

Comprehensive Registry of Esophageal Cancer in Japan, 2007

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The Registration Committee for Esophageal Cancer of the Japan Esophageal Society

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Preface 2007

We deeply appreciate the great contributions of many physicians in the registry of esophageal cancer cases. The Comprehensive Registry of Esophageal Cancer in Japan, 2007, was published here, despite some delay. The registry complies with the Act for the Protection of Personal Information. The encryption with a HASH function is used for “anonymity in an unlinkable fashion”.

These data were first made available on December 25, 2014, as the Comprehensive Registry of Esophageal Cancer in Japan, 2008. Not all the pages are reprinted here; however, the original table and figure numbers have been maintained.

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

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We briefly summarized the Comprehensive Registry of Esophageal Cancer in Japan, 2007. Japanese Classification of Esophageal Cancer 10th and UICC TNM Classification 6th were used for cancer staging according to the subjected year. A total of 5216 cases were registered from 257 institutions in Japan. Tumor locations were cervical: 4.4 %, upper thoracic: 12.7 %, middle thoracic: 49.5 %, lower thoracic: 25.1 % and EG junction: 5.9 %. Superficial carcinomas (Tis, T1a, and T1b) were 35.7 %. As for the histologic type of biopsy specimens, squamous cell carcinoma and adenocarcinoma accounted for 90.1 % and 3.9 %, respectively. Regarding clinical results, the 5-year survival rates of patients treated using endoscopic mucosal resection, concurrent chemoradiotherapy, radiotherapy alone, chemotherapy alone, or esophagectomy were 88.1, 25.1, 16.0, 9.4, and 52.8 %, respectively. Esophagectomy was performed in 2834 cases. Concerning the approach used for esophagectomy, 19.8 % of the cases were treated thoraco-

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scopically. The operative mortality (within 30 days after surgery) was 0.67 % and the hospital mortality was 1.27 %.

We hope that this Comprehensive Registry of Esophageal Cancer in Japan for 2007 will help to improve all aspects of the diagnosis and treatment of esophageal cancer in Japan.

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I. Clinical factors of esophageal cancer patients treated in 2007

Institution-registered cases in 2007

Institution
Aichi Cancer Center
Aizawa Hospital
Akita University Hospital
Arao Municipal Hospital
Asahikawa Medical College Hospital
Beppu Medical Center
Chiba Cancer Center
Chiba Medical Center
Chiba Prefectural Sawara Hospital
Chiba University Hospital
Chibaken Saiseikai Narashino Hospital
Dokkyo Medical University Hospital
Fujioka General Hospital
Fujisawa Shounandai Hospital
Fujita Health University
Fukui Prefectural Hospital
Fukui University Hospital
Fukuoka Dental College and Dental Hospital
Fukuoka Saiseikai General Hospital
Fukuoka University Hospital
Fukuoka Wajiro Hospital
Fukushima Medical University Hospital
Gifu Prefectural General Medical Center
Gifu University Hospital
Gunma Central General Hospital
Gunma Prefectural Cancer Center
Gunma University Hospital
Gunmaken Saiseikai Maebashi Hospital
Hakodate Goryokaku Hospital
Hakodate National Hospital
Hamamatsu University School of Medicine, University Hospital
Health Insurance Naruto Hospital
Heartlife Hospital
Higashiosaka City General Hospital
Hino Memorial Hospital
Hiratsuka City Hospital
Hiratsuka Kyosai Hospital
Hiroshima City Asa Hospital
Hiroshima University Research Institute for Radiation Biology Medicine
Hitachi General Hospital
Hokkaido kin-ikyo Central Hospital
Hokkaido P.W.F.A.C Obihiro-Kosei General Hospital
Hokkaido University Hospital
Hyogo Cancer Center

continued

Institution
Hyogo College of Medicine
Ibaraki Prefectural Central Hospital
Ida Municipal Hospital
Iizuka Hospital
Imazu Surgical Clinic
Inazawa City Hospital
International University of Health and Welfare Hospital
Ishikawa Prefectural Central Hospital
Iwakuni Medical Center
Iwate Medical University Hospital
Japanese Red Cross Kyoto Second Hospital
Japanese Red Cross Shizuoka Hospital
Jichi Medical University Hospital
Juntendo University Hospital
Junwakai Memorial Hospital
Kagawa Prefectural Central Hospital
Kagawa Rosai Hospital
Kagawa University Hospital
Kagoshima Kenritsu Satsunan Hospital
Kagoshima University Hospital
Kanazawa Medical University Hospital
Kanazawa University Hospital
Kansai Medical University Hirakata Hospital
Kansai Rosai Hospital
Kashiwa Kousei General Hospital
Kawakita General Hospital
Kawasaki Hospital
Kawasaki Medical School Hospital
Kawasaki Municipal Hospital
Keio University Hospital
Keiyukai Sapporo Hospital
Kikuna Memorial Hospital
Kinki Central Hospital
Kinki University Hospital
Kiryu Kosei General Hospital
Kishiwada City Hospital
Kitakyushu Municipal Medical Center
Kitano Hospital
Kitasato University Hospital
Kitasato University Kitasato Institute Medical Center Hospital
Kobe City Medical Center General Hospital
Kobe University Hospital
Kochi University Hospital
Kokura Memorial Hospital
Kumamoto City Hospital
Kumamoto University Hospital
Kurashiki Central Hospital
Kurume First Social Insurance Hospital

continued

Institution

Kurume University Hospital
 Kuwana Medical Center
 Kyorin University Hospital
 Kyoto University Hospital
 Kyushu University Hospital
 Kyusyu Medical Center
 Machida Municipal Hospital
 Matsuda Hospital
 Matsumoto Medical Center
 Matsushita Memorial Hospital
 Matsuyama Red Cross Hospital
 Mie University Hospital
 Mito Red Cross Hospital
 Miyazaki Konan Hospital
 Murakami General Hospital
 Musashino Red Cross Hospital
 Nagahama City Hospital
 Nagano Red Cross Hospital
 Nagasaki University Hospital
 Nagayoshi General Hospital
 Nagoya City University Hospital
 Nagoya Daiichi Red Cross Hospital
 Nagoya University Hospital
 Nara Hospital Kinki University Faculty of Medicine
 Nara Medical University Hospital
 National Cancer Center Hospital
 National Cancer Center Hospital East
 National Center for Global Health and Medicine
 National Defense Medical College Hospital
 National Hospital Organization Chiba Medical Center
 National Hospital Organization Chiba-East Hospital
 National Hospital Organization Fukuoka-East Medical Center
 National Hospital Organization Hokkaido Cancer Center
 National Hospital Organization Kure Medical Center
 National Hospital Organization Kyushu Cancer Center
 National Hospital Organization Nagoya Medical Center
 National Hospital Organization Osaka National Hospital
 National Hospital Organization Tokyo Medical Center
 Nihon University Itabashi Hospital
 Niigata Cancer Center Hospital
 Niigata City General Hospital
 Niigata Prefectural Shibata Hospital
 Niigata University Medical and Dental Hospital
 Nikko Memorial Hospital
 Nippon Medical School Hospital
 Nippon Medical School Chiba Hokusoh Hospital
 Nippon Medical School Hospital
 Nippon Medical School Musashi Kosugi Hospital

continued

Institution

Nippon Medical School Tama Nagayama Hospital
 Nishi-Kobe Medical Center
 Nishinomiya Municipal Central Hospital
 NTT West Japan Osaka Hospital
 Numazu City Hospital
 Ohta General Hospital Foundation Ohta Nishinouchi Hospital
 Oita Red Cross Hospital
 Oita University Hospital
 Okayama Saiseikai General Hospital
 Okayama University Hospital
 Omuta City Hospital
 Onomichi Municipal Hospital
 Osaka City General Medical Center
 Osaka City University Hospital
 Osaka Hospital of Japan Seafarers Relief Association
 Osaka Koseinenkin Hospital
 Osaka Medical Center for Cancer and Cardiovascular Diseases
 Osaka Medical College Hospital
 Osaka Prefectural Hospital Organization Osaka General Medical Center
 Osaka Red Cross Hospital
 Osaka University Hospital
 Otsu Red Cross Hospital
 Rinku General Medical Center
 Ryukyu University Hospital
 Saga University Hospital
 Saga-Ken Medical center Koseikan
 Saiseikai Utsunomiya Hospital
 Saiseikai Yahata General Hospital
 Saitama City Hospital
 Saitama Medical Center
 Saitama Medical Center Jichi Medical University
 Saitama Medical University Hospital
 Saitama Medical University International Medical Center
 Saitama Prefectural Cancer Center
 Saitama Social Insurance Hospital
 Sakai Municipal Hospital
 Saku Central Hospital
 Sano Kousei General Hospital
 Seirojika National Hospital University Hospital
 Sendai City Hospital
 Sendai Medical Center
 Shiga Medical Center for Adults
 Shiga University of Medical Science Hospital
 Shikoku Cancer Center
 Shimada Hospital
 Shimane University Hospital
 Shimizu Welfare Hospital

continued

Institution

Shinshu University Hospital
 Shizuoka Cancer Center
 Shizuoka City Shizuoka Hospital
 Shizuoka General Hospital
 Showa University Hospital
 Social Insurance Omuta Tenryo Hospital
 Social Insurance Tagawa Hospital
 Social Insurance Yokohama Central Hospital
 Sonoda First Hospital
 Sugita Genpaku Memorial Obama Municipal Hospital
 Suita Municipal Hospital
 Suwa Red Cross Hospital
 Syowa University Hospital
 Syowa University Toyosu Hospital
 Takaoka Hospital
 Takasago Municipal Hospital
 Takatsuki Red Cross Hospital
 Tenri Hospital
 The Cancer Institute Hospital of JFCR
 The Jikei University Hospital
 The Research Center Hospital for Charged Particle Therapy of the NIRS
 Tochigi Cancer Center
 Toho University Hospital
 Toho University Omori Medical Center
 Tohoku Kosai Hospital
 Tohoku University Hospital
 Tokai University Hospital
 Tokushima Municipal Hospital
 Tokushima Red Cross Hospital
 Tokushima University Hospital
 Tokyo Dental College Ichikawa General Hospital
 Tokyo Jikeikai Medical

continued

Institution

Tokyo Medical and Dental University Hospital
 Tokyo Medical University Hospital
 Tokyo Metropolitan Cancer and Infectious Center Komagome Hospital
 Tokyo Metropolitan Health and Medical Corporation Toshima Hospital
 Tokyo University Hospital
 Tokyo Women's Medical University Hospital
 Tokyo Women's Medical University Medical Center East
 Tonan Hospital
 Tone Central Hospital
 Toranomom Hospital
 Tottori Prefectural Central Hospital
 Tottori University Hospital
 Toyama Prefectural Central Hospital
 Toyama University Hospital
 Tsuchiura Kyodo Hospital
 Tsukuba University Hospital
 University Hospital, Kyoto Prefectural University of Medicine
 University of Miyazaki Hospital
 Wakayama Medical University Hospital
 Yamagata Prefectural and Sakata Municipal Hospital Organization
 Yamagata Prefectural Central Hospital
 Yamagata Prefectural Shinjo Hospital
 Yamaguchi-ken Saiseikai Shimonoseki General Hospital
 Yamanashi Prefectural Central Hospital
 Yamanashi University Hospital
 Yokohama City Municipal Hospital
 Yokohama City University Hospital
 Yokohama City University Medical Center
 Yuri General Hospital

(Total 257 institutions)

Patient background**Table 1** Age and gender

Age	Male	Female	Unknown	Cases (%)
~29	9	0	0	9 (0.2 %)
30~39	9	7	0	16 (0.3 %)
40~49	122	36	4	162 (3.1 %)
50~59	911	158	8	1077 (20.6 %)
60~69	1800	238	18	2056 (39.4 %)
70~79	1298	206	9	1513 (29.0 %)
80–89	277	63	2	342 (6.6 %)
90~	11	7	0	18 (0.3 %)
Unknown	17	5	1	23 (0.4 %)
Total	4454	720	42	5216 (100 %)

Table 11 Primary treatment

Treatments	Cases (%)
Surgery	2892 (55.4 %)
Esophagectomy	2834 (54.3 %)
Palliative	58 (1.1 %)
Chemotherapy/radiotherapy	1366 (26.2 %)
Endoscopic treatment	782 (15.0 %)
Others	13 (0.2 %)
None/unknown	163 (3.1 %)
Total	5216 (100 %)

Table 12 Tumor location

Location of tumor	Endoscopic treatment (%)	Chemotherapy and/or radiotherapy (%)	Palliative surgery (%)	Esophagectomy (%)	Other (%)	None/Unknown (%)	Total (%)
Cervical	13 (1.7 %)	127 (9.3 %)	1 (1.7 %)	77 (2.7 %)	0	9 (5.5 %)	227 (4.4 %)
Upper thoracic	76 (9.7 %)	238 (17.4 %)	14 (24.1 %)	312 (11.0 %)	1 (7.7 %)	20 (12.3 %)	661 (12.7 %)
Middle thoracic	439 (56.1 %)	652 (47.7 %)	31 (53.4 %)	1380 (48.7 %)	7 (53.8 %)	73 (44.8 %)	2582 (49.5 %)
Lower thoracic	171 (21.9 %)	281 (20.6 %)	11 (19.0 %)	808 (28.5 %)	1 (7.7 %)	36 (22.1 %)	1308 (25.1 %)
E > G	35 (4.5 %)	29 (2.1 %)	1 (1.7 %)	199 (7.0 %)	0	3 (1.8 %)	267 (5.1 %)
E = G	0	3 (0.2 %)	0	25 (0.9 %)	0	1 (0.6 %)	29 (0.6 %)
G > E	0	1 (0.1 %)	0	10 (0.4 %)	0	0	11 (0.2 %)
Unknown	48 (6.1 %)	35 (2.6 %)	0	23 (0.8 %)	4 (30.8 %)	21 (12.9 %)	131 (2.5 %)
Total	782 (100 %)	1366 (100 %)	58 (100 %)	2834 (100 %)	13 (100 %)	163 (100 %)	5216 (100 %)

EG esophago-gastric

Table 15 Histologic types of biopsy specimens

Histologic types	Cases (%)
Not examined	63 (1.2 %)
SCC	4702 (90.1 %)
SCC	3062 (58.7 %)
Well diff.	301 (5.8 %)
Moderately diff.	1015 (19.5 %)
Poorly diff.	324 (6.2 %)
Adenocarcinoma	205 (3.9 %)
Undifferentiated	17 (0.3 %)
Carcinosarcoma	14 (0.3 %)
Malignant melanoma	12 (0.2 %)
Other tumors	51 (1.0 %)
Unknown	152 (2.9 %)
Total	5216 (100 %)

SCC squamous cell carcinoma

Table 16 Depth of tumor invasion, cT (UICC TNM 6th)

cT	Cases (%)
cTX	152 (2.9 %)
cT0	10 (0.2 %)
cTis	128 (2.5 %)
cT1	245 (4.7 %)
cT1a	579 (11.1 %)
cT1b	906 (17.4 %)
cT2	703 (13.5 %)
cT3	1840 (35.3 %)
cT4	653 (12.5 %)
Total	5216 (100 %)

Table 17 Lymph node metastasis, cN (UICC TNM 6th)

cN	Cases (%)
cNX	236 (4.5 %)
cN0	2433 (46.6 %)
cN1	2547 (48.8 %)
Total	5216 (100 %)

Table 18 Distant metastasis, cM (UICC TNM 6th)

cM	Cases (%)
cMX	178 (3.4 %)
cM0	4208 (80.7 %)
cM1	189 (3.6 %)
cM1a	167 (3.2 %)
cM1b	474 (9.1 %)
Total	5216 (100 %)

Table 20 Clinical Stage (UICC TNM 6th)

Location of tumor	Endoscopic treatment (%)	Chemotherapy and/or radiotherapy (%)	Palliative surgery (%)	Esophagectomy (%)	Other (%)	None/unknown (%)	Total (%)
0	95 (12.1 %)	5 (0.4 %)	0	13 (0.5 %)	0	4 (2.5 %)	117 (2.2 %)
I	555 (71.0 %)	181 (13.3 %)	3 (5.2 %)	673 (23.7 %)	3 (23.1 %)	21 (12.9 %)	1436 (27.5 %)
IIA	10 (1.3 %)	128 (9.4 %)	7 (12.1 %)	571 (20.1 %)	2 (15.4 %)	18 (11.0 %)	736 (14.1 %)
IIB	3 (0.4 %)	77 (5.6 %)	4 (6.9 %)	361 (12.7 %)	0	6 (3.7 %)	451 (8.6 %)
III	29 (3.7 %)	469 (34.3 %)	31 (53.4 %)	831 (29.3 %)	3 (23.1 %)	32 (19.6 %)	1395 (26.7 %)
IV	4 (0.5 %)	114 (8.3 %)	3 (5.2 %)	34 (1.2 %)	0	20 (12.3 %)	175 (3.4 %)
IVA	2 (0.3 %)	73 (5.3 %)	2 (3.4 %)	87 (3.1 %)	0	2 (1.2 %)	166 (3.2 %)
IVB	11 (1.4 %)	255 (18.7 %)	3 (5.2 %)	165 (5.8 %)	1 (7.7 %)	25 (15.3 %)	460 (8.8 %)
Unknown	73 (9.3 %)	64 (4.7 %)	5 (8.6 %)	99 (3.5 %)	4 (30.8 %)	35 (21.5 %)	280 (5.4 %)
Total	782 (100 %)	1366 (100 %)	58 (100 %)	2834 (100 %)	13 (100 %)	163 (100 %)	5216 (100 %)

II. Results of endoscopically treated patients in 2007

Table 22 Details of endoscopic treatment

Treatment details	Cases (%)
EMR	223 (28.5 %)
EMR + ESD	5 (0.6 %)
EMR + YAG laser	2 (0.3 %)
EMR + Tracheal stenting	1 (0.1 %)
ESD	475 (60.7 %)
ESD + PDT	1 (0.1 %)
ESD + YAG laser	2 (0.3 %)
ESD + other treatment	4 (0.5 %)
PDT	6 (0.8 %)
PDT + YAG laser	1 (0.1 %)
YAG laser	7 (0.9 %)
Esophageal stenting	42 (5.4 %)
Esophageal stenting + tracheal stenting	1 (0.1 %)
Esophageal stenting + other treatment	1 (0.1 %)
Tracheal stenting	6 (0.8 %)
Others	5 (0.6 %)
Total	782 (100 %)

EMR endoscopic mucosal resection, ESD endoscopic submucosal dissection, PDT photodynamic therapy, YAG yttrium aluminum garnet, APC Argon plasma coagulation, MCT microwave coagulation therapy, RFA Radiofrequency ablation

* “Esophageal stenting + tracheal stenting + other (PEG)” case is included in “Esophageal stenting + tracheal stenting”

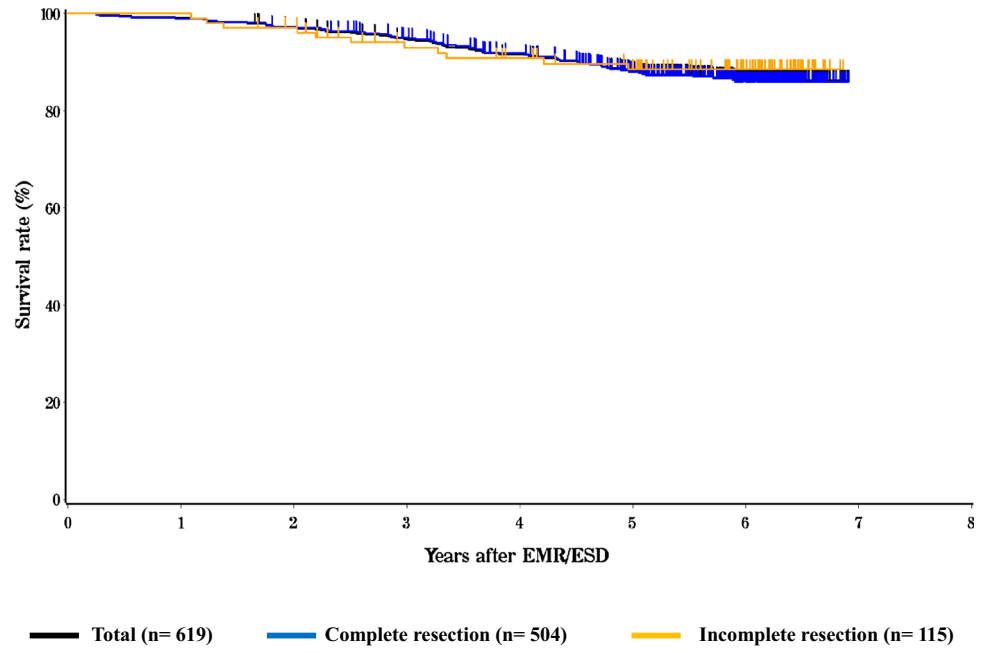
Table 30 Pathological depth of tumor invasion of EMR/ESD specimens

Pathological depth of tumor invasion (pT)	Cases (%)
pTX	27 (3.7 %)
pT0	6 (0.8 %)
pTis	170 (23.8 %)
pT1a	420 (58.9 %)
pT1b	87 (12.2 %)
pT2	3 (0.4 %)
Total	713 (100 %)

Table 26 Complications of EMR/ESD

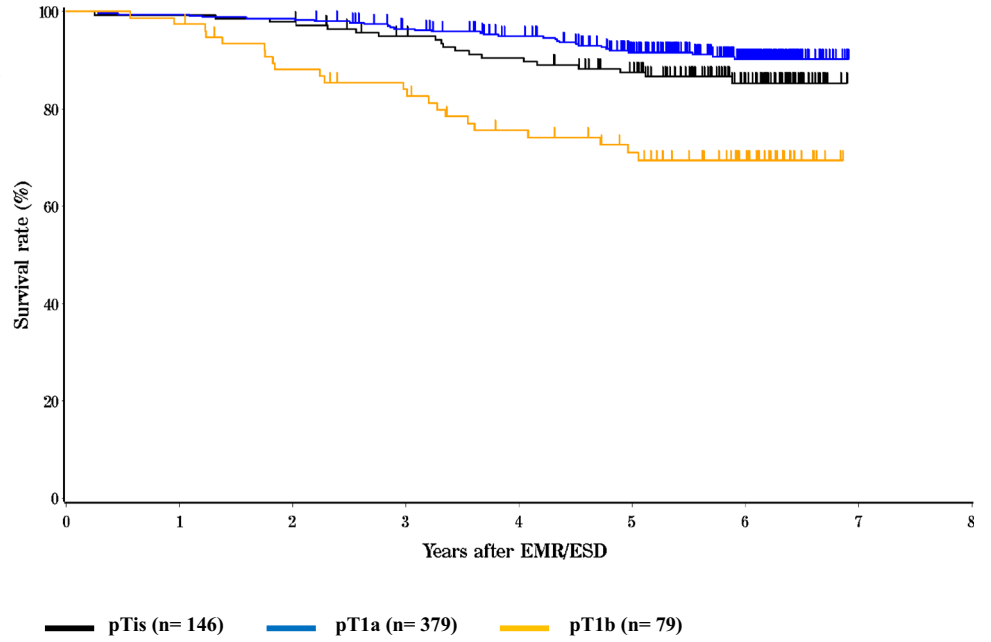
Complications of EMR/ESD	Cases (%)
None	653 (91.6 %)
Perforation	5 (0.7 %)
Bleeding	2 (0.3 %)
Mediastinitis	1 (0.1 %)
Stenosis	44 (6.2 %)
Perforation + mediastinitis	1 (0.1 %)
Perforation + stenosis	1 (0.1 %)
Others	6 (0.8 %)
Unknown	0
Total	713 (100 %)

Fig. 1 Survival of patients treated with EMR/ESD



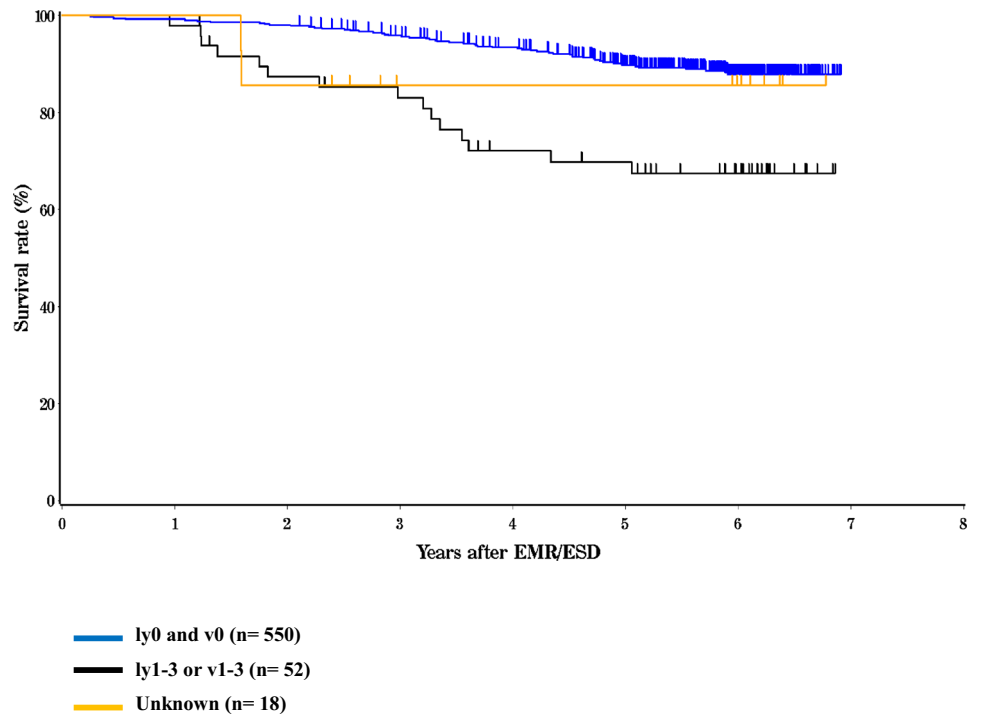
	Years after EMR/ESD							
	1	2	3	4	5	6	7	8
Total	99.2%	97.3%	94.8%	91.6%	88.1%	86.3%	-	-
Complete resection	99.0%	97.3%	95.1%	91.8%	88.1%	85.9%	-	-
Incomplete resection	100.0%	97.1%	93.0%	90.8%	88.5%	88.5%	-	-

Fig. 3 Survival of patients treated with EMR/ESD according to the pathological depth of tumor invasion (pT)



	Years after EMR/ESD							
	1	2	3	4	5	6	7	8
pTis	99.3%	97.9%	95.0%	90.5%	87.5%	85.3%	-	-
pT1a	99.4%	98.6%	96.5%	95.0%	91.7%	90.2%	-	-
pT1b	97.4%	88.1%	84.0%	75.6%	71.1%	69.5%	-	-

Fig. 4 Survival of patients treated with EMR/ESD according to the lymphatic and venous invasion



	Years after EMR/ESD							
	1	2	3	4	5	6	7	8
ly0 and v0	99.2%	98.1%	95.9%	93.4%	89.7%	87.9%	-	-
ly1-3 or v1-3	98.0%	87.4%	83.1%	72.1%	69.8%	67.4%	-	-
Unknown	100.0%	85.7%	85.7%	85.7%	85.7%	85.7%	-	-

III. Results in patients treated with chemotherapy and/or radiotherapy in 2007

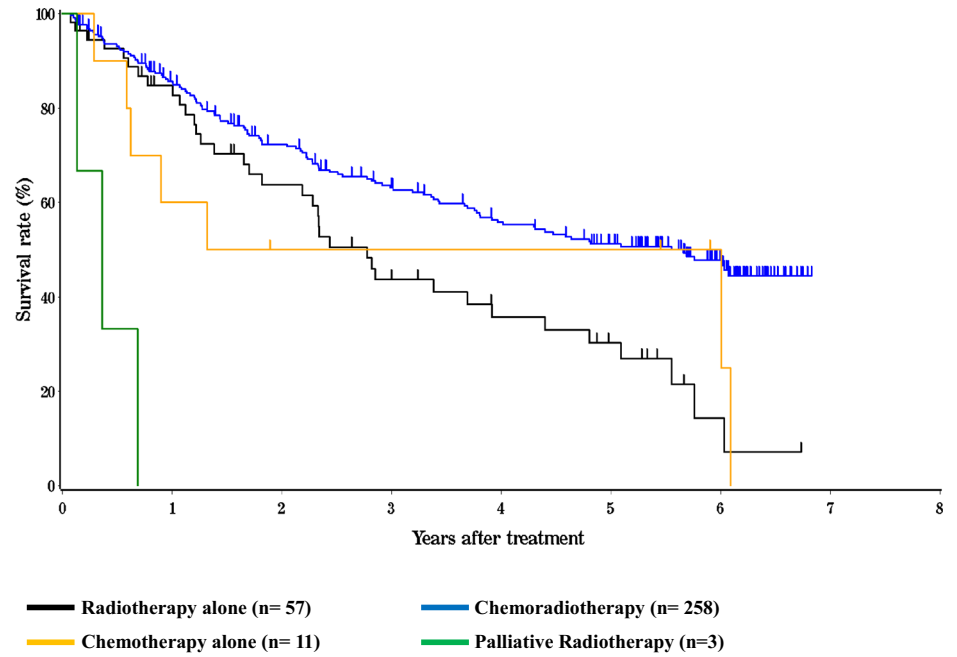
Table 33 Dose of radiation (non-surgically treated cases)

Dose of radiation (Gy)	Definitive		Palliative (%)	Recurrence (%)	Others (%)	Unknown (%)	Total (%)
	Radiation alone (%)	With chemotherapy (%)					
0	0	0	0	0	0	0	0
~29	7 (3.8 %)	12 (1.5 %)	15 (8.3 %)	0	0	1 (0.7 %)	35 (2.6 %)
30–39	6 (3.3 %)	22 (2.7 %)	20 (11.0 %)	2 (11.8 %)	10 (32.3 %)	1 (0.7 %)	61 (4.5 %)
40–49	6 (3.3 %)	31 (3.8 %)	23 (12.7 %)	4 (23.5 %)	13 (41.9 %)	0	77 (5.6 %)
50–59	14 (7.7 %)	118 (14.4 %)	39 (21.5 %)	2 (11.8 %)	4 (12.9 %)	1 (0.7 %)	178 (13.0 %)
60–69	139 (76.0 %)	607 (74.3 %)	79 (43.6 %)	7 (41.2 %)	2 (6.5 %)	0	834 (61.1 %)
70~	8 (7.2 %)	14 (2.1 %)	0	0	0	0	22 (2.2 %)
Unknown	3 (1.6 %)	13 (1.6 %)	5 (2.8 %)	2 (11.8 %)	2 (6.5 %)	134 (97.8 %)	159 (11.6 %)
Total	183 (100 %)	817 (100 %)	181 (100 %)	17 (100 %)	31 (100 %)	137 (100 %)	1366 (100 %)
Median (min–max)	60.0 (6.0–81.6)	60.0 (10.0–169.0)	58.0 (1.8–68.8)	50.0 (30.0–60.0)	40.0 (30.0–66.0)	30.0 (24.0–50.4)	60.0 (1.8–169.0)

Table 34 Dose of radiation (surgically treated cases)

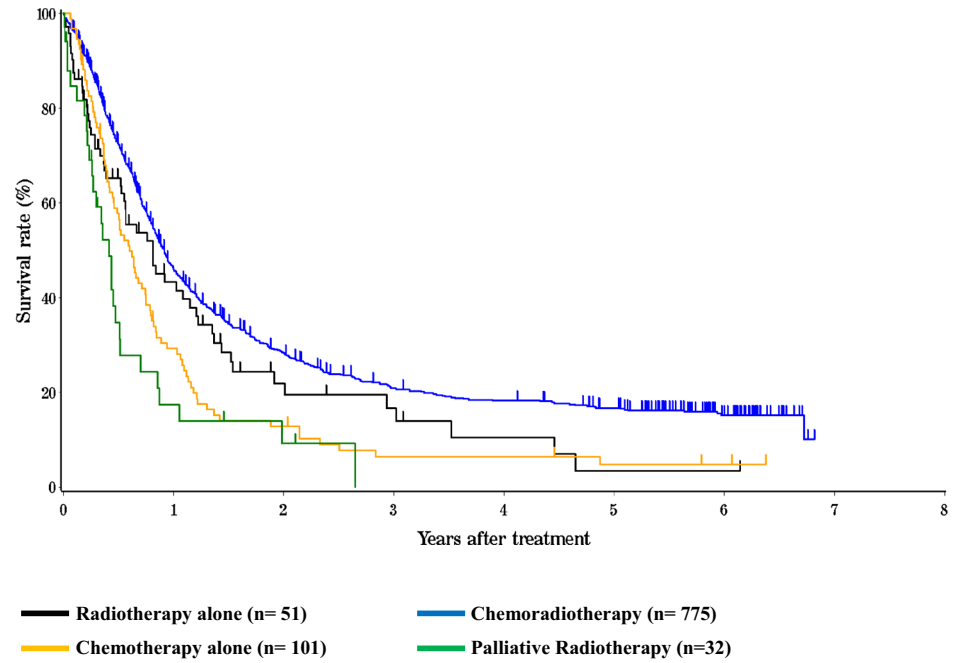
Dose of radiation (Gy)	Preoperative radiation (%)	Postoperative radiation (%)
0	0	0
~29	4 (1.8 %)	4 (4.3 %)
30–39	53 (23.8 %)	5 (5.3 %)
40–49	140 (62.8 %)	25 (26.6 %)
50–59	3 (1.3 %)	29 (30.9 %)
60–69	17 (7.6 %)	27 (28.7 %)
70–	1 (0.5 %)	1 (1.1 %)
Unknown	5 (2.2 %)	3 (3.2 %)
Total	223 (100 %)	94 (100 %)
Median (min–max)	40 (23.4–70.0)	50 (14.0–75.0)

Fig. 6 Survival of patients treated with chemotherapy and/or radiotherapy (cStage I-IIA)



	Years after treatment							
	1	2	3	4	5	6	7	8
Radiotherapy alone	84.8%	63.7%	43.7%	35.8%	30.3%	14.3%	-	-
Chemoradiotherapy	85.7%	72.3%	63.1%	55.8%	51.2%	47.7%	-	-
Chemotherapy alone	60.0%	50.0%	50.0%	50.0%	50.0%	50.0%	-	-
Palliative radiotherapy	0.0%	-	-	-	-	-	-	-

Fig. 7 Survival of patients treated with chemotherapy and/or radiotherapy (cStage IIB-IVB)



	Years after treatment							
	1	2	3	4	5	6	7	8
Radiotherapy alone	43.3%	21.9%	16.7%	10.4%	3.5%	3.5%	-	-
Chemoradiotherapy	46.1%	28.3%	21.0%	18.3%	16.7%	15.2%	-	-
Chemotherapy alone	29.3%	12.9%	6.4%	6.4%	4.8%	4.8%	-	-
Palliative radiotherapy	17.4%	9.3%	0.0%	-	-	-	-	-

IV. Results in patients underwent esophagectomy in 2007

Table 40 Treatment modalities of esophagectomy

Treatments	Cases (%)
Esophagectomy	1540 (54.3 %)
Esophagectomy + radiotherapy	98 (3.5 %)
Esophagectomy + chemoradiotherapy	514 (18.1 %)
Esophagectomy + chemoradiotherapy + endoscopic treatment	3 (0.1 %)
Esophagectomy + chemoradiotherapy + other treatment	1 (0.0 %)
Esophagectomy + radiotherapy + other treatment	2 (0.1 %)
Esophagectomy + chemotherapy	613 (21.6 %)
Esophagectomy + chemotherapy + endoscopic treatment	5 (0.2 %)
Esophagectomy + endoscopic treatment	55 (1.9 %)
Esophagectomy + other treatment	3 (0.1 %)
Total	2834 (100 %)

Table 42 Tumor location

Locations	Cases (%)
Cervical	77 (2.7 %)
Upper thoracic	312 (11.0 %)
Middle thoracic	1380 (48.7 %)
Lower thoracic	808 (28.5 %)
E > G	199 (7.0 %)
E = G	25 (0.9 %)
G > E	10 (0.4 %)
Unknown	23 (0.8 %)
Total lesions	2834 (100 %)

Table 43 Approaches to tumor resection

Approaches	Cases (%)
Cervical approach	39 (1.4 %)
Right thoracotomy	2417 (85.3 %)
Left thoracotomy	44 (1.6 %)
Left thoracoabdominal approach	75 (2.6 %)
Laparotomy	95 (3.4 %)
Transhiatal thoracic esophagectomy	57 (2.0 %)
Transhiatal lower esophagectomy	41 (1.4 %)
Sternotomy	15 (0.5 %)
Others	11 (0.4 %)
Unknown	40 (1.4 %)
Total	2834 (100 %)

Table 44 Endoscopic surgery

Endoscopic surgery	Cases (%)
None	2010 (70.9 %)
Thoracoscopy-assisted	427 (15.1 %)
Laparoscopy-assisted	128 (4.5 %)
Thoracoscopy + Laparoscopy-assisted	131 (4.6 %)
Mediastinoscopy-assisted	31 (1.1 %)
Thoracoscopy + Laparoscopy + Mediastinoscopy-assisted	1 (0.0 %)
Thoracoscopy + Mediastinoscopy-assisted	3 (0.1 %)
Laparoscopy + Mediastinoscopy-assisted	1 (0.0 %)
Others	2 (0.1 %)
Unknown	100 (3.5 %)
Total	2834 (100 %)

Table 45 Fields of lymph node dissection according to the location of the tumor

Field of lymphadenectomy	Cervical	Upper thoracic	Middle thoracic	Lower thoracic	E > G	E = G	G > E	Unknown	Total
None	4 (5.2 %)	17 (5.4 %)	70 (5.1 %)	34 (4.2 %)	8 (4.0 %)	0	0	3 (37.5 %)	136 (4.8 %)
C	19 (24.7 %)	3 (1.0 %)	3 (0.2 %)	4 (0.5 %)	3 (1.5 %)	0	0	1 (12.5 %)	33 (1.2 %)
C + UM	13 (16.9 %)	2 (0.6 %)	0	0	0	0	0	1 (12.5 %)	16 (0.6 %)
C + UM + MLM	4 (5.2 %)	12 (3.8 %)	29 (2.1 %)	11 (1.4 %)	2 (1.0 %)	0	0	0	58 (2.0 %)
C + UM + MLM + A	20 (26.0 %)	181 (58.0 %)	665 (48.2 %)	300 (37.1 %)	17 (8.5 %)	0	0	5 (62.5 %)	1188 (41.9 %)
C + UM + MLM + A + Other	0	0	2 (0.1 %)	1 (0.1 %)	0	0	0	0	3 (0.1 %)
C + UM + A	1 (1.3 %)	7 (2.2 %)	2 (0.1 %)	0	0	0	0	0	10 (0.4 %)
C + MLM + A	1 (1.3 %)	0	8 (0.6 %)	2 (0.2 %)	0	0	0	0	11 (0.4 %)
C + A	6 (7.8 %)	1 (0.3 %)	4 (0.3 %)	0	2 (1.0 %)	0	0	0	13 (0.5 %)
UM	0	1 (0.3 %)	2 (0.1 %)	0	0	0	0	1 (12.5 %)	4 (0.1 %)
UM + MLM	0	3 (1.0 %)	16 (1.2 %)	10 (1.2 %)	1 (0.5 %)	0	0	1 (12.5 %)	31 (1.1 %)
UM + MLM + A	5 (6.5 %)	59 (18.9 %)	454 (32.9 %)	307 (38.0 %)	54 (27.1 %)	6 (24.0 %)	0	4 (50.0 %)	889 (31.4 %)
UM + MLM + A + Other	0	0	1 (0.1 %)	1 (0.1 %)	0	0	0	0	2 (0.1 %)
UM + A	0	0	3 (0.2 %)	5 (0.6 %)	0	0	0	0	8 (0.3 %)
MLM	0	0	6 (0.4 %)	2 (0.2 %)	1 (0.5 %)	0	0	2 (25.0 %)	11 (0.4 %)
MLM + A	1 (1.3 %)	7 (2.2 %)	42 (3.0 %)	97 (12.0 %)	76 (38.2 %)	11 (44.0 %)	5 (50.0 %)	2 (25.0 %)	241 (8.5 %)
A	1 (1.3 %)	3 (1.0 %)	12 (0.9 %)	12 (1.5 %)	31 (15.6 %)	7 (28.0 %)	5 (50.0 %)	2 (25.0 %)	73 (2.6 %)
A + Other	0	0	1 (0.1 %)	0	0	0	0	0	1 (0.0 %)
Unknown	2 (2.6 %)	16 (5.1 %)	60 (4.3 %)	22 (2.7 %)	4 (2.0 %)	1 (4.0 %)	0	1 (12.5 %)	106 (3.7 %)
Total	77 (100 %)	312 (100 %)	1380 (100 %)	808 (100 %)	199 (100 %)	25 (100 %)	10 (100 %)	23 (100 %)	2834 (100 %)

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

Table 47 Reconstruction route

Reconstruction route	Cases (%)
None	34 (1.2 %)
Subcutaneous	300 (10.2 %)
Retrosternal	1129 (38.5 %)
Intrathoracic	368 (12.5 %)
Posterior mediastinal	1006 (34.3 %)
Cervical	23 (0.8 %)
Others	27 (0.9 %)
Unknown	47 (1.6 %)
Total	2934 (100 %)

Table 48 Organs used for reconstruction

Organs used for reconstruction	Cases (%)
None	41 (1.4 %)
Whole stomach	105 (3.5 %)
Gastric tube	2328 (78.7 %)
Jejunum	143 (4.8 %)
Free jejunum	35 (1.2 %)
Colon	111 (3.8 %)
Free colon	5 (0.2 %)
Skin graft	1 (0.0 %)
Others	126 (4.3 %)
Unknown	64 (2.2 %)
Total organs	2959 (100 %)
Total cases	2834

Table 55 Histological classification

Histological classification	Cases (%)
SCC	2407 (84.9 %)
SCC	385 (13.6 %)
Well diff.	492 (17.4 %)
Moderately diff.	1109 (39.1 %)
Poorly diff.	421 (14.9 %)
Adenocarcinoma	106 (3.7 %)
Barrett's adenocarcinoma	46 (1.6 %)
Adenosquamous cell carcinoma	19 (0.7 %)
Mucoepidermoid carcinoma	2 (0.1 %)
Adenoid cystic carcinoma	1 (0.0 %)
Basaloid carcinoma	45 (1.6 %)
Undiff. carcinoma (small cell)	7 (0.2 %)
Undiff. carcinoma	3 (0.1 %)
Other carcinoma	3 (0.1 %)
Sarcoma	1 (0.0 %)
Carcinosarcoma	30 (1.1 %)
Malignant melanoma	11 (0.4 %)
Dysplasia	5 (0.2 %)
Other	28 (1.0 %)
Unknown	120 (4.2 %)
Total	2834 (100 %)

SCC Squamous cell carcinoma

Table 56 Depth of tumor invasion, pT (JES 10th)

pT-category	Cases (%)
pTX	138 (4.9 %)
pT0	52 (1.8 %)
pTis	22 (0.8 %)
pT1a	216 (7.6 %)
pT1b	744 (26.3 %)
pT2	371 (13.1 %)
pT3	1131 (39.9 %)
pT4	160 (5.6 %)
Total	2834 (100 %)

Table 58 Pathological grading of lymph node metastasis, pN (JES 10th)

Lymph node metastasis	Cases (%)
pNX	228 (8.0 %)
pN0	1441 (50.8 %)
pN1	352 (12.4 %)
pN2	518 (18.3 %)
pN3	162 (5.7 %)
pN4	133 (4.7 %)
Total	2834 (100 %)

Table 59 Numbers of the metastatic nodes

Numbers of lymph node metastasis	Cases (%)
0	1188 (41.9 %)
1–2	703 (24.8 %)
3–6	521 (18.4 %)
7~	292 (10.3 %)
Unknown	130 (4.6 %)
Total	2834 (100 %)

Table 60 Pathological findings of distant organ metastasis, pM (JES 10th)

Distant metastasis	Cases (%)
pMX	137 (4.8 %)
pM0	2642 (93.2 %)
pM1	55 (1.9 %)
Total	2834 (100 %)

Table 61 Residual tumor, R

Residual tumor	Cases (%)
RX	303 (10.7 %)
R0	2229 (78.7 %)
R1	162 (5.7 %)
R2	140 (4.9 %)
Total	2834 (100 %)

Table 72 Causes of death

Cause of death	Cases (%)
Death due to recurrence	888 (71.4 %)
Death due to other cancer	63 (5.1 %)
Death due to other disease (rec+)	32 (2.6 %)
Death due to other disease (rec-)	149 (12.0 %)
Death due to other disease (rec?)	9 (0.7 %)
Operative death*	19 (1.5 %)
Postoperative hospital death**	36 (2.9 %)
Unknown	48 (3.9 %)
Total of death cases	1244 (100 %)

rec recurrence

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

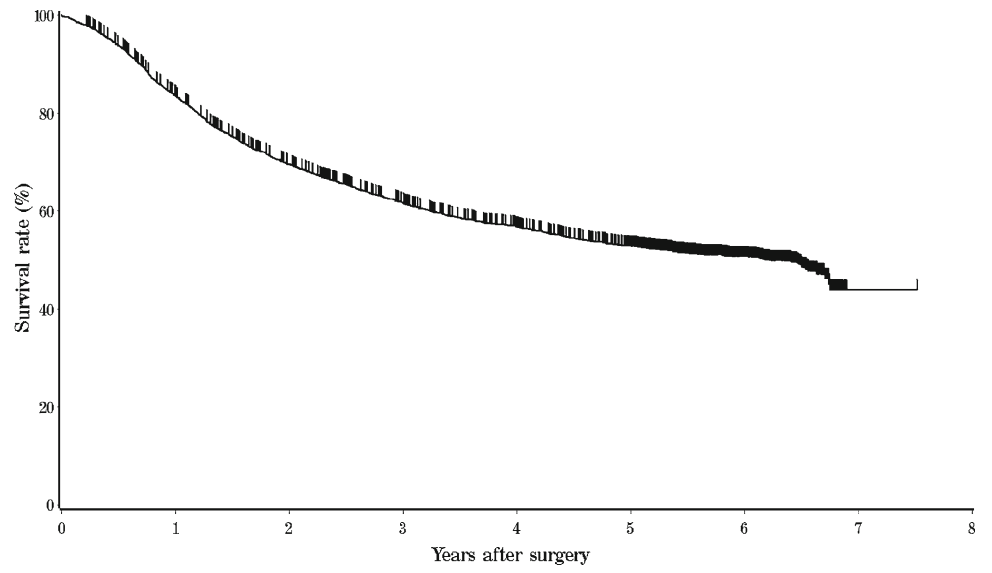
** Hospital death is defined as death during the same hospitalization, regardless of department at time of death

Operative mortality: 0.67 %

Hospital mortality: 1.27 %

Follow-up period (months)	
Median (min - max)	43.47 (0.03 - 90.18)

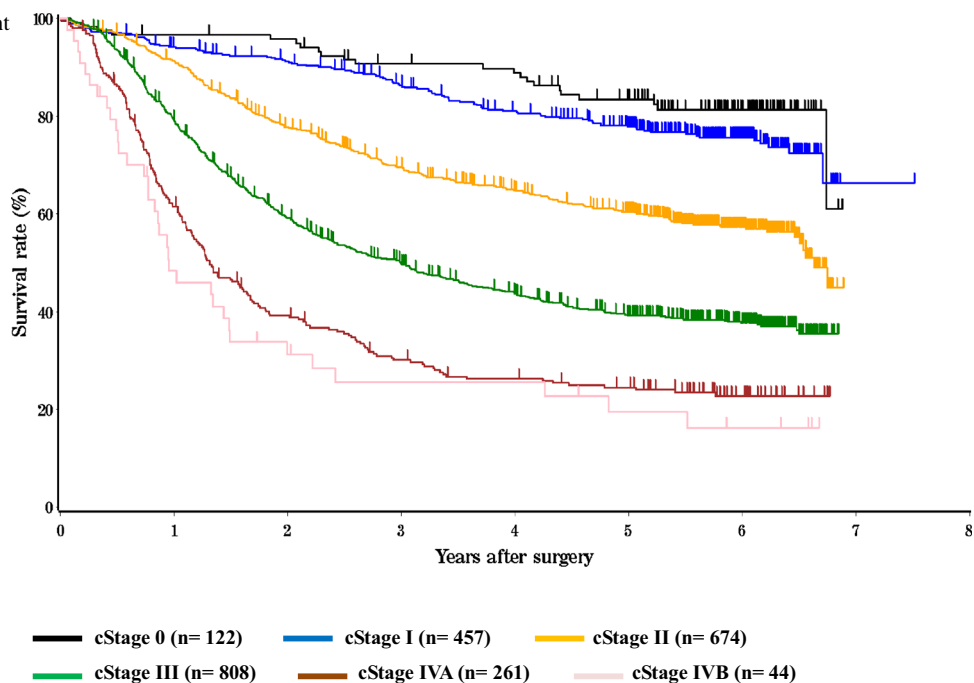
Fig. 8 Survival of patients underwent esophagectomy



— Esophagectomy (n= 2561)

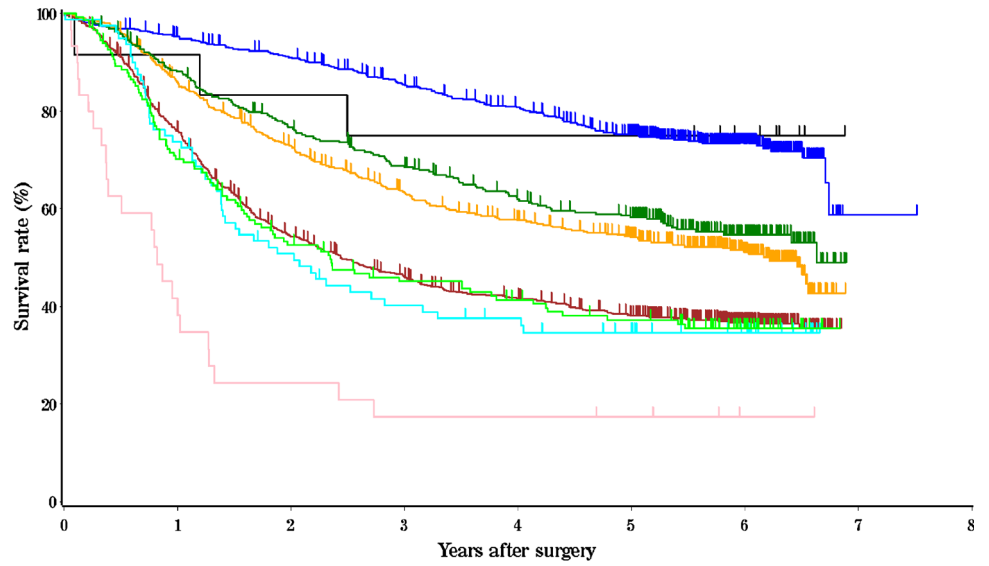
	Years after surgery							
	1	2	3	4	5	6	7	8
Esophagectomy	83.6%	69.6%	61.7%	56.8%	52.8%	50.7%	43.9%	-

Fig. 9 Survival of patients underwent esophagectomy according to clinical stage (JES TNM 10th)



	Years after surgery							
	1	2	3	4	5	6	7	8
cStage 0	96.7%	95.8%	90.7%	88.9%	83.5%	81.3%	-	-
cStage I	94.2%	91.2%	86.3%	81.1%	77.8%	75.7%	66.4%	-
cStage II	91.4%	77.8%	69.6%	64.9%	60.4%	57.3%	-	-
cStage III	79.1%	59.1%	49.9%	43.6%	39.2%	37.8%	-	-
cStage IVA	61.5%	39.3%	30.1%	26.3%	24.5%	22.8%	-	-
cStage IVB	48.4%	31.3%	25.6%	25.6%	19.5%	16.2%	-	-

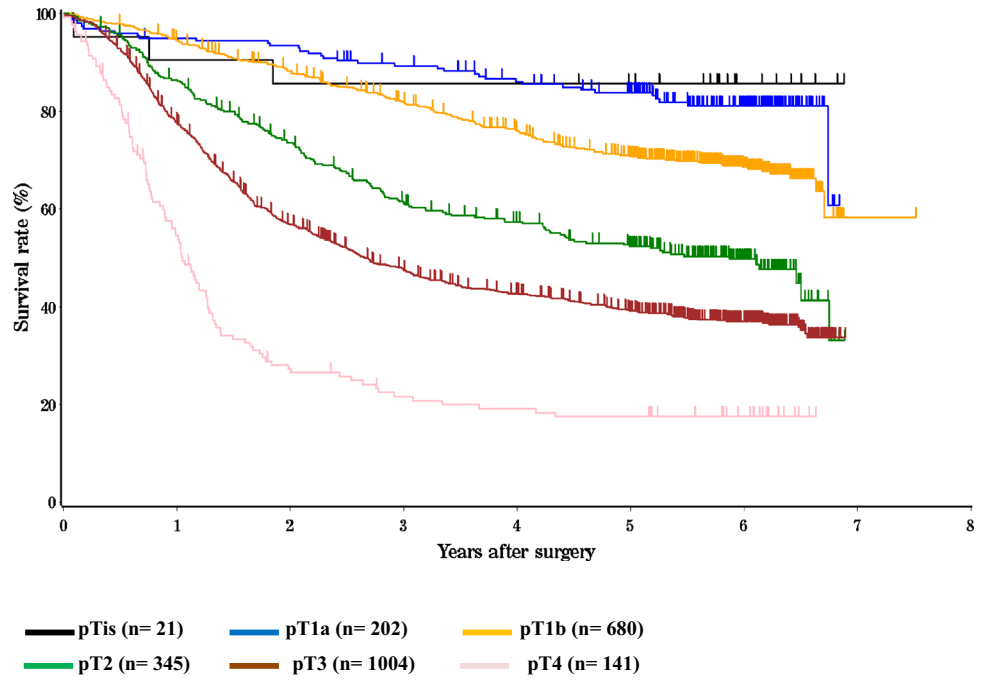
Fig. 10 Survival of patients underwent esophagectomy according to clinical stage (UICC TNM 6th)



— cStage 0 (n= 12) — cStage I (n= 607) — cStage IIA (n= 515)
— cStage IIB (n= 333) — cStage III (n= 743) — cStage IV (n= 31)
— cStage IVA (n= 81) — cStage IVB (n= 150)

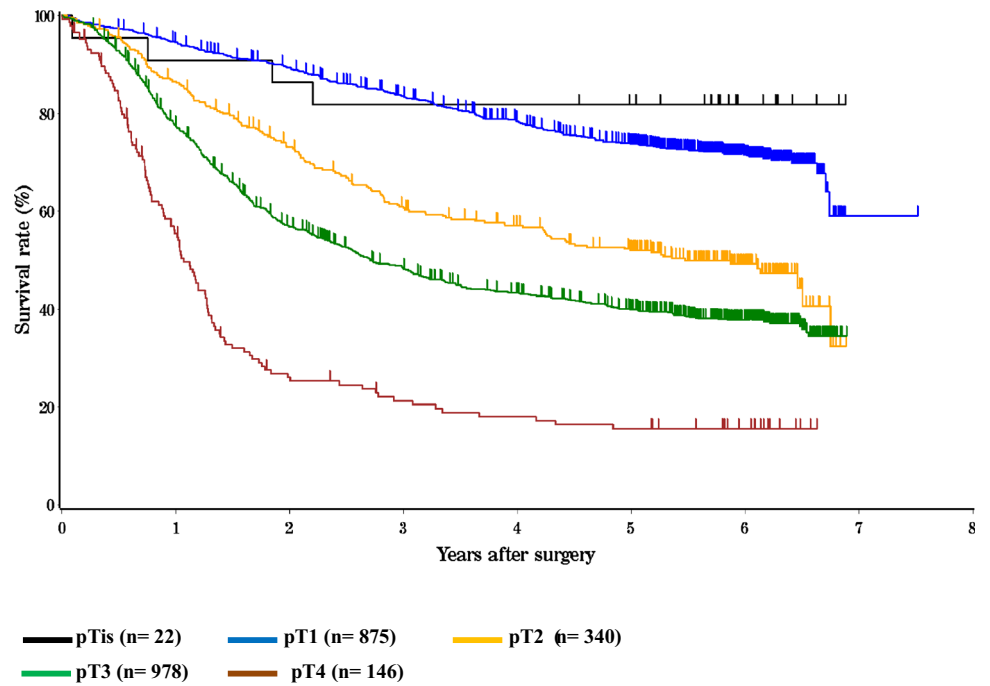
	Years after surgery							
	1	2	3	4	5	6	7	8
cStage 0	91.7%	83.3%	75.0%	75.0%	75.0%	75.0%	-	-
cStage I	95.3%	91.0%	85.4%	80.8%	75.2%	73.4%	58.8%	-
cStage IIA	85.9%	72.9%	63.4%	57.6%	54.2%	51.2%	-	-
cStage IIB	88.1%	76.7%	68.6%	62.0%	58.3%	54.7%	-	-
cStage III	76.0%	54.3%	46.0%	41.7%	38.1%	36.8%	-	-
cStage IV	38.3%	24.3%	17.4%	17.4%	17.4%	17.4%	-	-
cStage IVA	73.8%	50.8%	40.2%	37.6%	34.7%	34.7%	-	-
cStage IVB	70.2%	52.7%	45.2%	41.4%	37.3%	35.5%	-	-

Fig. 11 Survival of patients underwent esophagectomy according to the depth of tumor invasion: pT (JES TNM 10th)



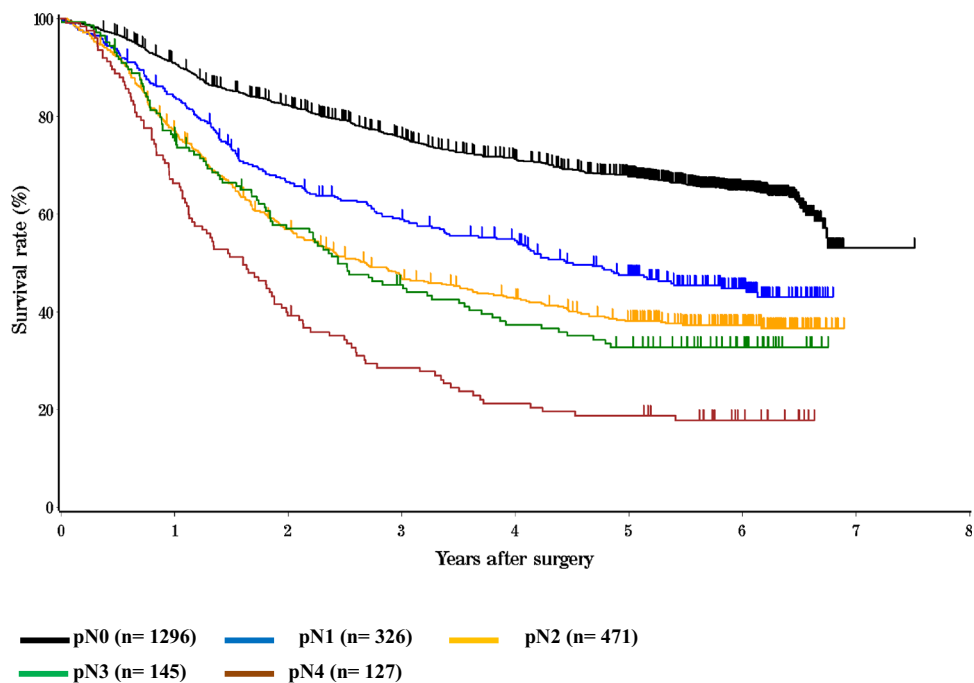
	Years after surgery							
	1	2	3	4	5	6	7	8
pTis	90.5%	85.7%	85.7%	85.7%	85.7%	85.7%	-	-
pT1a	95.0%	93.4%	89.3%	86.1%	83.8%	81.1%	-	-
pT1b	94.6%	88.3%	81.9%	76.1%	70.8%	68.5%	-	-
pT2	86.5%	73.6%	61.2%	57.4%	52.3%	49.7%	-	-
pT3	77.6%	56.8%	47.5%	42.7%	39.2%	37.0%	-	-
pT4	54.6%	27.3%	21.7%	19.2%	17.5%	-	-	-

Fig. 12 Survival of patients underwent esophagectomy according to the depth of tumor invasion: pT (UICC TNM 6th)



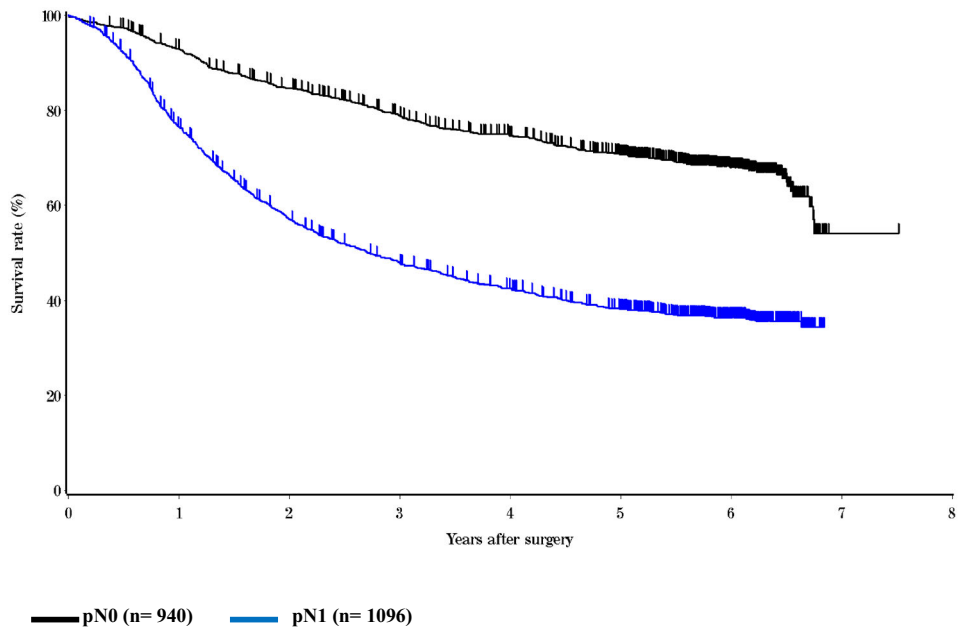
	Years after surgery							
	1	2	3	4	5	6	7	8
pTis	90.9%	86.4%	81.8%	81.8%	81.8%	81.8%	-	-
pT1	94.5%	89.4%	83.6%	78.4%	73.8%	71.5%	59.1%	-
pT2	86.6%	73.2%	60.6%	57.0%	51.9%	49.3%	-	-
pT3	77.4%	56.8%	48.3%	43.3%	40.0%	37.8%	-	-
pT4	55.5%	26.1%	21.3%	18.0%	15.6%	15.6%	-	-

Fig. 13 Survival of patients underwent esophagectomy according to lymph node metastasis: pN (JES TNM 10th)



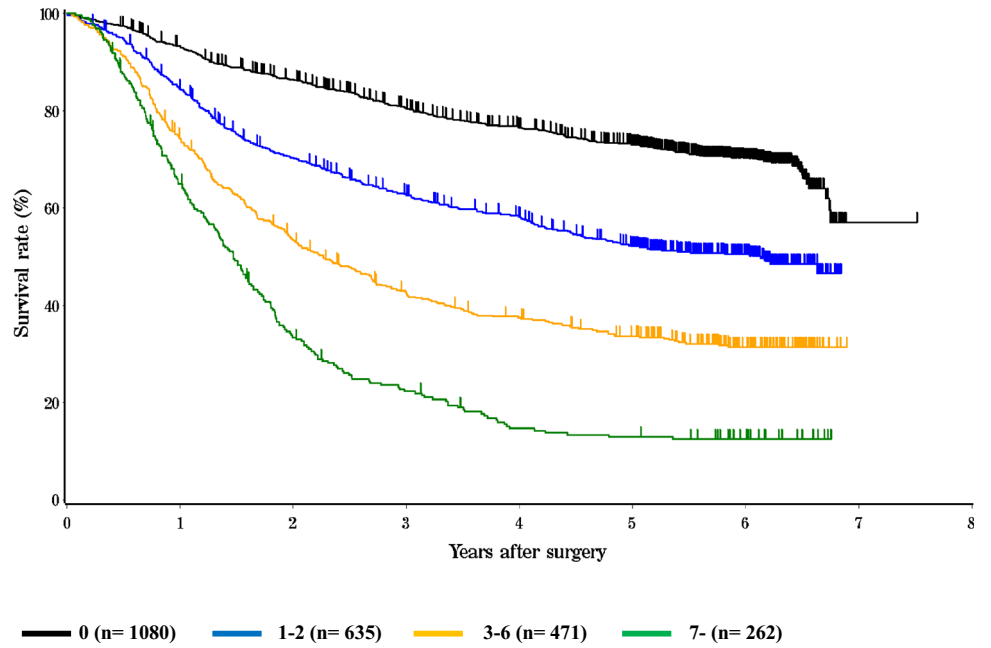
	Years after surgery							
	1	2	3	4	5	6	7	8
pN0	91.0%	82.3%	75.7%	71.3%	67.8%	64.9%	-	-
pN1	83.9%	66.6%	58.9%	54.6%	47.5%	44.8%	-	-
pN2	76.9%	56.9%	47.1%	42.7%	38.2%	37.3%	-	-
pN3	75.0%	57.1%	45.5%	37.3%	32.8%	32.8%	-	-
pN4	66.4%	39.2%	28.6%	21.2%	18.8%	17.8%	-	-

Fig. 14 Survival of patients underwent esophagectomy according to lymph node metastasis: pN (UICC TNM 6th)



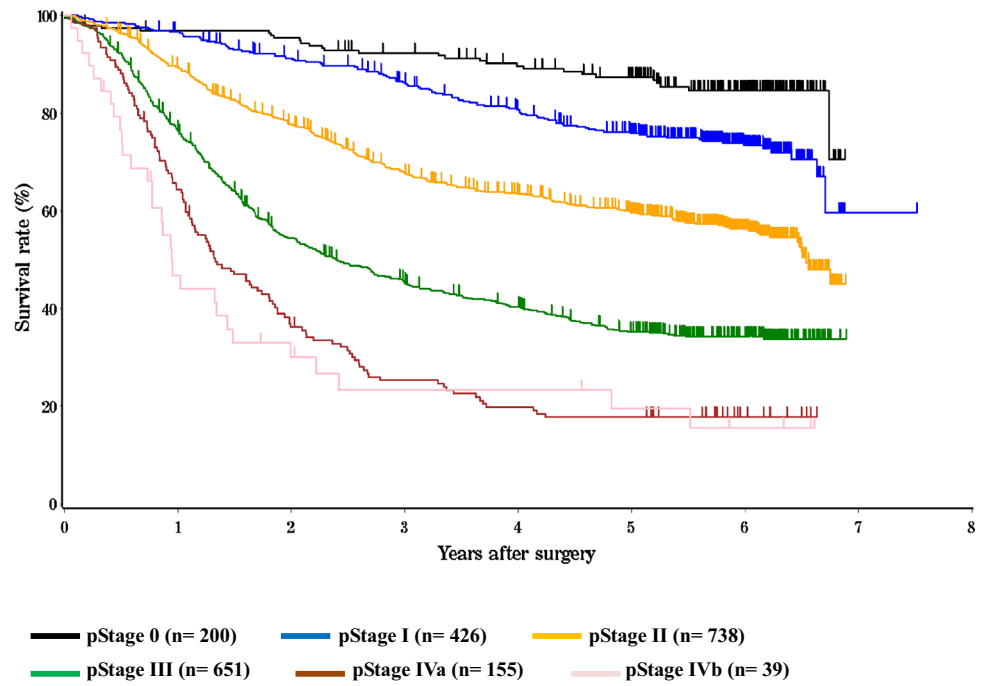
	Years after surgery							
	1	2	3	4	5	6	7	8
pN0	93.0%	84.7%	78.9%	74.6%	70.7%	68.0%	54.1%	-
pN1	76.5%	57.1%	47.9%	42.5%	38.2%	36.4%	-	-

Fig. 15 Survival of patients underwent esophagectomy according to number of metastatic node



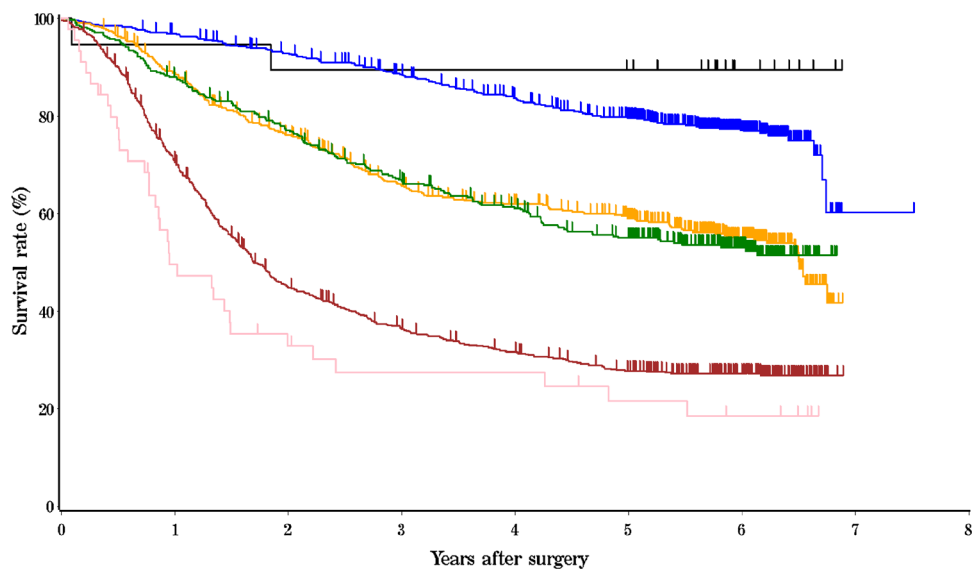
	Years after surgery							
	1	2	3	4	5	6	7	8
0	93.3%	86.4%	80.5%	76.5%	73.0%	70.1%	-	-
1-2	84.4%	70.3%	62.7%	58.2%	52.1%	50.5%	-	-
3-6	74.2%	53.5%	42.7%	37.5%	33.7%	31.4%	-	-
7-	65.0%	33.5%	22.4%	14.7%	12.9%	12.5%	-	-

Fig. 16 Survival of patients underwent esophagectomy according to pathological stage (JES TNM 10th)



	Years after surgery							
	1	2	3	4	5	6	7	8
pStage 0	97.0%	95.4%	92.3%	89.6%	87.4%	84.7%	-	-
pStage I	96.7%	91.3%	86.3%	80.7%	75.9%	73.4%	59.6%	-
pStage II	89.5%	77.7%	67.8%	63.5%	59.6%	56.3%	-	-
pStage III	76.4%	54.4%	45.4%	40.4%	35.2%	34.2%	-	-
pStage IVa	64.4%	36.2%	25.3%	19.8%	17.8%	17.8%	-	-
pStage IVb	46.8%	30.0%	23.4%	23.4%	19.5%	15.6%	-	-

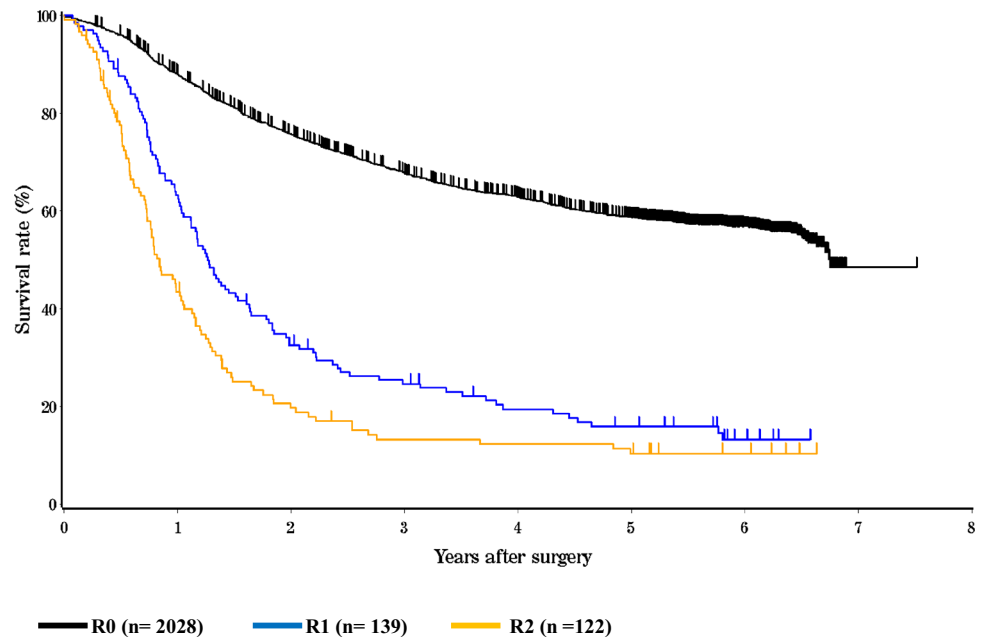
Fig. 17 Survival of patients underwent esophagectomy according to pathological stage (UICC TNM 6th)



— pStage 0 (n= 19)
 — pStage I (n= 609)
 — pStage IIA (n= 525)
— pStage IIB (n= 385)
 — pStage III (n= 701)
 — pStage IV (n= 45)

	Years after surgery							
	1	2	3	4	5	6	7	8
pStage 0	94.7%	89.4%	89.4%	89.4%	89.4%	89.4%	-	-
pStage I	97.0%	92.9%	88.6%	83.7%	79.7%	77.0%	-	-
pStage IIA	88.9%	76.1%	65.7%	62.1%	59.0%	55.2%	-	-
pStage IIB	88.0%	77.2%	66.7%	61.2%	55.1%	53.2%	-	-
pStage III	70.6%	45.0%	36.5%	31.6%	27.8%	27.2%	-	-
pStage IV	49.6%	32.9%	27.4%	27.4%	21.6%	18.5%	-	-

Fig. 18 Survival of patients underwent esophagectomy according to residual tumor (R)



	Years after surgery							
	1	2	3	4	5	6	7	8
R0	88.0%	75.8%	67.8%	62.9%	58.7%	56.8%	48.5%	-
R1	63.3%	32.6%	24.7%	19.5%	15.9%	13.3%	-	-
R2	43.5%	19.7%	13.3%	12.3%	10.4%	10.4%	-	-

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