ORIGINAL ARTICLE

Preoperative Mechanical Bowel Preparation Unnecessary in Patients Undergoing Thoracic Surgery

Objective: **The purpose of this study was to assess a hypothesis that routine mechanical bowel preparation (MBP) is unnecessary before thoracic surgery.** *Methods:* **Five hundreds and sixty cases of standard thoracic surgery including unilateral thoracotomies, bilateral thoracotomies, median sternotomies and video-assisted thoracic surgery have been performed in Kyushu Medical Center Hospital from June 1999 to December 2002. Two hundreds and eighty cases received preoperative MBP and the other 280 cases did not receive it. The usefulness of MBP was assessed retrospectively with these patients.** *Results:* **It proved that cessation of MBP did not provide any disadvantage for postoperative complication and hospital stay.** *Conclusions:* **From these results, routine MBP appears to be unnecessary before thoracic surgery. (Jpn J Thorac Cardiovasc Surg 2004; 52: 407–410)**

Key words: preoperative management, mechanical bowel preparation, thoracic surgery

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Mechanical bowel preparation (MBP) is carried out to remove the fecal material before surgery.[1] Oral sennosid, magnesium sulphate and/or glycerin enema are common methods for MBP.[2] Especially in abdominal surgery, decompression in the gastrointestinal tract with MBP decreases the risk of anastomosis complications. In non-abdominal surgery such as head and neck surgery, thoracic surgery, and bone or arthrogeneous surgery, this preoperative management is widely controlled by a standard or a simplified manner to decrease the risk of perioperative complication.[3] On the other hand, there have been some reports suspecting the usefulness of the MBP even in colorectal surgery.[3–5] Because it is unpleasant for the patient, often distressful, and potentially harmful,[6] if the results, such as bowel complications and postoperative course, are the same or less than desired, MBP is not necessary for preoperative management. We herein report the data of clinical course retrospectively compared 560 consecutive patients with and without MBP before thoracic surgery.

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Subjects and Methods

Five hundreds and sixty consecutive patients underwent thoracic surgery under general anesthetic in National Kyushu Medical Center Hospital from June 1999 to December 2002. In the first period, the patients received standard MBP before surgery and in the latter period they did not. They were divided into two groups with or without preoperative MBP. Clinical characteristics and postoperative course of the two groups were reviewed retrospectively.

All patients stopped food intake after dinner before operation day. Two hundred and eighty patients received no MBP before surgery while 280 patients received a standard one: 2 tablets of oral sennosid the night before and/or enema with 60 ml of glycerin in the early morning of the operation day. If preparation was thought to be incomplete with a standard method, enema with 60 ml of glycerin was added for the patients. Standard thoracic surgeries were undertaken and most patients received unilateral pulmonary ventilation during the operation. Almost all operations were not emergency, 2 of which are emergency without MBP. A gastric tube was inserted before anesthesia and removed immediately after extubation of an endotracheal tube. All patients underwent a standard thoracic surgery: 81 extended resection, 124 lobectomy, 321 limited resec-

Table I. *Demographic characters of patients without preoperative mechanical bowel preparations (no MBP) and with it (MBP)*

	no MBP (n=280)	*MBP (n=280)*	*p-value*
Demography			
Male/Female	187/93	176/104	0.376
Age (yrs)	57.7±17.9	58.1±17.7	0.791
BMI (kg/m^2)	22.7±3.2	22.5±3.5	0.590
Habitual laxatives	43 (15.4%)	38 (13.6%)	0.631
Abdominal surgery	56 (20.0%)	54 (19.3%)	0.915
Disease			
Lung cancer	124 (44.3%)	107 (38.2%)	
Metastatic lung tumor	39 (13.9%)	38 (13.6%)	
Benign lung tumor	21 (7.5%)	45 (16.7%)	
Mediastinal tumor	17 (6.1%)	15 (5.4%)	0.110
Pneumothorax	32 (11.4%)	33 (11.8%)	
Chest wall disease	5 (1.8%)	6 (2.1%)	
Others	42 (15.0%)	36 (12.9%)	

BMI, Body mass index.

tion, 12 extended thymectomy and 22 others.

The clinical records of the patients were reviewed retrospectively with regard to demographics (patient age, gender, body mass index and preoperative usage of any laxatives), diagnoses, details of surgical therapy (type of thoracotomy and surgical procedure, anesthesia and operation time), and postoperative course (necessity of any laxatives after surgery, complications and length of postoperative stay).

The differences in results among patients with or without MBP were evaluated using the chi-square test for independence. The continuous variables were compared based on the Student's *t* test. *P*-values under 0.05 were considered to be significant. All data are given as the mean±standard deviation.

Results

Patients characteristics are depicted in Table I. Gender, age, body mass index, habitual laxatives and history of abdominal surgery overlapped between patients with or without MBP. Characteristics of disease are also identical between them.

Characters of anesthesia and operative procedures are demonstrated in Table II. There was no significant difference between the outcomes in method and time of anesthesia, time of operation and position of patients during operation. Fifty cases altered the position during operation for bilateral lung resection. Ten cases had abdominal incisions, that were for omentopexy to bronchial fistura and simultaneous resection of liver mass. There was no significant difference in proportion of thoracotomies and surgical characteristics between patients with and without MBP.

Incontinence of stool was observed during anesthesia in only 1 patient with preoperative MBP. He underwent partial resection of unilateral lung for metastatic lung tumors through posterorateral thoracotomy. He had laxatives for severe constipation and needed additional enemas after standard MBP.

Postoperative course is demonstrated in Table III. Oral feeding was started on postoperative day 1 in most cases except for 15 cases postoperative respirator needed and 3 cases with partial esophagectomy for local invasion of lung cancer. Gastric tube was needed for about a week for patients having undergone partial esophagectomy. First defecation after operation was postoperative day 3 in average in both patients with or without MBP. The rate of postoperative constipation needing any laxatives were higher in patients with MBP than without it (30 vs. 18 cases, respectively. p=0.096). Postoperative abdominal complications were observed in 2 patients with MBP who had acute gastroectasis. They both occurred 2 days after surgery and got better after about 10 days observation with reinsertion of gastric tube. There was no complication of ileus or other abdominal complications around all patients. There was no difference in morbidity and mortality between the patients with or without preoperative MBP. Postoperative stay was shorter in patients without MBP than with it (12.0± 11.5 vs. 14.4±7.0 days, respectively. p=0.083).

Table II. *Characters of anesthesia and operative procedures in patients without preoperative mechanical bowel preparations (no MBP) and with it (MBP)*

	no MBP (n=280)	*MBP (n=280)*	*p-value*
Anesthesia and surgery			
GE/G	213/67	224/56	0.307
Anesthesia time (min)	253.0±110.8	254.3±104.4	0.222
Operation time (min)	156.5±99.9	166.6±96.0	0.230
Position of patient			
Lateral position	119 (78.2%)	234 (83.6%)	
Supine position	23 (8.2%)	34 (12.1%)	0.235
Alternating position	23 (8.2%)	27 (9.6%)	
Type of thoracotomy			
Unilateral incision	112 (40.0%)	112 (40.0%)	
Bilateral incision	12 (4.3%)	13 (4.6%)	
Median sternotomy	17 (6.1%)	13 (4.6%)	0.933
VATS	126 (45.0%)	131 (46.8%)	
Others	13 (4.6%)	11 (3.9%)	
Surgery characteristics			
Extended resection	42 (15.0%)	39 (13.9%)	
Lobectomy	64 (22.9%)	60 (21.4%)	
Limited resection	154 (55.0%)	167 (59.6%)	0.254
Extended thymectomy	4 (1.4%)	8 (2.9%)	
Others	16 (5.7%)	6 (2.1%)	

GE, General anesthesia with epidural analgesia; *G,* general anesthesia without epidural analgesia; *VATS,* video-assisted thoracic surgery; *Extended resection,* bilobectomy, pneumonectomy, and combined resections involving visceral organs like other lobe, great vessels, chest wall, pericardium and cardiac wall; *Limited resection,* segmentectomies, wedge resections and tumor enucleations.

Table III. *Surgical outcomes in patients without preoperative bowel preparations (no MBP) and with it (MBP)*

	no MBP(n=280)	*MBP (n=280)*	*p-value*
First defecation day (POD)	3.0±1.2	3.3±1.4	0.118
Constipation after surgery	18 (6.4%)	30 (10.7%)	0.096
Bowel complication	0 (0%)	2 (0.7%)	0.499
Other complications	25 (8.9%)	29 (10.4%)	0.668
Postoperative stay (days)	12.0±11.5	14.4±7.0	0.083

POD, Postoperative day.

Discussion

Preoperative MBP before thoracic surgery is a widespread procedure. It is carried out commonly with oral laxatives and enemas in order to remove fecal material as possible, thus decreasing the risk of perioperative complication.[3] On the other hand, patients who received preoperative MBP complain of physical and emotional problems such as sleep disturbance, abdominal or anal pain, nausea, vertigo, irritation and anxiety.[6] As in colorectal surgery, necessity of MBP is controversial[3-5] much less in non-abdominal surgery. This retrospective study evaluates the necessity of MBP especially in general thoracic surgery. If the study reveals that MBP is nonessential, preoperative management will be eased for patients, hospital stay can be shortened and medical cost will be lowered.

Our results showed no disadvantage without preoperative MBP in 280 patients who had undergone general thoracic surgery. There was no difference in

demographic characteristics including gender, body weight and habituation of laxatives between patients with and without MBP and anesthesia and operative characteristics are also comparable in the respective patients. Postoperative courses, complications and postoperative hospital stays were slightly better in patients without MBP.

We experienced an over 12 hours of operation and over 15 hours of anesthesia without any fecal trouble in a patient who had no MBP. In addition, alteration of positions and abdominal incision did not lead to any complications. Analgesic and sedative drugs commonly delayed coordinated intestinal motility in the period after operation.[7] Under general anesthesia, inhibition of cholinomimetic neuron suppresses bowel movement. Adrenergic neuron also suppresses bowel movement for hours after operation.[8,9] We experienced only 1 case of incontinence during operation. He had had severe constipation and habitually taken laxatives. Incontinence seemed to occur after an incomplete MBP before surgery. These data suggest that method and duration of anesthesia and operation have no impact on bowel complication during thoracic surgery.

Forty-three patients who had habitual laxatives undertook thoracic surgery without MBP and they all have no troubles in association with bowel movement during and after operation. These results suggest that preoperative MBP may not be needed regardless of laxative intake.

Our data showed that first defecation was observed on day 3 on average after thoracic surgery in both patients with or without MBP. Almost all patients managed to walk to bathroom on the first day after surgery with an appropriate analgesia, except for patients under control of respirator.

Two cases of postoperative gastroectasis were demonstrated after unilateral lobectomy and lymph node dissection of hilum and mediastinum with lung cancer patients. The 2 cases received preoperative MBP. The gastroectasis might be induced by injury of vagus during operative procedure, such as lymph node dissection. The pathology of it left unclear and we could not mention the association between gastroectasis and MBP. Gastric tube was inserted in order to decompress the gastrointestinal tract. It was commonly inserted during insertion of an endotracheal tube. It was needed in cases who underwent partial esophagectomy and in cases with gastroectasis. There was no complication of ileus or other abdominal complications among all the patients.

Patients with MBP had a similar incidence of other complications, when compared with those without it. Postoperative stay was shorter in patients without MBP.

Conclusions

Although MBP is widely advocated as a preoperative management in general surgery, our results suggest that there is no disadvantage in postoperative course, complication and length of hospital stay without MBP in thoracic surgery. Therefore, MBP can safely be excluded and routine MBP appears to be unnecessary prior to thoracic surgery.

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