

ESDs were performed. Finally, there were no procedure-related mortalities at any of the institutions (Tables 1 and 2).

### Independent risk factors for complications assessed by univariate and multivariate analysis

In the screening analysis for complication risk factors, tumor size, tumor location, macroscopic type, and histology had no significant association with the ESD complication rate (not significant), but there was a significantly decreased risk of complications corresponding to the increased number of ESDs performed at the 3 groups of institutions (group A, <50 ESDs, 17.6%; group B,  $\geq 50$  and <100 ESDs, 8.2%; and group C,  $\geq 100$  ESDs, 5.1%) ( $P < .0001$ ) (Table 3). In the logistic regression models, the complication rate was independently higher for large tumors ( $\geq 50$  mm) (multivariate analysis: odds ratio, 2.1; 95% confidence interval, 1.1-3.4;  $P = .0198$ ), whereas the larger number of ESDs performed by groups B and C decreased the risk of complications (multivariate analyses: group B/group C: odds ratio, 0.4/0.2; 95% confidence interval, 0.2-0.9/0.1-0.5;  $P = .0253/.0002$ ) (Table 4). There was no association, however, between the types of knives used during the ESDs and the complication rate (data not shown).

### DISCUSSION

This is the first large prospective, multicenter cohort study of colorectal ESDs performed at specialized centers in Japan. There is increasing evidence of the effectiveness of colorectal ESD because the procedure makes it possible to treat large nongranular type LSTs ( $> 20$  mm) that had been treated by surgery in the past.<sup>8</sup> The longer procedure time and higher complication rate of ESD compared with conventional EMR have also been discussed previously.<sup>36</sup> In fact, a small number of analyses<sup>12</sup> conducted in an earlier Japanese multicenter study indicated a higher complication rate during colorectal ESDs and that standardization of the colorectal ESD procedure would be difficult.

This study is particularly important because more than 1000 colorectal ESD cases in 10 specialized centers were analyzed at a time when the use of colorectal ESD is spreading in Japan, and a number of trained endoscopists are starting to perform colorectal ESDs in Western countries as well.<sup>21,22</sup> The complication rate significantly decreased with the increased number of ESDs performed at an institution from 17.6% for group A (<50 ESDs) to 8.2% for group B ( $\geq 50$  and <100 ESDs) to 5.1% for group C ( $\geq 100$  ESDs), probably because of greater clinical experience in performing colorectal ESDs on a regular basis at group B institutions and even more so at group C institutions. There were no significant statistical differences for the mean procedure time, en bloc resection rate, and curative resection rate among the 3 groups, most likely because the mean tumor size was smaller and the locations differed as did the macroscopic types in group A,

TABLE 3. Risk factors for ESD complications

Risk factors	Complications		
	No	Yes	P Value
ESDs	1039	72	
Sex, male	639	42	.595
Age, y, mean $\pm$ SD	66.2 $\pm$ 10.5	64.8 $\pm$ 9.5	.273
Tumor size, mm			
<50	851	52	
$\geq 50$	188	20	.0316
Tumor location			
Cecum	93	10	
Right colon	384	24	
Left colon	249	14	
Rectum	313	24	.451
Macroscopic type			
LST-NG	397	22	
LST-G	501	36	
Depressed (IIC)	30	0	
Protruded (IS)	54	8	
Recurrent tumor			
Submucosal tumor	18	1	.075
Histology			
Non-neoplastic	3	1	
Adenoma	328	28	
Mucosal cancer	487	32	
SM1 cancer	106	6	
SM2 cancer	96	5	
Others	19	0	.45
Institutions (no. of ESDs)			
Group A (<50)	56	12	
Group B ( $\geq 50$ and <100)	201	18	
Group C ( $\geq 100$ )	782	42	<.0001
Trend			<.0001

ESD, Endoscopic submucosal dissection; LST-NG, nongranular type laterally spreading tumor; LST-G, granular type laterally spreading tumor; SD, standard deviation; SM1, submucosal invasion less than 1000  $\mu$ m from the muscularis mucosae; SM2, submucosal invasion 1000  $\mu$ m or more from the muscularis mucosae.

TABLE 4. Risk factors for complications

	Univariate Analysis			Multivariate Analysis		
	OR	95 CI	p Value	OR	95 CI	p Value
<b>Macroscopic Type</b>						
LST-NG	1					
Recurrent Tumor	2.3	0.7-6.0	0.1088			
Others	1.3	0.8-2.3	0.2668			
<b>Tumor Size</b>						
<50 mm	1			1		
≥50 mm	1.7	1.0-2.9	0.0439	2.1	1.1-3.4	0.0198
<b>Institutions (ESDs)</b>						
A (<50)	1			1		
B (≥50, <100)	0.4	0.2-0.9	0.0351	0.4	0.2-0.9	0.0253
C (≥100)	0.3	0.1-0.5	0.0004	0.2	0.1-0.5	0.0002

CI, confidence interval; OR, odds ratio; ESD, endoscopic submucosal dissection.

suggesting that less-experienced endoscopists did not attempt to perform ESDs in more challenging cases.

To decrease the colorectal ESD complication rate in the future, it will be necessary to establish a learning curve based on the results of our large case series. In addition, conservative treatment of perforations should be possible in the future in those cases in which endoscopic clipping has already been shown to be effective.

The indications for ESD in this series were markedly different from those for conventional EMR,<sup>17,36</sup> and the overall perforation rate of 5.2% was higher compared with conventional EMR,<sup>36</sup> but considerably lower than the earlier Japanese multicenter analyses mentioned previously<sup>12</sup> in which delayed perforation cases were regarded as requiring emergency surgery because of the risk of peritonitis. Two of the 4 patients with delayed perforations in this series, however, were successfully treated conservatively as abdominal findings and inflammation changes based on laboratory data were slight. Taku et al<sup>12</sup> also reported that conservative treatment might be possible, even for cases of delayed perforation when abdominal findings and laboratory data are stable, but we must carefully follow patients with delayed perforation and continued close communication with consulting surgeons is essential because the number of such cases has been quite limited so far.

The other principal ESD complication involved postoperative bleeding, but the total postoperative bleeding rate was only 1.5%, and none of the 17 patients required a blood transfusion or emergency surgery. This relatively low rate of postoperative bleeding was probably a result of using the coagulation technique for exposed vessels during ESD procedures, and the incidence of postoperative bleeding also decreased as the total number of ESDs

performed at the 3 respective groups of institutions increased.

Univariate and multivariate analysis revealed that large tumor size (≥50 mm) and less experience performing ESDs (group A, <50 cases) were independent risk factors for complications, so endoscopists should begin by performing colorectal ESDs on smaller lesions.

The mean ESD procedure time was considerably longer compared with that of conventional EMR,<sup>36</sup> but the indications for ESD and EMR were different, as were the tumor characteristics.<sup>36</sup> We should be comparing, therefore, the procedure times between ESD and surgery rather than ESD and EMR.

As for ESD devices, more than 2 knives were used in most institutions and CO<sub>2</sub> insufflation was used at 8 of the 10 institutions to reduce patient discomfort (Table 1). These factors also will need to be taken into account when considering costs in the future.

This was a prospective multicenter cohort study, but eligibility criteria for performing colorectal ESDs were sometimes unclear at some of the institutions. It will be necessary, therefore, to further assess the clinical outcome of using ESD for the treatment of large colorectal tumors in the future.

Another limitation of this study is that no long-term outcome data are available yet because a few of the institutions have only started performing colorectal ESDs in recent years. With more than 6 months of follow-up for cases at the National Cancer Center Hospital, there have been only 3 local recurrences (2%) in ESD cases (mean endoscopic follow-up period, 20.0 ± 12.9 months) compared with 33 recurrences (14%) in EMR cases (mean endoscopic follow-up period 25.9 ± 17.0 months).<sup>36</sup>

In conclusion, ESD performed by experienced endoscopists is a safe and very effective procedure for treating large superficial colorectal tumors such as nongranular type LSTs larger than 20 mm and granular type LSTs larger than 30 mm that would have previously been treated with surgery, as well as large villous tumors and intramucosal lesions, recurrent lesions, and residual mucosal lesions showing nonlifting sign after EMR.

## ACKNOWLEDGMENTS

We express our appreciation to Christopher Dix for his assistance in editing this manuscript; Dr. Kohsaku Maeda, Osaka Koseinenkin Hospital, for acquisition of data; and Dr. Keisuke Hori, Okayama University, for statistical analysis.

## REFERENCES

- Ahmad NA, Kochman ML, Long WB, et al. Efficacy, safety, and clinical outcomes of endoscopic mucosal resection: a study of 101 cases. *Gastrointest Endosc* 2002;55:390-6.
- Yokota T, Sugihara K, Yoshida S. Endoscopic mucosal resection for colorectal neoplastic lesions. *Dis Colon Rectum* 1994;37:1108-11.
- Soetikno RM, Gotoda T, Nakanishi Y, et al. Endoscopic mucosal resection. *Gastrointest Endosc* 2003;57:567-79.
- Deyle P, Largiadier F, Jenny S, et al. A method for endoscopic electroresection of sessile colonic polyp. *Endoscopy* 1973;5:38-40.
- Kudo S. Endoscopic mucosal resection of flat and depressed type of early colorectal cancer. *Endoscopy* 1993;25:455-61.
- Hotta K, Fujii T, Saito Y, et al. Local recurrence after endoscopic resection of colorectal tumors. *Int J Colorectal Dis* 2009;24:225-30.
- Kitajima K, Fujimori T, Fujii S, et al. Correlations between lymph node metastasis and depth of submucosal invasion in submucosal invasive colorectal carcinoma: a Japanese collaborative study. *J Gastroenterol* 2004;39:534-43.
- Kobayashi N, Saito Y, Uraoka T, et al. Treatment strategy for laterally spreading tumors in Japan: before and after the introduction of colorectal endoscopic submucosal dissection. *J Gastroenterol Hepatol* 2009;24:1387-92.
- Hosokawa K, Yoshida S. Recent advances in endoscopic mucosal resection for early gastric cancer [in Japanese with English abstract]. *Jpn J Cancer Chemother* 1998;25:476-83.
- Ohkuwa M, Hosokawa N, Boku N, et al. New endoscopic treatment for intramucosal gastric tumors using an insulated-tip diathermic knife. *Endoscopy* 2001;33:221-6.
- Ono H, Kondo H, Gotoda T, et al. Endoscopic mucosal resection for treatment of early gastric cancer. *Gut* 2001;48:225-9.
- Taku K, Sano Y, Fu KI, et al. Iatrogenic perforation associated with therapeutic colonoscopy: a multicenter study in Japan. *J Gastroenterol Hepatol* 2007;22:1409-14.
- Gotoda T, Kondo H, Ono H, et al. A new endoscopic resection procedure using an insulation-tipped electrosurgical knife for rectal flat lesions: report of two cases. *Gastrointest Endosc* 1999;50:560-3.
- Saito Y, Uraoka T, Matsuda T, et al. A pilot study to assess safety and efficacy of carbon dioxide insufflation during colorectal endoscopic submucosal dissection under conscious sedation. *Gastrointest Endosc* 2007;65:537-42.
- Yamamoto H, Kawata H, Sunada K, et al. Success rate of curative endoscopic mucosal resection with circumferential mucosal incision assisted by submucosal injection of sodium hyaluronate. *Gastrointest Endosc* 2002;56:507-12.
- Toyonaga T, Man-I M, Morita Y, et al. The new resources of treatment for early stage colorectal tumors: EMR with small incision and simplified endoscopic submucosal dissection. *Dig Endosc* 2009;21(Suppl 1):S31-7.
- Saito Y, Uraoka T, Matsuda T, et al. Endoscopic treatment of large superficial colorectal tumors: a case series of 200 endoscopic submucosal dissections (with video). *Gastrointest Endosc* 2007;66:966-73.
- Uraoka T, Kawahara Y, Kato J, et al. Endoscopic submucosal dissection in the colorectum: present status and future prospects. *Dig Endosc* 2009;21(Suppl 1):S13-6.
- Fujishiro M, Yahagi N, Kakushima N, et al. Outcomes of endoscopic submucosal dissection for colorectal epithelial neoplasms in 200 consecutive cases. *Clin Gastroenterol Hepatol* 2007;5:674-7.
- Tamegai Y, Saito Y, Masaki N, et al. Endoscopic submucosal dissection: a safe technique for colorectal tumors. *Endoscopy* 2007;39:418-22.
- Antillon MR, Bartalos CR, Miller ML, et al. En bloc endoscopic submucosal dissection of a 14-cm laterally spreading adenoma of the rectum with involvement to the anal canal: expanding the frontiers of endoscopic surgery (with video). *Gastrointest Endosc* 2008;67:332-7.
- Hurlstone DP, Atkinson R, Sanders DS, et al. Achieving R0 resection in the colorectum using endoscopic submucosal dissection. *Br J Surg* 2007;94:1536-42.
- Kudo S, Kashida H, Tamura T, et al. Colonoscopic diagnosis and management of nonpolypoid early colorectal cancer. *World J Surg* 2000;24:1081-90.
- Fujii T, Hasegawa RT, Saitoh Y, et al. Chromoscopy during colonoscopy. *Endoscopy* 2001;33:1036-41.
- Saito Y, Emura F, Matsuda T, et al. Invasive pattern is an indication for surgical treatment. *Gut* online (serial online), March 2004. Available at: <http://gut.bmjournals.com/cgi/eletters/53/2/284>.
- Matsuda T, Fujii T, Saito Y, et al. Efficacy of the invasive/non-invasive pattern by magnifying chromoendoscopy to estimate the depth of invasion of early colorectal neoplasms. *Am J Gastroenterol* 2008;103:2700-6.
- Saito Y, Fujii T, Kondo H, et al. Endoscopic treatment for laterally spreading tumors in the colon. *Endoscopy* 2001;33:682-6.
- Tanaka S, Haruma K, Oka S, et al. Clinicopathologic features and endoscopic treatment of superficially spreading colorectal neoplasms larger than 20 mm. *Gastrointest Endosc* 2001;54:62-6.
- Uraoka T, Saito Y, Matsuda T, et al. Endoscopic indications for endoscopic mucosal resection of laterally spreading tumors in the colorectum. *Gut* 2006;55:1592-7.
- Ishiguro A, Uno Y, Ishiguro Y, et al. Correlation of lifting versus non-lifting and microscopic depth of invasion in early colorectal cancer. *Gastrointest Endosc* 1999;50:329-33.
- Kobayashi N, Saito Y, Sano Y, et al. Determining the treatment strategy for colorectal neoplastic lesions: endoscopic assessment or the non-lifting sign for diagnosing invasion depth? *Endoscopy* 2007;39:701-5.
- Japanese Research Society for Cancer of the Colon and Rectum. General rules for clinical and pathological studies on cancer of the colon, rectum and anus: histopathological classification, 6th ed. Tokyo: Kanehara Syuppan; 1998. p. 60-90.
- Sano Y, Fu KI, Saito Y, et al. A newly developed bipolar-current needle-knife for endoscopic submucosal dissection of large colorectal tumors. *Endoscopy* 2006;38(Suppl 5):E95.
- Uraoka T, Fujii T, Saito Y, et al. Effectiveness of glycerol as a submucosal injection for EMR. *Gastrointest Endosc* 2005;61:736-40.
- Schlemper RJ, Riddell RH, Kato Y, et al. The Vienna classification of gastrointestinal epithelial neoplasia. *Gut* 2000;47:251-5.
- Saito Y, Fukuzawa M, Matsuda T, et al. Clinical outcome of endoscopic submucosal dissection versus endoscopic mucosal resection of large colorectal tumors as determined by curative resection. *Surg Endosc* 2010;23:343-52.



## A laterally-spreading tumor in a colonic interposition treated by endoscopic submucosal dissection

Hideaki Bando, Hiroaki Ikematsu, Kuang-I Fu, Yasuhiro Oono, Takashi Kojima, Keiko Minashi, Tomonori Yano, Takahisa Matsuda, Yutaka Saito, Kazuhiro Kaneko, Atsushi Ohtsu

Hideaki Bando, Hiroaki Ikematsu, Yasuhiro Oono, Takashi Kojima, Keiko Minashi, Tomonori Yano, Kazuhiro Kaneko, Atsushi Ohtsu, Department of Gastrointestinal Oncology & Endoscopy, National Cancer Center Hospital East, Kashiwanoha 6-5-1, Kashiwa, Chiba 277-8577, Japan

Kuang-I Fu, Department of Gastroenterology, Juntendou University Nerima Hospital, Tokyo 177-0033, Japan

Takahisa Matsuda, Yutaka Saito, Endoscopy Division, National Cancer Center Hospital, Tokyo 104-0045, Japan

**Author contributions:** Bando H designed the research, collected, analyzed and interpreted the data; Ikematsu H, Fu KI, Oono Y, Kojima T, Minashi K, Yano T, Matsuda T, Saito Y, Kaneko K and Ohtsu A wrote and revised the paper.

**Correspondence to:** Hiroaki Ikematsu, MD, Department of Gastrointestinal Oncology & Endoscopy, National Cancer Center Hospital East, Kashiwanoha 6-5-1, Kashiwa, Chiba 277-8577, Japan. [hikemats@east.ncc.go.jp](mailto:hikemats@east.ncc.go.jp)

Telephone: +81-4-71331111 Fax: +81-4-71346928

Received: September 5, 2009 Revised: October 13, 2009

Accepted: October 20, 2009

Published online: January 21, 2010

© 2010 Baishideng. All rights reserved.

**Key words:** Colonic interposition; Early colonic carcinoma; Endoscopic submucosal dissection

**Peer reviewers:** Christopher Mantyh, MD, Associate Professor, Department of Surgery, Duke University Medical Center, Box 3117, Durham, NC 27711, United States; Ming-Te Huang, Professor, Department of Surgery, Taipei Medical University-Shuang Ho Hospital, Taipei 23561, Taiwan, China

Bando H, Ikematsu H, Fu KI, Oono Y, Kojima T, Minashi K, Yano T, Matsuda T, Saito Y, Kaneko K, Ohtsu A. A laterally-spreading tumor in a colonic interposition treated by endoscopic submucosal dissection. *World J Gastroenterol* 2010; 16(3): 392-394 Available from: URL: <http://www.wjgnet.com/1007-9327/full/v16/i3/392.htm> DOI: <http://dx.doi.org/10.3748/wjg.v16.i3.392>

### Abstract

Herein we describe an early colonic carcinoma which developed in a colonic interposition 14 years after surgery for esophageal cancer, which was successfully treated by endoscopic submucosal dissection (ESD). An 80-year-old man underwent colonic interposition between the upper esophagus and stomach after surgery for an early esophageal squamous cell carcinoma in 1994. He received a surveillance endoscopy, and a laterally-spreading tumor of granular type, approximately 20 mm in size, was identified in the colonic interposition. An endoscopic biopsy revealed moderately differentiated adenocarcinoma histologically, however, we diagnosed the lesion as an intramucosal carcinoma based on the endoscopic findings. The lesion was safely and completely removed *en bloc* by ESD using a bipolar knife. Histologically, the lesion was an intramucosal moderately differentiated adenocarcinoma in a tubular adenoma.

### INTRODUCTION

Although rarely reported, adenoma and adenocarcinoma can occur as a late complication in colon segments used to replace the esophagus. Herein, we describe an early colonic carcinoma which developed in a colonic interposition 14 years after surgery for esophageal cancer, which was successfully treated by endoscopic submucosal dissection (ESD).

### CASE REPORT

An 80-year-old man underwent colonic interposition between the upper esophagus and stomach after surgery for an early esophageal squamous cell carcinoma (T1, N0, M0, stage I according to the TNM classification) in 1994. He received an esophagogastroduodenoscopy for surveillance and a laterally-spreading tumor of granular type (LST-G), approximately 20 mm in size, was identified in the colonic interposition. On conventional view, a



Table 1 Summary of reported cases of neoplasia arising in a colonic interposition

Case	Authors	Age	Gender	Size (mm)	Histology	Period after surgery (yr)	Follow up	Therapy	Course
1	Goldsmith <i>et al</i> <sup>[5]</sup> , 1968	48	F	50	Adenocarcinoma	2	+	Surgery	Follow up
2	Szántó <i>et al</i> <sup>[6]</sup> , 1981	65	M	5	Adenomatous polyp	1	-	Polypectomy	Follow up
3	Haerr <i>et al</i> <sup>[7]</sup> , 1987	72	M	NI	Adenocarcinoma	9	+	Radiation chemotherapy	Death
4	Houghton <i>et al</i> <sup>[8]</sup> , 1989	64	M	NI	Adenocarcinoma	20	-	Surgery	Follow up
5	Theile <i>et al</i> <sup>[9]</sup> , 1992	68	M	29	Adenocarcinoma	12	NI	Surgery	Follow up
6	Lee <i>et al</i> <sup>[10]</sup> , 1994	75	F	NI	Adenocarcinoma	20	+	Surgery	Follow up
7	Altorjay <i>et al</i> <sup>[11]</sup> , 1995	NI	M	60	Adenomatoid polyp Carcinoma	6	+	Surgery	Death
8	Kovacs <i>et al</i> <sup>[12]</sup> , 1997	8	M	9	Tubular adenoma	13	+	Polypectomy	Follow up
9	Altomare <i>et al</i> <sup>[13]</sup> , 2006	64	M	6	Tubular adenoma	7	+	Polypectomy	Follow up
10	Present case, 2008	80	M	25	Adenocarcinoma in tubular adenoma	14	-	ESD	Follow up

ESD: Endoscopic submucosal dissection; NI: No information.

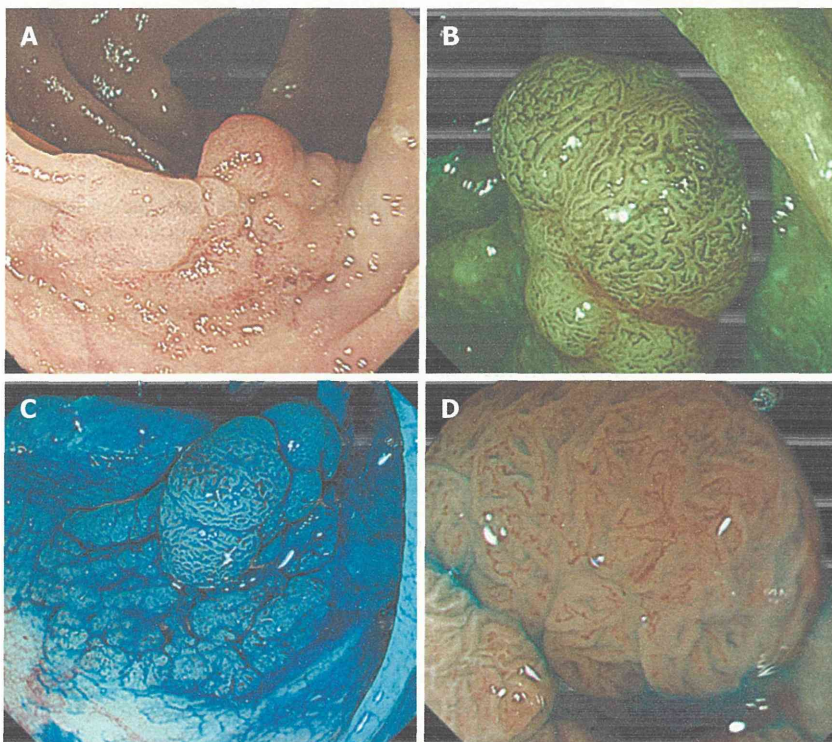


Figure 1 A laterally-spreading tumor of granular type (LST-G) in the colonic interposition was shown at colonoscopy. Narrow-band imaging with magnification revealed a capillary pattern type II. Magnifying chromoendoscopy using 0.4% indigo carmine revealed a type IV pit pattern. A: Conventional view; B: Narrow-band imaging with magnification; C: Chromoendoscopy with 0.4% indigo carmine; D: Magnifying chromoendoscopy using 0.4% indigo carmine dye spraying.



Figure 2 Histologically, the resected specimen showed an intramucosal adenocarcinoma in a tubular adenoma. Cross sectional view (HE, magnification  $\times 5$ ).

large, reddish nodule was detected in the lesion. With magnifying narrow-band imaging (NBI) observation, the lesion revealed a capillary pattern type II according to Sano's classification<sup>[1]</sup>, and a type IV pit pattern according to Kudo's classification was detected under magnifying chromoendoscopy using 0.4% Indigo carmine dye

spraying<sup>[2]</sup>. An endoscopic biopsy was taken from the large nodule and a histological diagnosis of moderately differentiated adenocarcinoma was established, however, we diagnosed the lesion as an intramucosal carcinoma based on the above endoscopic findings (Figure 1). Thus, the lesion was considered a good candidate for endoscopic



resection. The lesion was safely and completely removed *en bloc* by ESD using a bipolar knife (B-knife<sup>®</sup> XEMEX Co. Ltd. Tokyo, Japan)<sup>[3,4]</sup>. Histologically, the lesion was an intramucosal moderately differentiated adenocarcinoma in a tubular adenoma. Lateral and vertical margins of the specimen were negative. There was no lymphatic and venous invasion (Figure 2). The patient was hospitalized for 6 d after ESD to confirm the absence of complications such as delayed perforation, and was then discharged.

## DISCUSSION

Despite the fact that many interposition grafts are performed for malignant esophageal disease, to the best of our knowledge, there have only been 10 reported cases, including four adenomatous polyps and six adenocarcinomas, arising in a colonic interposition (Table 1)<sup>[5-13]</sup>. Because the sizes of the adenomatous polyps in the reported cases were small, they were treated with polypectomy. Reoperation or chemoradiotherapy was performed in patients with cancers. Therefore, this is the first case of an early adenocarcinoma in a colonic interposition resected by ESD.

We performed ESD instead of endoscopic mucosal resection (EMR) in this case, as the lesion was not well-elevated even after submucosal injection of glycerol. This phenomenon is the so-called "non-lifting sign positive" as determined by Uno *et al.*<sup>[14]</sup>. As our endoscopic diagnosis of an intramucosal carcinoma was established with magnifying NBI and chromoendoscopy, submucosal benign fibrosis rather than desmoplastic reaction created by invasive cancer was considered to cause the non-lifting sign positive. EMR for the lesion with the non-lifting sign positive may result in incomplete resection or unfavorable complications such as colonic perforation. During ESD, hyaluronic acid was additionally injected into the submucosal layer and a transparent hood was attached to the tip of the scope for better submucosal dissection<sup>[15]</sup>. To reduce deep burn to the muscle layer, we used a bipolar knife instead of a monopolar knife. To reduce operating time, we used a bipolar snare to remove the lesion after adequate dissection. These efforts enabled us to completely and safely remove the lesion *en bloc* without complication. Furthermore, the patient's colonic interposition was reconstructed using the subcutaneous route, and thus the risk of mediastinitis even if perforation occurred was lower than that if reconstructed substantially.

Despite the fact that many interposition grafts are performed for malignant esophageal disease, few reports of adenocarcinoma arising in a colonic interposition have been reported. It is commonly thought that patients who have esophageal malignancy carry a dismal prognosis, and few of these patients will survive long enough to develop colonic adenocarcinoma. However, with recent progress in chemotherapy, many patients have long-term survival. Almost all case reports presenting with adenoma or adenocarcinoma arise five or more years after colonic interposition surgery, and there are only two case reports where adenoma or adenocarcinoma in the

colonic interposition has arisen 1 or 2 years after surgery (Table 1). In our case, adenocarcinoma in a tubular adenoma was detected 14 years postoperatively. Colonoscopic screening is usually performed before colonic interposition. However, Heresbach *et al.*<sup>[6]</sup> reported an overall miss rate of 23.4% in the colonoscopic detection of neoplasia including both adenomas and colorectal cancers. Therefore, we recommend upper endoscopic screening within 1 year of colonic interposition and periodic surveillance, as lesions may be detected early and removed safely by endoscopy.

## REFERENCES

- Sano Y, Ikematsu H, Fu KI, Emura F, Katagiri A, Horimatsu T, Kaneko K, Soetikno R, Yoshida S. Meshed capillary vessels by use of narrow-band imaging for differential diagnosis of small colorectal polyps. *Gastrointest Endosc* 2009; **69**: 278-283
- Kudo S, Rubio CA, Teixeira CR, Kashida H, Kogure E. Pit pattern in colorectal neoplasia: endoscopic magnifying view. *Endoscopy* 2001; **33**: 367-373
- Saito Y, Uraoka T, Matsuda T, Emura F, Ikehara H, Mashimo Y, Kikuchi T, Fu KI, Sano Y, Saito D. Endoscopic treatment of large superficial colorectal tumors: a case series of 200 endoscopic submucosal dissections (with video). *Gastrointest Endosc* 2007; **66**: 966-973
- Sano Y, Fu KI, Saito Y, Doi T, Hanafusa M, Fujii S, Fujimori T, Ohtsu A. A newly developed bipolar-current needle-knife for endoscopic submucosal dissection of large colorectal tumors. *Endoscopy* 2006; **38** Suppl 2: E95
- Goldsmith HS, Beattie EJ Jr. Malignant villous tumor in a colon bypass. *Ann Surg* 1968; **167**: 98-100
- Szántó I, Kiss J, Vámosi-Nagy I, Vörös A. Endoscopic polypectomy in the segment of colon used for oesophageal replacement. *Endoscopy* 1981; **13**: 134
- Haerr RW, Higgins EM, Seymore CH, el-Mahdi AM. Adenocarcinoma arising in a colonic interposition following resection of squamous cell esophageal cancer. *Cancer* 1987; **60**: 2304-2307
- Houghton AD, Jourdan M, McColl I. Dukes A carcinoma after colonic interposition for oesophageal stricture. *Gut* 1989; **30**: 880-881
- Theile DE, Smithers BM, Strong RW, Windsor CJ. Primary adenocarcinoma in a colonic 'oesophageal' segment. *Aust N Z J Surg* 1992; **62**: 158-160
- Lee SJ, Koay CB, Thompson H, Nicolaidis AR, Das Gupta AR. Adenocarcinoma arising in an oesophageal colonic interposition graft. *J Laryngol Otol* 1994; **108**: 80-83
- Altortjay A, Kiss J, Vörös A, Szanto I, Bohak A. Malignant tumor developed in colon-esophagus. *Hepatogastroenterology* 1995; **42**: 797-799
- Kovacs BJ, Griffin RA, Chen YK. Synchronous adenomas in a colonic interposition graft and the native colon. *Am J Gastroenterol* 1997; **92**: 2303-2304
- Altomare JF, Komar MJ. A tubular adenoma arising in a colonic interposition. *J Clin Gastroenterol* 2006; **40**: 765-766
- Uno Y, Munakata A. The non-lifting sign of invasive colon cancer. *Gastrointest Endosc* 1994; **40**: 485-489
- Yamamoto H, Yahagi N, Oyama T, Gotoda T, Doi T, Hirasaki S, Shimoda T, Sugano K, Tajiri H, Takekoshi T, Saito D. Usefulness and safety of 0.4% sodium hyaluronate solution as a submucosal fluid "cushion" in endoscopic resection for gastric neoplasms: a prospective multicenter trial. *Gastrointest Endosc* 2008; **67**: 830-839
- Heresbach D, Barrioz T, Lapalus MG, Coumaros D, Bauret P, Potier P, Sautereau D, Boustière C, Grimaud JC, Barthélémy C, Sée J, Serraj I, D'Halluin PN, Branger B, Ponchon T. Miss rate for colorectal neoplastic polyps: a prospective multicenter study of back-to-back video colonoscopies. *Endoscopy* 2008; **40**: 284-290

S-Editor Wang JL L-Editor Webster JR E-Editor Tian L



