannula is performed. Three operating port sites are required placed in the right and left quadrants. An angled laparoscopy (30°) is necessary. The sigmoid colon is fully mobilized, and the left ureter is identified. After that, the retrorectal space is entered using a combination of blunt and sharp dissection, proceeding caudally, until the levator ani muscles are exposed. The specimen is resected and the rectum is closed at the level of peritoneal reflection, through an incision incorporating the left trocar site. The anvil from a conventional circular stapler is inserted into the descending colon and transfixed with a purse string suture. The anastomosis is then accomplished under direct vision, on the posterior wall of the rectum, 2.0 cm above the dentate line. All trocars are removed, and a single fascial suture is used to close the trocar sites. The skin wounds are closed with

staples. The nasogastric tube is removed, but the bladder catheter is allowed to remain until the following morning. Analgesia is accomplished by administering a combination of intramuscular injection for the first 24 hours, supplemented by oral analgesics.

## RESULTS

Over 31 months, 66 patients underwent surgical treatment for megacolon: 42 males of a mean age of 48 years. The median operative time was 140 minutes, with two intra-op complications: partial section of left ureter and small bowel enterotomy. All repairs were made laparoscopically with no conversion. Procedures were assisted with an 8,0 cm specimen extraction incision. The nasogastric tube is removed in the operating room and the urinary catheter is kept in place for the postoperative day. The patient is encouraged to ambulate after 12 hours and a clear liquid diet is started. Intravenous analgesia was required in only 40% of patients. Median postoperative interval to passage of flatus was 1.7 days; mean oral intake was 1.8 days and average length of stay 5 days. Postoperative complications include: one re-laparotomy for anastomotic dehiscence, and two wound infections at the mini-laparotomy site. Radiological control of the anastomosis was done in the fifth postoperative day. No sexual or urinary dysfunction or fecal incontinence was reported. In the third month after surgery patients were submitted to a barium enema control. At the present time, all followed patients have regular bowel movements without the use of laxatives.

## CONCLUDING SUMMARY

Laparoscopic pullthrough operation for megacolon is relatively easy, safe, feasible and associated with uniformly good results. Surgeon must have expertise in colorectal surgery and laparoscopic technique

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