



Comprehensive registry of esophageal cancer in Japan, 2015

Masayuki Watanabe¹ · Yasushi Toh² · Ryu Ishihara³ · Koji Kono⁴ · Hisahiro Matsubara⁵ · Tatsuya Miyazaki⁶ · Masaru Morita² · Kentaro Murakami⁵ · Kei Muro⁷ · Hodaka Numasaki⁸ · Tsuneo Oyama⁹ · Hiroshi Saeki¹⁰ · Koji Tanaka¹¹ · Takahiro Tsushima¹² · Masaki Ueno¹³ · Takashi Uno¹⁴ · Toshiyuki Yoshio¹⁵ · Shiyori Usune¹⁶ · Arata Takahashi¹⁶ · Hiroaki Miyata¹⁶ · The Registration Committee for Esophageal Cancer of the Japan Esophageal Society

Received: 29 June 2022 / Accepted: 20 August 2022 / Published online: 24 September 2022
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Abstract

Background The registration committee for esophageal cancer in the Japan Esophageal Society (JES) has collected the patients' characteristics, treatment, and outcomes of patients who underwent any treatment during 2015 in Japan.

Methods We analyzed patients' data who had visited the participating hospitals in 2015. We collected the data using the National Clinical Database with a web-based data collection system. We used the Japanese Classification of Esophageal Cancer 10th edition by JES and the TNM classification by the Union of International Cancer Control (UICC) for cancer staging.

Results A total of 9368 cases were registered from 355 institutions in Japan. Squamous cell carcinoma and adenocarcinoma accounted for 86.7% and 7.4%, respectively. The 5-year survival rates of patients treated by endoscopic resection, concurrent chemoradiotherapy, radiotherapy alone, and esophagectomy were 87.2%, 33.5%, 24.2%, and 59.9%, respectively. Esophagectomy was performed in 5172 cases. Minimally invasive approaches were selected for 60.6%, and 54.4% underwent thoracoscopic esophagectomy. The operative mortality (within 30 days after surgery) was 0.79% and the hospital mortality was 2.3%. The survival curves showed an excellent discriminatory ability both in the clinical and pathologic stages by the JES system. The survival of pStage IV was better than IIIC in the UICC system because pStage IV included the patients with supraclavicular lymph node metastasis (M1 LYM).

Conclusion We hope this report improves all aspects of diagnosing and treating esophageal cancer in Japan.

Keywords Esophageal cancer · Esophagectomy · Endoscopic resection · Chemotherapy · Chemoradiotherapy · Cancer registry

Preface 2015

We sincerely appreciate the outstanding contributions of many physicians in the registry of esophageal cancer cases. The Comprehensive Registry of Esophageal Cancer in Japan, 2015, was published here. In 2019, the data collection method was changed from an electronic submission to a

web-based data collection using the National Clinical Database (NCD). Personal information was replaced with individual management codes inside each institute, and the NCD collected only anonymized information. The registry complies with the Act for the Protection of Personal Information.

We briefly summarized the Comprehensive Registry of Esophageal Cancer in Japan, 2015. According to the subject year, we used the Japanese Classification of Esophageal Cancer 10th by the Japan Esophageal Society (JES) [1] and the Union of International Cancer Control (UICC) TNM Classification 7th [2] for cancer staging. A total of 9368 cases were registered from 355 institutions in Japan. Tumor locations were cervical in 4.6%, upper thoracic in 12.1%, middle thoracic in 46.0%, lower thoracic in 27.9%, and esophagogastric junction in 8.5%. Superficial carcinomas (Tis, T1a, T1b) were 38.2%. As for the histologic

These data were first made available on July 4, 2022, as the Comprehensive Registry of Esophageal Cancer in Japan, 2015.

The authors were members of the Registration Committee for Esophageal Cancer, the Japan Esophageal Society, and made great contribution to the preparation of this material.

✉ Masayuki Watanabe
masayuki.watanabe@jfc.or.jp

Extended author information available on the last page of the article

type of biopsy specimens, squamous cell carcinoma and adenocarcinoma accounted for 86.7% and 7.4%, respectively. Regarding clinical results, the 5-year survival rates of patients treated using endoscopic resection, concurrent chemoradiotherapy, radiotherapy alone, and esophagectomy were 87.2%, 33.5%, 24.2%, and 59.9%, respectively. The endoscopic submucosal dissection accounted for 92.9% of endoscopic resection. Esophagectomy was performed in 5172 cases. Minimally invasive approaches were selected for 60.6%, and 54.4% underwent thoracoscopic esophagectomy. The operative mortality (within 30 days after surgery) was 0.79%, and the hospital mortality was 2.3%. The N-grade significantly differed between the JES and the UICC systems; based on the location of metastatic lymph nodes in the JES system and the number of metastatic nodes in the UICC system. However, the N-grades effectively estimated the survival in both the JES and the UICC systems. The survival curves showed an excellent discriminatory ability both in the clinical and pathologic stages by the JES system. In contrast, in the UICC system, the survival of cStage IIB was identical to IB and better than IIA, and the survival curves were similar between cStage IIIC and IV. Also, the survival curve of pStage IIB was superior to IIA, and the survival of pStage IV was better than IIIC. pStage IV in the UICC system included the patients with supraclavicular lymph node metastasis (M1 LYM), which is possibly the reason for the better prognosis of pStage IV than IIIC.

We hope that this Comprehensive Registry of Esophageal Cancer in Japan 2015 will help improve all aspects of the diagnosis and treatment of esophageal cancer in Japan.

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I. Clinical features of esophageal cancer patients treated in 2015

Institution-registered cases in 2015

Institutions

Aomori Prefectural Central Hospital
 Ageo Central General Hospital
 Aichi Cancer Center
 Aichi Medical University Hospital
 Aizawa Hospital
 Akita University Hospital
 Arao Municipal Hospital
 Asahi Rousai Hospital
 Asahikawa Medical University Hospital
 Cancer Institute Hospital of JFCR
 Chiba Cancer Center
 Chiba-Nishi General Hospital
 Chiba University Hospital
 Dokkyo Medical University Hospital
 Dokkyo Medical University Saitama Medical Center
 Edogawa Hospital
 Ehime Prefectural Central Hospital
 Eijyu General Hospital
 Fuji City General Hospital
 Fujioka General Hospital
 Fujisaki Hospital
 Fujisawa City Hospital
 Fujita Health University Hospital
 Fukaya Red Cross Hospital
 Fukui University Hospital
 Fukui-ken Saiseikai Hospital
 Fukuoka City Hospital
 Fukuoka Shin Mizumaki Hospital
 Fukuoka University Chikushi Hospital
 Fukuoka University Hospital
 Fukuoka Wajiro Hospital
 Fukushima Medical University Hospital
 Fukushima Rosai Hospital
 Fukuyama City Hospital

Institutions

Gifu Prefectural General Center
 Gifu Municipal Hospital
 Gifu University Hospital
 Gunma Prefectural Cancer Center
 Gunma Saiseikai Maebashi Hospital
 Gunma University Hospital
 Hachinohe City Hospital
 Hakodate City Hospital
 Hakodate Goryokaku Hospital
 Hakodate National Hospital
 Hamamatsu University Hospital
 Hamanomachi Hospital
 Hannan Chuo Hospital
 Hanyu General Hospital
 Hasuda Hospital
 Heartlife Hospital
 Higashiosaka City Medical Center
 Hiraka General Hospital
 Hiratsuka City Hospital
 Hirosaki University Hospital
 Hiroshima City Asa Hospital
 Hiroshima City Hospital
 Hiroshima Memorial Hospital
 Hiroshima Prefectural Hospital
 Hiroshima Red Cross Hospital & Atomic-bomb Survivors Hospital
 Hiroshima University Hospital
 Hitachi General Hospital
 Hofu Institute of Gastroenterology
 Hokkaido University Hospital
 Hospital of the University of Occupational and Environmental Health, Japan
 Hyogo Cancer Center
 Hyogo Prefectural Amagasaki General Medical Center
 Hyogo Prefectural Nishinomiya Hospital
 Ibaraki Prefectural Central Hospital
 Iizuka Hospital
 Ikeda City Hospital
 Imari Arita Kyoritsu Hospital
 International University of Health and Welfare Hospital
 International University of Health and Welfare Mita Hospital
 Iseikai Hospital
 Ishikawa Prefectural Central Hospital
 Itami City Hospital
 Iwata City Hospital
 Iwate Medical University Hospital
 Iwate Prefectural Central Hospital
 Iwate Prefectural Chubu Hospital
 Iwate Prefectural Ofunato Hospital
 JA Hiroshima General Hospital
 JA Kouseiren Enshu Hospital
 JA Onomichi General Hospital

Institutions

Japanese Red Cross Ashikaga Hospital
 Japanese Red Cross Fukuoka Hospital
 Japanese Red Cross Ishinomaki Hospital
 Japanese Red Cross Kitami Hospital
 Japanese Red Cross Kyoto Daiichi Hospital
 Japanese Red Cross Maebashi Hospital
 Japanese Red Cross Medical Center
 Japanese Red Cross Musashino Hospital
 Japanese Red Cross Nagoya Daiichi Hospital
 Japanese Red Cross Nagoya Daini Hospital
 Japanese Red Cross Saitama Hospital
 Japanese Red Cross Tottori Hospital
 Japanese Red Cross Wakayama Medical Center
 Japanese Red Cross Yamaguchi Hospital
 JCHO Gunma Chuo Hospital
 JCHO Kyushu Hospital
 JCHO Osaka Hospital
 Jichi Medical University Hospital
 Jichi Medical University Saitama Medical Center
 Juntendo University Hospital
 Juntendo University Nerima Hospital
 Juntendo University Shizuoka Hospital
 Juntendo University Urayasu Hospital
 Junwakai Memorial Hospital
 Kagawa Prefectural Central Hospital
 Kagawa Rosai Hospital
 Kagawa University Hospital
 Kagoshima City Hospital
 Kagoshima Medical Association Hospital
 Kagoshima University Hospital
 Kaizuka City Hospital
 Kakogawa Central City Hospital
 Kanagawa Cancer Center
 Kanagawa Prefectural Ashigarakami Hospital
 Kanazawa Medical University Hospital
 Kanazawa University Hospital
 Kansai Denryoku Hospital
 Kansai Medical University Hospital
 Kansai Medical University Medical Center
 Kansai Rosai Hospital
 Kanto Central Hospital for Public School Teachers
 Kashiwa Kousei General Hospital
 Kawakita General Hospital
 Kawasaki Medical School Hospital
 Kawasaki Medical School Kawasaki Hospital
 Kawasaki Municipal Hospital
 Kawasaki Municipal Ida Hospital
 Kawasaki Saiwai Hospital
 Keio University Hospital
 Keiyu Hospital
 Keiyukai Sapporo Hospital

Institutions

Kindai University Hospital
 Kindai University Nara Hospital
 Kinki Central Hospital
 Kiryu Kousei General Hospital
 Kishiwada City Hospital
 Kitaharima Medical Center
 Kitakyushu Municipal Medical Center
 Kitano Hospital
 Kitasato University Hospital
 Kobe City Medical Center General Hospital
 Kobe University Hospital
 Kochi Health Science Center
 Kochi University Hospital
 Kohga Public Hospital
 Kokura Memorial Hospital
 Kosei Hospital
 Kouseiren Takaoka Hospital
 Kumagai General Hospital
 Kumamoto University Hospital
 Kumamoto Regional Medical Center
 Kurashiki Central Hospital
 Kurume University Hospital
 Kyorin University Hospital
 Kyoto Okamoto Memorial Hospital
 Kyoto University Hospital
 Kyoto-Katsura Hospital
 Kyushu Central Hospital
 Kyushu University Hospital
 Matsudo City General Hospital
 Matsushita Memorial Hospital
 Matsuyama Red Cross Hospital
 Mie University Hospital
 Minamiosaka Hospital
 Minoh City Hospital
 Mito Red Cross Hospital
 Mitsui Memorial Hospital
 Miyazaki University Hospital
 Moriguchi Keijinkai Hospital
 Nagahama City Hospital
 Nagahama Red Cross Hospital
 Nagano Municipal Hospital
 Nagaoka Chuo General Hospital
 Nagasaki University Hospital
 Nagoya City University Hospital
 Nagoya City West Medical Center
 Nagoya Tokushukai General Hospital
 Nagoya University Hospital
 Nanpuh Hospital
 Nara City Hospital
 Nara Medical University Hospital
 National Cancer Center Hospital

Institutions

National Cancer Center Hospital East
National Center for Global Health and Medicine
National Defence Medical College Hospital
Nerima Hikarigaoka Hospital
New Tokyo Hospital
NHO Beppu Medical Center
NHO Chiba Medical Center
NHO Disaster Medical Center
NHO Iwakuni Clinical Center
NHO Kanmon Medical Center
NHO Kure Medical Center
NHO Kyoto Medical Center
NHO Kyushu Cancer Center
NHO Kyushu Medical Center
NHO Matsumoto Medical Center
NHO Mito Medical Center
NHO Miyakonojo Medical Center
NHO Nagasaki Medical Center
NHO Oita Medical Center
NHO Osaka Medical Center
NHO Saitama Hospital
NHO Sendai Medical Center
NHO Shikoku Cancer Center
NHO Takasaki General Medical Center
NHO Tokyo Medical Center
NHO Yokohama Medical Center
Nihonkai General Hospital
Niigata Cancer Center Hospital
Niigata City General Hospital
Niigata Prefectural Central Hospital
Niigata Prefectural Shibata Hospital
Niigata University Medical & Dental Hospital
Nikko Memorial Hospital
Nippon Medical School Chiba Hokusou Hospital
Nippon Medical School Hospital
Nippon Medical School Musashi Kosugi Hospital
Nippon Medical School Tama Nagayama Hospital
Nishi Kobe Medical Center
Nissan Tamagawa Hospital
Northern Okinawa Medical Center
NTT Medical Center Tokyo
Numazu City Hospital
Obihiro Kousei Hospital
Ofuna Chuo Hospital
Ogaki Municipal Hospital
Ogikubo Hospital
Ogori Daiichi General Hospital
Ohara General Hospital
Ohta Hospital
Ohta Nishinouchi Hospital
Oita Prefectural Hospital

Institutions

Oita Red Cross Hospital
Oita University Hospital
Okayama City Hospital
Okayama Red Cross General Hospital
Okayama Saiseikai General Hospital
Okayama University Hospital
Okitama Public General Hospital
Osaka City General Hospital
Osaka City University Hospital
Osaka General Medical Center
Osaka International Cancer Institute
Osaka Medical and Pharmaceutical University Hospital
Osaka Police Hospital
Osaka Red Cross Hospital
Osaka Rosai Hospital
Osaka University Hospital
Osaki City Hospital
Otsu City Hospital
Rinku General Medical Center
Saga Prefectural Hospital Koseikan
Saga University Hospital
Saiseikai Fukuoka General Hospital
Saiseikai Karatsu Hospital
Saiseikai Kawaguchi General Hospital
Saiseikai Noe Hospital
Saiseikai Utsunomiya Hospital
Saiseikai Yamaguchi General Hospital
Saiseikai Yokohama Tobu Hospital
Saitama Cancer Center
Saitama Citizens Medical Center
Saitama City Hospital
Saitama Medical University International Medical Center
Saitama Medical University Saitama Medical Center
Sakai City Medical Center
Saku Central Hospital
Seikei-kai Chiba Medical Center
Seirei Hamamatsu General Hospital
Sendai City Hospital
Sendai Kosei Hospital
Shiga General Hospital
Shiga University of Medical Science Hospital
Shimane Prefectural Central Hospital
Shimane University Hospital
Shin Takeo Hospital
Shinko Hospital
Shinshu University Hospital
Shizuoka Cancer Center
Shizuoka City Shizuoka Hospital
Shizuoka General Hospital
Showa University Hospital
Showa University Koto Toyosu Hospital

Institutions
Southern Tohoku General Hospital
St. Luke's International Hospital
St. Marianna University School of Medicine Hospital
St. Mary's Hospital
Steel Memorial Yawata Hospital
Suita Municipal Hospital
Tachikawa Hospital
Takatsuki Red Cross Hospital
Tama Kyuryo Hospital
Teikyo University Chiba Medical Center
Teikyo University Hospital
Teikyo University Hospital Mizonokuchi
Teine Keijinkai Hospital
Tenri Hospital
The Hospital of Hyogo College of Medicine
The Jikei University Daisan Hospital
The Jikei University Hospital
Tochigi Cancer Center
Toda Central General Hospital
Toho University Ohashi Medical Center
Toho University Omori Medical Center
Toho University Sakura Medical Center
Tohoku University Hospital
Tokai University Hachioji Hospital
Tokai University Hospital
Tokai University Tokyo Hospital
Tokushima Red Cross Hospital
Tokushima University Hospital
Tokyo Dental College Ichikawa General Hospital
Tokyo Medical and Dental University Hospital
Tokyo Medical University Hachioji Medical Center
Tokyo Medical University Hospital
Tokyo Metropolitan Cancer and Infectious Diseases Center Komagome Hospital
Tokyo Metropolitan Tama Medical Center
Tokyo University Hospital
Tokyo Women's Medical University Hospital
Tokyo Women's Medical University Medical Center East
Tokyo Women's Medical University Yachiyo Medical Center
Tonan Hospital
Toranomon Hospital
Toshima Hospital
Tottori Prefectural Central Hospital
Tottori University Hospital
Toyama Prefectural Central Hospital
Toyama University Hospital
Toyonaka Municipal Hospital
Toyota Kosei Hospital
Toyota Memorial Hospital
Tsuchiura Kyodo Hospital
Tsukuba University Hospital

Institutions
University Hospital, Kyoto Prefectural University of Medicine
University of the Ryukyus Hospital
Wakayama Medical University Hospital
Wakayama Rosai Hospital
Yamagata Prefectural Central Hospital
Yamagata University Hospital
Yamaguchi University Hospital
Yamanashi Prefectural Central Hospital
Yamanashi University Hospital
Yao Municipal Hospital
Yokkaichi Hospital
Yokohama City Minato Red Cross Hospital
Yokohama City Municipal Hospital
Yokohama City University Hospital
Yokohama City University Medical Center
Yokosuka General Hospital Uwamachi
Yuai Memorial Hospital

(Total 355 institutions).

Patient background

Table 1, 2, 3, 4, 5, 6, 7, 8

Table 1 Age and gender

Age	Male	Female	Cases (%)
≤ 29	14	5	19 (0.2%)
30–39	17	11	28 (0.3%)
40–49	171	93	264 (2.8%)
50–59	946	227	1173 (12.5%)
60–69	2928	559	3487 (37.2%)
70–79	2954	502	3456 (36.9%)
80–89	713	185	898 (9.6%)
90 ≤	25	18	43 (0.5%)
Total	7768	1600	9368

Table 2 Performed treatment

Treatments	Cases (%)
Surgery	5354 (57.2%)
Esophagectomy	5172 (55.2%)
Palliative surgery	182 (1.9%)
Chemotherapy and/or Radiotherapy	5119 (54.6%)
Chemoradiotherapy	1207 (12.9%)
Radiotherapy alone	330 (3.5%)
Chemotherapy alone	450 (4.8%)
Palliative radiation	112 (1.2%)
Others	3020 (32.2%)
Endoscopic treatment	1709 (18.2%)

Table 3 Tumor location

Location of tumor	Endoscopic treatment (%)	Surgery		Chemotherapy and/or radiotherapy					Total (%)
		Esophagectomy (%)	Palliative surgery (%)	CRT (%)	RT alone (%)	Chemotherapy alone (%)	Palliative radiotherapy (%)	Others (%)	
Cervical	39 (2.3%)	155 (3.0%)	11 (6.0%)	147 (12.2%)	32 (9.7%)	22 (4.9%)	6 (5.4%)	107 (3.5%)	435 (4.6%)
Upper thoracic	171 (10.0%)	581 (11.2%)	24 (13.2%)	220 (18.2%)	56 (17.0%)	39 (8.7%)	9 (8.0%)	373 (12.4%)	1131 (12.1%)
Middle thoracic	903 (52.8%)	2305 (44.6%)	99 (54.4%)	555 (46.0%)	142 (43.0%)	177 (39.3%)	57 (50.9%)	1364 (45.2%)	4308 (46.0%)
Lower thoracic	430 (25.2%)	1585 (30.6%)	39 (21.4%)	252 (20.9%)	76 (23.0%)	171 (38.0%)	33 (29.5%)	946 (31.3%)	2609 (27.9%)
EG	110 (6.4%)	393 (7.6%)	2 (1.1%)	20 (1.7%)	8 (2.4%)	18 (4.0%)	6 (5.4%)	166 (5.5%)	562 (6.0%)
E=G	30 (1.8%)	75 (1.5%)	3 (1.6%)	3 (0.2%)	0 (0.0%)	5 (1.1%)	1 (0.9%)	26 (0.9%)	118 (1.3%)
GE	6 (0.4%)	71 (1.4%)	3 (1.6%)	3 (0.2%)	1 (0.3%)	10 (2.2%)	0 (0.0%)	34 (1.1%)	110 (1.2%)
unknown	20 (1.2%)	7 (0.1%)	1 (0.5%)	7 (0.6%)	15 (4.5%)	8 (1.8%)	0 (0.0%)	4 (0.1%)	95 (1.0%)
Total	1709	5172	182	1207	330	450	112	3020	9368

E esophageal, G gastric

Table 4 Histologic type of biopsy specimens

Histologic types	Endoscopic treatment (%)	Surgery		Chemotherapy and/or radiotherapy					Total (%)
		Esophagectomy (%)	Palliative surgery (%)	CRT (%)	RT alone (%)	Chemotherapy alone (%)	Palliative RT (%)	Others (%)	
Squamous cell carcinoma	1405 (82.2%)	4524 (87.5%)	165 (90.7%)	1152 (95.4%)	307 (93.0%)	360 (80.0%)	103 (92.0%)	2730 (90.4%)	8123 (86.7%)
Squamous cell carcinoma	1065 (62.3%)	2486 (48.1%)	114 (62.6%)	764 (63.3%)	205 (62.1%)	221 (49.1%)	59 (52.7%)	1566 (51.9%)	5041 (53.8%)
Well differentiated	136 (8.0%)	421 (8.1%)	11 (6.0%)	60 (5.0%)	26 (7.9%)	32 (7.1%)	5 (4.5%)	227 (7.5%)	687 (7.3%)
Moderately differentiated	179 (10.5%)	1231 (23.8%)	28 (15.4%)	223 (18.5%)	53 (16.1%)	69 (15.3%)	28 (25.0%)	710 (23.5%)	1783 (19.0%)
Poorly differentiated	25 (1.5%)	386 (7.5%)	12 (6.6%)	105 (8.7%)	23 (7.0%)	38 (8.4%)	11 (9.8%)	227 (7.5%)	612 (6.5%)
Adenocarcinoma	56 (3.3%)	358 (6.9%)	8 (4.4%)	17 (1.4%)	3 (0.9%)	41 (9.1%)	2 (1.8%)	190 (6.3%)	507 (5.4%)
Barrett's carcinoma	56 (3.3%)	116 (2.2%)	1 (0.5%)	0 (0.0%)	1 (0.3%)	10 (2.2%)	2 (1.8%)	17 (0.6%)	187 (2.0%)
Adenosquamous carcinoma	3 (0.2%)	16 (0.3%)	0 (0.0%)	3 (0.2%)	1 (0.3%)	3 (0.7%)	0 (0.0%)	10 (0.3%)	23 (0.2%)
Mucoepidermoid carcinoma	0 (0.0%)	3 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (0.1%)	4 (0.0%)
Basaloid carcinoma	4 (0.2%)	43 (0.8%)	1 (0.5%)	5 (0.4%)	0 (0.0%)	4 (0.9%)	0 (0.0%)	15 (0.5%)	56 (0.6%)
Neuroendocrine tumor	1 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (0.4%)	0 (0.0%)	0 (0.0%)	3 (0.0%)

Table 4 (continued)

Histologic types	Endoscopic treatment (%)	Surgery		Chemotherapy and/or radiotherapy					Total (%)
		Esophagectomy (%)	Palliative surgery (%)	CRT (%)	RT alone (%)	Chemotherapy alone (%)	Palliative RT (%)	Others (%)	
Neuroendocrine carcinoma	1 (0.1%)	19 (0.4%)	1 (0.5%)	9 (0.7%)	1 (0.3%)	10 (2.2%)	1 (0.9%)	16 (0.5%)	47 (0.5%)
Undifferentiated carcinoma	1 (0.1%)	5 (0.1%)	0 (0.0%)	3 (0.2%)	0 (0.0%)	1 (0.2%)	0 (0.0%)	3 (0.1%)	10 (0.1%)
Malignant melanoma	2 (0.1%)	20 (0.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (0.7%)	0 (0.0%)	5 (0.2%)	27 (0.3%)
Carcinosarcoma	0 (0.0%)	15 (0.3%)	1 (0.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.9%)	5 (0.2%)	18 (0.2%)
GIST	1 (0.1%)	4 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.0%)	8 (0.1%)
Adenoid cystic carcinoma	1 (0.1%)	4 (0.1%)	0 (0.0%)	1 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.0%)	5 (0.1%)
Nonepithelial tumors	2 (0.1%)	3 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.0%)	6 (0.1%)
Other epithelial tumors	23 (1.3%)	6 (0.1%)	0 (0.0%)	1 (0.1%)	0 (0.0%)	2 (0.4%)	0 (0.0%)	3 (0.1%)	34 (0.4%)
Other tumors	50 (2.9%)	7 (0.1%)	0 (0.0%)	2 (0.2%)	3 (0.9%)	2 (0.4%)	1 (0.9%)	3 (0.1%)	77 (0.8%)
Unknown	103 (6.0%)	29 (0.6%)	5 (2.7%)	14 (1.2%)	14 (4.2%)	12 (2.7%)	2 (1.8%)	17 (0.6%)	233 (2.5%)
Total	1709	5172	182	1207	330	450	112	3020	9368

GIST gastrointestinal stromal tumor

Table 5 Depth of tumor invasion, cT (UICC TNM 7th)

Clinical T	Endoscopic treatment (%)	Surgery		Chemotherapy and/or radiotherapy					Total (%)
		Esophagectomy (%)	Palliative surgery (%)	CRT (%)	RT alone (%)	Chemotherapy alone (%)	Palliative RT (%)	Others (%)	
cT0	12 (0.7%)	4 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.9%)	0 (0.0%)	17 (0.2%)
cT1a	1332 (77.9%)	240 (4.6%)	1 (0.5%)	46 (3.8%)	16 (4.8%)	8 (1.8%)	4 (3.6%)	70 (2.3%)	1698 (18.1%)
cT1b	242 (14.2%)	1392 (26.9%)	5 (2.7%)	177 (14.7%)	66 (20.0%)	31 (6.9%)	4 (3.6%)	362 (12.0%)	1880 (20.1%)
cT2	20 (1.2%)	857 (16.6%)	6 (3.3%)	107 (8.9%)	48 (14.5%)	50 (11.1%)	14 (12.5%)	525 (17.4%)	1123 (12.0%)
cT3	54 (3.2%)	2315 (44.8%)	78 (42.9%)	435 (36.0%)	114 (34.5%)	217 (48.2%)	62 (55.4%)	1702 (56.4%)	3294 (35.2%)
cT4a	9 (0.5%)	174 (3.4%)	15 (8.2%)	120 (9.9%)	21 (6.4%)	44 (9.8%)	2 (1.8%)	126 (4.2%)	411 (4.4%)
cT4b	23 (1.3%)	172 (3.3%)	73 (40.1%)	308 (25.5%)	49 (14.8%)	77 (17.1%)	23 (20.5%)	226 (7.5%)	786 (8.4%)
cTX	17 (1.0%)	18 (0.3%)	4 (2.2%)	14 (1.2%)	16 (4.8%)	23 (5.1%)	2 (1.8%)	9 (0.3%)	159 (1.7%)
Total	1709	5172	182	1207	330	450	112	3020	9368

Table 6 Lymph node metastasis, cN (UICC TNM 7th)

Clinical N	Endoscopic treatment (%)	Surgery		Chemotherapy and/or radiotherapy					Total (%)
		Esophagectomy (%)	Palliative surgery (%)	CRT (%)	RT alone (%)	Chemotherapy alone (%)	Palliative RT (%)	Others (%)	
cN0	1612 (94.3%)	2365 (45.7%)	19 (10.4%)	327 (27.1%)	128 (38.8%)	69 (15.3%)	22 (19.6%)	844 (27.9%)	4621 (49.3%)
cN1	54 (3.2%)	1752 (33.9%)	57 (31.3%)	389 (32.2%)	119 (36.1%)	139 (30.9%)	30 (26.8%)	1290 (42.7%)	2602 (27.8%)
cN2	31 (1.8%)	901 (17.4%)	76 (41.8%)	346 (28.7%)	63 (19.1%)	144 (32.0%)	37 (33.0%)	745 (24.7%)	1642 (17.5%)
cN3	12 (0.7%)	154 (3.0%)	30 (16.5%)	145 (12.0%)	20 (6.1%)	98 (21.8%)	23 (20.5%)	141 (4.7%)	503 (5.4%)
cNX	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Total	1709	5172	182	1207	330	450	112	3020	9368

Table 7 Distant metastasis, cM (UICC TNM 7th)

Clinical M	Endoscopic treatment (%)	Surgery		Chemotherapy and/or radiotherapy					Total (%)
		Esophagectomy (%)	Palliative surgery (%)	CRT (%)	RT alone (%)	Chemotherapy alone (%)	Palliative RT (%)	Others (%)	
cM0	1680 (98.3%)	4976 (96.2%)	133 (73.1%)	897 (74.3%)	266 (80.6%)	218 (48.4%)	86 (76.8%)	2814 (93.2%)	8370 (89.3%)
cM1	29 (1.7%)	196 (3.8%)	49 (26.9%)	310 (25.7%)	64 (19.4%)	232 (51.6%)	26 (23.2%)	206 (6.8%)	998 (10.7%)
Total	1709	5172	182	1207	330	450	112	3020	9368

Table 8 Clinical Stage (UICC TNM 7th)

Clinical stage	Endoscopic treatment (%)	Surgery		Chemotherapy and/or radiotherapy					Total (%)
		Esophagectomy (%)	Palliative surgery (%)	CRT (%)	RT alone (%)	Chemotherapy alone (%)	Palliative RT (%)	Others (%)	
Stage IA	1557 (91.1%)	1291 (25.0%)	5 (2.7%)	175 (14.5%)	70 (21.2%)	12 (2.7%)	4 (3.6%)	234 (7.7%)	3126 (33.4%)
Stage IB	10 (0.6%)	448 (8.7%)	3 (1.6%)	36 (3.0%)	15 (4.5%)	17 (3.8%)	8 (7.1%)	235 (7.8%)	548 (5.8%)
Stage IIA	6 (0.4%)	537 (10.4%)	5 (2.7%)	62 (5.1%)	25 (7.6%)	17 (3.8%)	7 (6.3%)	324 (10.7%)	661 (7.1%)
Stage IIB	19 (1.1%)	568 (11.0%)	2 (1.1%)	63 (5.2%)	31 (9.4%)	22 (4.9%)	3 (2.7%)	353 (11.7%)	715 (7.6%)
Stage IIIA	21 (1.2%)	1146 (22.2%)	30 (16.5%)	136 (11.3%)	50 (15.2%)	51 (11.3%)	20 (17.9%)	858 (28.4%)	1454 (15.5%)
Stage IIIB	9 (0.5%)	575 (11.1%)	20 (11.0%)	96 (8.0%)	18 (5.5%)	31 (6.9%)	16 (14.3%)	434 (14.4%)	758 (8.1%)
Stage IIIC	30 (1.8%)	391 (7.6%)	68 (37.4%)	322 (26.7%)	49 (14.8%)	61 (13.6%)	26 (23.2%)	370 (12.3%)	992 (10.6%)
Stage IV	29 (1.7%)	196 (3.8%)	49 (26.9%)	310 (25.7%)	64 (19.4%)	232 (51.6%)	26 (23.2%)	206 (6.8%)	998 (10.7%)
Unknown	28 (1.6%)	20 (0.4%)	0 (0.0%)	7 (0.6%)	8 (2.4%)	7 (1.6%)	2 (1.8%)	6 (0.2%)	116 (1.2%)
Total	1709	5172	182	1207	330	450	112	3020	9368

II. Results of endoscopically treated patients in 2015

Tables 9, 10, 11, and Figs. 1, 2, 3.

Table 9 Details of endoscopic treatment for curative intent

Treatment details	Cases (%)
EMR	114 (6.8%)
EMR + YAG laser	1 (0.1%)
EMR + MCT or RFA	0 (0.0%)
ESD	1537 (91.2%)
ESD + EMR	14 (0.8%)
ESD + PDT	0 (0.0%)
ESD + YAG laser	1 (0.1%)
PDT	5 (0.3%)
YAG laser	14 (0.8%)
Total	1686

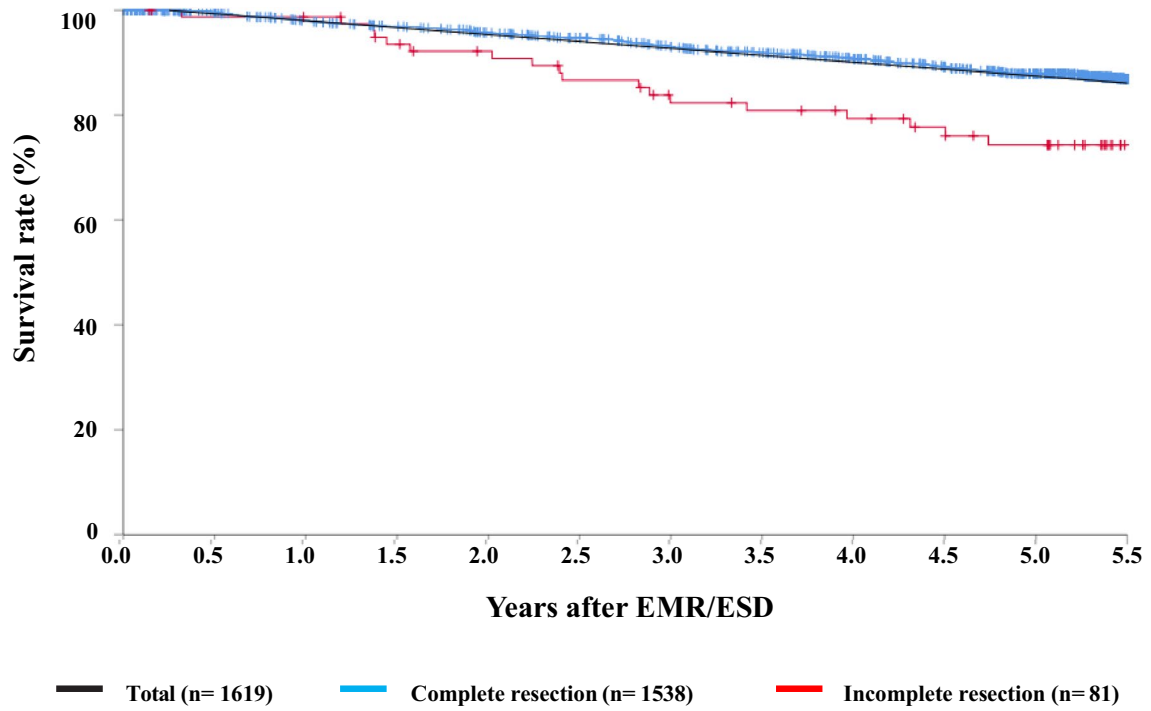
EMR endoscopic mucosal resection, *PDT* photodynamic therapy, *YAG* yttrium aluminum garnet, *MCT* microwave coagulation therapy, *ESD* endoscopic submucosal dissection

Table 10 Complications of EMR/ESD

Complications of EMR/ESD	Cases (%)
None	1599 (96.0%)
Perforation	15 (0.9%)
Bleeding	2 (0.1%)
Mediastinitis	2 (0.1%)
Stenosis	45 (2.7%)
Others	0 (0.0%)
Unknown	2 (0.1%)
Total	1665

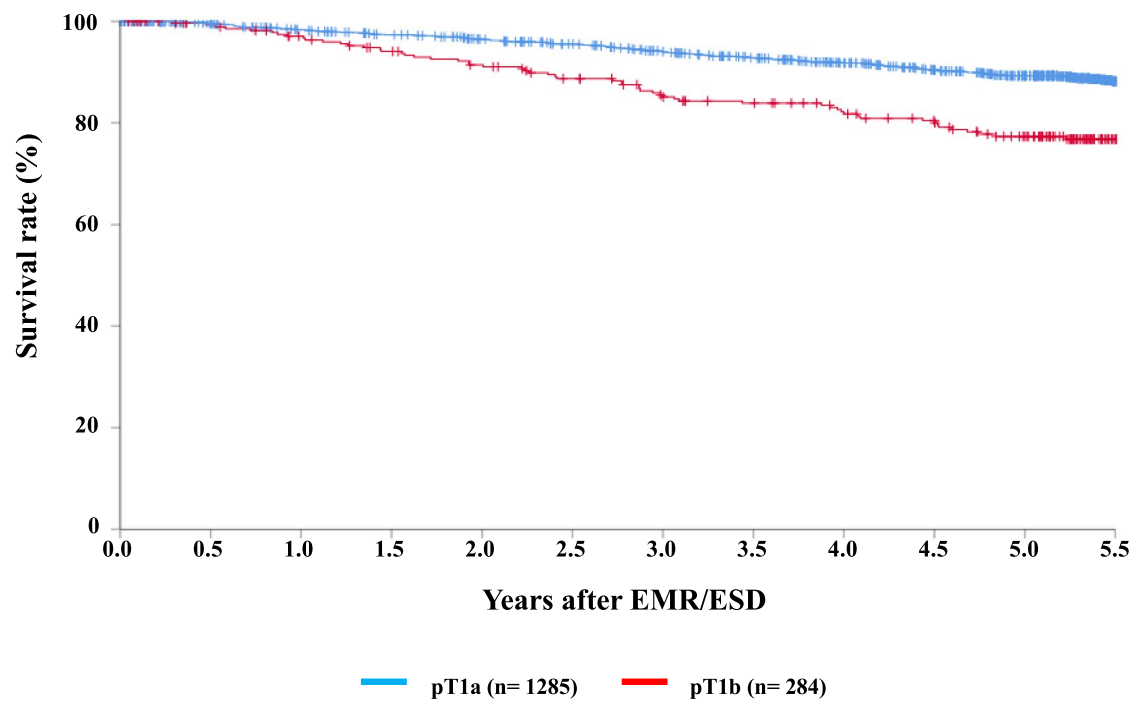
Table 11 Pathologic depth of tumor invasion of EMR/ESD specimens

Pathological depth of tumor invasion (pT)	Cases (%)
pT0	34 (2.0%)
pT1a	1315 (78.8%)
pT1b	291 (17.4%)
pT2	6 (0.4%)
pT3	0 (0.0%)
pTX	23 (1.4%)
Total	1669



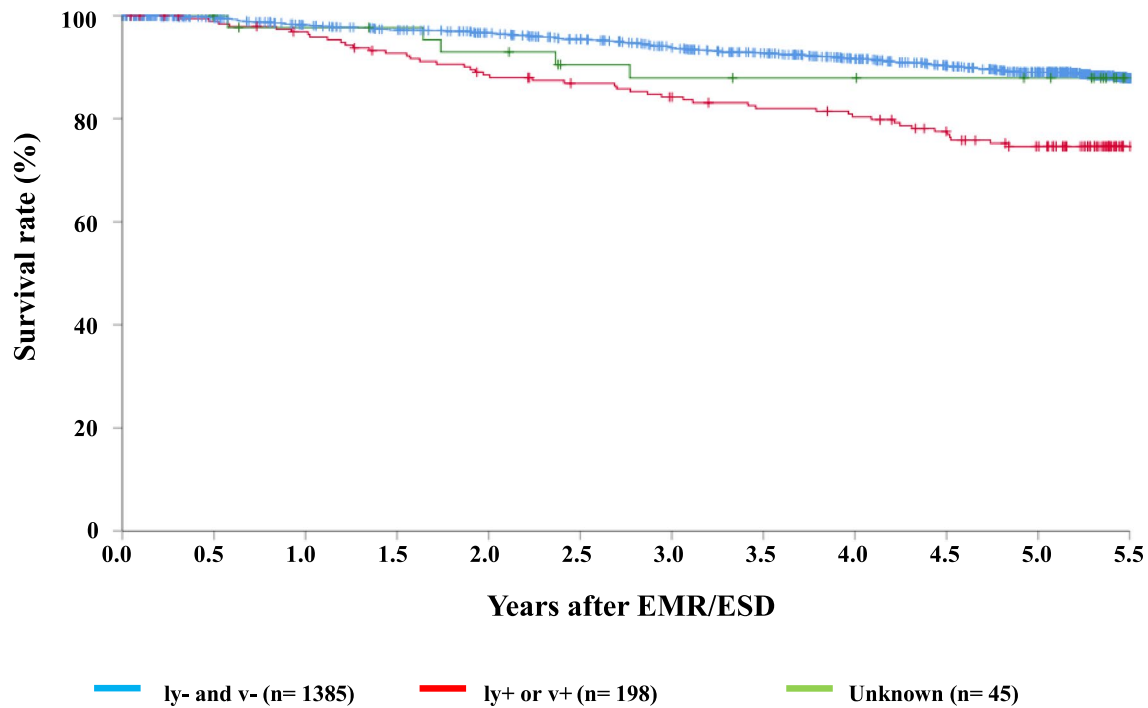
	Years after EMR/ESD				
	1	2	3	4	5
Total	98.2%	95.6%	92.5%	90.2%	87.2%
Complete resection	98.1%	95.8%	93.1%	90.8%	87.9%
Incomplete resection	98.7%	92.1%	82.2%	79.2%	74.3%

Fig. 1 Survival of patients treated with EMR/ESD



	Years after EMR/ESD				
	1	2	3	4	5
pT1a	98.4%	96.5%	94.1%	91.8%	89.3%
pT1b	97.1%	91.4%	85.2%	82.3%	77.3%

Fig. 2 Survival of patients treated with EM/ESD according to the pathological depth of tumor invasion, pT (JES 10th)



	Years after EMR/ESD				
	1	2	3	4	5
ly0_and_v0	98.3%	96.7%	93.8%	91.7%	89.0%
ly1-3_or_v1-3	96.9%	88.5%	84.2%	80.4%	74.6%
Unknown	97.7%	93.0%	88.1%	88.1%	88.1%

Fig. 3 Survival of patients treated with EMR/ESD according to the lymphatic and venous invasion

III. Results in patients treated with chemotherapy and/or radiotherapy in 2015

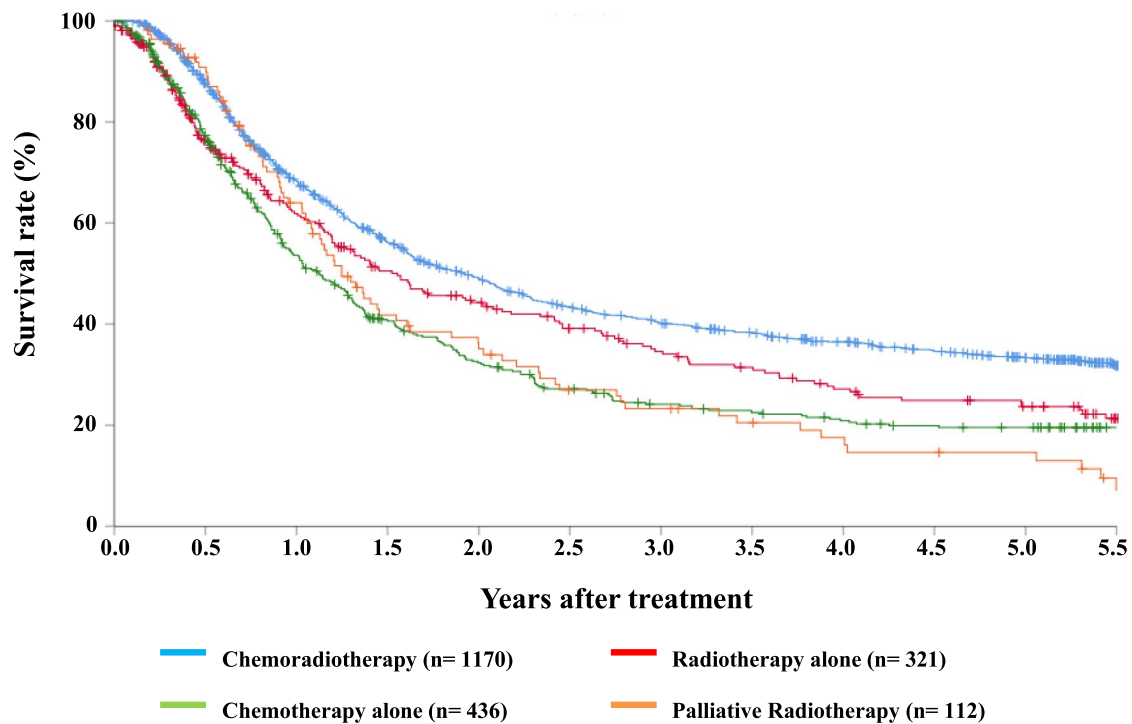
Tables 12, 13 and Figs. 4, 5, 6.

Table 12 Dose of irradiation (non-surgically treated cases)

Dose of irradiation (Gy)	Definitive		Palliative (%)	Recurrence (%)	Others (%)	Total
	Radiation alone (%)	Chemoradiotherapy (%)				
-29	9 (4.3%)	13 (1.3%)	29 (9.3%)	0 (0.0%)	2 (28.6%)	53 (3.5%)
30–39	9 (4.3%)	12 (1.2%)	50 (16.0%)	3 (8.8%)	0 (0.0%)	74 (4.8%)
40–49	13 (6.3%)	32 (3.3%)	52 (16.6%)	5 (14.7%)	1 (14.3%)	103 (6.7%)
50–59	38 (18.3%)	260 (26.8%)	70 (22.4%)	11 (32.4%)	1 (14.3%)	380 (24.8%)
60–69	131 (63.0%)	619 (63.8%)	105 (33.5%)	15 (44.1%)	3 (42.9%)	873 (57.0%)
-70	7 (3.4%)	33 (3.4%)	6 (1.9%)	0 (0.0%)	0 (0.0%)	46 (3.0%)
Unknown	1 (0.5%)	1 (0.1%)	1 (0.3%)	0 (0.0%)	0 (0.0%)	3 (0.2%)
Total	208 (100.0%)	970 (100.0%)	313 (100.0%)	34 (100.0%)	7 (100.0%)	1532 (100.0%)
Median (min–max)	60.0 (1.8–92.0)	60.0 (1.8–99.0)	50.0 (1.8–99.0)	52.2 (30.0–66.0)	59.4 (14.0–61.2)	60.0 (1.8–99.0)

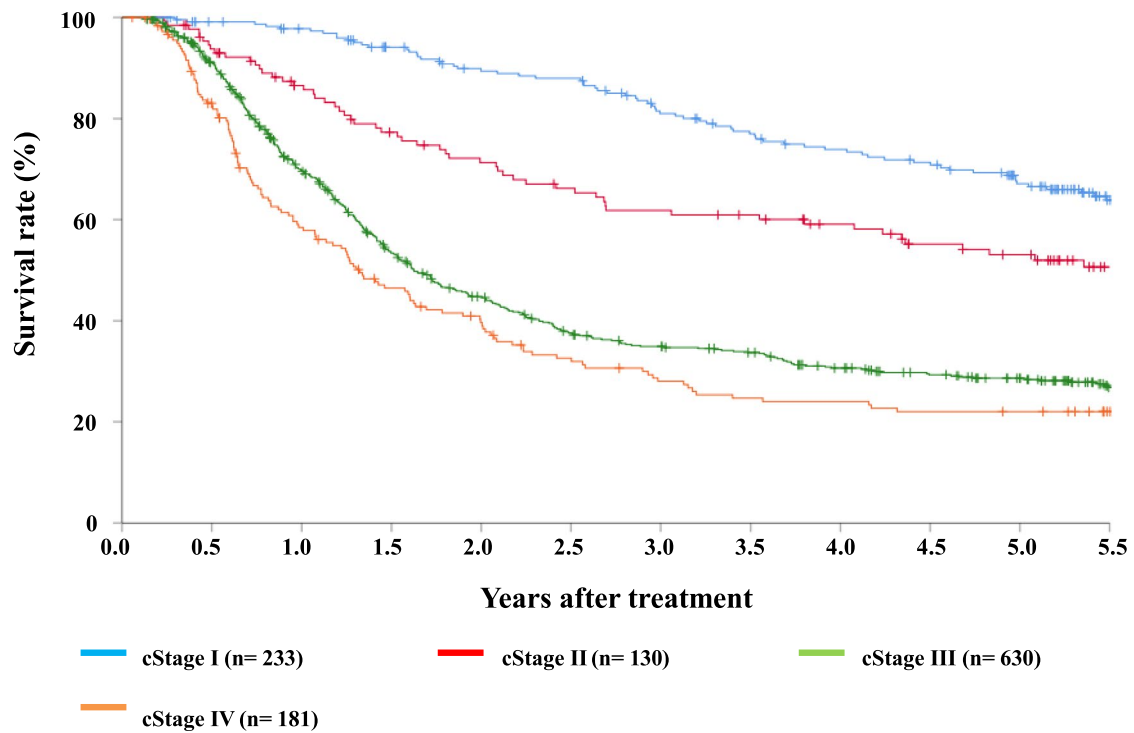
Table 13 Dose of irradiation (surgically treated cases)

Dose of irradiation (Gy)	Preoperative irradiation (%)	Postoperative irradiation (%)
-29	6 (2.2%)	5 (8.1%)
30–39	30 (11.1%)	14 (22.6%)
40–49	194 (71.9%)	18 (29.0%)
50–59	23 (8.5%)	22 (35.5%)
60–69	17 (6.3%)	0 (0.0%)
-70	0 (0.0%)	0 (0.0%)
Unknown	1 (0.0%)	1 (1.6%)
Total Median	270	62
(min-max)	40.0 (20.0–66.0)	50.4 (1.8–61.2)



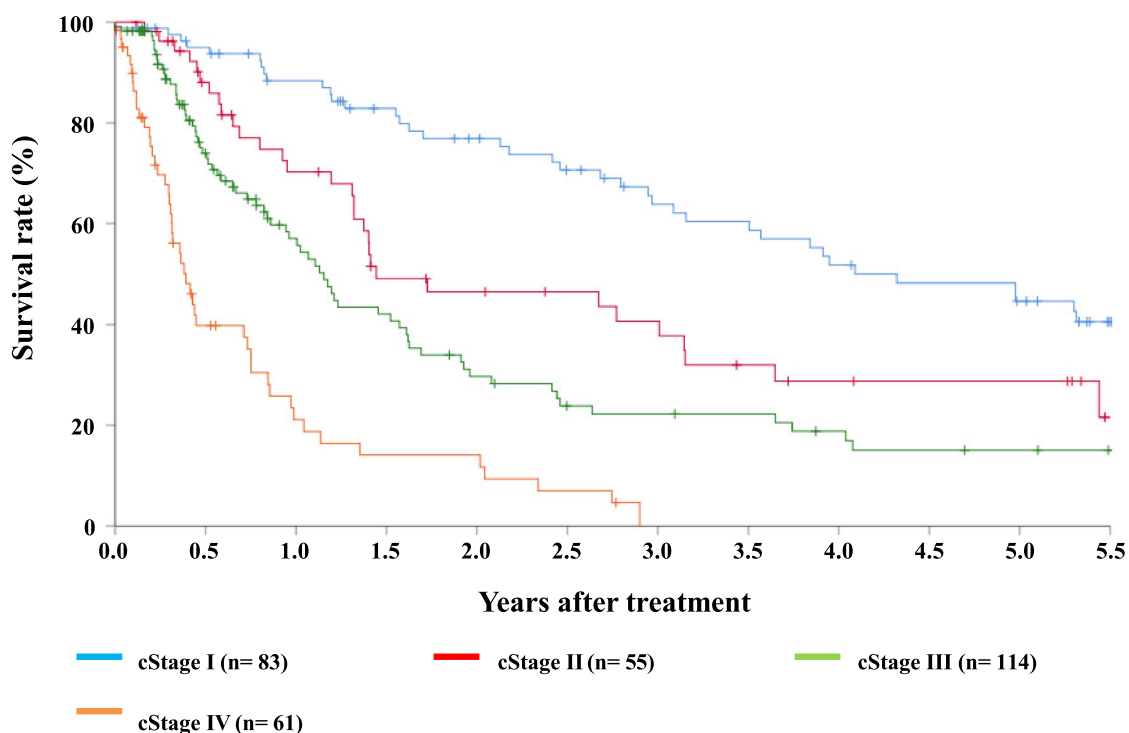
	Years after treatment				
	1	2	3	4	5
Chemoradiotherapy	68.9%	49.4%	40.5%	36.7%	33.5%
Radiotherapy alone	63.5%	45.3%	35.5%	27.8%	24.2%
Chemotherapy alone	55.0%	33.3%	24.8%	21.5%	20.1%
Palliative radiotherapy	64.9%	35.7%	23.8%	18.4%	15.2%

Fig. 4 Survival of patients treated with chemotherapy and/or radiotherapy



	Years after treatment				
	1	2	3	4	5
cStage I	97.8%	89.4%	81.0%	74.0%	67.1%
cStage II	86.5%	71.3%	61.8%	59.0%	52.9%
cStage III	70.1%	45.1%	35.2%	30.9%	28.8%
cStage IV	59.1%	40.1%	28.4%	24.3%	22.3%

Fig. 5 Survival of patients treated with definitive chemoradiotherapy according to the clinical stage (UICC TNM 7th)



	Years after treatment				
	1	2	3	4	5
cStage I	88.5%	77.0%	64.0%	51.9%	44.8%
cStage II	72.0%	47.6%	42.0%	29.1%	29.1%
cStage III	59.2%	30.7%	23.0%	19.5%	15.4%
cStage IV	27.3%	18.2%	1.7%	-	-

Fig. 6 Survival of patients who underwent radiotherapy alone according to the clinical stage (UICC TNM 7th)

IV. Results in patients who underwent esophagectomy in 2015

Tables 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, and Figs. 7, 8, 9, 10, 11, 12, 13, 14, 15

Table 14 Treatment modalities of esophagectomy

Treatment modalities	Cases (%)
Esophagectomy alone	2166 (41.9%)
Esophagectomy + postoperative chemotherapy	418 (8.1%)
Esophagectomy + postoperative chemoradiotherapy	109 (2.1%)
Esophagectomy + postoperative radiotherapy	30 (0.6%)
Preoperative chemotherapy + Esophagectomy	1901 (36.8%)
Preoperative chemoradiotherapy + Esophagectomy	266 (5.1%)
Definitive radiotherapy + Esophagectomy	7 (0.1%)
Definitive chemoradiotherapy + Esophagectomy	122 (2.4%)
Others	153 (3.0%)
Total	5172

Table 15 Tumor location

Locations	Cases (%)
Cervical	181 (3.3%)
Upper thoracic	620 (11.3%)
Middle thoracic	2437 (44.5%)
Lower thoracic	1616 (29.5%)
EG	404 (7.4%)
E = G	106 (1.9%)
GE	93 (1.7%)
Unknown	22 (0.4%)
Total	5479

EG esophagogastric, *E* esophagus, *G* gastric

Table 17 Video-assisted surgery

Video-assisted surgery	Cases (%)
None	2039 (39.4%)
Thoracoscopy	1480 (28.6%)
Thoracoscopy + Laparoscopy	1319 (25.5%)
Thoracoscopy + Laparoscopy + Mediastinoscopy	9 (0.2%)
Thoracoscopy + Mediastinoscopy	3 (0.1%)
Thoracoscopy + Other	2 (0.0%)
Laparoscopy	222 (4.3%)
Laparoscopy + Mediastinoscopy	16 (0.3%)
Laparoscopy + Mediastinoscopy + Other	0 (0.0%)
Mediastinoscopy	72 (1.4%)
Laparoscopy + Other	5 (0.1%)
Others	4 (0.1%)
Unknown	1 (0.0%)
Total	5172

Table 16 Approaches to tumor resection

Approaches	Cases (%)
Cervical	143 (2.8%)
Right thoracic	4590 (88.7%)
Left thoracic	72 (1.4%)
Left thoracoabdominal	58 (1.1%)
Abdominal	133 (2.6%)
Transhiatal lower esophagectomy	71 (1.4%)
Transhiatal thoracic esophagectomy	81 (1.6%)
Sternotomy	9 (0.2%)
Others	9 (0.2%)
Unknown	6 (0.1%)
Total	5172

Thoracic includes thoracotomy and thoracoscopic
 Abdominal includes laparotomy and laparoscopic

Table 18 Fields of lymph node dissection according to the location of tumor

Field of lymphadenectomy	Cervical	Upper thoracic	Middle thoracic	Lower thoracic	Abdominal	E = G	GE	Unknown	Total
None	10 (6.3%)	9 (1.5%)	34 (1.5%)	36 (2.3%)	6 (1.6%)	0 (0.0%)	4 (5.2%)	1 (12.5%)	100 (1.9%)
C	31 (19.5%)	14 (2.4%)	31 (1.3%)	17 (1.1%)	1 (0.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	94 (1.8%)
C + UM	19 (11.9%)	3 (0.5%)	5 (0.2%)	1 (0.1%)	2 (0.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	30 (0.6%)
C + UM + MLM	8 (5.0%)	19 (3.2%)	48 (2.1%)	24 (1.5%)	1 (0.3%)	0 (0.0%)	1 (1.3%)	0 (0.0%)	101 (2.0%)
C + UM + MLM + A	73 (45.9%)	382 (65.3%)	1227 (53.2%)	626 (40.0%)	60 (16.0%)	11 (11.5%)	3 (3.9%)	4 (50.0%)	2386 (46.1%)
C + UM + A	1 (0.6%)	7 (1.2%)	15 (0.7%)	3 (0.2%)	1 (0.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	27 (0.5%)
C + MLM	1 (0.6%)	1 (0.2%)	0 (0.0%)	2 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	4 (0.1%)
C + MLM + A	1 (0.6%)	2 (0.3%)	13 (0.6%)	9 (0.6%)	2 (0.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	27 (0.5%)
C + A	1 (0.6%)	0 (0.0%)	6 (0.3%)	4 (0.3%)	1 (0.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	12 (0.2%)
UM	1 (0.6%)	2 (0.3%)	13 (0.6%)	7 (0.4%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	23 (0.4%)
UM + MLM	3 (1.9%)	12 (2.1%)	45 (2.0%)	22 (1.4%)	2 (0.5%)	0 (0.0%)	1 (1.3%)	0 (0.0%)	85 (1.6%)
UM + MLM + A	8 (5.0%)	116 (19.8%)	785 (34.0%)	667 (42.6%)	150 (39.9%)	39 (40.6%)	16 (20.8%)	2 (25.0%)	1783 (34.5%)
UM + A	1 (0.6%)	1 (0.2%)	4 (0.2%)	4 (0.3%)	1 (0.3%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	11 (0.2%)
MLM	1 (0.6%)	4 (0.7%)	4 (0.2%)	11 (0.7%)	2 (0.5%)	2 (2.1%)	2 (2.6%)	0 (0.0%)	26 (0.5%)
MLM + A	0 (0.0%)	6 (1.0%)	62 (2.7%)	114 (7.3%)	109 (29.0%)	37 (38.5%)	29 (37.7%)	0 (0.0%)	357 (6.9%)
A	0 (0.0%)	7 (1.2%)	15 (0.7%)	17 (1.1%)	38 (10.1%)	7 (7.3%)	21 (27.3%)	1 (12.5%)	106 (2.0%)
Total	159	585	2,307	1,564	376	96	77	8	5172

C bilateral cervical nodes, UM upper mediastinal nodes, MLM middle-lower mediastinal nodes, A abdominal nodes

Table 19 Reconstruction route

Route	Cases (%)
None	57 (1.1%)
Subcutaneous	319 (6.2%)
Retrosternal	2383 (46.1%)
Posterior mediastinal	1977 (38.2%)
Intrathoracic	317 (6.1%)
Cervical	67 (1.3%)
Others	44 (0.9%)
Unknown	8 (0.2%)
Total	5172

Table 20 Organs used for reconstruction

Organs	Cases (%)
None	69 (1.3%)
Whole stomach	212 (4.0%)
Gastric tube	4504 (85.4%)
Jejunum	210 (4.0%)
Free jejunum	85 (1.6%)
Colon	158 (3.0%)
Free colon	17 (0.3%)
Others	21 (0.4%)
Total organs	5,276
Total cases	5,103

Table 21 Histological classification

Histological classification	Cases (%)
Squamous cell carcinoma	4,329 (83.7%)
Squamous cell carcinoma	925 (17.9%)
Well differentiated	727 (14.1%)
Moderately differentiated	2075 (40.1%)
Poorly differentiated	602 (11.6%)
Adenocarcinoma	316 (6.1%)
Barrett's carcinoma	139 (2.7%)
Adenosquamous carcinoma	34 (0.7%)
Mucoepidermoid carcinoma	2 (0.0%)
Basaloid carcinoma	87 (1.7%)
Neuroendocrine tumor	1 (0.0%)
Neuroendocrine carcinoma	29 (0.6%)
Undifferentiated carcinoma	8 (0.2%)
Malignant melanoma	22 (0.4%)
Carcinosarcoma	25 (0.5%)
GIST	3 (0.1%)
Adenoid cystic carcinoma	4 (0.1%)
Sarcoma	3 (0.1%)
Other carcinomas	7 (0.1%)
Other tumors	33 (0.6%)
Unknown	130 (2.5%)
Total	5,172

GIST gastrointestinal stromal tumor

Table 22 Pathological depth of tumor invasion, pT (JES 10th)

Pathological depth of tumor invasion	Cases (%)
pT0	227 (4.4%)
pT1a	637 (12.3%)
pT1b	1470 (28.4%)
pT2	606 (11.7%)
pT3	1915 (37.0%)
pT4a	152 (2.9%)
pT4b	102 (2.0%)
pTX	63 (1.2%)
Total	5172

Table 23 Pathological grading of lymph node metastasis, pN (JES 10th)

Lymph node metastasis	Cases (%)
pN0	2568 (49.7%)
pN1	926 (17.9%)
pN2	989 (19.1%)
pN3	349 (6.7%)
pN4	309 (6.0%)
Unknown	31 (0.6%)
Total	5172

Table 24 Pathological grading of lymph node metastasis, pN (UICC TNM 7th)

Lymph node metastasis (Number of metastasis)	Cases (%)
pN0	2614 (50.5%)
pN1(1–2)	1353 (26.2%)
pN2(3–6)	754 (14.6%)
pN3(7–)	398 (7.7%)
pNX	53 (1.0%)
Total	5172

Table 25 Pathological findings of distant organ metastasis, pM (JES 10th)

Distant metastasis (M)	Cases (%)
M0	5009 (96.8%)
M1	103 (2.0%)
Mx	60 (1.2%)
Total	5172

Table 26 Residual tumor

Residual tumor (R)	Cases (%)
R0	4667 (90.2%)
R1	241 (4.7%)
R2	152 (2.9%)
RX	112 (2.2%)
Total	5172

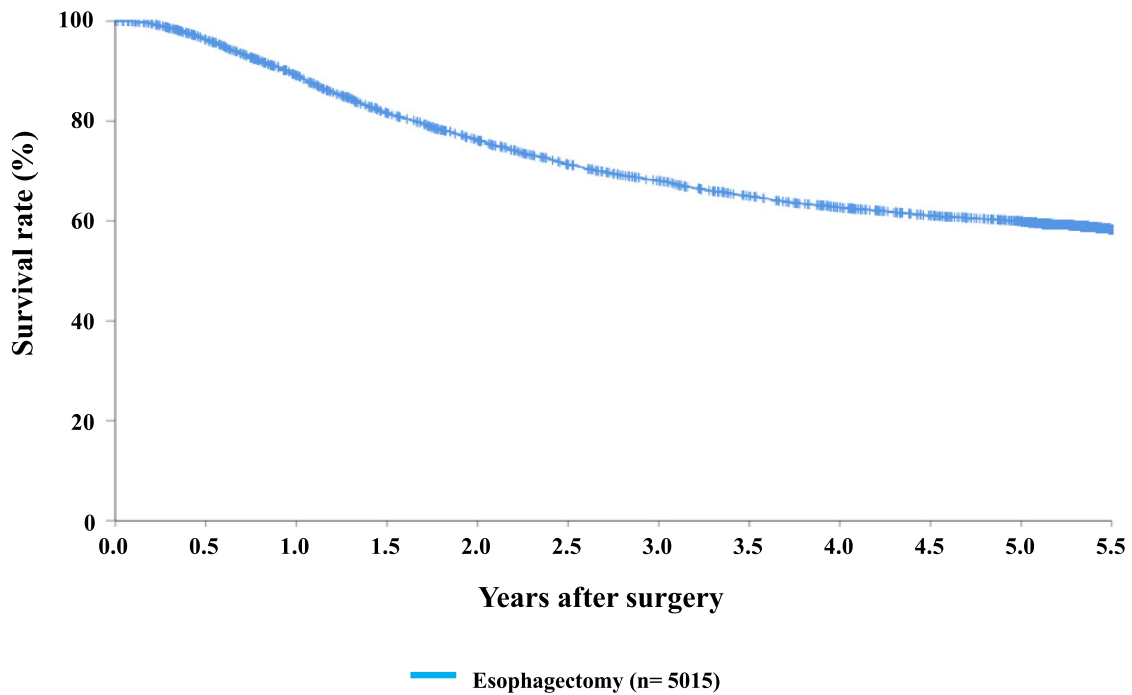
Table 27 Cause of death after esophagectomy

Cause of death	Cases (%)
Death due to recurrence	1809 (62.6%)
Death due to other cancer	205 (7.1%)
Death due to other diseases (with recurrence)	68 (2.4%)
Death due to other diseases (without recurrence)	404 (14.0%)
Death due to other diseases (recurrence unknown)	23 (0.8%)
Operative death*	41 (1.4%)
Postoperative hospital death**	77 (2.7%)
Unknown	264 (9.1%)
Total of death cases	2891
Follow-up period (months)	
Median (min–max)	59.76 (0.00–78.72)

*Operative death means death within 30 days after operation in or out of the hospital.

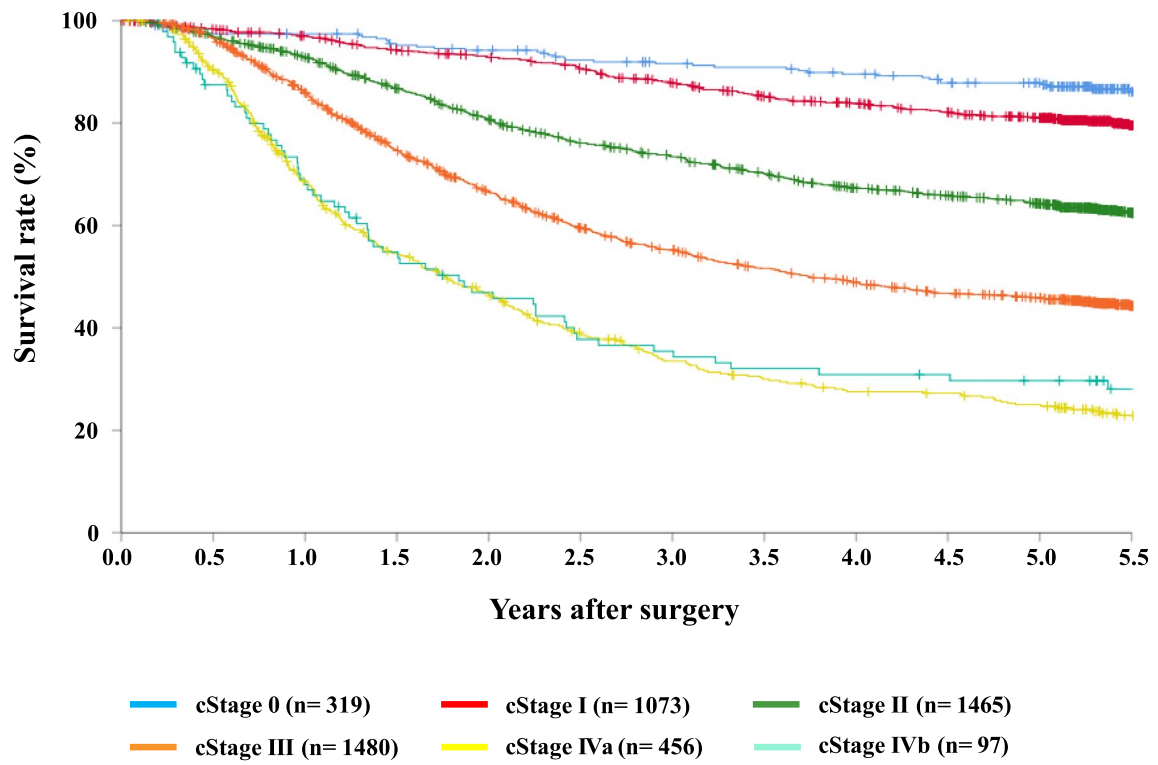
Operative mortality rate: 0.79%

**Hospital death is defined as death during the same hospitalization, regardless of department at the time of death. Hospital mortality rate: 2.3%



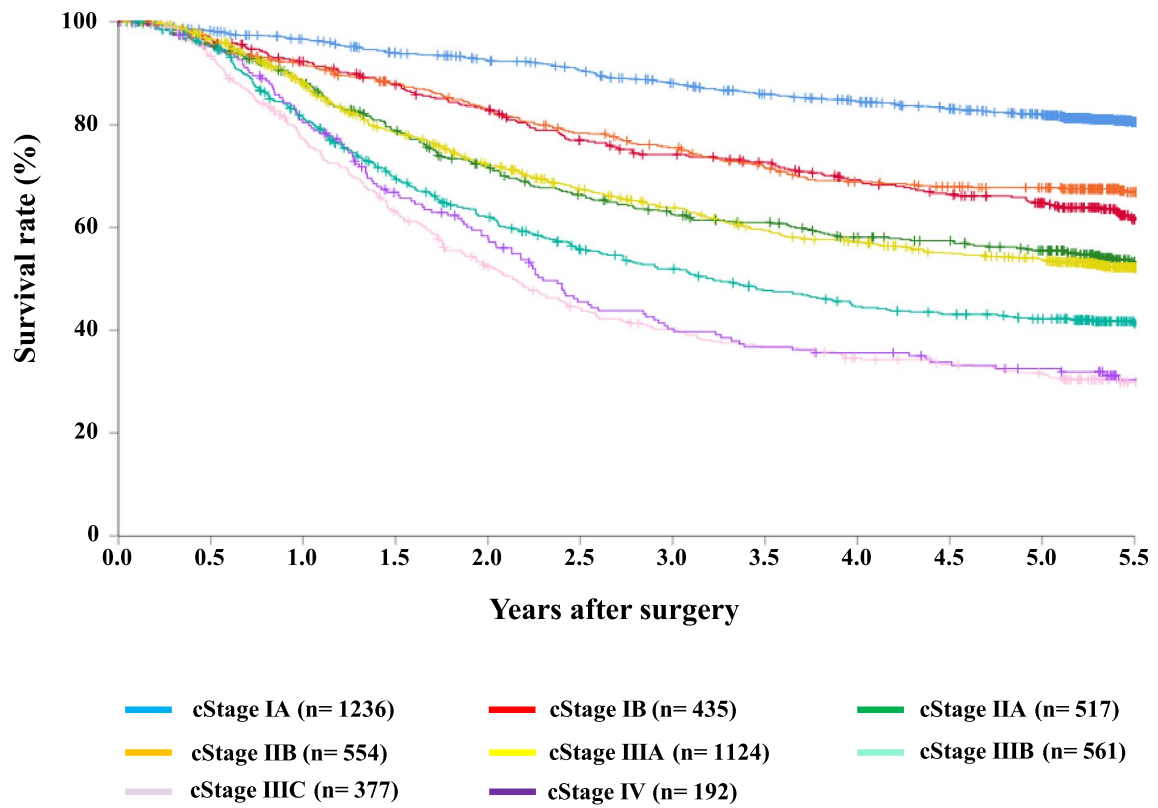
	Years after surgery				
	1	2	3	4	5
Esophagectomy	89.1%	76.2%	68.1%	62.7%	59.9%

Fig. 7 Survival of patients who underwent esophagectomy



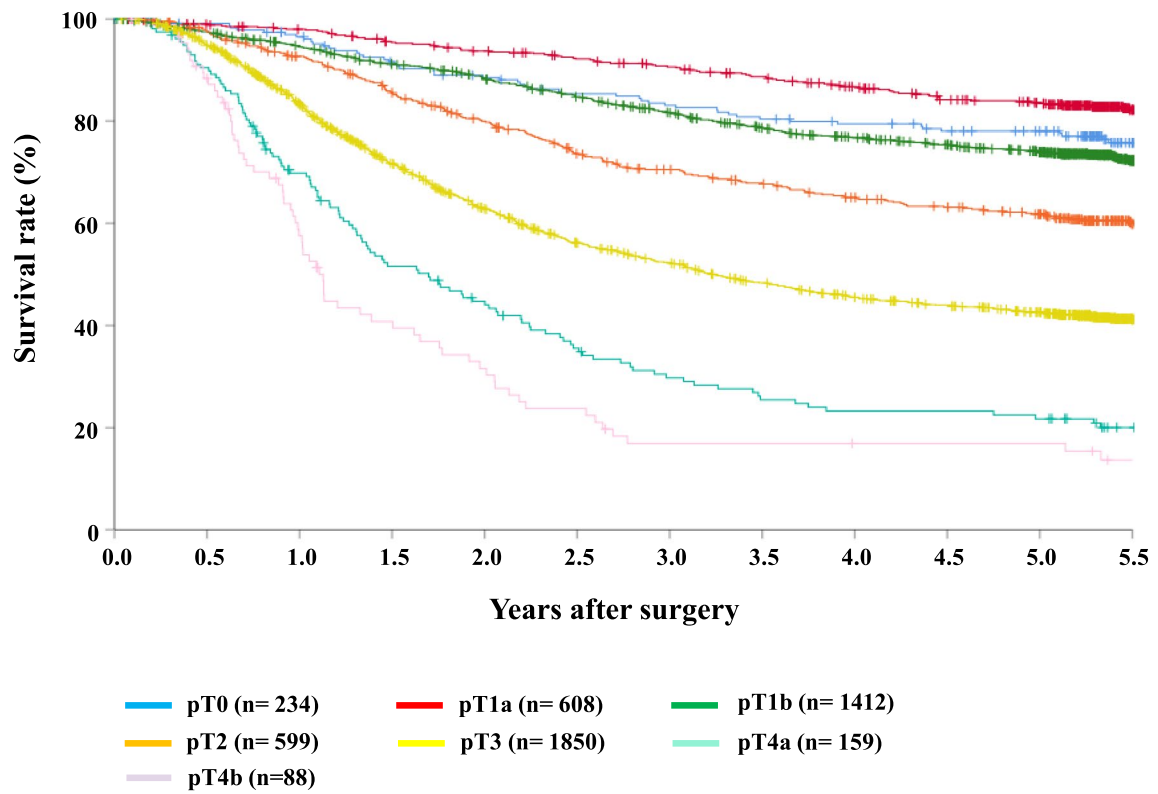
	Years after surgery				
	1	2	3	4	5
cStage 0	97.5%	94.2%	91.6%	89.6%	87.8%
cStage I	97.1%	92.8%	87.9%	83.9%	80.9%
cStage II	92.8%	80.7%	73.5%	67.3%	64.3%
cStage III	86.0%	66.6%	55.3%	49.0%	45.9%
cStage IVa	68.7%	46.8%	33.7%	27.6%	25.1%
cStage IVb	68.4%	47.3%	35.8%	31.1%	29.9%

Fig. 8 Survival of patients who underwent esophagectomy according to the clinical stage (JES 10th)



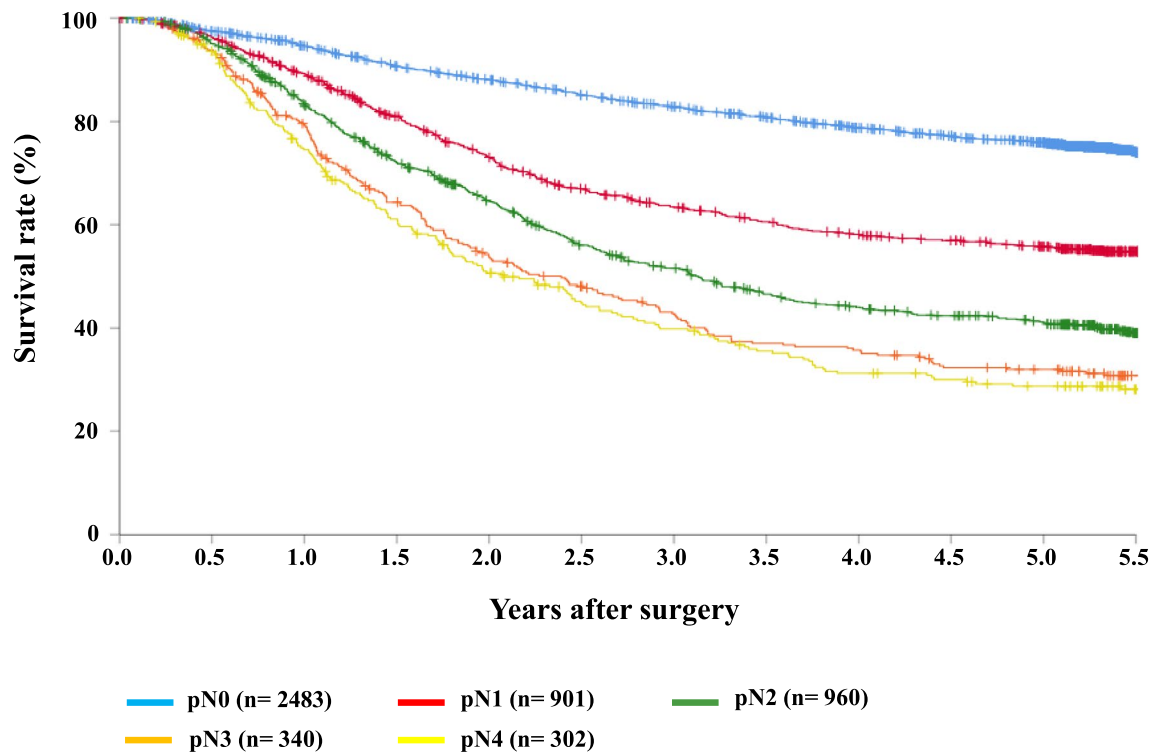
	Years after surgery				
	1	2	3	4	5
cStage IA	96.6%	92.4%	88.1%	84.6%	81.9%
cStage IB	92.3%	83.1%	74.2%	69.3%	64.7%
cStage IIA	88.4%	71.7%	62.5%	58.1%	55.5%
cStage IIB	91.6%	82.8%	75.6%	68.9%	67.7%
cStage IIIA	88.0%	72.3%	63.9%	57.3%	53.8%
cStage IIIB	81.4%	62.1%	52.1%	44.7%	42.4%
cStage IIIC	77.3%	52.3%	40.2%	34.4%	31.6%
cStage IV	80.5%	58.5%	40.6%	35.8%	32.7%

Fig. 9 Survival of patients who underwent esophagectomy according to the clinical stage (UICC TNM 7th)



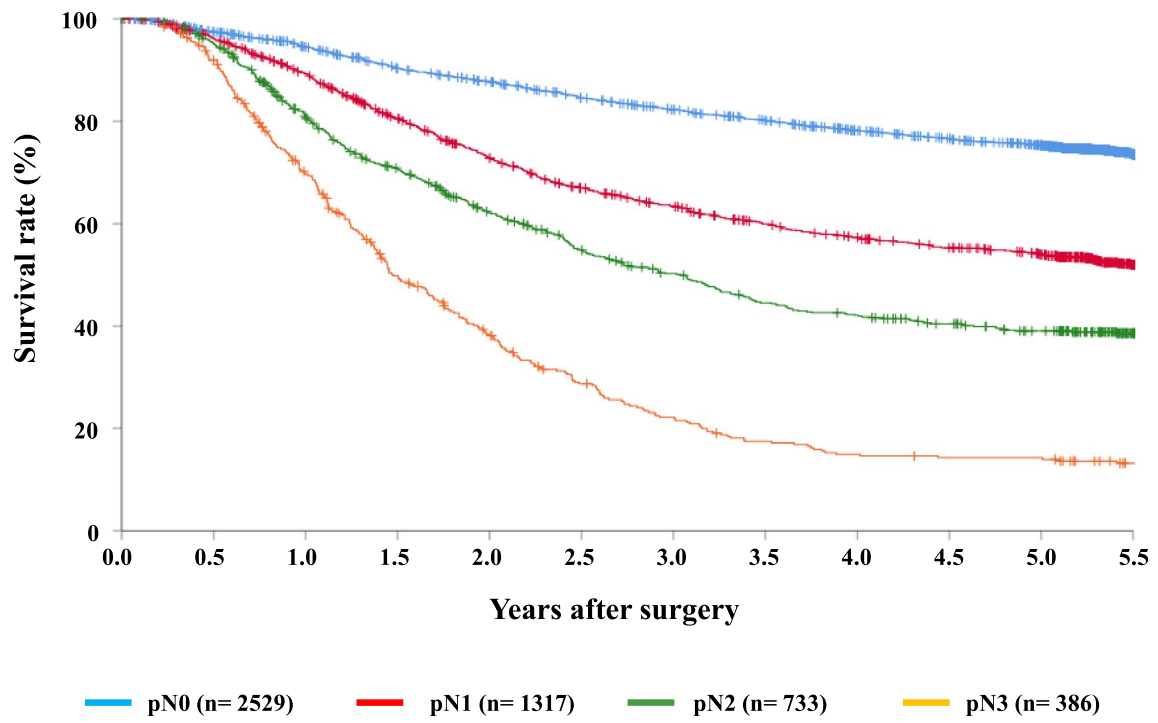
	Years after Esophagectomy				
	1	2	3	4	5
pT0	96.5%	88.5%	83.1%	79.5%	78.0%
pT1a	98.0%	93.8%	90.6%	86.7%	83.6%
pT1b	94.6%	88.3%	81.7%	76.8%	73.9%
pT2	92.7%	79.9%	70.5%	65.0%	61.7%
pT3	83.4%	63.0%	52.4%	45.6%	42.7%
pT4a	69.7%	44.5%	29.7%	23.2%	21.7%
pT4b	58.6%	32.5%	17.3%	17.3%	17.3%

Fig. 10 Survival of patients who underwent esophagectomy according to the depth of tumor invasion, pT (JES 10th)



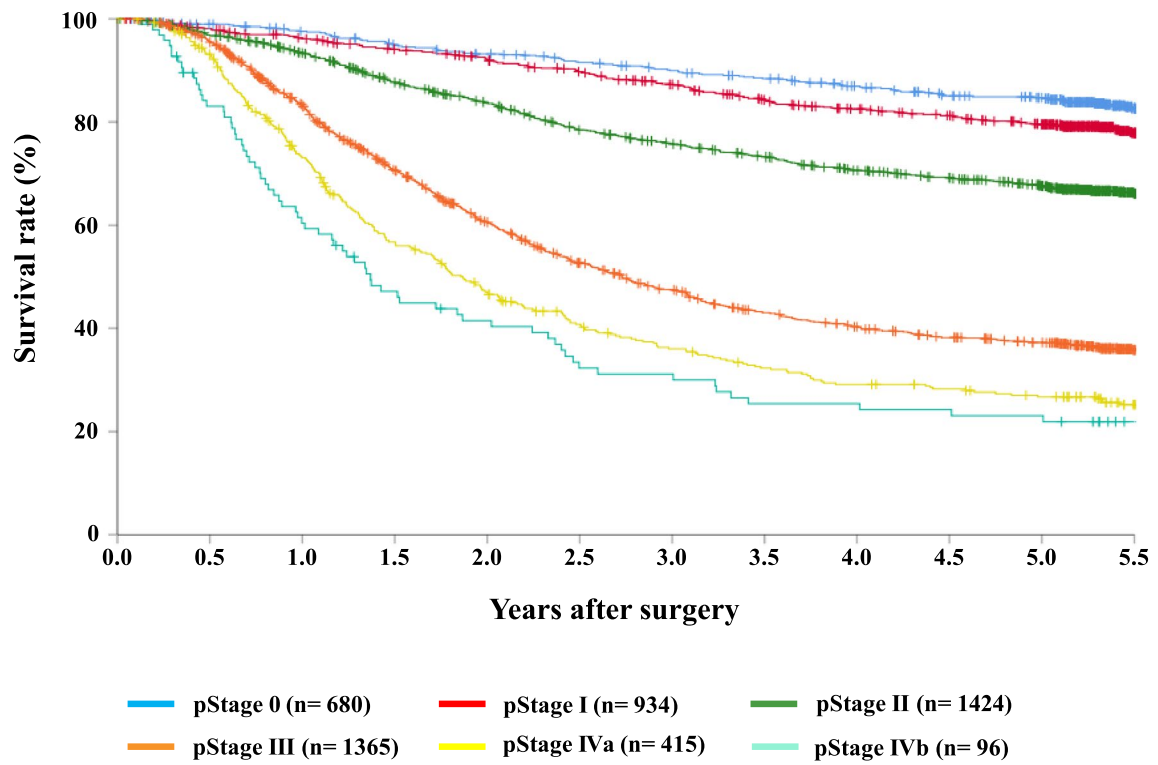
	Years after Esophagectomy				
	1	2	3	4	5
pN0	94.6%	88.0%	82.9%	78.8%	75.9%
pN1	89.2%	73.2%	63.6%	58.2%	55.8%
pN2	83.2%	64.5%	51.5%	44.0%	41.0%
pN3	79.3%	53.9%	42.8%	35.8%	32.0%
pN4	74.9%	50.9%	40.4%	31.7%	29.1%

Fig. 11 Survival of patients who underwent esophagectomy according to lymph-node metastasis (JES 10th)



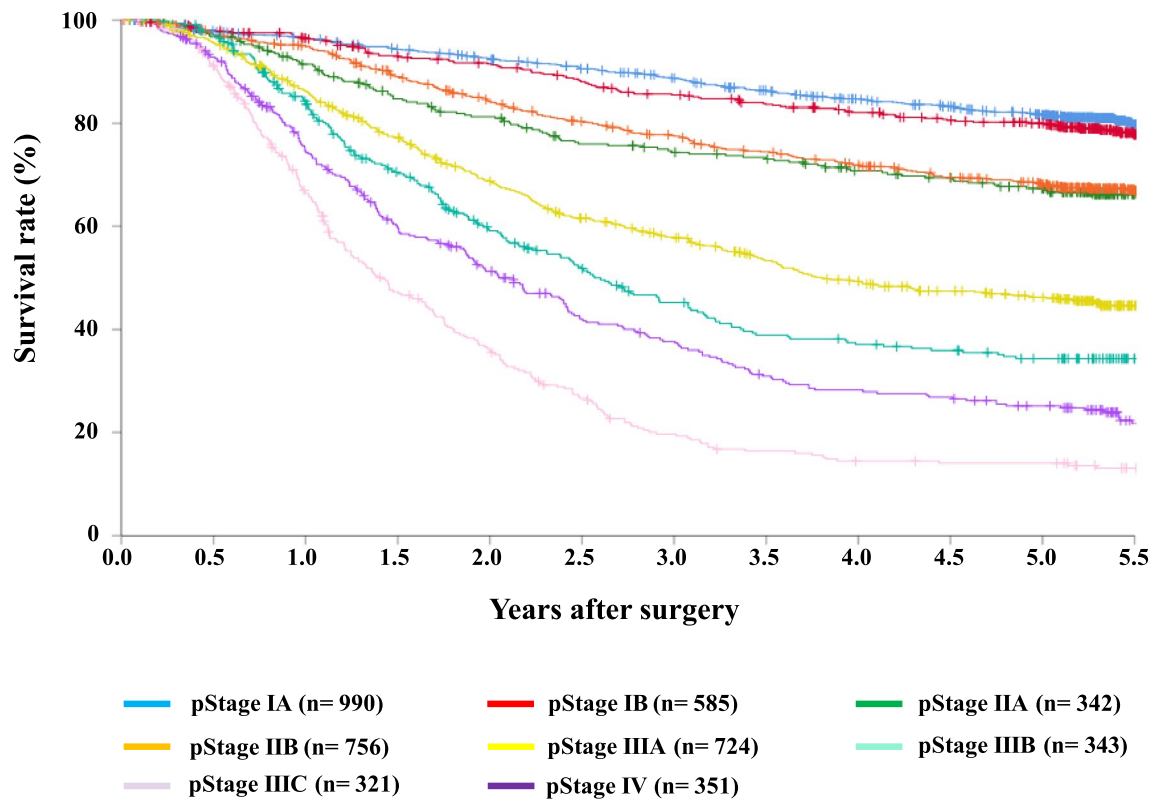
	Years after Esophagectomy				
	1	2	3	4	5
pN0	94.5%	87.7%	82.3%	78.2%	75.3%
pN1	89.3%	73.0%	63.4%	57.3%	54.0%
pN2	80.9%	62.0%	50.2%	42.1%	39.0%
pN3	69.8%	38.4%	22.6%	15.2%	14.5%

Fig. 12 Survival of patients who underwent esophagectomy according to lymph-node metastasis (UICC TNM 7th)



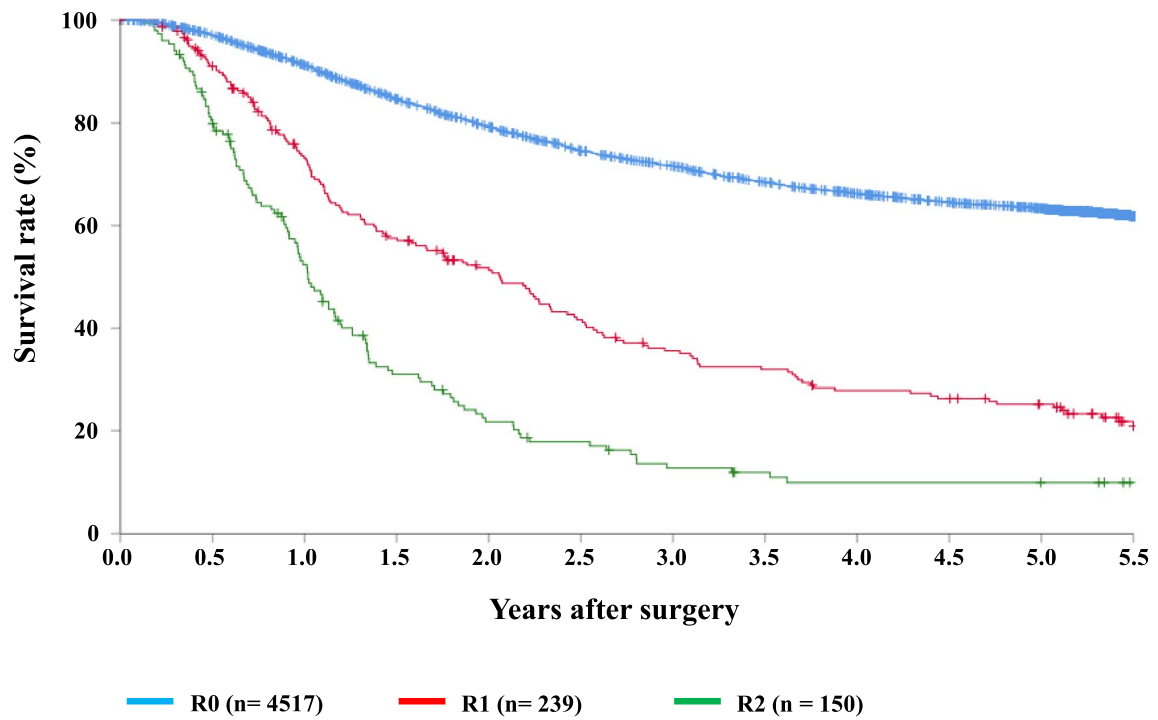
	Years after Esophagectomy				
	1	2	3	4	5
pStage 0	97.6%	93.2%	90.0%	87.0%	84.7%
pStage I	96.2%	92.0%	87.3%	82.5%	79.5%
pStage II	93.4%	83.6%	75.8%	70.6%	67.6%
pStage III	83.2%	60.7%	47.5%	40.4%	37.3%
pStage IVa	73.3%	47.3%	36.3%	29.4%	27.0%
pStage IVb	60.8%	41.9%	31.4%	25.6%	23.3%

Fig. 13 Survival of patients who underwent esophagectomy according to the pathological stage (JES 10th)



	Years after Esophagectomy				
	1	2	3	4	5
pStage IA	96.4%	92.4%	88.7%	84.7%	81.6%
pStage IB	96.5%	91.5%	85.5%	82.1%	80.0%
pStage IIA	91.4%	81.3%	74.4%	70.8%	67.3%
pStage IIB	95.0%	84.2%	77.6%	71.9%	68.1%
pStage IIIA	86.2%	69.0%	57.8%	49.4%	46.3%
pStage IIIB	84.3%	59.2%	45.3%	37.2%	34.4%
pStage IIIC	66.7%	36.3%	20.1%	14.7%	14.3%
pStage IV	74.6%	51.4%	37.9%	28.4%	25.2%

Fig. 14 Survival of patients who underwent esophagectomy according to the pathological stage (UICC TNM 7th)



	Years after Esophagectomy				
	1	2	3	4	5
R0	91.2%	79.3%	71.6%	66.3%	63.3%
R1	73.4%	51.5%	35.3%	27.6%	24.9%
R2	52.7%	22.3%	13.2%	10.4%	10.4%

Fig. 15 Survival of patients

Declarations

Ethical statement All procedures were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1964 and later versions.

Conflict of interest Shiyori Usune, Arata Takahashi, and Hiroaki Miyata are affiliated with the Department of Healthcare Quality Assessment at the University of Tokyo. The department is a social collaboration department supported by grants from the National Clinical Database, Johnson & Johnson K.K., Nipro Co, and Intuitive Surgical Sàrl. Other authors have no conflict of interest.

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Authors and Affiliations

Masayuki Watanabe¹  · Yasushi Toh² · Ryu Ishihara³ · Koji Kono⁴ · Hisahiro Matsubara⁵ · Tatsuya Miyazaki⁶ · Masaru Morita² · Kentaro Murakami⁵ · Kei Muro⁷ · Hodaka Numasaki⁸ · Tsuneo Oyama⁹ · Hiroshi Saeki¹⁰ · Koji Tanaka¹¹ · Takahiro Tsushima¹² · Masaki Ueno¹³ · Takashi Uno¹⁴ · Toshiyuki Yoshio¹⁵ · Shiyori Usune¹⁶ · Arata Takahashi¹⁶ · Hiroaki Miyata¹⁶ · The Registration Committee for Esophageal Cancer of the Japan Esophageal Society

¹ Department of Gastroenterological Surgery, Cancer Institute Hospital of Japanese Foundation for Cancer Research, 3-8-31 Ariake, Koto-ku, Tokyo 135-8550, Japan

² Department of Gastroenterological Surgery, National Hospital Organization Kyushu Cancer Center, 3-1-1 Notame, Minami-ku, Fukuoka 811-1395, Japan

³ Department of Gastrointestinal Oncology, Osaka International Cancer Institute, 3-1-69 Otemae, Chuo-ku, Osaka 541-8567, Japan

⁴ Department of Gastrointestinal Tract Surgery, Fukushima Medical University School of Medicine, 1 Hikarigaoka, Fukushima 960-1295, Japan

⁵ Department of Frontier Surgery, Graduate School of Medicine, Chiba University, 1-8-1 Inohana, Chuo-ku, Chiba 260-8670, Japan

⁶ Department of Surgery, Japanese Red Cross Maebashi Hospital, 389-1 Asakura-machi, Maebashi, Gunma 371-0811, Japan

⁷ Department of Clinical Oncology, Aichi Cancer Center Hospital, 1-1 Kanokoden, Chikusa-ku, Nagoya 464-8681, Japan

⁸ Department of Medical Physics and Engineering, Graduate School of Medicine, Osaka University, 2-2 Yamadaoka, Suita, Osaka 565-0871, Japan

⁹ Department of Endoscopy, Saku Central Hospital Advanced Care Center, 3400-28 Nakagomi, Saku, Nagano 385-0051, Japan

¹⁰ Department of General Surgical Science, Graduate School of Medicine, Gunma University, 3-39-22 Showa-machi, Maebashi, Gunma 371-8511, Japan

¹¹ Department Gastroenterological Surgery, Graduate School of Medicine, Osaka University, 2-2 Yamadaoka, Suita, Osaka 565-0871, Japan

¹² Division of Gastroenterological Oncology, Shizuoka Cancer Center, 1007 Shimonagakubo, Nagaizumi-cho, Sunto-gun, Shizuoka 411-8777, Japan

¹³ Department of Gastroenterological Surgery, Toranomon Hospital, 2-2-2 Toranomon, Minato-ku, Tokyo 105-8470, Japan

¹⁴ Department of Diagnostic Radiology and Radiation Oncology, Graduate School of Medicine, Chiba University, 1-8-1 Inohana, Chuo-ku, Chiba 260-8670, Japan

¹⁵ Department of Upper Gastrointestinal Medicine, Cancer Institute Hospital of Japanese Foundation for Cancer Research, 3-8-31 Ariake, Koto-ku, Tokyo 135-8550, Japan

¹⁶ Department of Healthcare Quality Assessment, Graduate School of Medicine, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8655, Japan