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Safety of Elective Colorectal Surgery Without Mechanical Bowel Preparation

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ABSTRACT

BACKGROUND: The current practice of mechanical bowel preparation (MBP) before colorectal surgery is questionable. Mechanical bowel preparation is unpleasant for the patient, often distressful, and ially harmful. The results are often less than desired, increasing the risk of contamination.

Aim of the study: To see the safety of elective colorectal surgery without MBP, we prospectively evaluated a consecutive series of patients who underwent resection and primary anastomosis of the colon and upper rectum. One surgeon performed all operations. Endpoints were wound infection, anastomotic failure, and death.

Patient and methods:

A prospective study of elective colorectal surgery without MBP in Al-Sader Medical City in Al-Najaf Al-Ashraf included 76 patients who had undergone colorectal surgery without any mechanical preparation, cases Collected from 2008-2011

Results

The result of our study consists of 76 patients; 40 (52.6%) of them were males, while 36 (47.4%) were females. Left colonic surgery was 36 (47.4%) patients and right colonic surgery was 40 (52.6%) patients, wound infection was 22 (28.9%), anastomotic leakage was 6 (7.9%), Death 45.3%). There was no significant p-value for all results.

Conclusions: Mechanical Bowel Preparation is not mandatory for the safety of colorectal surgery.

Introduction:

The importance of a mechanically cleansed and empty bowel in achieving a safe colonic resection and anastomosis is widely acknowledged by virtually all colorectal surgeons. However, the practice of mechanical bowel preparation (MBP) before colorectal surgery has come under scrutiny in recent years.

The primary objective of preoperative MBP is to minimize the risk of septic complications and anastomotic dehiscence. Numerous studies have indicated the potential benefits of MBP in reducing these risks. Nevertheless, it is important to recognize that mechanical bowel preparation is often an unpleasant and distressing experience for patients, and it can have potential adverse effects. [1,2,3,4,5,6]

Patients undergoing MBP frequently experience abdominal pain, nausea, vomiting, and fatigue,

which can significantly impact their overall well-being. Additionally, the procedure is associated with feelings of embarrassment and fear, further exacerbating the patient's discomfort. The elderly population, in particular, faces the additional risk of electrolyte disturbance due to fluid overload shortly before the operation. [7,8,9,10,11]

Evidence from animal experiments suggests that MBP may have a detrimental effect on colonic healing and can facilitate bacterial translocation, potentially contributing to septic complications post-surgery. Although the more rigid whole bowel irrigation regimens have been replaced by simpler approaches using oral solutions like polyethylene glycol or sodium phosphate, patients still endure the unpleasant effects of bowel preparation."[12]

Moreover, the effectiveness of MBP in achieving its desired outcomes is often less than satisfactory, particularly in patients with stenotic lesions. Solid stools are transformed into liquid masses, making them difficult to control during surgery and increasing the likelihood of peritoneal cavity contamination during open anastomosis.

In emergency procedures, a loaded bowel is generally considered a contraindication for anastomosis. However, there is a growing trend towards one-stage procedures with peroperative colonic irrigation. It is worth noting that the rigorous cleansing of the colon before surgery has not been conclusively demonstrated to benefit patients in clinical trials. [13,14,15]

Given the aforementioned factors, there has been a notable shift in the perception of the necessity of MBP before colorectal surgery. While MBP was widely accepted as a surgical "dogma" in the 1970s, subsequent research has shown that systemic antibiotic prophylaxis is effective in reducing septic complications in colorectal surgery. Retrospective studies examining the outcomes of colon surgery without MBP have reported low rates of postoperative infectious complications.

This paradigm shift underscores the need for further investigation and consideration of alternative approaches to bowel preparation in colorectal surgery. It is essential to balance the potential benefits of MBP with the adverse effects experienced by patients, particularly in light of the emerging evidence challenging its efficacy.

Patients and methods:

Between January 2008 & August 2011, data were collected prospectively on a consecutive series of patients who underwent elective colorectal surgery without MBP in AL-SADER MEDICAL CITY in al-Najaf al-ashraf All patients (76 patients) admitted to the care of a surgeon, patients who underwent MBP for colonoscopy, barium enema, mechanical bowel washing or other reason in the week before operation were excluded. After the complete history, a complete investigation was done. Elective patients were allowed for normal meals (soft) the evening for the operation; preoperative MBP with purgatives, enema, irrigation, or other was not performed.

Prophylactic antibiotie (3rd generation cephalosporin ceftriaxone, 1gram & metronidazole 500mg i.v.) were given at night before operation& after operation for five days, then orally for five days. Routine thromboprophylaxis with low-dose subcutaneous heparin was given as indicated.

Laparotomies were carried out through midline incisions amid midline and extended to upper or lower as needed. The bowel was divided between none rushing oceluding clamps. The bowel ends were cleansed with swabs soak in povidine jodine solution.

Occasionally, some stool close to the resection line was gently cleaned with moist swabs; in case of a fecal spill, the abdominal or pelvic cavity was locally washed with saline. Primary anastomosis was wrapped in omentum; when possible, drains were routinely used, and nasogastric suction was used as needed. Patients were mobilized early the examined daily until discharge. Endpoints of the study was about wound infection, anastomotic leak & death. Patients

were divided into two groups, right colon surgery &left colon surgery, according to the right colic artery. The two groups have no significant differences regarding age, sex, pathology, or comorbid disease; the type of sutures is a slow, absorbable end to end single layer and end-to-end two-layer hand sewing.

Mortality was defined as in-hospital death. All patients were submitted to consent.

Statistical analysis was done by using SPSS (Statistical Package for social sciences) version 17. In which we use the chi-square (X2) test for categorical data set P<0.05 as significant.

Results

Fig 1- Distribution of patients according to sex

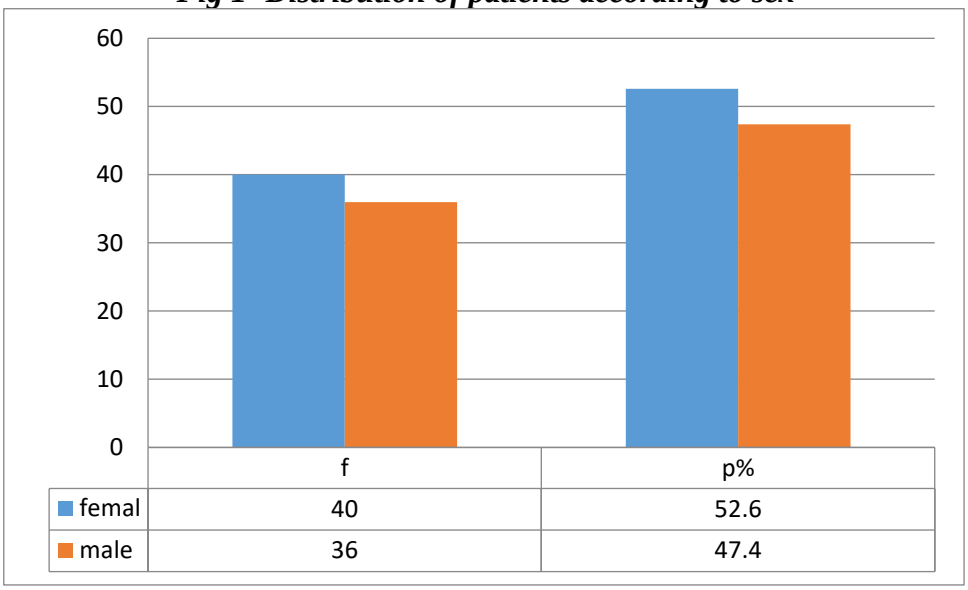

Table 1- The Relationship between side of surgery and wound infection

		Positive	Negative	
Side of surgery	Left	8 22.2%	28 77.8%	36 100%
	right	14 35%	26 65%	40 100%
Total		22 28.9%	54 71.1%	76 100%
P value			0.22	

Table 2- The Relationship between side of surgery and anastomotic leakage

			anastomotic leakage
		Positive	Negative
Side of surgery	Left	2 5.6%	34 94.4%
	right	4 10%	36 90%
P value			0.22

Table 3- The Relationship between side of surgery and death

			death	Total
		Positive	Negative	
	Left	2 5.6%	34 94.4%	36 100%

Side of surgery	right	2 5%	38 95%	40 100%
P value			0.914	

Table 4- Distribution of operation and related disease

Disease	Type of surgery	Number of patients
Sigmoid tumour	Sigmoid colostomy	10
Sigmoid polyps	Sigmoid colostomy	4
Cecal mass	Right hemicolectomy	14
Right colonic mass	Right hemicolectomy	26
Left colonic mass	left hemicolectomy	4
Rectal mass	AP resection	6
Closer colostomy	Colorectal colocolonic	12
total		76

Discussion

In our study of elective colorectal surgery without MBP shows that total wound infection was 28.9% compared with other study that shows 11% of wound infection in patients undergoing colorectal operations with antibiotic prophylaxis.30 Wound infection without MBP was 19.6 in the Hughes study in 1972,8.3% in the Irving study in 1987,11.7% in the Santos study in 1994. This study shows that 7.9% anastomotie leakage and other reported leakage rate varies greatly from 0% to 30% but average 5%. Other study, anastomotic leakage without MBP was 9.8% in Hughes's study,0% in Irving's study, and 5% in Santo's study.

In our study, four anastomotic leakages were on the right side, and two anastomotic leakages were on the left. The loaded bowel played no role, and that other factor, such as complicated diverticular disease associated with peritonitis and previous surgery, contributed to the failure of the anastomoses. [16,17,18] had a role in anastomotic leakage.

Death mortality was 5.3% in other studies, where total mortality ranges from 0% to 16%, with an average of approximately the causes of death in our study related to sepsis and anastomotic leak.

Our study confirms the results obtained from the few other series on colonic anastomoses without MBP Huzhesm reported on a small randomized trial in 1972. The 46 patients who underwent MBP fared no better than the 51 who did not. Irving and Scrimgeour 1987 wrote a seminar on 72 consecutive elective and emergency colectomies with primary anastomsis, where all MBP was omitted, and the patient was only covered by a single peroperative duse of cefuroxime and metronidazole. No anastomotic leakage was clinically apparent, and wound infection was noted in 8.3% of patients. Platell and Hal, in 1998, gave an excellent review of the literature and performed a meta-analysis of three trials in patients undergoing elective enorectal onerations. It revealed the incidence of wound infection in patients who received MBPI10.8% versus 7.4%; the incidence of anastomotic leakage was twice that of unprepared patients, but this difference was not major (8.1% versus 4%. In left colonic emergencies, there is a strong trend toward one-stage resection and anastomosis[19]

Several studies have shown that this can be performed safely atter esenus decompression of the obstructed colon alone, without the need for intraoperative colonic irrigation 13.3 One randomized trial on emergency patients with colonic injuries showed that whether on-table colonic lavage was performed or not had no influence on morbidity or mortality Several factors can explain why feces do not harm the healing process. The intestinal flora has important functions. Colonic mucosa derives most of its energy supply from the colonic lumen by bacterial metabolites of fermentable fiber, mainly short-chain fatty acids like butyrata6061)

The endogenous microbial flora prevents the overgrowth of potentially pathogenic

microorganism, it stimulates the immune system, especially the gut-associated lymphatic tissue, it help to eliminate toxins from the lumen, and it participates in intestinal regulation, nutrient absorption, intestinal motility, and blood flow An empty bowel, deprived of its Natural short-chain fatty acid source, can develop atrophy In recent experiments the presence of normal intestinal flora enhances the healing of colonic anastomoses.

Conclusion

The findings of this comprehensive study provide compelling evidence to support the notion that elective colon and rectal surgeries can be carried out without the customary mechanical bowel preparation. Consequently, the routine use of bowel cleansing should be reconsidered and applied judiciously, reserving it for situations where intraoperative colonoscopy is anticipated. The importance of conducting multicenter studies cannot be overstated, as they offer a valuable opportunity to evaluate the reproducibility of these results across a broader spectrum of techniques. Such robust data would undoubtedly enhance the credibility of advocating for a departure from the longstanding tradition in the field of surgical practice.

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