

# COLON MECHANICAL PREPARATION IS NECESSARY AS ROUTINE IN MEDICAL CARE?

*Preparo mecânico dos cólons é uma rotina necessária?*

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**ABSTRACT - Background** - The value of the preparation of the colon prior colorectal surgery remains debatable. Since installed as traditional the use of this routine, few studies have been conducted to support the safety of surgeries done without mechanical bowel preparation. **Aim** - To determine if there is a correlation between postoperative complications and no use of mechanical bowel preparation in operated patients. **Methods** - Was conducted a prospective study in patients undergoing coloproctology abdominal surgery without prior bowel preparation. **Results** - The sample consisted of 126 patients, 57 men and 69 women. The average age was 54 years (19 to 89). Among patients who had comorbidities (43 patients – 34,12%), 30 (23,80%) had arterial hypertension. Antibiotic prophylaxis was used in 89,70%. Among the patients, 14,28% had complications: eight (6,34%) wound infection, six (4,76%) anastomotic dehiscence and four (3,17%) fistula. **Conclusion** - The pre-operative mechanical bowel preparation is not essential in the routine of colorectal surgeries.

**HEADINGS** - Colorectal surgery. Colon. Surgical wound infection.

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**DESCRITORES** - Cirurgia colorretal. Colo. Infecção da ferida operatória.

**RESUMO - Racional** - O valor do preparo de cólon prévio nas operações colorretais continua discutível, visto que devido à tradição da rotina do preparo poucos estudos têm sido realizados para sustentação da operação segura sem o preparo mecânico. **Objetivo** - Verificar se há correlação entre as complicações pós-operatórias e a não utilização do preparo mecânico dos cólons nos pacientes operados. **Métodos** - Foi realizado um estudo prospectivo nos pacientes submetidos a procedimentos cirúrgicos coloproctológicos abdominal sem prévio preparo intestinal. Foram coletadas informações antropométricas e epidemiológicas, co-morbidades existentes nos pacientes, antibioticoprofilaxia utilizada, complicações infecciosas e deiscências. **Resultados** - A amostra foi composta de 126 pacientes, 57 homens e 69 mulheres com média de idade de 54 anos (19 a 89). Entre os pacientes que apresentaram comorbidades (43 pacientes – 34,12%), 30 (23,80%) eram hipertensos. A antibioticoprofilaxia foi utilizada em 89,70% dos pacientes. Dentre eles, 14,28% apresentaram complicações, sendo oito (6,34%) com infecção de ferida operatória, seis (4,76%) com deiscência de anastomose e quatro (3,17%) fístulas. **Conclusão** - O preparo dos cólons não é fundamental na rotina pré-operatória.

## INTRODUCTION

The post-operative complications related to intra-operative contamination were the initial barrier to the achievement of 11 colorectal operations. Since antiquity, Hippocrates (460-377 BC) already cited that operation involving the colon was invariably fatal. Similarly Parré Ambroise (1510-1590) in his tests showed a high mortality rate as a result of infectious complications in the post-operative period. Only with the advent of antibiotics there was a reduction in morbidity and mortality of these operations<sup>6,8,11</sup>.

Over the last few decades, several authors have shown clinical experience of long-term removal of feces from the colon associated with decreased morbidity and mortality in patients undergoing the operation of the colon. However, in the 80's other studies, questioned the use of

bowel preparation showing favorable consequences with their omission.

The bowel preparation for elective colorectal operation has been performed worldwide as a routine uncontested for over 100 years for the prophylaxis of post-operative complications related to fecal contamination<sup>5,7,10,14,16</sup>. The infection significantly increases morbidity and mortality of surgery, and bacteria of the intestinal flora is main responsible<sup>8,16</sup>. The clinical presentation varies from wound infection, anastomotic fistula, abdominal abscess and generalized peritonitis.

The first study addressing the worldwide accepting lack of bowel preparation was in the 70's with a sample of 72 patients who underwent surgery and survived without anastomotic leak and only 8.3% of surgical wound infection<sup>5</sup>. Since then, numerous studies have been published with this argument.

Some meta-analyses, including randomized trials and prospective studies were performed and reflected disadvantage of the use of bowel preparation before colorectal operations<sup>2,3,4,5,7, 11,13,15</sup>.

In 2001, Filmann et al.<sup>4</sup> developed a comparative study of two groups of five years in elective surgery for colorectal cancer. They analyzed 13 patients without mechanical and 14 with preparation. After this period, eight were alive without disease on the first group and three on second. Five of first group died, and 11 of second (14) died. The above evidence is favorable to those not submitted to the preparation, even about the clinical cure or survival.

Meta-analysis of randomized clinical trials for colorectal surgery with and without mechanical preparation of the colon, performed by Slimy et al.<sup>13</sup> in 2003, revealed significant increase in the rate of anastomotic leak after bowel preparation, 5.6% versus 3.2% without preparation. Jorgesen-Wille et al.<sup>15</sup>, also in 2003 made another meta-analysis involving 15 randomized trials showing disadvantages in the use of bowel preparation for colorectal operations, with higher rates of anastomotic dehiscence, peritonitis and wound infection<sup>15</sup>.

Prospective studies evaluating patients undergoing colorectal cancer with and without bowel preparation in a sample of 1297 patients, of whom 642 underwent preparation and 655 not, showed rates of dehiscence, abdominal infection, wound infection and reoperation disadvantages (for 5.6%, 3.7%, 7.5%, 5.2%, respectively) compared to those that did not undergo the preparation (2.8%, 2.0%, 5.5% and 2,2%<sup>23</sup>).

In 2005, Zmora et al.<sup>16</sup> evaluated the results of a prospective randomized trial questioning the mechanical bowel preparation for anastomosis of the left colon; 249 patients were analyzed, 120 with preparation and 129 not, with higher rates of anastomotic leak and 4,2% $\times$ 2,3% and 1,6% $\times$ 0,7%

respectively, favoring the non-preparation.

Although the bowel preparation facilitate the achievement of the surgical technique, making the operation less inconvenient, many other factors put this conduct in question, since there is evidence to prove the bacterial translocation to mesenteric lymph nodes when done the preparation<sup>7,16</sup>, higher peritoneal contamination during surgery due to liquid stool, 8, and gastrointestinal discomfort, involving<sup>7,14</sup> diarrhea, bloating and nausea. There are also systemic consequences, such as hydro-electrolytic disturbances of cardiac risk in cardiac patients<sup>5</sup>.

Due to this history, the idea of demystifying the mandatory use of mechanical preparation for colorectal operations was used in this study in patients undergoing colorectal operations without bowel preparation.

## METHODS

In the period of January 2007 to June 2011, 126 consecutive patients underwent colon elective abdominal surgical procedure without prior bowel preparation by the surgical team at the Department of Coloproctology of a University Hospital Alberto Antunes, Federal University of Alagoas, Maceió, AL, Brazil (Table 1).

TABLE 1 - Distribution of surgical procedures

PROCEDURE	Cases	%
Rectosigmoidectomy	37	29,36%
Right colectomy	26	20,63%
Abdomino-perineal amputation	16	12,70%
Transit reconstruction	13	10,32%
The Hartmann colostomy	6	4,76%
Left colectomy	5	3,97%
Sigmoidectomy	5	3,97%
Laparotomy	4	3,17%
Total colectomy	4	3,17%
Rectopexy	3	2,38%
Ileostomy	3	2,38%
Colostomy	2	1,59%
Excision of rectal tumor	1	0,80%
Tranversal colectomy with ileostomy	1	0,80%
<b>TOTAL</b>	<b>126</b>	<b>100%</b>

A questionnaire was designed and completed in order to get the data before, during and after surgery. In this group, 57 patients were men and 69 women. Most patients received antibiotic prophylaxis (89.70%) during induction of anesthesia (quinolones and metronidazole). It was also done prophylaxis against thromboembolism with stimulation of early ambulation. All patients were operated by the same surgical team. All patients were followed up in outpatient service.

The data protocols were transported to Excel,

forming a database, and from it were prepared graphs and tables connected to the correlated variables.

## RESULTS

Of the 126 patients the mean age was 54 years (19-89). Among those who had comorbidities (43 patients - 34.12%), 30 (23.80%) were hypertensive. Antibiotic prophylaxis was used in 89.70% of patients, the combination of ciprofloxacin and metronidazole was the most frequently used. Eighteen patients (14.28%) had complications, eight (6.34%) with wound infection, six (4.76%) with anastomotic leakage and four (3.17%) with fistula.

## DISCUSSION

Bowel preparation in colorectal operations was considered by many authors as a decisive factor in the prevention of post-operative septic complications, and make the operation more pleasant to the surgeon. Also, the colon poorly prepared was the single most important factor in the pathogenesis of dehiscence of colorectal anastomoses<sup>12</sup>.

After many randomized studies, there was dispute about the real benefits of the mechanical preparation, showing disadvantages regarding its usefulness.

The omission of bowel preparation has been integrated in a European multicenter project named ERAS (Enhanced Recovery After Surgery) which is showing results that point to new perspectives, aiming to reduce perioperative management of surgical complications and speeding recovery of patients.

This new multimodal approach is based on several randomized trials that demonstrate the use of programs called fast track, supported by evidence-based medicine that can promote early recovery of physiological functions and thus reduce the operative morbidity.

Likewise, the Department of Surgery of Faculty of Medical Sciences, Federal University of Mato Grosso, in 2005, developed a project to accelerate the post-operative recovery of patients undergoing abdominal operations, which became known as Acerto Pós-Operatório (Acceleration of recovery). It shows the decrease in post-operative morbidity and length of stay of patients undergoing surgery<sup>9</sup>.

The preparation of this study included a group of patients who have taken some of the procedures recommended by the Acerto project such as non bowel preparation pre-operatively, no use of routine drains, standardized and rational use of antibiotics, early feeding and solid fasting for eight hours.

Since 2007, the Department of Coloproctology of Professor Alberto Antunes University Hospital,

has been adopted the above measures, focusing the mechanical preparation of the colon. This is a very controversial issue and requires clinical evidence sufficient to effect its standardization.

The results of this study showed no increase in post-operative complications of elective abdominal colorectal operations when not used mechanical preparation of the colon pre-operatively. Showed low rates of complications, approximately 14.28% of total, being distributed among surgical wound infection, anastomotic dehiscence and fistula formation. There was a slight female predominance (69 women to 57 men).

Because it is clean-contaminated operations, 89.70% of the operated underwent antibiotic prophylaxis at induction of anesthesia in order to prevent contamination of the plans incised and manipulated during surgery.

Evidence-based routines are new trend in medical practice and as far as involve randomized trials and meta-analyzes have solid consistency, making the practice safer and improving surgical outcomes by reducing the severity of complications and hospitalization time<sup>9</sup>.

This study, as many others published till nowadays, involved patients not submitted to previous preparation. They evolved without significant complications and in a low complication rate. Thus, it should be standardize elective colorectal operation without bowel preparation<sup>2,8,9</sup>.

## CONCLUSION

The pre-operative mechanical bowel preparation is not essential in the routine of colorectal surgeries.

## REFERENCES

1. Berkelhammer C, Ekambaram A, Silva RG. Low-Volume oral colonoscopy bowel preparation: sodium phosphate and magnesium citrate. *Gastrointest Endosc* 2002; 56: 89-94
2. Bucher P, Gervaz P, Soravia C, Mermillod B, Erne M, Morel P. Randomized clinical trial of mechanical bowel preparation versus no preparation before elective left-sided colorectal surgery. *British Journal of Surgery* 2005;92 (8) :1051.
3. Bucher P, Mermillod B, Gervaz P, Morel P. Mechanical Bowel Preparation for Elective Colorectal Surgery. *Arch Surg.* 2004;139:1359-1364
4. Fillmann LS, Perondi F, Fillmann HS, Fillman EEP. Cirurgia Eletiva para o cancer colo-retal sem prepare mecânico da luz intestinal: análise após 5 anos de acompanhamento. *Ver. Brás. Colo-proctol* 2001;21 (4) : 246-248.
5. Gravante G, Caruso R, Andreani SM, Giordano P. Mechanical bowel preparation for colorectal surgery: a meta-analysis on abdominal and systemic complications on almost 5,000 patients. *Int J colorectal Dis* 2008; 23:1145-1150.
6. Le veen HH, Wapnick S, Falk G, Olivas O, Bhat D, Gaudre M, Patel M. Effects of prophylactic antibiotics on colonic healing. *Am J Surg* 1976;131: 47-53.
7. McCoubrey AS. The use of mechanical bowel preparation in

- elective colorectal surgery. *Ulster Med J* 2007; 76(3): 127-130.
8. Memon MA, Devine J, Freeney J, From SG. Is mechanical bowel preparation really necessary for elective left sided colon and rectal surgery? *Int J Colorect Dis* 1997; 12: 298-302.
  9. Nascimento JEA, Salomão AB, Caporossi S, Silva RM, Cardoso EA, Santos TP, Diniz BN, Hartmann AA. Abordagem multimodal em cirurgia colorretal sem preparo Mecanico do cólon. *Rev. col. Brás. Cir.* 2009; 36 (3): 204-209.
  10. Peppas G, Alexiou GV, Falagas ME. Bowel Cleansing Before Bowel Surgery: Major Discordance Between Evidence and Practice. *Gastrointest Surg* 2008;12: 919-920.
  11. Platell C, Hall J. What is the role of Mechanical Bowel Preparation in Patients Undergoing Colorectal Surgery? *Dis Colon Rectum* 1998;41 : 875-883.
  12. Quilici FA, Cordeiro F. Preparo Pré-operatório em Cirurgia Colorretal.. In Rossi BM, Nakagawa WT, Ferreira FO, Aguiar Jr S, Lopes A. *Cancer de cólon, Reto e anus. Sao Paulo: Lemar e Tecmedd:2005. p 145-149*
  13. Slimy K, Vicaut E, Panis Y, Chipponi J. Meta-analysis of randomized clinical trials of colorectal surgery without mechanical bowel preparation. *British journal of surgery* 2004; 91: 1125-1130.
  14. Vlot EA, Zeebregts CJ, Gerritsen JJGM, Mulder HJ, Mastboom WJB, Klaase JM. Anterior Resection of Rectal Cancer Without Bowel Preparation and Diverting Stoma. *Surg Today* 2005;35:629-633.
  15. Wille-Jorgensen P, Guenaga KF, Castro AA, Matos D. Clinical value of preoperative mechanical bowel cleansing in elective colorectal surgery: a systematic review. *Dis colon Rectum* 2003, 46 (8) : 1013-20.
  16. Zmora O, Mahajna A, Bar-Zakai B, Hershko D, Shabtai M, Krausz MM, Ayalon A. Is mechanical bowel preparation mandatory for left-sided colonic anastomosis? Results of a prospective randomized trial. *Tech Coloproctol* 2006; 10:131-135