

Endoscopic submucosal dissection for gastric tube cancer after esophagectomy

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Background: Recent improvements in the survival of patients after esophagectomy have led to an increasing occurrence of gastric tube cancer (GTC). Removal of the reconstructed gastric tube, however, can lead to high morbidity and mortality.

Objective: To assess the feasibility and effectiveness of endoscopic submucosal dissection (ESD) for GTC.

Design: Retrospective study.

Setting: National Cancer Center Hospital, Tokyo, Japan.

Patients: We investigated patients with GTC after esophagectomy undergoing ESD from 1998 to 2011.

Intervention: ESD.

Main Outcome Measurements: Patient characteristics, endoscopic findings, technical results, histopathology including curability and *Helicobacter pylori* gastritis, and long-term outcomes.

Results: There were 51 consecutive patients with 79 lesions including 38 lesions (48%) meeting the absolute indication, 31 (39%) satisfying the expanded indications, and 10 (13%) falling outside such indications. The median procedure time was 90 minutes. There were 73 en bloc resections (92%), 59 en bloc resections with tumor-free margins (R0 resections, 75%), and 51 curative resections (65%) based on the Japanese Gastric Cancer Association criteria. Fifty patients (98%) were assessed as *H pylori* gastritis positive. Adverse events included 3 perforations (3.8%) during ESD and 2 delayed perforations (2.5%) without any emergency surgery and 3 delayed bleeding (3.8%). Local recurrence was detected in 4 patients (7.8%), and metachronous GTCs were identified in 18 patients (35%). Five patients (10%) died of GTC including 3 metachronous lesions. The 5-year overall survival rate was 68.4%, and the disease-specific survival rate was 86.7% with 100% for curative and 72.7% for non-curative patients during a median follow-up period of 3.8 years (range, 0-12.1 years).

Limitation: Single-center retrospective study.

Conclusions: ESD for GTC was feasible and effective for curative patients; however, long-term outcomes for non-curative patients were less satisfactory. (Gastrointest Endosc 2014;79:260-70.)

Recent improvements in the survival of patients after esophagectomy have led to an increasing occurrence of gastric tube cancer (GTC) in the reconstructed gastric

Abbreviations: EGC, early gastric cancer; GTC, gastric tube cancer; ESD, endoscopic submucosal dissection; HMI, horizontal margin positive; HMX, horizontal margin inconclusive; IT, insulation-tipped; LNM, lymph node metastasis; SM1, submucosal superficial cancer; SM2, submucosal deep cancer.

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tube.¹⁻⁴ It is well known that second primary cancers in other regions can frequently occur in esophageal cancer patients.⁵⁻¹⁰ Most notably, gastric cancer including GTC,

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TABLE 1. Japanese Gastric Cancer Association absolute and expanded indications for endoscopic resection**Absolute indication**

Differentiated type intramucosal cancer ≤ 20 mm in size without ulceration

Expanded indications

Differentiated type intramucosal cancer > 20 mm in size without ulceration

Differentiated type intramucosal cancer ≤ 30 mm in size with ulceration

Undifferentiated type intramucosal cancer ≤ 20 mm in size without ulceration

TABLE 2. Japanese Gastric Cancer Association absolute and expanded histopathological criteria for curative endoscopic resection**En bloc resection**

Negative horizontal and vertical margin

No lymphovascular infiltration**Absolute indication**

Differentiated type intramucosal cancer ≤ 20 mm in size without ulceration

Expanded indications

Differentiated type intramucosal cancer > 20 mm in size without ulceration

Differentiated type intramucosal cancer ≤ 30 mm in size with ulceration

Differentiated type submucosal superficial cancer (SM1*) ≤ 30 mm in size

Undifferentiated type intramucosal cancer ≤ 20 mm in size without ulceration

*Less than 500 μm from the muscularis mucosae.

Take-home Message

- Endoscopic submucosal dissection (ESD) for gastric tube cancer (GTC) after esophagectomy was feasible and effective based on favorable long-term outcomes for curative patients. Long-term outcomes for non-curative patients were less satisfactory, however, with 5 patients dying of GTC, including 3 patients dying of metachronous lesions.
- Improved earlier GTC diagnosis, therefore, may result in more curative ESD procedures and ultimately better long-term outcomes.

examine. Surgical removal of the reconstructed gastric tube, however, has been reported to be a very invasive procedure that can lead to high morbidity and mortality.¹¹ As a result, alternatives to surgical resection of the reconstructed gastric tube have been explored.

The use of endoscopic resection including endoscopic submucosal dissection (ESD) for early gastric cancer (EGC) is now accepted as a standard treatment and in widespread use at present.¹²⁻¹⁴ ESD is a technique developed to enable the resection of large and ulcerative lesions regardless of tumor location that could not be removed by using conventional EMR. The other major advantage of ESD is its ability to achieve a higher rate of en bloc resection, thus providing more accurate histological assessment compared with EMR. The indications for endoscopic resection and histopathological criteria for curative endoscopic resection of EGC according to the Japanese Gastric Cancer Association Gastric Cancer Treatment Guidelines 2010 (ver. 3) are shown in Tables 1 and 2.¹⁵ These indications and histological criteria were recently expanded to cover lesions with a negligible risk of lymph node metastasis (LNM).¹⁶⁻¹⁸ These expanded indications and criteria for gastric ESD include GTC after esophagectomy.¹⁹⁻²²

ESD for GTC after esophagectomy is a technically difficult procedure because of the limited working space and unusual fluid-pooling area in the reconstructed gastric tube as well as the presence of severe gastric fibrosis with staples under the suture line. An en bloc resection is still possible, however, when the procedure is performed by a highly skilled endoscopist. We also occasionally perform ESD for GTC with suspected submucosal invasion, which is outside even the expanded indications, because surgical resection of the reconstructed gastric tube results in high morbidity and mortality. Only a few reports on endoscopic resection of GTC in the reconstructed gastric tube involving small numbers of patients with limited follow-up or mixed data on surgical resection and ESD are currently available.^{11,19-24} We decided, therefore, to evaluate the feasibility, effectiveness, and long-term outcomes of ESD performed for GTC in the reconstructed gastric tube in patients after esophagectomy.

and head and neck cancer are more commonly identified compared with other types of cancer. Thus, successful therapy of such lesions is very important, particularly in patients who have good prognosis after esophagectomy.^{7,8,10}

Although patients who have undergone esophagectomy for primary esophageal cancer undergo annual follow-up endoscopic examinations, GTC may nonetheless be difficult to diagnose because of suboptimal visualization caused by residual food that is frequently seen after esophagectomy with gastric tube reconstruction. Furthermore, the long and narrow gastric tube may be difficult to

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