



Figure 1. The primary tumor before CRT was diagnosed as a type 1 SCC, with a circumferential intraepithelial lesion, which had been located in the mid esophagus at a previous hospital.

the effectiveness and safety of ESD for colorectal tumors by using a bipolar needle-knife (B-knife) and an insulation-tipped knife (IT-knife), neither of which has any coagulation effect at the needle tip.²¹⁻²⁴ The aim of our study was to evaluate the efficacy and safety of ESD for local recurrent or residual esophageal tumors by using a B-knife and an IT-knife.

PATIENTS AND METHODS

Four patients with esophageal SCC, each of whom had developed a local recurrent or residual tumor (2 recurrent tumors and 2 residual tumors) after CRT, were included in this study, which was conducted between January 2006 and September 2006 at the National Cancer Center Hospital (NCCH) in Tokyo. Three of the ESD cases involved stage I lesions treated by CRT, and the other case was of a stage II lesion. The 4 ESDs were performed from 217 days to 1377 days after the initial CRT.

ESDs by using a B-knife and an IT-knife were performed on all 4 patients, with Glyceol (Chugai, Tokyo, Japan)²⁵ used in each case as the submucosal (sm) injection solution to maintain proper sm elevation. All of the local recurrent or residual tumors were confirmed as intramucosal or sm superficial, without lymph-node metastasis, by EUS and a CT before treatment.

Endoscopic operating system

ESD procedures were performed by using video endoscopes (GIF-Q240 or GIF-Q260; Olympus Optical Co, Ltd, Tokyo, Japan).

ESD procedure

A transparent disposable attachment (D-201-1074; Olympus) was fitted onto the tip of the endoscope to retract the sm layer and to facilitate dissection. Lesion margins were delineated before ESD by using 1.5% iodine

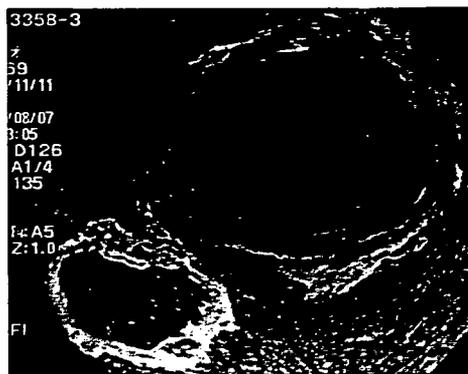


Figure 2. An endoscopy revealed a 0-IIc superficial residual lesion, 40 mm in diameter, located in the mid esophagus. After iodine staining, the lesion became more apparent and was larger than 50% in circumference.

staining (Figs. 1 and 2). After sm injection of Glyceol, a circumferential incision in the mucosa was made by using a B-knife and an IT-knife.²¹⁻²⁴ Additional Glyceol was then injected into the sm layer to lift the lesion, and the thickened sm layer was dissected by using an IT-knife (Figs. 3 and 4). The B-knife was mainly used for the dissection of fibrosis caused by CRT.²¹⁻²⁴ The operation time was recorded for all patients.

Sedation

Midazolam (3-5 mg intravenously) was administered in all cases. An additional 2 mg was given as necessary, whenever indicated, based on the individual endoscopist's judgment.

Histologic assessment

All specimens were evaluated after being cut into 2-mm slices; they were examined microscopically for histologic type, depth of invasion, lateral resection margin, and vertical resection margin.

Follow-up care

All patients who had an ESD at the NCCH were regularly observed, with annual endoscopic and EUS examinations and CTs. Complete follow-up care was available for all 4 patients in the ESD group.

Statistical analysis

All variables in this study were described as mean (SD). All statistical analyses were performed by using SAS version 8.0 (SAS Institute Inc, Cary, NC). The *P* value was 2 sided, and *P* < .05 was used to determine statistical significance.

Ethics

The ethics committee at the NCCH approved the study protocol, and written informed consent was obtained from all 4 patients in the ESD group before entering the study.



Figure 3. An en bloc resection was achieved without complication in 100 minutes.

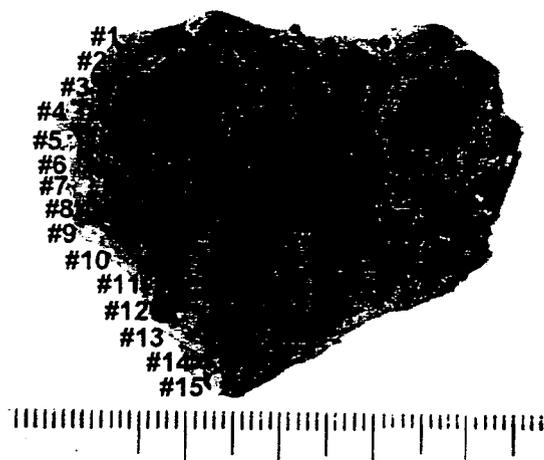


Figure 4. The resected specimen was 50 mm in diameter, with both the lateral and vertical margins negative by endoscopy. Both the lateral and vertical margins were negative on histopathologic examination, and the depth of invasion was m2. A curative local resection was achieved in this case.

RESULTS

During the study period, 4 patients were treated with ESD. All 4 lesions were eligible for outcome analysis. Clinical characteristics of the patients are presented in Table 1. Each of the 4 ESD cases was successfully resected en bloc, with no complications. The mean (SD) ESD time was 58 ± 42 minutes (range 15-100 minutes), and the mean (SD) size of the resected specimens was 35 ± 15 mm (range 15-50 mm). On histopathologic examination, the lateral and vertical margins were negative in 3 of 4 ESD cases, but the depth of invasion was sm1 in 2 of those cases, so additional CRT was performed on those patients. A curative local resection was achieved in the other case. None of the patients developed local recurrence or distant metastasis in the follow-up period. There were no immediate or late complications related to ESD procedures

TABLE 1. Clinical characteristics of patients

No. lesions	4
Stage before CRT (stage I/II)	3/1
Days after CRT (median)	749 (range 217-1377)
Residual/recurrent	2/2
Tumor depth (m/sm)	2/2
Tumor size (mean [SD]) (mm)	35 ± 15 (range 15-50)
Procedure time (mean [SD]) (min)	58 ± 42
En bloc resection rate	100% (4/4)
Tumor-free lateral margin rate	75% (3/4)
Local recurrence rate	0% (0/4)
Complication (perforation)	0 (0%)

reported. The median (SD) follow-up time was 3 ± 2 months (range 0-6 months) for the ESD group.

DISCUSSION

The ESD technique, by using a B-knife²¹⁻²⁴ and an IT-knife,^{17,23,24} enhanced the en bloc resection rate, thereby increasing the likelihood of curative results for local residual or recurrent tumors. In fact, ESDs with a B-knife and an IT-knife are performed to treat superficial neoplastic lesions, such as gastric and colonic neoplasms, at the NCCH.^{17,22-24} ESD has enabled us to treat recurrent gastric cancers after EMR. As indicated in our previous reports,²⁶ about 5% of such cases involved perforations, although virtually all of the perforation cases were successfully treated by means of endoscopic clipping, without the need for additional surgery.

The esophagus is located in the mediastinum, so the risks of ESD are further enhanced, and perforations must be avoided. The newly developed B-knife results in a safer ESD, because the electric current is localized at the needle tip.²¹ The IT-knife^{17,23,24} also decreases the risk of perforation as a result of the insulated tip attached to the end of the needle. A B-knife was mainly used for the dissection of fibrosis caused by CRT. The combined use of these two instruments has enabled us to safely perform ESDs even for local recurrence of residual tumors after CRT with successful results similar to our experience in the colorectum.^{23,24} Although the number of patients who underwent ESD in our series was limited and the follow-up periods were short, there were no cases of recurrence after ESD during any of the follow-up periods. Further follow-up data are required, however, for meaningful recurrence and survival analyses.

For comparison, 17 local recurrent or residual tumors (10 recurrent tumors, 7 residual tumors) in 14 patients treated at the NCCH between January 2005 and December

2005 by conventional strip biopsy (EMR) were included as historical controls. Ten of the EMR lesions were stage I treated by CRT, and the other 7 were stage II lesions. The 17 EMRs were performed from 134 days to 636 days after the initial CRT.

Analysis showed a significant difference between the 2 treatment groups in terms of en bloc resection rates, with 100% (4/4) in the ESD group compared with 47% (8/17) in the EMR group ($P = .05$), despite the tumor size being significantly larger in the ESD group. Further analysis showed a difference between the 2 groups in terms of resection margin involvement, with 25% (1/4) in the ESD group and 65% (11/17) in the EMR group (not significant). The higher en bloc resection rate and lower incidence of margin involvement in the ESD group compared with the EMR group resulted in a higher curability rate.

It is recognized that ESD for local recurrent or residual tumors is difficult because of fibrosis, which results after CRT. Although it is still not technically feasible to perform either EMR or ESD for an invasive SCC deeper than sm2 (close to the muscle layer), ESD enables us to resect invasive SCC for both sm1 and sm2. Surgical treatment for esophageal SCC is difficult, with a poor quality-of-life reported for patients after surgery, whereas a higher recurrence rate has been reported after CRT treatment. ESD or EMR should be performed initially, therefore, followed by CRT to treat possible lymph node metastasis when EUS or magnifying endoscopy examinations reveal no evidence of deeper invasion to the muscle layer as previously reported.²⁷

In conclusion, ESD for recurrent or residual superficial esophageal tumors after CRT with a B-knife or an IT-knife achieves the goal of an en bloc resection with a low rate of incomplete treatment without greater risk than the EMR technique. ESD should be the reference procedure, therefore, for treating such lesions.

ACKNOWLEDGMENTS

We thank Christopher Dix for editing this manuscript and Paul Fockens, MD, for critically reading the manuscript.

DISCLOSURES

The authors report that there are no disclosures relevant to this publication.

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Received July 13, 2007. Accepted October 2, 2007.

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Presented at 15th United European Gastroenterology Week, October 27-31, 2007, Paris, France (*Gastroenterology* 2007;39[Suppl]:A224).

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Endoscopic submucosal dissection for cancers of the remnant stomach after distal gastrectomy

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Background: Endoscopic submucosal dissection (ESD) of early gastric cancer is less invasive than surgical resection, and if technically feasible, it may result in less long-term morbidity than does incisional surgery. However, ESD is technically difficult in patients who have had a previous distal gastrectomy.

Objective: Our purpose was to retrospectively assess the results of ESD of early gastric cancer in the remnant stomach.

Design: Case series.

Setting and Patients: A total of 31 lesions in 30 patients with early remnant gastric cancer were treated with ESD at Okayama University Hospital, Tsuyama Central Hospital, Hiroshima City Hospital, Kagawa Prefectural Central Hospital, and Mitoyo General Hospital from March 2001 to January 2007.

Intervention: ESD.

Main Outcome Measurements: En bloc resection rate, complete resection rate, operation time, and complications.

Results: En bloc resection and complete resection were achieved in 30 (97%) and in 23 (74%) lesions, respectively. The median operation time required for ESD in the remnant stomach was 113 minutes (range 45-450 minutes). Perforation occurred in 4 (13%). The incidence of delayed bleeding requiring blood transfusion was 0%.

Limitation: Short duration of follow-up.

Conclusions: ESD is feasible in the remnant stomach but has a relatively high complication rate and should only be performed by experienced endoscopists.

Abbreviations: EMR, endoscopic mucosal resection; ESD, endoscopic submucosal dissection.

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0016-5107/\$32.00
doi:10.1016/j.gie.2007.10.021

Distal gastrectomy for benign disease appears to lead to an increased risk for the development of gastric cancer.^{1,2} Although remnant gastric cancers are usually detected at an advanced stage and surgical resection of the total remnant stomach has been accepted for a long time,