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Original Article

Prior esophagogastroduodenoscopy does not affect the cecal intubation time at bidirectional endoscopies

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Abstract: Bidirectional endoscopy (BE) is often used to assess patients for the reason of anemia or to screen asymptomatic population for malignancy. Limited clinical data favors to perform first the upper gastrointestinal system endoscopy, but its effect to the duration of colonoscopy is yet to be determined. The aim of this retrospective study is to evaluate the effect of upper gastrointestinal system endoscopy on the time to achieve cecal intubation during colonoscopy in patients undergoing BE. Patients of four endoscopists at similar experience levels were retrospectively identified and categorized into the upper gastrointestinal system endoscopy before colonoscopy group (group 1) or the colonoscopy only group (group 2). The demographics, clinical data and the time to achieve cecal intubation for each patient were analyzed. The mean time to achieve cecal intubation in the first group that included 319 cases was 8.4 ± 0.93 minutes and the mean time in the second group that included 1672 cases was 8.56 ± 1.16 minutes. There was no statistically significant difference between the groups. There was also no significant difference between the Group 1 and Group 2 when compared according to which of the four endoscopists performed the procedures. Performing the upper gastrointestinal system endoscopy prior to colonoscopy did not affect the time to achieve cecal intubation. Considering that performing the upper gastrointestinal system endoscopy prior to the colonoscopy is more advantageous in terms of patient comfort and analgesic requirement, beginning to BE with it seems more favorable.

Keywords: Endoscopy, bidirectional, cecal intubation

Introduction

Bidirectional endoscopy (BE) is a procedure in which an esophagogastroduodenoscopy (EGD) and a colonoscopy are performed in the same session. Endoscopy of the upper and lower gastrointestinal tract is an important diagnostic tool in the evaluation of suspected gastrointestinal malignancies as well as for nonspecific symptoms such as abdominal pain, bloating, weight loss [1-3]. BE is often used to assess patients with clinical findings such as iron deficiency anemia or a positive fecal occult blood test [4-9]. BE is also used to screen asymptomatic elderly patients for malignancy [10, 11]. Currently, the number of cases referred for BE accounts for more than 10% of all cases referred for endoscopy [12]. BE was found to be more advantageous than undergoing two separate endoscopic sessions because it led to a shorter hospital stay, was less expensive and allowed the patient evaluation to be completed more quickly [13].

The part of the BE to perform first is a controversial subject, and often depends on the preference of the endoscopist. Some endoscopists believe that performing the EGD first makes the colonoscopy part more difficult and prolongs the procedure time because of gas insufflation. Conversely, some endoscopists think that performing the colonoscopy first makes the EGD procedure more difficult due to increased bowel motility and the external pressure of the colon on the stomach [14, 15].

If the EGD is the first procedure performed and the patient is anesthetized, the colonoscopy may be compromised due to air insufflation into the gastrointestinal system. The irritation produced by the excess air and the effect that it has on the time to perform the colonoscopy are two important factors to consider when deciding which procedure to perform first.

This is a retrospective study that evaluated the effect of EGD on the time to achieve cecal intu-

Table 1. The demographics and the mean ± SD durations of cecal intubation

	Group-1	Group-2	*p* value
Total Number of the colonoscopies (n)	319	1672	-
Mean age (years old)	59	50	p > 0.05
Male/Female ratio (%)	60.8/39.2	51.9/48.1	p > 0.05
Mean duration of cecal intubation (min)	8.4 ± 0.9	8.5 ± 1.1	p > 0.05

bation during colonoscopy in patients undergoing BE. The all BE in this study were performed by four endoscopists, who work at the same center, have similar levels of experience and who are similar in age. The duration of colonoscopies performed after an EGD was compared to the duration of colonoscopies performed alone.

Materials and methods

All of the patients of four endoscopists at our clinic who underwent an endoscopy between November 2010 and October 2012 were retrospectively identified and categorized into the EGD before colonoscopy group (group 1) or the colonoscopy only group (group 2). The demographics, clinical data and duration of the colonoscopy of each patient were retrospectively analyzed. The endoscopists who performed the procedures analyzed in this study were trained within the first half of 2010 at the surgical endoscopy unit of a newly established teaching hospital and had 0 to 3 years of experience as a general surgeon at the time of endoscopy training. One endoscopist was female and their ages ranged from 29 to 32.

Patients who had a biopsy of any pathological lesion identified during EGD were excluded from the study except patients in whom a single biopsy at the antrum of the stomach was obtained for urease testing. Also, patients with benign gastric outlet stenosis in whom it was difficult to advance the endoscope through the pylorus or bulbus were excluded from this study. Apart from this, the duration of procedure at EGD was ignored.

Patients in whom a biopsy was taken for any reason during a colonoscopy, who had terminal ileum intubation, who underwent the procedure without anesthesia, patients in whom the colon cleansing was found to be insufficient, who had a history of abdominal surgery including urological and gynecological procedures and patients in whom an experienced endoscopist was consulted in order to advance the endoscope were excluded from this study.

All patients were evaluated by an anesthesiologist before the procedure. The same parenteral medication (25 mg meperidine, 1 mg/kg propofol) was administered intravenously by the anesthesia technician after a blood pressure reading was taken before the start of the procedure. Immediately prior to administering meperidine and propofol, patients who were undergoing EGD received lidocaine spray in the pharyngeal region (Xylocaine; 100 mg Astra Pharmaceuticals, Kings Langley, UK).

A standard 140 cm adult video endoscope (EG530 WR, Fujifilm Cooperation, Tokyo, Japan) was used for EGD and a 199 cm adult video colonoscope (EC 530 WL, Fujifilm Cooperation, Tokyo, Japan) was used for colonoscopy. All endoscopies were carried out with the assistance of an anesthesia technician and two nurses. Throughout all procedures, the patient's blood pressure, electrocardiogram, and oxygen saturation were monitored.

When performing EGD procedures, the endoscope was first advanced to the second part of the duodenum and as the endoscope was pulled back, the duodenal bulb, antrum, pylorus, corpus, fundus and cardia were examined and lastly a detailed evaluation of the esophagus was performed after the biopsies were obtained from the antrum for urease test.

All colonoscopy procedures were performed after adequate sedation was achieved. Patients were placed in the left lateral decubitus position on a flat hospital gurney and a digital rectal examination was performed. If deemed necessary, the patient was placed in the supine position during the procedure. The first image obtained during the colonoscopy was the ampulla of the rectum in retroflection and the endoscope was advanced to the cecum. A detailed examination was performed while exiting the colon. To ensure that the endoscope was passed all the way to the cecum, the stump of the appendix and the ileocecal valve were identified.

Table 2. Patient distribution and the mean ± SD durations of cecal intubation of four endoscopists

Endoscopist	1	2	3	4	p
Group 1 (n)	75	76	80	88	p > 0.05
Group 2 (n)	425	403	431	413	p > 0.05
Mean Duration in Group 1 (Min)	8.4 ± 0.9	8.3 ± 0.9	8.3 ± 0.9	8.45 ± 0.9	p > 0.05
Mean Duration in Group 2 (Min)	8.5 ± 1.1	8.4 ± 1.1	8.5 ± 1.1	8.60 ± 1.1	p > 0.05

The time interval between the image of ampulla in retroflection and cecum was used to determine the time to achieve cecal intubation, reported in minutes. Informed consent from all patients for both the procedures and the permission to use their medical information for scientific purposes was obtained, and the study was approved by the local ethics committee of the hospital.

Statistical analysis

An independent t-test was used for to compare numerical variables. An ANOVA test was used to compare the duration of the colonoscopies. A *p* value of < 0.05 was considered as statistically significant. Statistical analysis was performed by using SPSS for Windows, version 15 (SPSS Inc, Chicago, IL).

Results

The four endoscopists included in our study performed 2654 colonoscopies within the study period and 425 of these were BE in which EGD was performed first (16%). A total of 663 cases were excluded (24.98%) from the study. The two most common reasons for exclusion criteria were the detection of pathological findings that required biopsy (n = 423, 15.9%), and the help of a senior endoscopist in order to reach the cecum (n = 138, 5.2%). The incidence of the cases that required help during colonoscopy were similar in group 1 (n:21, 4.94%) and group 2 (n:117, 5.24%). Interestingly of the 138 cases at which the help of a senior endoscopist needed, the cecum could be visualized in only 35 patients and the final failure rate of cecal intubation was 3.88% in this series.

The remaining 1991 cases met inclusion criteria and 319 of the cases were included in Group 1, and 1672 of the cases were included in the group 2. The age and gender distributions of patients were similar in both groups. The groups were also homogenous according to which endoscopist was performing the procedure.

The mean time to achieve the cecal intubation in the first group that underwent BE was 8.4 ± 0.9 minutes and the mean time in the second group was 8.5 ± 1.1 minutes (**Table 1**). There was no statistically significant difference in the time to achieve cecal intubation between Group 1 and Group 2 patients (p > 0.05).

There was also no statistically significant difference in time to achieve cecal intubation between both Group 1 and Group 2 when compared according to which of the four endoscopists performed the procedure (**Table 2**).

Discussion

Currently, endoscopy is widely used and there is a concurrent increase in the frequency of BE [15]. The proportion of BE to single direction endoscopy is known to exceed ten percent and our current rate of 16% also markedly exceeds the reported rate. Despite its wide use there is limited data about which part of the BE to perform first. Sometimes cecal intubation can be so challenging that one wishes to eliminate all potential causes of difficulties while performing a colonoscopy. The natural tendency to put the blame on a prior EGD before a colonoscopy when a difficulty in technique is encountered, is somewhat indispensible. In this retrospective study, we tried to prove that prior EGD is innocent by determining whether performing an EGD prior to colonoscopy prolongs the duration of the colonoscopy. We compared the time to achieve cecal intubation at the colonoscopies after EGD with the single colonoscopies at the patients of four endoscopists with the same level of experience. With an effort to minimize the confounders we excluded the patients with a prior history of abdominal surgery and also the patients identified with a pathological lesion during endoscopies. This might be the reason why the mean intubation time of the cecum was found to be below 9 minutes in our series.

Previous studies focusing on the durations of BE are limited, Cho et al. reported that the EGDs that are performed after colonoscopies

are more difficult due to increased gas insufflation and bowel movements, and are more uncomfortable for the patient [14]. In another study by Hsieh et al., it was found that more propofol was needed in the patients undergoing BE in which the colonoscopy was performed first, however no other significant differences were identified. It was concluded from the study by Hsieh et al. that EGD should be done prior to colonoscopy in order to decrease the amount of propofol used and because patients tolerated the procedure better [15].

Ideally, this study would have been conducted as a prospective, blinded study, however, it would have been difficult to blind the study due to the small number of staff working in the endoscopy suite and thus, the results could have been biased due to the lack of blinding.

In conclusion, the clearly demonstrated solo message of this study is that when performing BE, EGD prior to colonoscopy did not affect the duration of the colonoscopy. Although there are few studies on this subject, it seems that performing the EGD prior to the colonoscopy is advantageous in terms of patient comfort and analgesic requirement. Based on the results of this study, we believe that when performing BE, to do the EGD first does not affect the procedure time and can be preferred due to other reasons.

Disclosure of conflict of interest

The Authors have nothing to disclosure.

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