



# The Value of Terminal Ileum Intubation During Colonoscopy

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## Abstract

It is uncertain whether terminal ileum intubation should be performed routinely during colonoscopy, as there is uncertainty regarding its diagnostic value. The aim of the present study is to assess the diagnostic yield of terminal ileum intubation during colonoscopy according to indications for colonoscopy. This is a cross-sectional study in which the results of 294 total colonoscopy procedures were reviewed; ileal intubation was performed in 269 (91.49%) patients. The indications for colonoscopy, the results of ileoscopy, and the histopathological results of ileal biopsies were evaluated.

A total of 54 (20%) out of 269 patients who had successful intubation into the terminal ileum showed macroscopic abnormalities on the terminal ileum. Biopsies were positive in 4 out of 54 (7.4%); all were of Crohn disease. Two were erosions (9.5%) and 2 were ulcers (18.8%). The two erosions were presented as abdominal pain, abdominal pain and alternating bowel motion. Those with ulcers were presented with diarrhea and perianal disease.

## Keywords

- ▶ colonoscopy
- ▶ terminal ileum
- ▶ ileocecal intubation
- ▶ Crohn's disease

**Conclusions** Considering the low diagnostic yield of ileal intubation during colonoscopy, the decision to perform ileoscopy or not during colonoscopy needs to be made on a case-by-case basis. However, routine ileal intubation, brief attempts should be considered despite low diagnostic yield.

## Introduction

It is dubious whether terminal ileum intubation ought to be performed routinely during colonoscopy as there is uncertainty regarding its diagnostic value.<sup>1</sup> Concerns regarding complete colonoscopy dictates that cecal landmarks such as the ileocecal valve and the appendiceal opening during colonoscopy are largely accepted, although some regard ileal

intubation as the evidence of a complete procedure.<sup>2–4</sup> Although ileoscopy is not practiced routinely, it may be beneficial in some patients with right lower quadrant pain, diarrhea of unknown cause, inflammatory bowel disease, hematochezia, and suspected ileocecal tuberculosis.<sup>5–10</sup> Most studies on ileoscopy were done Western countries, and less in Asian countries.<sup>8,11</sup> Ileocolonoscopy is the procedure of choice for chronic nonbloody diarrhea of unknown

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origin. A histopathological examination of multiple sites is crucial to diagnose microscopic colitis. The routine ileal biopsy of normally appearing mucosa assessed by standard-resolution white-light ileoscopy is controversial because of the reported low diagnostic yield.<sup>12</sup> Currently, the position employed to intubate the ileum is with the patient in the left lateral position and entering the valve at the 6 o'clock position. However, we have sometimes encountered difficulty when performing ileoscopy in this position, leading to extra time being consumed during busy endoscopy lists. During such difficult procedures, placing the patient in the prone position using a 'down and left' technique facilitated ileal intubation.<sup>13,14</sup> As performing a biopsy of an endoscopically normal terminal ileum is controversial.<sup>15-18</sup> The aim of the present study is to assess the diagnostic yield of terminal ileum intubation during colonoscopy according to indications for colonoscopy.

## Methods

This is a cross-sectional study in which the results of 294 total colonoscopy procedures were reviewed; ileal intubations were performed in 269 patients

All procedures at Gastroenterology and Hepatology Center were performed at the gastroenterology and hepatology center in Baghdad from April 2018 to September 2020 using Olympus, Lucera CF-H260AL.

The degree of bowel preparation was reasonable in all patients. Midazolam and pethidine were used for conscious sedation with doses according to the needs of each individual patient.

The indications for colonoscopy, the results of ileoscopy, and the histopathological results of ileal biopsies were evaluated.

Biopsy was taken in all macroscopic abnormalities of the terminal ileum.

An abnormality was considered as being clinically significant if it raised a new diagnosis or if it led to specific investigations or management, such as inflammatory bowel disease, intestinal tuberculosis, Behcet's disease, and tumors; otherwise they were considered as nonspecific.

## Inclusion Criteria

Indications for Colonoscopy:

1-Abdominal pain: abdominal pain only or with diarrhea, constipation, alternating bowel motion, persistent or recurrent abdominal pain, and hematochezia with or without fever.

2-Without abdominal pain: including constipation, alternating bowel motion, diarrhea, and bleeding from rectum only.

## Exclusion Criteria

Asymptomatic medical check-up. Follow-up of known surgical or medical gastrointestinal conditions.

## Statistical Analysis

Statistical analysis was performed with IBM SPSS Statistics for Windows, version 23.0 (IBM Corp., Armonk, NY, USA).

## Results

A total of 54 (20%) out of 269 patients who underwent successful terminal ileum intubation showed macroscopic abnormalities on the terminal ileum, which included ulcers, erosions, congestion, and nodular mucosa.

In 22 out of 269 patients (8%), there was mucosal nodularity. In 21 (7.8%) patients, there was congestion and/or erosions. In 11 (4%) patients, the abnormalities were ulcers. A total of 65 (24.16%) patients presented with haematochezia; 10(3%) of them associated with abdominal pain; 30 (11.1%) without abdominal pain; and 25 (9.2%) without abdominal pain but with abnormal bowel motion. ► **Tables 1,2,3**

## Biopsy Results

Biopsies of the 54 patients with macroscopical abnormalities of the terminal ileum were positive in 4 (7.4%) patients, which corresponded to 1.4% of all ileal intubations. All were of Crohn's disease; 2 were erosions (9.5%) out of 21 patients with congestion/erosions; and 2 were ulcers (18.1%) out of 11 ulcer patients.

## Diagnostic Biopsies According to Clinical Indications for Colonoscopy (► Table 4)

The two patients with erosions presented with abdominal pain or with abdominal pain and alternating bowel motion.

**Table 1** indications and findings in abdominal pain with other symptoms

Indications	n (out of 269) (%)	Abnormal terminal ileum n (%)	Nodular	Congestion /erosion	Ulcer
Abdominal pain	26 (9.6%)	5 (19.2)	3	2	0
with diarrhea	35 (13%)	10 (28.5)	3	4	3
with constipation	38 (14.1%)	7 (16.4)	5	1	1
and alternating bowel motion	30 (11.1%)	9 (27.5)	2	6	1
with bleeding from rectum	10 (3.7%)	0 (0%)	0	0	0
Total	139 (51.6%)	31 (22.3)	13	13	5

**Table 2** Indications and findings in patients without abdominal pain

Indications	n (out of 269) (%)	Abnormal terminal ileum n (%)	Nodular	Congestion/erosion	Ulcer
Constipation	27 (10%)	4 (14.8%)	3	1	0
Bleeding from rectum	30 (11.1%)	5 (16.6%)	3	0	2
Bleeding from rectum with abnormal bowel motion	25 (9.2%)	4 (16%)	2	1	1
Diarrhea	16 (5.9%)	4 (25%)	1	2	1
Total	98 (36.4%)	17 (17.34%)	9	4	4

**Table 3** Miscellaneous indications

Indications	n (%)	Abnormal terminal ileum n (%)	Nodular	Congestion/erosion	Ulcer
Suspected irritable bowel syndrome	11 (4%)	4 (36.6%)	0	3	1
Tumors	8 (2.9%)	0 (0%)	0	0	0
Perianal complaints	6 (2.2%)	2 (33.3%)	0	1	1
Anemia and melaena	3 (1.1%)	0 (0%)	0	0	0
Liver secondaries	4 (1.4%)	0 (0%)	0	0	0
Total	32 (11.8%)	6 (18.75%)	0	4	2

**Table 4** Relation of clinical indications endoscopic findings and histopathological biopsy results

Clinical indication	Abnormal ileoscopic findings	Histopathological biopsy
Abdominal pain	1 erosion	Crohn's disease
Diarrhea	1 ulceration	Crohn's disease
Perianal disease	1 ulceration	Crohn's disease
Abdominal pain with alternating bowel motion	1 erosion	Crohn's disease
Total	4/54 (7.5%)	

Those with ulcers presented with diarrhea and perianal disease.

## Discussion

In the present study, the most common indication for ileal intubation was abdominal pain (51.6%) followed by haematochezia (24.16%), constipation (10%), diarrhea (5.9%), and suspected irritable bowel syndrome (4%). There were 91% successful ileal intubations. There were 20% abnormal macroscopical findings in the terminal ileum, which were mucosal nodularity (8%), congestion and/or erosions (7.8%), and ulcers (4%). Positive biopsies were 7.4%, all corresponding to Crohn's disease.

Compared with Akere et al.,<sup>19</sup> the indication for intubation was abdominal pain (26.2%), haematochezia (25%),

constipation (14.2%), and diarrhea (14.2%); the rate of successful ileal intubation was 30.9%; abnormal macroscopical findings were 2.4%, including ulcers, polypoid lesions, and cobblestone appearance, which may be attributed to the wide disparity in successful intubations. The rate of positive biopsies was 93.7%, including chronic nonspecific ileitis, acute chronic ileitis, and tuberculous ileitis, which can be attributed to differences in the diets of the patients.

Velidedeoglu et al.<sup>20</sup> showed the most common indications for intubation are diarrhea (39%), haematochezia (28%), abdominal pain (26%), abdominal bloating (18%), constipation (5%), and mucoid rectal discharge (5%). Macroscopical abnormalities were ulcers and/or erosions (39%), mucosal nodularity 18%, and erythema was 42%.

A study by Wijewantha et al.<sup>21</sup> showed a successful intubation rate of 90.15% and 47/81 (58%) positive biopsies. This high percent because ileal intubation done for only indicated intubation as this will be (6.15%) from the overall. From those, 28/47 (59.5%) were Crohn's disease, 6/47 (12.7%) were tuberculosis, 8/47 (17%) were ileitis due to resolving infection, and 5/47 (10.6%) were drug-induced ileitis. There were macroscopical abnormalities in 34/47 (72.3%), of which 21/34 (61.7%) were mild inflammation or erosions, and 13/34 (38.3%) were few aphthous ulcers. The most common indications of terminal ileoscopy were diarrhea in 29.31%, abdominal pain in 15.83%, suspected irritable bowel syndrome in 10.6%, and anemia in 9.81%.

## Conclusion

High ileal intubation rates may be achieved without complications.

The diagnostic yield of the procedure is very low; therefore, the decision to perform ileoscopy or not during colonoscopy needs to be made on a case-by-case basis.

However, routine ileal intubation, brief attempts should be considered despite low diagnostic yield, it may be useful to improve or maintain endoscopic skills, especially in a training setting.

#### Ethical Approval and Permission

Ethical permission was granted by the scientific committee in Gastroenterology and Hepatology Center.

#### Financial Support and Scholarship

None to declare

#### Conflict of Interests

The authors have no conflict of interests to declare.

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