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Original research

Prevalence and management of colorectal neoplasia in surgically treated esophageal cancer patients

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HIGHLIGHTS

- We examined the prevalence of colorectal neoplasia in esophageal cancer patients.
- Esophageal cancer is frequently associated with colorectal cancer and adenomas.
- Colonoscopy is useful to detect colorectal neoplasia before and after esophagectomy.

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ABSTRACT

Aims: The existence of other primary tumors during the treatment of esophageal cancer patients has been an important issue. Our aim is to investigate the prevalence and management of colorectal neoplasia (CRN) in surgically treated esophageal cancer patients.

Methods: Between 2002 and 2008, 93 patients with esophageal cancer were surgically treated. Seventy-three patients underwent subtotal esophagectomy and 20 underwent lower esophagectomy for esophageal cancer. Colonoscopy was available for detecting CRN before and after surgery.

Results: Eighty-nine (95.7%) of the 93 patients were screened by colonoscopy preoperatively or within a year from the operation. Thirty-nine patients (43.8%) with CRN were synchronously identified: adenoma in 34 (38.2%) and adenocarcinoma in 5 patients (5.6%). Eleven adenomas with high grade-dysplasia and 8 adenomas with low grade-dysplasia were removed endoscopically. Three superficial adenocarcinomas were endoscopically removed before surgery, and 2 adenocarcinomas were surgically removed. Seventy-four patients (83.1%) were followed using colonoscopy, and 11 subsequent CRN, including 2 superficial adenocarcinomas, were endoscopically detected in 8 patients (10.8%). The size of esophageal cancer was larger in the patients with than without CRN ($p = 0.036$). The body mass index in esophageal cancer patients with CRN tended to be higher than in those without CRN ($p = 0.065$).

Conclusions: We noted that esophageal cancer is frequently associated with synchronous and/or metachronous colorectal cancer and adenomas. Colonoscopy is useful to detect and manage CRN before and after esophagectomy, although a few limitations exist.

1. Introduction

Esophageal cancer associated with other primary cancer is relatively common, especially in the aerodigestive tract [1–5]. In surgery for esophageal cancer, the stomach is usually used for esophageal reconstruction. The colon is also used for esophageal substitution after esophagectomy in esophageal cancer patients, including cases with coexisting gastric cancer or who have undergone gastrectomy [6–8]. The incidence of colorectal cancer (CRC) has been increasing rapidly in recent decades in Asian countries, including Japan [9]. Under these conditions it may be important to be aware of the prevalence of coexisting colorectal neoplasia (CRN) in esophageal cancer patients. CRC synchronously or metachronously associated with squamous cell carcinoma (SCC) or adenocarcinoma of the esophagus has been described regarding several issues [1–5,10]. However, there are only a few reports on the prevalence of CRN in esophageal cancer patients screened by colonoscopy [11,12]. The purpose of the present study is to investigate the prevalence and management of CRN, including adenomas

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and adenocarcinomas, in surgically treated esophageal cancer patients.

2. Patients and methods

2.1. Patients

Ninety-three consecutive patients with esophageal cancer who underwent esophagectomy in Shinshu University Hospital between 2002 and 2008 were studied in the present study. The background data of these esophageal cancer patients are summarized in Table 1. Seventy-three patients underwent subtotal esophagectomy with 2- or 3-field node dissection for thoracic esophageal cancer, and 20 patients underwent lower esophagectomy for cancer of the distal esophagus. Histopathologically, 74, 12, 4, and 3 tumors were diagnosed as SCC, adenocarcinoma, basaloid-squamous carcinoma, and neuroendocrine carcinoma of the esophagus, respectively. Primary cancer arising from other organs was defined according to the criteria of Warren and Gates [13]. When primary CRN was detected within one year, it was considered synchronous. When primary CRN was not detected within one year, it was considered metachronous. The clinicopathological features of esophageal cancer were described according to the TMN classification (the 7th Edition).

2.2. Colonoscopy in esophageal cancer patients

In 2002, we began to examine the lower digestive tract routinely using colonoscopy in patients who were scheduled for surgery for esophageal cancer with the aim of identifying the occurrence of primary CRN. Usually, colonic lavage was used with 2000 ml of solution containing polyethylene glycol. In case that preoperative colonoscopy could not be performed because of malignant esophageal stenosis, colonoscopy was performed within a year from esophagectomy. Colonoscopy was performed by us and several endoscopists in Shinshu University Hospital and other hospitals in Nagano Prefecture. These endoscopists were usually a Board Certified Fellow of the Japan Gastroenterological Endoscopy Society. When endoscopists did not have such certification, one or two endoscopists with certification assisted them during colonoscopy. CRN detected by colonoscopy was histopathologically diagnosed based on biopsy specimens: colorectal adenomas with low-grade dysplasia (LGD) or high-grade dysplasia (HGD), and carcinoma.

Table 1
Background data of 93 esophagectomized patients.

Mean age (years old; range)	64.7 (41–83)
Gender	
Men	81 (87.1%)
Women	12 (12.9%)
Tumor site	
Upper esophagus	6 (6.5%)
Middle esophagus	45 (48.4%)
Lower esophagus	42 (45.2%)
Mean tumor size (mm; range)	51.7 (10–180)
Histologic type	
Squamous cell carcinoma	74 (79.6%)
Others	19 (20.4%)
Depth of invasion	
pT1	50 (53.8%)
pT2 and more	43 (46.2%)
Node metastasis	
pN0	50 (53.2%)
pN1 or more	44 (46.8%)
Distant metastasis	
M0	91 (97.8%)
M1	2 (2.2%)
Esophagectomy	
Open approach	61 (65.6%)
Video-assisted approach	32 (34.4%)
Digestive reconstruction	
Stomach	91 (97.8%)
Colon	1 (1.1%)
Jejunum	1 (1.1%)
Surgical mortality	0

2.3. Treatments for colorectal neoplasia

CRN detected by colonoscopy before esophagectomy was managed by follow-up or removal according to the histopathologic findings of the biopsy. Usually, adenomas with LGD less than 10 mm in diameter were followed by colonoscopy in the subsequent year, while those over 10 mm in diameter were removed endoscopically. Adenoma with HGD and mucosal adenocarcinoma were removed endoscopically. When submucosal adenocarcinomas were diagnosed, these tumors were divided into two types: slight-submucosal invasion (probably judged as <1000 μm) and massive-submucosal invasion (probably judged as ≥1000 μm), on endoscopic ultrasonography. Adenocarcinoma with slight-submucosal invasion was removed endoscopically, while that with massive-submucosal invasion was removed surgically. Colorectal cancer with invasion to the proper muscle layer or more was removed surgically. When CRN were detected by colonoscopy after esophagectomy, these lesions were also managed as mentioned above. Adenomas without synchronous endoscopic resection were followed by colonoscopy with a one- or two-year interval.

2.4. Statistical analysis

Data are shown as the prevalence or mean value, and continuous data such as age, tumor size and TNM staging were analyzed with the Mann–Whitney *U* test. Ordinal data such as gender, habit and tumor site were compared using the Chi-square test. Survival curves after esophagectomy were analyzed employing the Kaplan–Meier method. $P < 0.05$ was considered significant.

3. Results

Total colonoscopy was completed without any serious complications in 89 patients (95.7%: Fig. 1). Four patients (4.3%) could not receive colonoscopic examination before surgery because of esophageal malignant stenosis, and rejected it after surgery. Eighty-six patients (96.6%) underwent colonoscopy prior to esophagectomy. Three patients (3.4%) underwent colonoscopy after surgery because of esophageal malignant stenosis. CRN, including adenomas and adenocarcinomas, were synchronously identified in 39 (43.8%) of the 89 patients examined by colonoscopy. No patient had symptoms caused by CRN. Of the 89 patients, two patients (2.2%) have received surgery for antecedent CRC: rectal amputation for rectal cancer and left colectomy for descending colon cancer, respectively.

Forty-nine colorectal adenomas were synchronously observed in 34 (38.2%) of the 89 patients (Figs. 1 and 2): 38 adenomas with LGD in 23 and 11 adenomas with HGD in 11 patients. Endoscopic resections for adenomas were synchronously performed in 15 (44.1%) of the 34 patients: 8 adenomas with LGD in 6 and 11 adenomas with HGD in 11 patients. Four adenomas, diagnosed as LGD before esophagectomy, were subsequently removed endoscopically in 3 patients; an adenoma with LGD and 3 adenomas with HGD were finally diagnosed. Twenty-three adenomas (46.9%) were observed in the descending and sigmoid colon (Table 2).