

## Comprehensive Registry of Esophageal Cancer in Japan, 2004

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### Preface

Japan was struck by the Great East Japan Earthquake, which resulted in almost twenty thousand deaths and missing persons, 1 year ago. We would like to express our heartfelt condolences and sympathies to all the people who have been affected by this disaster. We pray that the

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These data were first made available on June 1, 2004, as the Comprehensive Registry of Esophageal Cancer in Japan, 2004. Not all the pages are reprinted here; however, the original table and figure numbers have been maintained.

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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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regions affected will recover as soon as possible and that the physicians working diligently in the affected areas remain in good health and spirits.

We deeply appreciate the cooperation of many physicians with the registry of esophageal cancer cases; nevertheless, the recovery from the Great East Japan Earthquake is ongoing. The Comprehensive Registry of Esophageal Cancer in Japan, 2004, was finally published here, despite some delay.

The registry of esophageal cancer cases has required some adjustments to comply with the Act for the Protection of Personal Information, which was promulgated in 2003 and began to be enforced in 2005. The most important point was “anonymity in an unlinkable fashion” using encryption with a hash function. The new registration

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system was completed in 2008, and the registry itself resumed the registry of cases of esophageal cancer that had been treated in 2001. This was the fourth time that the new registration system was used to prepare a Comprehensive Registry of Esophageal Cancer in Japan. The physicians in charge of the registration seem to have become accustomed to the new system.

Here, we have briefly summarized the Comprehensive Registry of Esophageal Cancer in Japan, 2004. A total of 5,066 cases were registered from 214 institutions in Japan. Comparing the Comprehensive Registry in 2004 to the Comprehensive Registry in 2003, the number of registered cases, surgical cases, and registered institutions increased by 407, 159, and 15, respectively. As for the histologic type of cancer according to biopsy specimens, squamous cell carcinoma and adenocarcinoma accounted for 88.7 and 2.9 %, 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 83.7, 26.4, 15.5, 8.6, and 50.2 %, respectively. Concerning the approach used to perform an esophagectomy, 18.0 % of the cases were treated endoscopically, that is, thoracoscopically, laparoscopically, or mediastinoscopically. Regarding the reconstruction route, the retrosternal, the posterior mediastinal, and the intrathoracic route were used in 36.0, 35.5 and 16.4 % of the cases, respectively. The operative mortality was 1.3 % (35 out of 2,669 cases).

We hope that this Comprehensive Registry of Esophageal Cancer in Japan for 2004 will help to improve all aspects of the diagnosis and treatment of esophageal cancer.

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**I. Clinical factors of esophageal cancer patients treated in 2004**

Institution-registered cases in 2004

Institution
Aichi Cancer Center
Aizawa Hospital
Akita University Hospital
Asahikawa Medical College Hospital
The Cancer Institute Hospital of JFCR
Chiba Cancer Center
Chibaken Saiseikai Narashino Hospital
Chiba University Hospital
Dokkyo Medical University Hospital

continued

Institution
Fuchu Hospital
Fujioka General Hospital
Fujita Health University
Fukui Red Cross Hospital
Fukui University Hospital
Fukuoka Saiseikai General Hospital
Fukuyama Hospital
Foundation for Detection of Early Gastric Carcinoma
Genwakai Himawari A Clinic
Gifu Prefectural General Medical Center
Gunma Central General Hospital
Gunma University Hospital
Hachioji Digestive Disease Hospital
Hakodate Goryokaku Hospital
Hamamatsu University School of Medicine, University Hospital
Health Insurance Naruto 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 chuo Hospital
Hokkaido University Hospital
Hokusatsu-byouin
Hyogo Cancer Center
Hyogo College of Medicine
Hyogo Prefectural Nishinomiya Hospital
Ibaraki Prefectural Central Hospital.
Ida Municipal Hospital
Iizuka Hospital
Inazawa City Hospital
International University of Health and Welfare Mita Hospital
Ishinomaki Red Cross Hospital
Iwakuni Medical Center
Iwate Medical University Hospital
Japanese Red Cross Shizuoka Hospital
Japanese Red Cross Society Onoda Hospital
Jichi Medical University Hospital
Jikei University Hospital
Juntendo University Hospital
Junwakai Memorial Hospital
Kagawa Prefectural Central Hospital
Kagawa University Hospital
Kagoshima University Hospital
Kanazawa University Hospital
Kansai Medical University Hirakata Hospital
Kansai Rosai Hospital
Kashiwa Kousei General Hospital

continued

Institution

Kawasaki Medical School Hospital  
 Keio University Hospital  
 Keiyukai Sapporo Hospital  
 Kikuna Memorial Hospital  
 Kinki Central Hospital  
 Kinki University Hospital  
 Kinki University Nara Hospital  
 Kinki University Sakai Hospital  
 Kiryu Kosei General Hospital  
 Kitakyushu Municipal Medical Center  
 Kitano Hospital  
 Kitasato Institute Hospital  
 Kitasato University Hospital  
 Kobe City Medical Center General Hospital  
 Kobe University Hospital  
 Kochi University Hospital  
 Kumamoto University Hospital  
 Kurashiki Central Hospital  
 Kurume University Hospital  
 Kuwana City Hospital  
 Kyorin University Hospital  
 Kyosai Tachikawa Hospital  
 Kyoto University Hospital  
 Kyushu Central Hospital of the Mutual Aid Association of Public School Teachers  
 Kyushu University Hospital  
 Matsuda Hospital  
 Matsudo City Hospital  
 Matsushita Memorial Hospital  
 Matsuyama Red Cross Hospital  
 Mie University Hospital  
 Minoh City Hospital  
 Mito Red Cross Hospital  
 Murakami General Hospital  
 Nagahama City Hospital  
 Nagano Red Cross Hospital  
 Nagaoka Chuo General Hospital  
 Nagoya City University Hospital  
 Nagoya Daiichi Red Cross Hospital  
 Nanpuh Hospital  
 Nara Medical University Hospital  
 National Cancer Center Hospital  
 National Cancer Center Hospital East  
 National Defense Medical College Hospital  
 National Hospital Organization Chiba Medical Center  
 National Hospital Organization Kure Medical Center  
 National Hospital Organization Kyushu Cancer Center  
 National Hospital Organization Matsumoto National Hospital  
 National Hospital Organization Nagasaki Medical Center

continued

Institution

National Hospital Organization Nagoya Medical Center  
 National Hospital Organization Osaka National Hospital  
 National Institute of Radiological Sciences  
 Nihon University Itabashi Hospital  
 Niigata Cancer Center Hospital  
 Niigata City General Hospital  
 Niigata Prefectural Shibata Hospital  
 Niigata University Medical and Dental Hospital  
 Nippon Medical School Musashi Kosugi Hospital  
 Nippon Medical School Tama Nagayama Hospital  
 Nishi-Kobe Medical Center  
 Nomura Hospital  
 NTT West 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  
 Osaka City University Hospital  
 Osaka General Medical Center  
 Osaka Koseinenkin Hospital  
 Osaka Medical Center for Cancer and Cardiovascular Diseases  
 Osaka Prefectural Hospital Organization Osaka General Medical Center  
 Osaka University Hospital  
 Otsu Red Cross Hospital  
 Rinku General Medical Center  
 Ryukyu University Hospital  
 Saga University Hospital  
 Saiseikai General Hospital  
 Saiseikai Kyoto Hospital  
 Saiseikai Gose Hospital  
 Saitama City Hospital  
 Saitama Medical Center Jichi Medical University  
 Saitama Medical University Hospital  
 Saitama Medical University International Medical Center  
 Saitama Red Cross Hospital  
 Saitama Social Insurance Hospital  
 Saku Central Hospital  
 Sano Kousei General Hospital  
 Sato Clinic  
 Sapporo Medical University  
 Sawara Hospital  
 Seikei-kai Chiba Medical Center  
 Sendai City Hospital  
 Sendai Medical Center  
 Shiga Medical Center for Adults  
 Shiga University of Medical Science Hospital

continued

Institution

Shikoku Cancer Center  
 Shimane University Hospital  
 Shimizu Welfare Hospital  
 Shinbeppu Hospital  
 Shinshiro Municipal Hospital  
 Shinshu University Hospital  
 Shizuoka Cancer Center  
 Shizuoka City Shimizu Hospital  
 Shizuoka City Shizuoka Hospital  
 Shouzankai-Saiki Hospital  
 Showa Inan General Hospital  
 Showa University Hospital  
 Showa University Northern Yokohama Hospital  
 Social Insurance Omuta Tenryo Hospital  
 Social Insurance Tagawa Hospital  
 Social Insurance Yokohama Central Hospital  
 Sonoda Daiichi Hospital  
 St. Luke's International Hospital  
 Sugita Genpaku Memorial Obama Municipal Hospital  
 Suita Municipal Hospital  
 Takasago Municipal Hospital  
 Tenri Hospital  
 Tochigi Cancer Center  
 Toho University Omori Medical Center  
 Toho University Hospital  
 Tohoku Kosai Hospital  
 Tohoku University Hospital  
 Tokai University Hospital  
 Tokushima Red Cross Hospital  
 Tokushima University Hospital  
 Tokyo Dental College Ichikawa General Hospital  
 Tokyo Medical and Dental University Hospital

continued

Institution

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  
 Tonan Hospital  
 Toranomon Hospital  
 Tottori Prefectural Central Hospital  
 Tottori University Hospital  
 Toyama Prefectural Central Hospital  
 Toyama University Hospital  
 Tsuchiura Kyodo Hospital  
 Tsukuba University Hospital  
 Tsuruoka Municipal Shonai Hospital  
 University Hospital, Kyoto Prefectural University of Medicine  
 University of Miyazaki Hospital  
 University of Occupational and Environmental Health  
 Wakayama Kenritsu University Hospital  
 Yamagata Prefectural and Sakata Municipal Hospital Organization  
 Yamagata Prefectural Central Hospital  
 Yamagata University Hospital  
 Yamaguchi University Hospital  
 Yamanashi University Hospital  
 Yamaguchi-ken Saiseikai Shimonoseki General Hospital  
 Yao Municipal Hospital  
 Yatsu Hoken Hospital  
 Yokohama City University Hospital  
 Yokohama City University Medical Center  
 Yokohama Rosai Hospital

**(Total 214 institutions)**

## Patient Background

**Table 1** Age and gender

\* Excluding 49 missing cases of gender

Age	Male	Female	Unknown	Cases (%)
~29	6	0	0	6 (0.1%)
30~39	9	6	0	15 (0.3%)
40~49	148	27	0	175 (3.5%)
50~59	975	150	0	1125 (22.8%)
60~69	1758	236	0	1994 (40.3%)
70~79	1200	183	0	1383 (28.0%)
80~89	174	53	0	227 (4.6%)
90~	12	7	0	19 (0.4%)
Total	4282	662	0	4944
Missing	57	16	0	73

**Table 12** Tumor location

\* Excluding 178 treatment unknown, missing cases of treatment types

Location of tumor	Endoscopic treatment (%)	Chemotherapy and/or radiotherapy (%)	Surgery		Total (%)
			Palliative operation (%)	Esophagectomy (%)	
Cervical	13 (2.4%)	112 (7.3%)	3 (2.5%)	101 (3.8%)	229 (4.7%)
Upper thoracic	55 (10.2%)	198 (12.9%)	20 (16.7%)	298 (11.2%)	571 (11.8%)
Middle thoracic	296 (55.0%)	680 (44.2%)	55 (45.8%)	1242 (46.9%)	2273 (46.9%)
Lower thoracic	142 (26.4%)	314 (20.4%)	32 (26.7%)	799 (30.2%)	1287 (26.6%)
Abdominal	13 (2.4%)	26 (1.7%)	9 (7.5%)	148 (5.6%)	196 (4.0%)
EG	4 (0.7%)	2 (0.1%)	0	24 (0.9%)	30 (0.6%)
EG-Junction(E=G)	0	1 (0.1%)	0	20 (0.8%)	21 (0.4%)
Cardia (G)	0	1 (0.1%)	0	2 (0.1%)	3 (0.1%)
Others	0	0	0	0	0
Unknown	15 (2.8%)	205 (13.3%)	1 (0.8%)	15 (0.6%)	236 (4.9%)
Total	538	1539	120	2649	4846
Missing	9	5	1	7	22

**EG: esophago-gastric**

**Table 15** Histologic types of cancer according to biopsy specimens

**\* Excluding 178 treatment unknown, missing cases of treatment types**

Histologic types	Endoscopic treatment (%)	Chemotherapy and/or radiotherapy (%)	Surgery		Total (%)
			Palliative operation (%)	Esophagectomy (%)	
Not examined	36 (6.8%)	5 (0.3%)	2 (1.7%)	5 (0.2%)	48 (1.0%)
SCC	456 (86.0%)	1263 (82.4%)	111 (92.5%)	2446 (92.7%)	4276 (88.7%)
SCC	355 (67.0%)	801 (52.3%)	79 (65.8%)	1380 (52.3%)	2615 (54.3%)
Well diff.	16 (3.0%)	73 (4.8%)	4 (5.0%)	252 (9.6%)	345 (7.2%)
Moderately diff.	65 (12.3%)	250 (16.3%)	20 (16.7%)	575 (21.8%)	910 (18.9%)
Poorly diff.	20 (3.8%)	139 (9.1%)	8 (6.7%)	239 (9.1%)	406 (8.4%)
Adenocarcinoma	18 (3.4%)	16 (1.0%)	2 (1.7%)	105 (4.0%)	141 (2.9%)
Undifferentiated	0	15 (1.0%)	1 (0.8%)	6 (0.2%)	22 (0.5%)
Carcinosarcoma	0	1 (0.1%)	2 (1.7%)	8 (0.3%)	11 (0.2%)
Malignant melanoma	1 (0.2%)	2 (0.1%)	0	10 (0.4%)	13 (0.3%)
Other tumors	3 (0.6%)	19 (1.2%)	0	14 (0.5%)	36 (0.7%)
Dysplasia	0	0	0	0	0
Unknown	16 (3.0%)	211 (13.8%)	2 (1.7%)	44 (1.7%)	273 (5.7%)
Total	530	1532	120	2638	4820
Missing	18	18	1	31	68

**SCC: squamous cell carcinoma**

**Table 19** Organs with metastasis in cM1 case (UICC-cTNM 5th)

**\* Excluding 178 treatment unknown, missing cases of treatment types**

Metastatic organs	Endoscopic treatment (%)	Chemotherapy and/or radiotherapy (%)	Surgery		Total (%)
			Palliative operation (%)	Esophagectomy (%)	
PUL	10 (27.8%)	86 (17.1%)	5 (45.5%)	11 (5.9%)	112 (15.3%)
OSS	0	14 (2.8%)	0	1 (0.5%)	15 (2.0%)
HEP	6 (16.7%)	94 (18.7%)	3 (27.3%)	16 (8.6%)	119 (16.2%)
BRA	1 (2.8%)	5 (1.0%)	0	1 (0.5%)	7 (1.0%)
LYM	15 (41.7%)	255 (50.8%)	3 (27.3%)	140 (75.7%)	413 (56.3%)
MAR	0	1 (0.2%)	0	0	1 (0.1%)
PLE	1 (2.8%)	5 (1.0%)	0	1 (0.5%)	7 (1.0%)
PER	0	0	0	3 (1.6%)	3 (0.4%)
SKI	0	3 (0.6%)	0	1 (0.5%)	4 (0.5%)
OTH	3 (8.3%)	21 (4.2%)	0	5 (2.7%)	29 (4.0%)
Unknown	0	18 (3.6%)	0	6 (3.2%)	24 (3.3%)
Lesions	36	502	11	185	734
Missing	1	5	0	6	12
One organ	18 (69.2%)	369 (85.4%)	7 (77.8%)	172 (96.6%)	566 (87.8%)
Two organs	6 (23.1%)	58 (13.4%)	2 (22.2%)	5 (2.8%)	71 (11.0%)
Three organs	2 (7.7%)	3 (0.7%)	0	1 (0.6%)	6 (0.9%)
Four organs~	0	2 (0.5%)	0	0	2 (0.3%)
Unknown	0	0	0	0	0
Total cases	26	432	9	178	645
Missing	1	5	0	6	12

**PUL: pulmones, OSS: ossis, HEP: hepar, BRA: brain, LYM: lymph node, MAR: marrow, PLE: pleural membrane, PER:peritoneal membrane, SKI: skin, OTH: others**

**Table 20** Clinical stage (UICC-cTNM 5th)

\* Excluding 178 treatment unknown, missing cases of treatment types

cStage	Endoscopic treatment (%)	Chemotherapy and/or radiotherapy (%)	Surgery		Total (%)
			Palliative operation (%)	Esophagectomy (%)	
0	88 (16.2%)	4 (0.3%)	0 (0.0%)	19 (0.7%)	111 (2.3%)
I	369 (68.0%)	203 (13.2%)	13 (10.7%)	619 (23.3%)	1204 (24.7%)
IIA	7 (1.3%)	185 (12.0%)	13 (10.7%)	493 (18.5%)	698 (14.3%)
IIB	4 (0.7%)	103 (6.7%)	11 (9.1%)	344 (12.9%)	462 (9.5%)
III	30 (5.5%)	559 (36.3%)	70 (57.9%)	952 (35.8%)	1611 (33.1%)
IV	3 (0.6%)	117 (7.6%)	3 (2.5%)	34 (1.3%)	157 (3.2%)
IVA	6 (1.1%)	91 (5.9%)	1 (0.8%)	71 (2.7%)	169 (3.5%)
IVB	16 (2.9%)	204 (13.2%)	4 (3.3%)	76 (2.9%)	300 (6.2%)
Unknown	20 (3.7%)	75 (4.9%)	6 (5.0%)	53 (2.0%)	154 (3.2%)
Total	543	1541	121	2661	4866
Missing	5	9	0	8	22

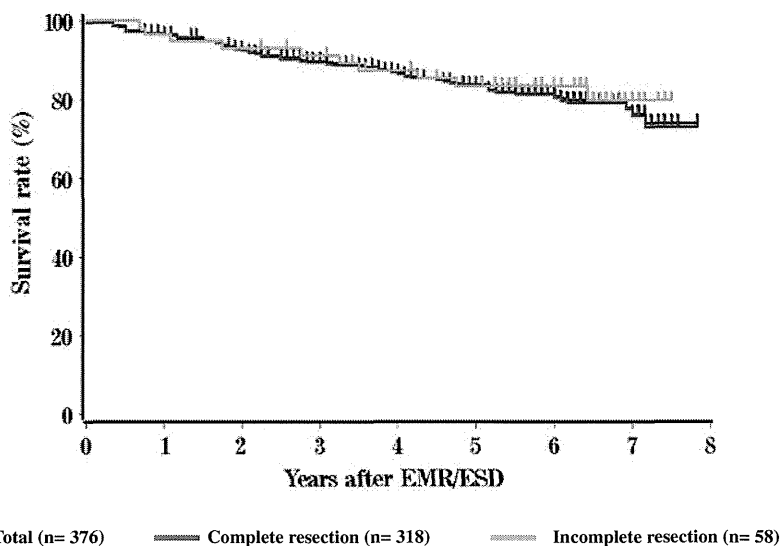
**II. Clinical results of patient treated with endoscopy in 2004**

**Table 21** Treatment modalities in patients receiving endoscopy

Treatment modalities	Cases (%)
Endoscopic treatment only	438 (80.7%)
Endoscopic treatment + Radiotherapy	27 (5.0%)
Endoscopic treatment + Chemotherapy	16 (2.9%)
Endoscopic treatment + Chemoradiotherapy	54 (9.9%)
Endoscopic treatment + Chemoradiotherapy + Others	3 (0.6%)
Endoscopic treatment + Others	5 (0.9%)
Total	543
Missing	5

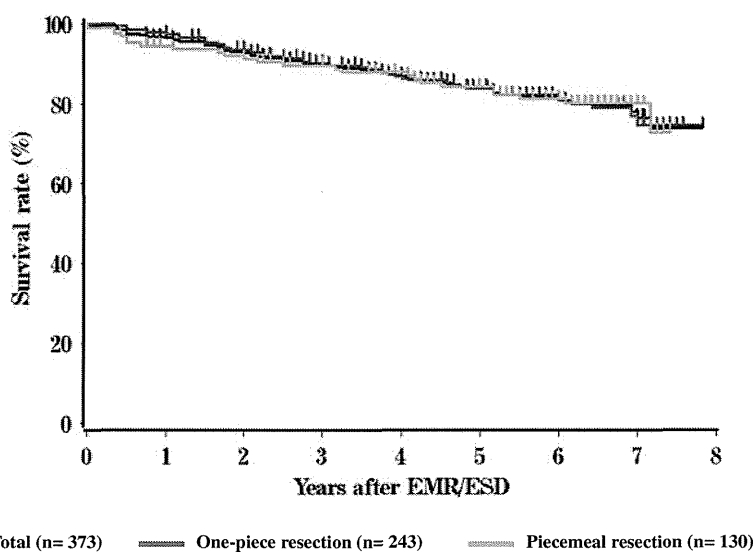


**Fig. 1** Survival of patients treated by EMR/ESD



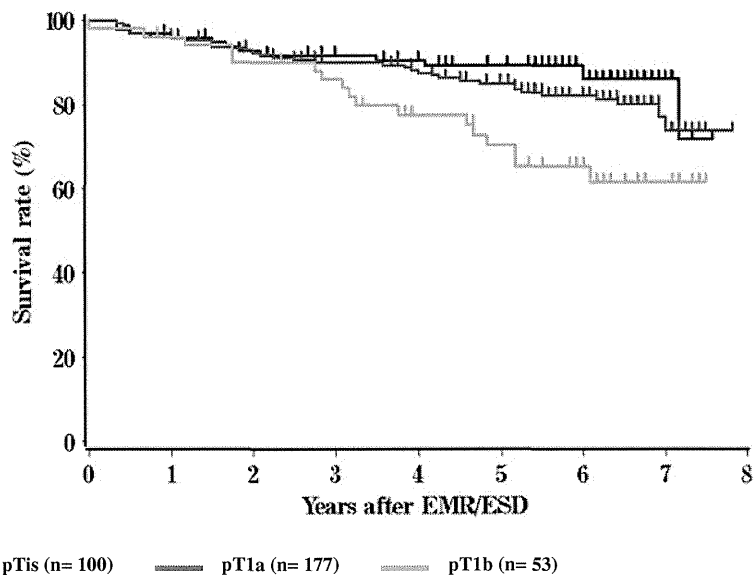
	Years after EMR/ESD							
	1	2	3	4	5	6	7	8
Total (n= 376)	96.5%	92.5%	89.4%	86.5%	83.7%	80.7%	76.4%	74.0%
Complete resection (n= 318)	96.5%	92.5%	89.4%	86.5%	83.7%	80.2%	75.7%	73.0%
Incomplete resection (n= 58)	96.5%	93.0%	91.2%	87.4%	83.4%	83.4%	79.7%	79.7%

**Fig. 2** Survival of patients in relation to type of EMR/ESD



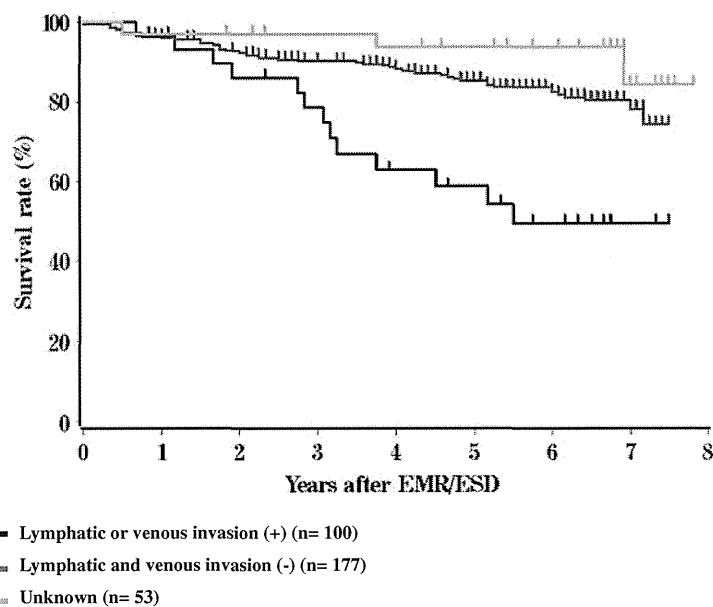
	Years after EMR/ESD							
	1	2	3	4	5	6	7	8
Total (n= 373)	96.5%	92.8%	89.9%	86.9%	83.9%	80.9%	76.5%	73.9%
One piece resection (n= 243)	97.5%	93.7%	90.1%	86.3%	83.8%	80.7%	74.5%	74.5%
Piecemeal resection (n= 130)	94.6%	91.3%	89.7%	87.9%	84.2%	81.2%	80.0%	72.8%

**Fig. 3** Survival of patients treated by EMR/ESD in relation to the pathological depth of tumor invasion (pT)



	Years after EMR/ESD							
	1	2	3	4	5	6	7	8
pTis	95.9%	92.8%	91.8%	90.6%	89.4%	86.1%	86.1%	71.7%
pT1a	96.0%	92.5%	90.1%	87.6%	85.0%	82.1%	73.8%	73.8%
pT1b	96.2%	90.1%	86.0%	77.6%	70.4%	65.3%	61.5%	61.5%

**Fig. 4** Survival of patients treated by EMR/ESD in relation to the lymphatic or venous invasion



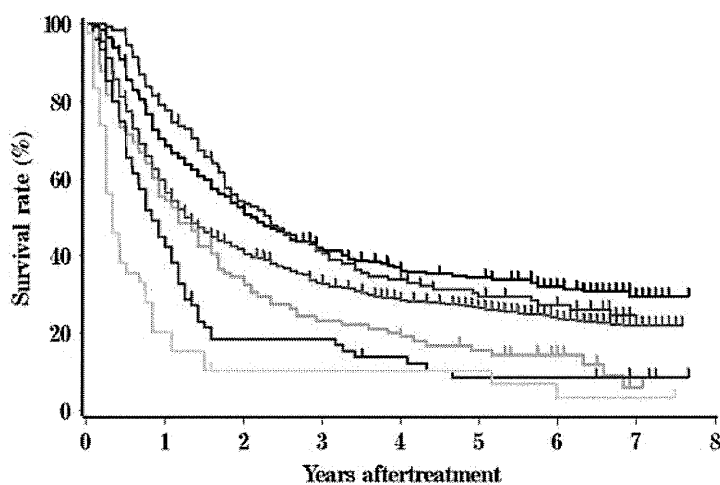
	Years after EMR/ESD							
	1	2	3	4	5	6	7	8
Lymphatic or venous invasion (+)	96.7%	85.9%	78.5%	62.9%	58.7%	49.3%	49.3%	49.3%
Lymphatic and venous invasion (-)	96.1%	92.4%	90.2%	88.2%	85.3%	82.4%	78.1%	74.2%
Unknown	97.1%	97.1%	97.1%	93.7%	93.7%	93.7%	84.3%	84.3%

### III. Clinical results in patients treated with chemotherapy and/or radiotherapy in 2004

**Table 34** Dose of irradiation with or without chemotherapy (non-surgically treated and curative cases)

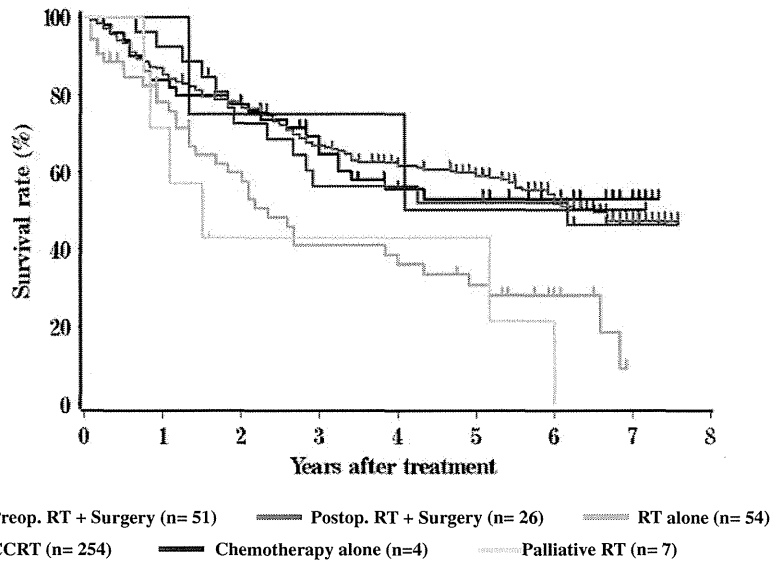
Dose of irradiation (Gy)	Chemotherapy		Preope RT (%)	Postope RT (%)
	with (%)	without (%)		
0	0	0	0	0
-29	6 (1.2%)	4 (4.7%)	15 (4.9%)	9 (5.3%)
30-39	12 (2.4%)	3 (3.5%)	78 (25.3%)	15 (8.8%)
40-49	26 (5.3%)	5 (5.8%)	179 (58.1%)	43 (25.1%)
50-59	58 (11.8%)	4 (4.7%)	10 (3.2%)	42 (24.6%)
60-69	366 (74.4%)	61 (70.9%)	24 (7.8%)	60 (35.1%)
70-	24 (4.9%)	9 (10.5%)	2 (0.6%)	2 (1.2%)
<b>Total</b>	<b>492</b>	<b>86</b>	<b>308</b>	<b>171</b>
Median (min - max)	60 ( 2 - 106 )	61 ( 8 - 84 )	40 ( 1.2 - 96 )	50 ( 1.2 - 70 )
Missing	2	0	12	9

**Fig. 5** Survival of patients treated by chemotherapy and/or radiotherapy



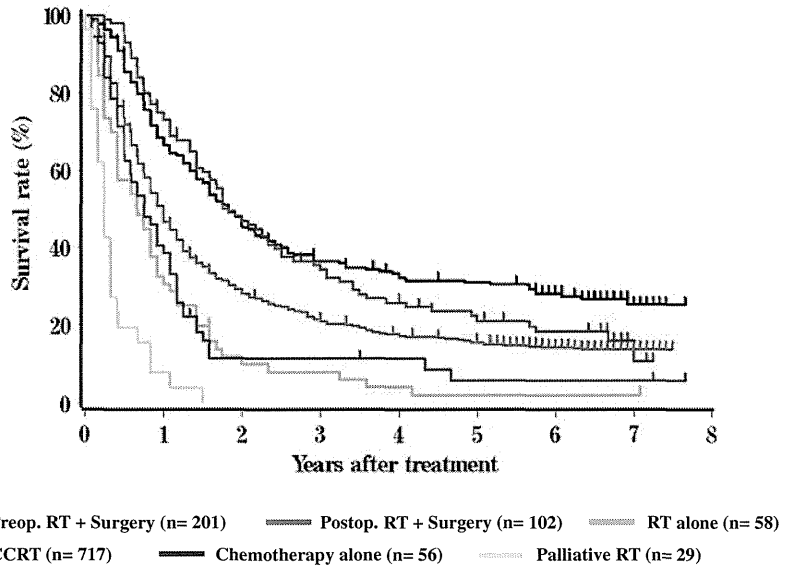
	Years after treatment							
	1	2	3	4	5	6	7	8
Preop. RT + Surgery (n=260)	69.0%	51.0%	41.3%	36.1%	34.3%	31.9%	29.4%	29.4%
Postop. RT + Surgery (n=131)	77.5%	53.5%	40.5%	33.8%	29.4%	27.2%	22.0%	22.0%
RT alone (n=116)	54.4%	33.5%	23.2%	19.0%	15.5%	14.3%	6.0%	6.0%
CCRT (n=1003)	56.5%	40.7%	32.7%	28.3%	26.4%	23.7%	21.8%	21.8%
Chemotherapy alone (n=75)	42.3%	18.3%	18.3%	13.7%	8.6%	8.6%	8.6%	8.6%
Palliative RT (n=42)	20.4%	10.2%	10.2%	10.2%	10.2%	3.4%	3.4%	3.4%

**Fig. 6** Survival of patients treated by chemotherapy and/or radiotherapy (cStage I–IIA)



	Years after treatment							
	1	2	3	4	5	6	7	8
Preop. RT + Surgery	83.8%	77.7%	64.7%	55.6%	53.1%	53.1%	53.1%	53.1%
Postop. RT + Surgery	92.3%	72.5%	56.4%	52.1%	52.1%	52.1%	46.3%	46.3%
RT alone	78.0%	59.8%	41.1%	36.2%	30.8%	30.8%	28.0%	9.3%
CCRT	86.0%	77.5%	66.7%	61.6%	58.9%	52.4%	47.3%	47.3%
Chemotherapy alone	100.0%	75.0%	75.0%	75.0%	75.0%	50.0%	50.0%	50.0%
Palliative RT	71.4%	42.9%	42.9%	42.9%	42.9%	21.4%	-	-

**Fig. 7** Survival of patients treated by chemotherapy and/or radiotherapy (cStage IIB–IVB)



	Years after treatment							
	1	2	3	4	5	6	7	8
Preop. RT + Surgery	67.0%	45.9%	36.5%	32.1%	31.0%	28.1%	25.2%	25.2%
Postop. RT + Surgery	73.0%	47.0%	34.4%	25.8%	21.1%	18.2%	10.6%	10.6%
RT alone	30.5%	9.9%	7.9%	4.0%	2.0%	2.0%	2.0%	2.0%
CCRT	46.9%	28.2%	21.1%	17.1%	15.6%	14.2%	13.7%	13.7%
Chemotherapy alone	38.7%	11.3%	11.3%	11.3%	5.7%	5.7%	5.7%	5.7%
Palliative RT	7.8%	0.0%	-	-	-	-	-	-

**IV. Clinical results in patients treated with esophagectomy in 2004**

**Table 45** Tumor location

Locations	Cases (%)
Cervical	101 (3.8%)
Upper thotacic	298 (11.3%)
Middle thoracic	1242 (46.9%)
Lower thoracic	799 (30.2%)
Abdominal	148 (5.6%)
EG	24 (0.9%)
EG-Junction (E=G)	20 (0.8%)
Unknown	15 (0.6%)
Total lesions	2647
Total cases	2647
Missing	7

EG: esophago-gastric

**Table 46** Approaches to tumor resection

Approaches	Cases (%)
Cervical approach	115 (4.3%)
Right thoracotomy	2143 (80.8%)
Left thoracotomy	43 (1.6%)
Left thoracoabdominal approach	61 (2.3%)
Laparotomy	86 (3.2%)
Transhiatal (without blunt dissection)	24 (0.9%)
Transhiatal (with blunt dissection)	74 (2.8%)
Sternotomy	14 (0.5%)
Others	79 (3.0%)
Unknown	14 (0.5%)
Total	2653
Missing	16

**Table 47** Endoscopic surgery

Endoscopic surgery	Cases (%)
None	2154 (81.8%)
Thoracoscopy-assisted	265 (10.1%)
Laparoscopy-assisted	81 (3.1%)
Thoracoscopy + Laparoscopy-assisted	108 (4.1%)
Mediastinoscopy-assisted	15 (0.6%)
Thoracoscopy + Mediastinoscopy-assisted	0
Laparoscopy + Mediastinoscopy-assisted	1 (0.0%)
Others	3 (0.1%)
Unknown	7 (0.3%)
Total	2634
Missing	35

**Table 48** Fields of lymph node dissection according to the location of the tumor

\* Excluding pharynx and missing 35 cases of locations

Locations	Cervical	Upper thoracic	Middle thoracic	Lower thoracic	Abdominal	EGJ	Total
Region of lymphadenectomy	Cases (%)	Cases (%)	Cases (%)	Cases (%)	Cases (%)	Cases (%)	Cases (%)
None	10 (10.0%)	18 (6.1%)	46 (3.7%)	22 (2.8%)	5 (3.4%)	0	101 (3.9%)
C	31 (31.0%)	0	9 (0.7%)	4 (0.5%)	0	0	44 (1.7%)
C+UM	23 (23.0%)	4 (1.4%)	0	1 (0.1%)	0	0	28 (1.1%)
C+UM+MLM	4 (4.0%)	7 (2.4%)	19 (1.5%)	5 (0.6%)	0	0	35 (1.3%)
C+UM+MLM+A	22 (22.0%)	179 (60.7%)	532 (43.1%)	258 (32.3%)	17 (11.4%)	2 (4.5%)	1010 (38.6%)
C+UM+A	2 (2.0%)	5 (1.7%)	1 (0.1%)	0	0	0	8 (0.3%)
C+MLM	0	0	0	0	0	0	0
C+MLM+A	1 (1.0%)	1 (0.3%)	3 (0.2%)	3 (0.4%)	0	0	8 (0.3%)
C+A	2 (2.0%)	1 (0.3%)	2 (0.2%)	1 (0.1%)	0	0	6 (0.2%)
UM	0	1 (0.3%)	3 (0.2%)	4 (0.5%)	1 (0.7%)	0	9 (0.3%)
UM+MLM	0	3 (1.0%)	22 (1.8%)	7 (0.9%)	4 (2.7%)	0	36 (1.4%)
UM+MLM+A	2 (2.0%)	65 (22.0%)	523 (42.4%)	353 (44.2%)	39 (26.2%)	7 (15.9%)	989 (37.8%)
UM+A	0	0	3 (0.2%)	2 (0.3%)	0	0	5 (0.2%)
MLM	0	0	8 (0.6%)	7 (0.9%)	0	0	15 (0.6%)
MLM+A	1 (1.0%)	7 (2.4%)	44 (3.6%)	98 (12.3%)	57 (38.3%)	21 (47.7%)	228 (8.7%)
A	0	3 (1.0%)	10 (0.8%)	29 (3.6%)	25 (16.8%)	14 (31.8%)	81 (3.1%)
Unknown	2 (2.0%)	1 (0.3%)	8 (0.6%)	4 (0.5%)	1 (0.7%)	0	16 (0.6%)
<b>Total</b>	<b>100</b>	<b>295</b>	<b>1233</b>	<b>798</b>	<b>149</b>	<b>44</b>	<b>2619</b>
Missing	1	3	9	1	1	0	15

C: bilateral cervical nodes

UM: upper mediastinal nodes

MLM: middle-lower mediastinal nodes

A: abdominal nodes

**Table 49** Extent of lymph node dissection

Grade of dissection (D)	Cases (%)
DX	42 (1.6%)
D0	127 (4.8%)
DI	355 (13.4%)
DII	1234 (46.7%)
DIII	885 (33.5%)
<b>Total</b>	<b>2643</b>
Missing	26

**Table 50** Reconstruction route

Reconstruction route	Cases (%)
None	40 (1.6%)
Antethoracic	236 (9.2%)
Retrosternal	919 (36.0%)
Intrathoracic	419 (16.4%)
Posterior mediastinal	906 (35.5%)
Others	21 (0.8%)
Unknown	12 (0.5%)
<b>Total</b>	<b>2553</b>
Missing	73

**Table 51** Organs used for reconstruction

Organs used for reconstruction	Cases (%)
None	49 (1.8%)
Whole stomach	104 (3.8%)
Gastric tube	2189 (79.7%)
Jejunum	115 (4.2%)
Free jejunum	62 (2.3%)
Colon	99 (3.6%)
Free colon	22 (0.8%)
Skin graft	1 (0.0%)
Others	97 (3.5%)
Unknown	8 (0.3%)
<b>Total lesions</b>	<b>2746</b>
<b>Total cases</b>	<b>2655</b>
Missing	14

**Table 58** Histological classification

Histological classification	Cases (%)
Not examined	6 (0.2%)
SCC	2337 (89.3%)
SCC	352 (13.5%)
Well diff.	517 (19.8%)
Moderately diff.	1067 (40.8%)
Poorly diff.	401 (15.3%)
Adenocarcinoma	73 (2.8%)
Barrett's adenocarcinoma	32 (1.2%)
Adenosquamous cell carcinoma	11 (0.4%)
(Co-existing)	3 (0.1%)
(Mucoepidermoid carcinoma)	1 (0.0%)
Adenoid cystic carcinoma	0
Basaloid carcinoma	40 (1.5%)
Undiff. carcinoma (small cell)	9 (0.3%)
Undiff. carcinoma	2 (0.1%)
Other carcinoma	3 (0.1%)
Sarcoma	5 (0.2%)
Carcinosarcoma	17 (0.6%)
Malignant melanoma	10 (0.4%)
Dysplasia	10 (0.4%)
Other	24 (0.9%)
Unkown	33 (1.3%)
<b>Total</b>	<b>2616</b>
Missing	53

SCC: Squamous cell carcinoma

**Table 59** Depth of tumor invasion

pT-category	Cases (%)
pXT	16 (0.6%)
pT0	36 (1.4%)
pTis	47 (1.8%)
pT1a	231 (8.9%)
pT1b	601 (23.1%)
pT2	317 (12.2%)
pT3	1132 (43.5%)
pT4	184 (7.1%)
Other	0
Unknown	36 (1.4%)
<b>Total</b>	<b>2600</b>
Missing	69

**Table 60** Subclassification of superficial carcinoma

Subclassification	Cases (%)
Not superficial carcinoma	1679 (65.4%)
m1 (ep)	43 (1.7%)
m2 (lpm)	73 (2.8%)
m3 (mm)	137 (5.3%)
sm1	86 (3.3%)
sm2	136 (5.3%)
sm3	242 (9.4%)
Unknown	172 (6.7%)
<b>Total</b>	<b>2568</b>
Missing	101

ep: epithelium

lpm: lamina propria mucosa mm: muscularis mucosa

**Table 61** Pathological grading of lymph node metastasis

Lymph node metastasis	Cases (%)
n (-)	1262 (49.1%)
n1 (+)	334 (13.0%)
n2 (+)	601 (23.4%)
n3 (+)	189 (7.4%)
n4 (+)	160 (6.2%)
Unknown	25 (1.0%)
<b>Total</b>	<b>2571</b>
Missing	98

**Table 62** Numbers of the metastatic nodes

Numbers of lymph node metastasis	Cases (%)
0	1181 (44.2%)
1-3	886 (33.2%)
4-7	351 (13.2%)
8-	216 (8.1%)
Unknown	35 (1.3%)
<b>Total</b>	<b>2669</b>
Missing	0

**Table 63** Pathological findings of distant organ metastasis

Distant metastasias (M)	Cases (%)
MX	44 (1.7%)
M0	2546 (96.0%)
M1	62 (2.3%)
Total	2652
Missing	17

**Table 64** Residual tumor

Residual tumor (R)	Cases (%)
RX	149 (5.7%)
R0	2138 (82.4%)
R1	170 (6.5%)
R2	139 (5.4%)
Unknown	0
Total	2596
Missing	73

**Table 75** Causes of death

Cause of death	Cases (%)
Death due to recurrence	933 (73.5%)
Death due to other cancer	63 (5.0%)
Death due to other disease (rec+)	32 (2.5%)
Death due to other disease (rec-)	129 (10.2%)
Death due to other disease (rec?)	15 (1.2%)
Operative death*	35 (2.8%)
Hospital death**	57 (4.5%)
Unknown	5 (0.4%)
Total of death cases	1269
Missing	6

rec: recurrence

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

Operative mortality : 1.3%

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

Hospital mortality : 2.1%

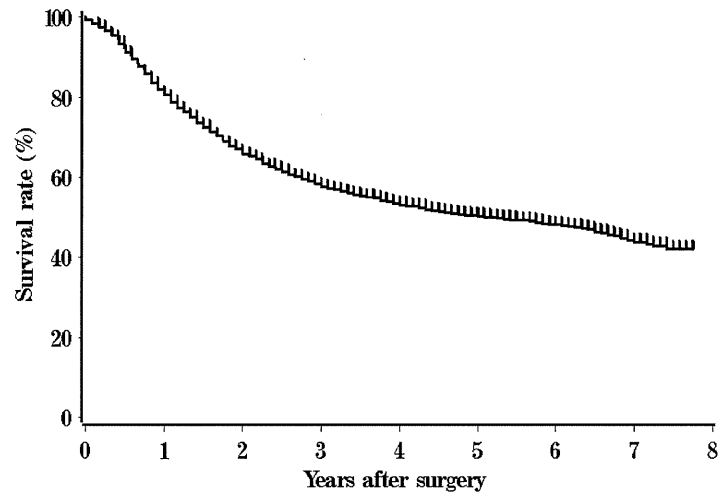
Follow-up period (years)	
Median (min - max)	3.25 (0.00 - 7.50 )

**Table 76** Initial recurrent lesion

Initial recurrence lesion of fatal cases	Cases (%)
Lymph node	580 (35.0%)
Lung	242 (14.6%)
Liver	199 (12.0%)
Bone	119 (7.2%)
Brain	31 (1.9%)
Primary lesion	141 (8.5%)
Dissemination	92 (5.5%)
Anastomotic region	10 (0.6%)
Others	90 (5.4%)
Unknown	155 (9.3%)
Total of recurrence lesion	1659
Total	1230
Missing	47



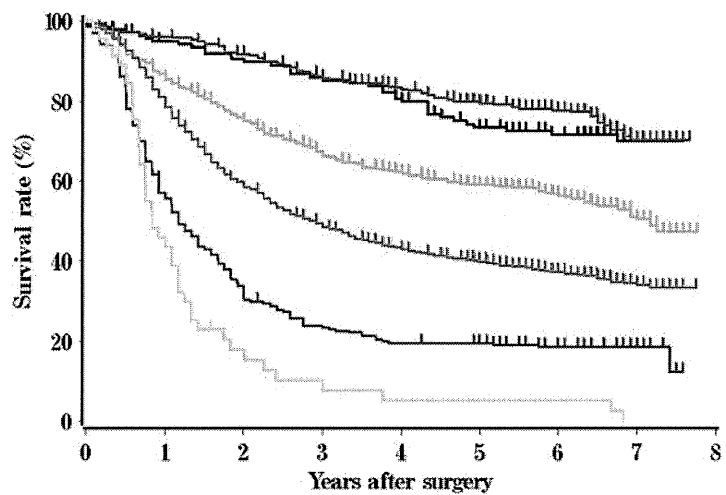
**Fig. 8** Survival of patients treated by esophagectomy



— Esophagectomy (n= 2282)

	Years after surgery							
	1	2	3	4	5	6	7	8
Esophagectomy	80.7%	66.1%	57.7%	53.1%	50.2%	48.1%	43.8%	42.0%

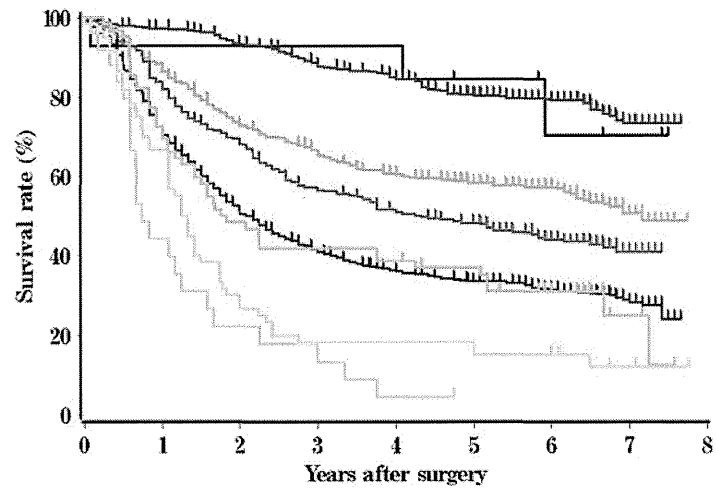
**Fig. 9** Survival of patients treated by esophagectomy in relation to clinical stage (JSED-cTNM 9th)



— cStage 0 (n= 142)    - - - cStage I (n= 365)    - · - cStage II (n= 590)  
 - · - cStage III (n= 798)    - - - cStage IVa (n= 241)    - · - cStage IVb (n= 47)

	Years after surgery							
	1	2	3	4	5	6	7	8
cStage 0	95.0%	89.7%	85.3%	79.9%	73.4%	71.4%	69.8%	69.8%
cStage I	96.0%	91.7%	85.7%	83.0%	79.5%	77.7%	70.2%	70.2%
cStage II	85.5%	75.0%	66.3%	61.9%	58.9%	56.6%	50.4%	47.2%
cStage III	79.0%	58.9%	48.5%	42.8%	39.8%	37.3%	34.1%	33.3%
cStage IVa	55.6%	30.8%	23.4%	19.5%	19.5%	18.5%	18.5%	12.3%
cStage IVb	43.5%	17.8%	10.2%	5.1%	5.1%	5.1%	0.0%	-

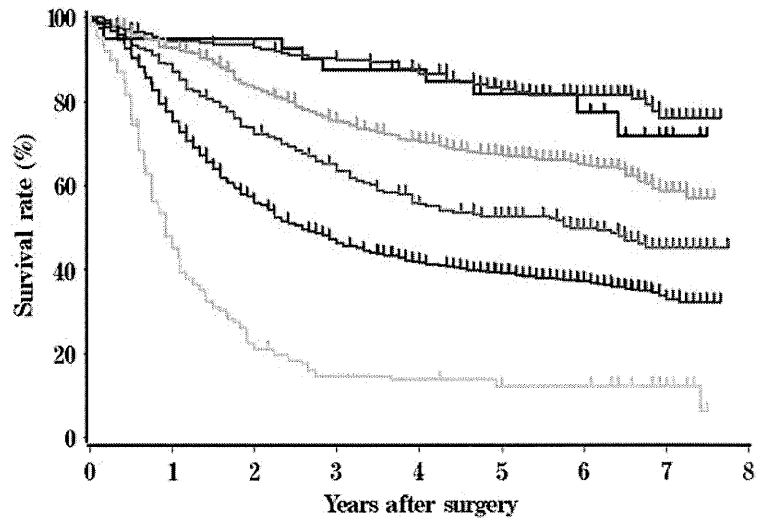
**Fig. 10** Survival of patients treated by esophagectomy in relation to clinical stage (UICC-cTNM 5th)



— cStage 0 (n= 14)      - - - - - cStage I (n= 520)      - · - · - cStage IIA (n= 429)  
 - · - · - cStage IIB (n= 302)      - - - - - cStage III (n= 820)      - · - · - cStage IV (n= 26)  
 - · - · - cStage IVA (n= 60)      - · - · - cStage IVB (n= 62)

	Years after surgery							
	1	2	3	4	5	6	7	8
cStage 0	92.9%	92.9%	92.9%	92.9%	84.4%	70.3%	70.3%	70.3%
cStage I	97.2%	93.4%	87.8%	84.6%	80.5%	79.2%	73.4%	73.4%
cStage IIA	86.8%	72.7%	65.4%	60.5%	58.3%	57.3%	50.7%	48.8%
cStage IIB	82.1%	68.0%	56.9%	50.9%	48.3%	44.0%	41.1%	41.1%
cStage III	70.6%	51.1%	40.9%	36.0%	33.5%	31.6%	28.2%	24.1%
cStage IV	44.2%	22.1%	17.7%	4.4%	4.4%	-	-	-
cStage IVA	66.7%	28.3%	18.3%	18.3%	15.0%	15.0%	12.0%	12.0%
cStage IVB	69.4%	48.4%	41.9%	38.7%	37.0%	31.1%	24.9%	12.4%

**Fig. 11** Survival of patients treated by esophagectomy in relation to the depth of tumor invasion (JSED-pTNM 9th: pT)



— pTis (n= 41)      - - - pT1a (n= 207)      - · - · - pT1b (n= 495)  
 - · - · - pT2 (n= 274)      - - - pT3 (n= 984)      - · - · - pT4 (n= 149)

	Years after surgery							
	1	2	3	4	5	6	7	8
pTis	95.1%	95.1%	87.6%	87.6%	81.8%	77.3%	71.7%	71.7%
pT1a	94.5%	93.0%	89.8%	86.7%	82.8%	81.5%	75.9%	75.9%
pT1b	92.7%	83.1%	75.3%	70.5%	67.3%	64.9%	58.6%	57.0%
pT2	87.0%	72.2%	63.8%	55.5%	52.6%	49.8%	45.2%	45.2%
pT3	75.5%	56.2%	46.3%	41.7%	39.2%	37.3%	32.9%	32.2%
pT4	45.0%	21.8%	14.6%	13.8%	12.3%	12.3%	12.3%	6.1%

**Fig. 12** Survival of patients treated by esophagectomy in relation to the depth of tumor invasion (UICC-pTNM 5th: pT)

