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Feature II. Therapeutic colonoscopy
[Invited paper]

3. Endoscopic decompression of carcinoma ileus of the left colon

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Operation is the therapy of choice for carcinoma ileus of the left colon, to which oroenteric decompression procedure is not applicable. All operations must be performed with considerations given to both the resolution of obstruction and curability of carcinoma. If an operation is performed without colonic decompression, the dilated colon will interfere with surgical procedures and may result in a lowered curability. Endoscopic decompression therapy was first performed in 1986 by Lelcuk et al in patients with sigmoid cancer, using a balloon for dilation of the esophagus. With the device kit commercially available today, a guide-wire is inserted beyond the stenosis site of the tumor mass under the endoscopic direct vision and an ileus tube is placed transanally after dilation of the stenosis site with a dilator. Colonic contents in the region proximal to the tumor mass can be removed and the symptom of ileus can be resolved by this procedure, thus making subsequent elective operation possible. Potential complications in the clinical application of this method include colonic perforation at the time of guide-wire insertion and necrosis of the colonic mucosa due to the pressure from a balloon, which is placed at the end of the insertion procedure. However, the device kit commercially available today is well prepared for such complications.

From the viewpoint of therapeutic endoscopy, the endoscopic guidance technique can be applied not only to decompression, but also to a variety of procedures, such as stenting and balloon-mediated dilation of the stenosis occurring in postoperative mechanical anastomosis, and is reliable and effective.

Key words: Carcinoma ileus of the left colon, colonic decompression, endoscopic decompression

Introduction

History of the treatment of carcinoma ileus of the left colon, for which colonic decompression by the oroenteric procedure is said to be ineffective, begins with the two-stage resection or the Hartman resection. The one-stage resection procedure using intraoperative colonic cleansing method began to be used in 1980, but there was no room for the endoscopic procedure. The first endoscopic decompression therapy was reported in 1986, when Lelcuk et al performed colonoscopic decompression for stenosis of the sigmoid colon[1]. Since then, endoscopic decompression has become widely used as a procedure that allows the avoidance of emergency operations, enables pretreatments and examinations, allows the conduct of highly invasive surgeries such as hepatectomy and combined resection of adjacent organs as the elective curative resections, and compensates for the shortcomings of one-stage and two-stage operations.

In this paper, we describe practical procedures of the endoscopic decompression therapy on the basis of our recent experience with a case of ileus due to sigmoid cancer.

I. Indications

Ileus due to carcinoma of the left colon is commonly regarded as an indication for the endoscopic decompression. However, most of the cases reported have been those involving the rectum or sigmoid colon, with a few reports of decompression at the site of splenic flexure and almost no reports of cases involving the descending colon or transverse colon. Cases of severely dilated colon with deformation of the cecum or other organ usually have a complete colonic obstruction and, therefore, are indications for surgical interventions rather than for the endoscopic decompression. In addition, indications for the endoscopic decompression are limited to the cases in which the area beyond the obstruction site can be contrasted by enema and the colonic lumen at the site of obstruction can be confirmed by endoscopy.

II. Methods

Device

The commercially available kit consists of a decompression catheter tube (transanal ileus tube), a dilator for dilation of the obstruction site (second dilator), a dilator for the forceps channel of endoscope (first dilator), and a guide-wire (Fig. 1).

Principle of ileus tube insertion (Fig. 2)

1) The direction of the colon is confirmed by the Gastrographin contrasting from the inserted endoscope. The guide-wire attached to the forceps channel of endoscope is inserted and passed through the site of stenosis.
2) Using this guide-wire as a guide, the first dilator is inserted beyond the site of stenosis.
3) The endoscope and guide-wire are withdrawn, leaving the first dilator in place.
4) Using this first dilator as a guide, the second dilator is inserted and passed through the site of stenosis. The site of stenosis is dilated by this procedure.
5) The second dilator is withdrawn and the ileus tube inserted using the first dilator as a guide.
6) The first dilator is withdrawn, leaving only the ileus tube in place, and the balloon is inflated.

Insertion methods

The insertion procedure is shown below using an actual case.

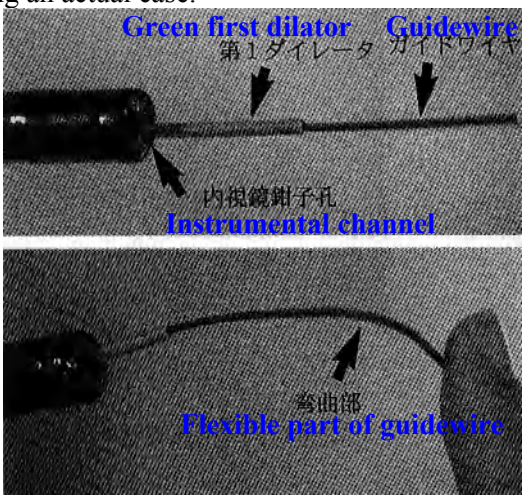

Figure 1 Guide-wire and dilator

The guide-wire and dilator can easily be passed through the forceps channel of the endoscope. Since the guide-wire can easily be bent at the region about 7 cm from the tip, the risk for tissue penetration is very low.
The first dilator is inserted after insertion of the guide-wire. The design of first dilator has been modified to a forceps channel-matching type to allow subsequent withdrawal of the endoscope.

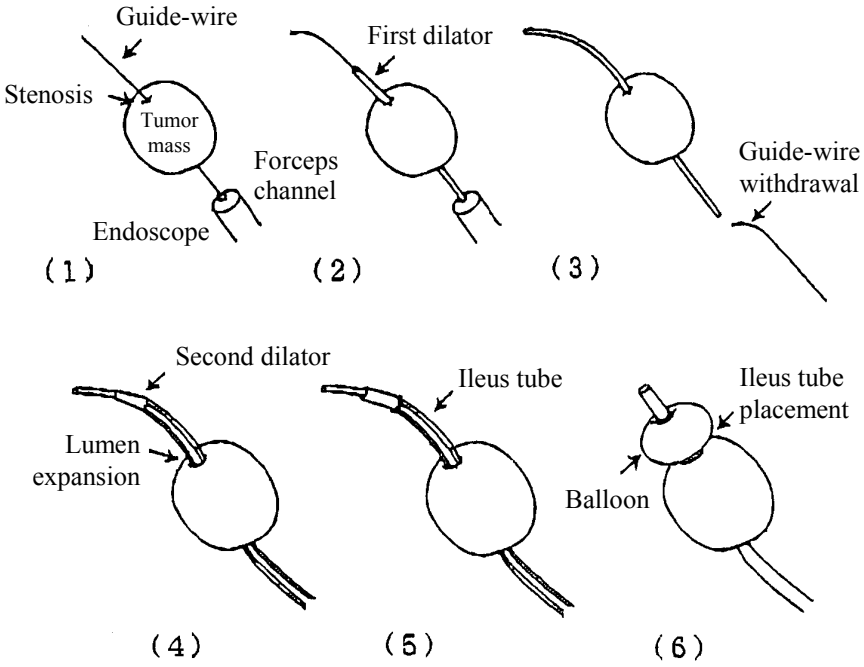

Figure 2 Principe of insertion

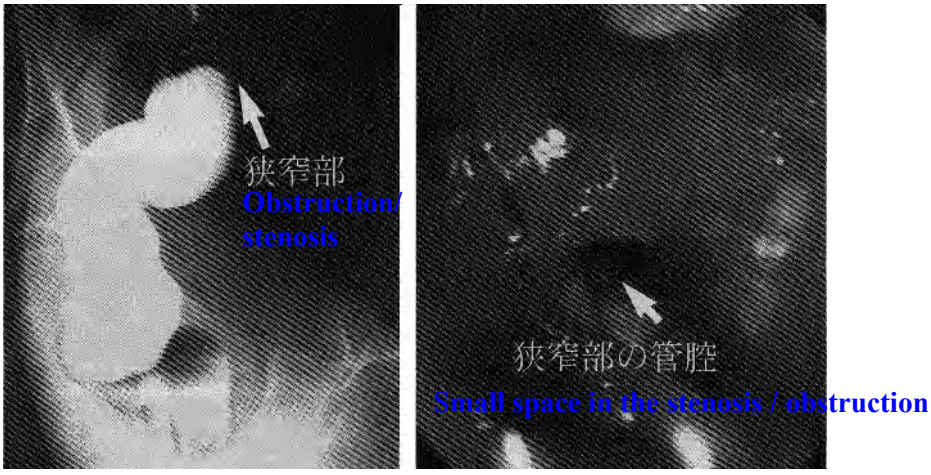

Figure 3 Endoscopic image (right) and enema image (left)
Enema image shows a circumferential stenosis in the region of sigmoid colon 16 cm from the anus. A minor flux of contrast medium is seen at the proximal side.
Narrow lumen can be confirmed in endoscopic image.

Female: 44 years old
Chief complaint: Abdominal tumor mass, abnormal bowel movement
Medical history: The patient had melena and visited a nearby clinic about two years ago. The enema examination there revealed no abnormal findings except internal hemorrhoids, and she has been on a suppository therapy since. She recently visited this department complaining that her stools became small in volume and caliber. The initial abdominal plain X-ray revealed a large mass of feces and gaseous shadows in the colon. The endoscopy and enema examination on the day revealed stenosis of the sigmoid colon (Fig. 3).

The stenosis site and colonic lumen were examined colonoscopically (Fig. 4).

Gastrographin was injected from the forceps channel of colonoscope and the magnitude of stenosis as well as the orientation and direction of the colon axis was determined (fig. 5-1).

Before insertion, the guide-wire was passed inside the first dilator until the first dilator reached about 5 cm from the tip of guide-wire (Fig. 5-2). The prepared guide-wire and first dilator were then inserted from the forceps channel of the endoscope. When stenosis is present in the sigmoid colon, a sliding tube may also be used if necessary.

Next, only the colonoscope was withdrawn and the second dilator was inserted by passing the previously placed first dilator inside the second dilator. About 9 mm lumen space was secured by this procedure. The second dilator was withdrawn after dilation (Fig. 6-3).

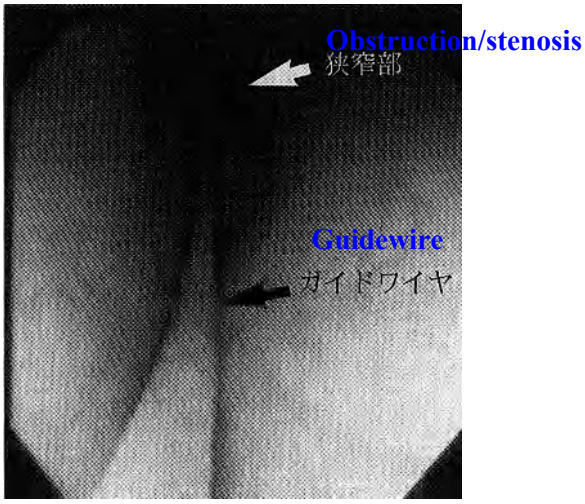

Figure 4 Insertion of guide-wire from forceps channel of endoscope
Guide-wire is passed through the colonic lumen under the endoscopic forward and direct vision.

The transanal ileus tube was inserted beyond the stenosis site using the first dilator as a guide. The balloon was then inflated and placed at the site (Fig. 6-4).

After insertion of the transanal ileus tube, colonic cleansing was performed with Niflec, 1,000 ml initially, followed by physiological saline solution 500 ml every 6 hours with continuous aspiration using a properly adjusted enema syringe. One week after the insertion, a low-anterior resection was performed as an elective operation. Thus, a curative operation was performed.

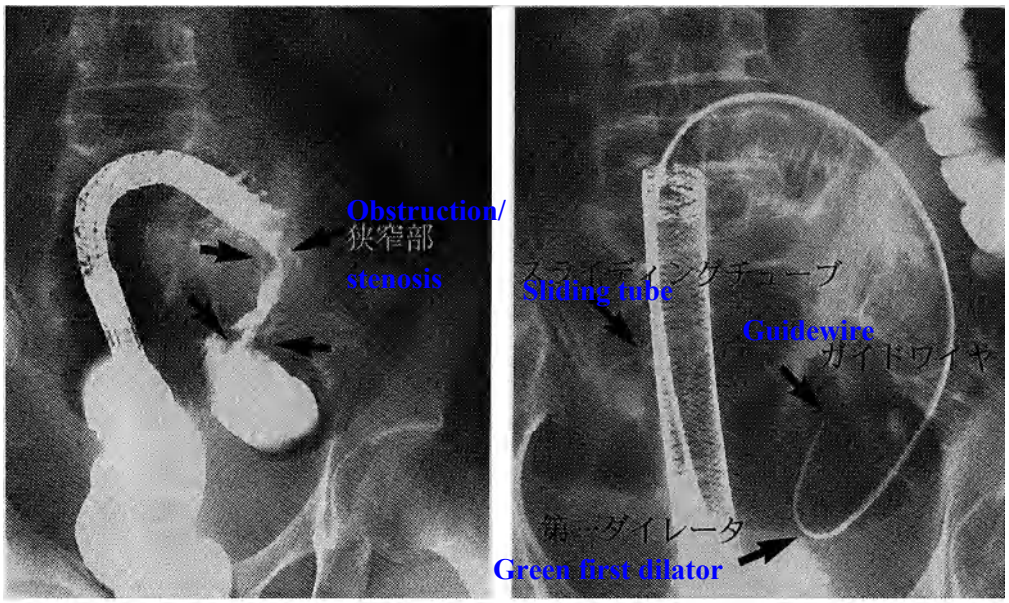

Figure 5 Endoscopic decompression technique (1)

1. Insertion of endoscope and contrasting: Contrasting reveals a long stenosis region.
2. Insertion of guide-wire and first dilator: Endoscope is withdrawn after securing the insertion, leaving sliding tube in place.

Resected tumor mass, the cause of the stenosis, was a large localized ulcer-type tumor having an ulcer 7 × 8 cm in size.

III. Discussion

Ileus has been reported to accompany about 8-23% of colon carcinoma[2] and its incidence rate is generally higher at the left side than at the right side of the colon. A comparison of colon carcinomas with and without ileus has shown that the positive rate of lymph node metastasis is higher, the intrinsic biological malignancy is higher, and prognosis is generally poorer for the carcinoma with ileus than that without ileus[3]. In contrast, there has also been a report that there are no differences between the two types of colon carcinomas[4].

Operations for carcinoma ileus of the colon should be performed with considerations given to both the resolution of ileus and curability of the carcinoma. Without decompression, there will be an increased risk for the development of anastomotic leakage due to local circulatory failure and edema caused by colonic dilation. In addition, general conditions are poor and preoperative examinations insufficient in many of the patients, which then lead to high operative risks. The dilated colon also lowers intraoperative maneuverability.

In two-stage operations frequently employed to avoid these problems, the risk for postoperative complications is apparently lowered. However, dividing an operation into two stages will lead to a delay in the resection of carcinoma. Surgical procedures will become more complicated because of colostomy in the second operation or severe organ adhesion, which then lead to difficulties in the systematic curative surgical therapy and, in a way, to a damage to the curability of carcinoma. Thus, there are problems in two-way operations with respect mainly to the curability of carcinoma, such as poorer prognosis compared with that in one-stage operations. It can therefore be considered that the difference in prognosis between colon carcinomas with and without ileus is due not only to the difference in biological malignancy but to these problems as well.

In general, decompression with an ileus tube is effective and an elective operation is possible in carcinoma ileus of the right colon. In the left colon carcinoma, on the other hand, surgery is inevitably the first choice treatment, as the decompression therapy is generally ineffective for this type of carcinoma.

As to the one-stage operation for carcinoma ileus of the colon, it has been reported that the intraoperative colonic cleansing significantly

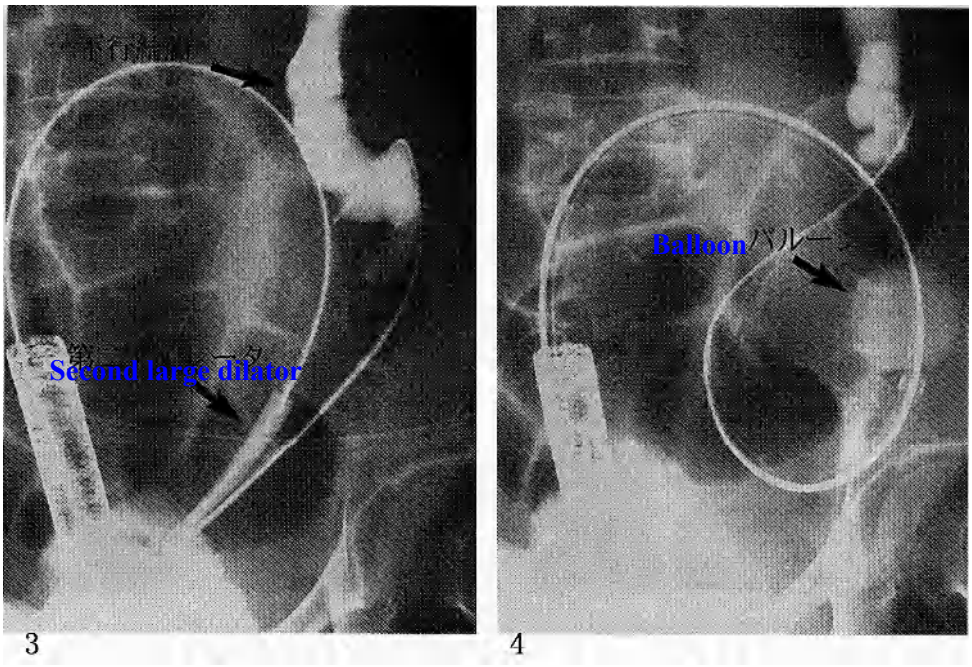

Figure 6 Endoscopic decompression technique (2)

3. Insertion of second dilator: The 8 mm second dilator may resist somewhat but can be inserted by pushing it under the fluoroscopic vision.
4. Insertion of ileus tube: The tip of the first dilator is guided to reach the

reduces the incidence rates of postoperative complications and ruptured sutures and improves the five-year survival rate for patients who underwent a curative operation[3]. It is therefore obvious that the colonic decompression is extremely effective for the safety of operation and curability of carcinoma. At the same time, however, the intraoperative cleansing is disadvantageous to patients with poor general conditions because there are some problems in this procedure, such as prolonged operation time and pollution of the operating field. Furthermore, in case of ruptured suture in the colon, it is unlikely that local circulatory failure can be resolved by the removal of colonic contents alone. Thus, the ideal treatment of carcinoma ileus of the left colon is to resolve the ileus condition first by a conservative treatment to avoid any emergency operation, to allow the patient's general condition to improve, and then to perform a total resection of primary lesion and colonic anastomosis in a one-stage operation after a sufficient preparation of the colon.

The meaning of endoscopic decompression therapy lies here. In the endoscopic decompression for carcinoma ileus of the left colon, a series of tubes are inserted endosmotically into the narrow colonic lumen at the site of the ileus-causing tumor, the space is widened stepwise, and an ileus tube is finally passed through the tumor site. Transanal colonic cleansing is then repeated through the ileus tube, thus resolving the symptom of ileus. After this procedure, the colon is well prepared for an elective operation. For the colonic decompression, Lelcuk used a balloon for dilation of the esophagus and Fukamachi used a Nelaton catheter[5]. Today, however, a device for the procedure is commercially available as a transanal ileus set (Create Medic Co., Ltd). The ileus tube that is kept inserted is a 22 Fr silicone tube. The balloon at the tip of the conventional oral ileus tube moves forward by peristaltic movement, but that of the transanal tube is kept at the site of stenosis and prevents the tube from coming out.

This method is generally used for stenoses and obstructions due to ulcers in the rectum and sigmoid colon, and insertion of the tube becomes inevitably more difficult as the site of stenosis becomes more proximal. Therefore, we do not actively introduce this method to the treatment of transverse colon or descending colon with a severe dilation in the proximal region; we usually perform intraoperative colonic cleansing instead. This method will also be effective in the pretreatment of rectal cancer with severe stenosis. The procedure for colonic cleansing includes the initial injection of Niflec 1,000 ml, followed by cleansing with

physiological saline solution 500 ml every 6 hours with careful observation of the color of cleansing solution[6].

Potential complications are perforation of the colon caused by the tip of the guide-wire and necrosis of the colonic mucosa due to the pressure from the indwelling balloon[7]. The commercially available device kit presumes the use of a colonoscope and its guide-wire and first dilator are designed to pass through the forceps channel of the endoscope. In addition, the flexible tip regions of guide-wire and first dilator have been intensively modified for easier manipulation and higher safety (Fig. 1). Nevertheless, the risk for perforation is still high in the case of long stenosis, stenosis at the flexure site, or local inflammation. When introducing this method, It is therefore important to 1) critically evaluate the case for indication, 2) grasp the conditions of obstructing site and its proximal region by Gastrographin contrasting at the time of insertion, and 3) prevent excessive progression of the indwelling balloon by filling it with diluted contrast medium.

Endoscope has become widely used in recent years and the field of its use is being expanded from examination to treatment. In particular, colonoscope is now used in a variety of procedures including colonic mucosal resection and full-thickness resection of the rectum by TEM[8]. The endoscopic guidance can be used not only in decompression, but also in various procedures including stenting and balloon-mediated dilation of membranous stenosis at the site of postoperative mechanical anastomosis, as described in other chapters of the present feature. Furthermore, this method is reliable and effective.

Conclusion

It is premature to consider every case of carcinoma ileus of the left colon as an indication for the transanal endoscopic decompression. Cases such as an extremely large colonic diameter and deformed cecum are contraindications rather than indications for this method and, therefore, surgical resolutions should be chosen without hesitation.

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