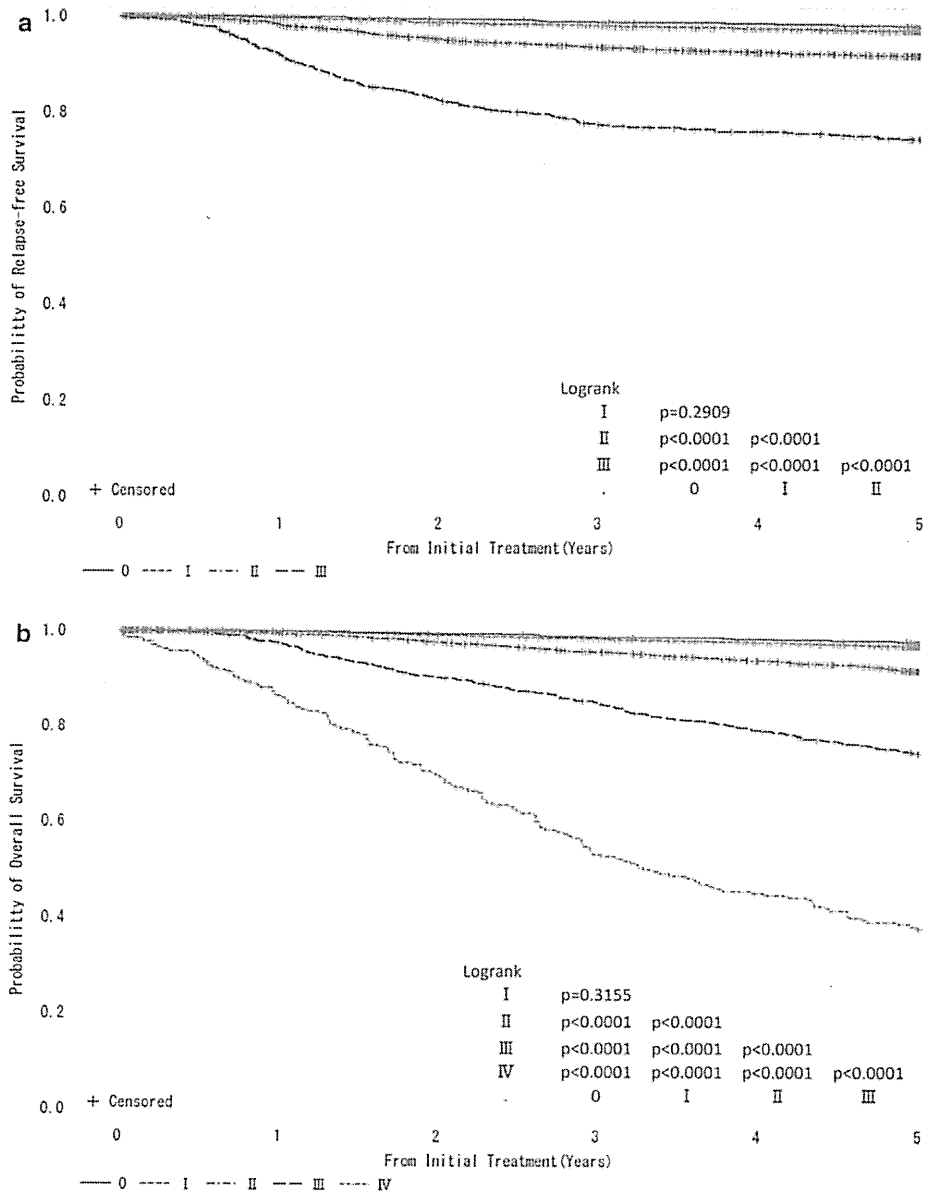

Fig. 3 a, b Kaplan–Meier curves for relapse-free and overall survival of all cases by clinical stage (UICC). *P* values were calculated using the log rank test

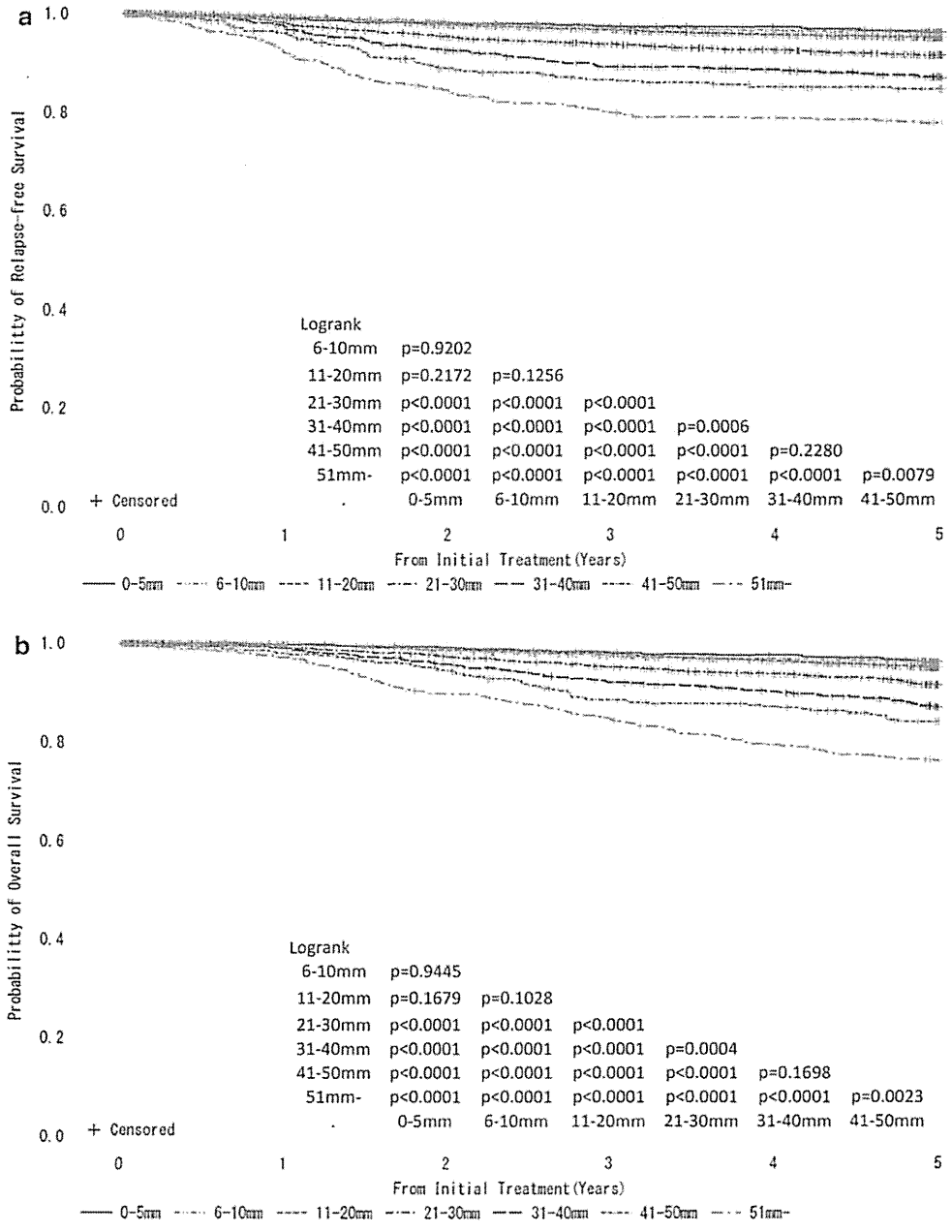

Fig. 4 a, b Kaplan–Meier curves for relapse-free and overall survival of cases without neoadjuvant therapy by pathological tumor size (pT size). Tumor size is a marker of invasiveness. *P* values were calculated using the log rank test

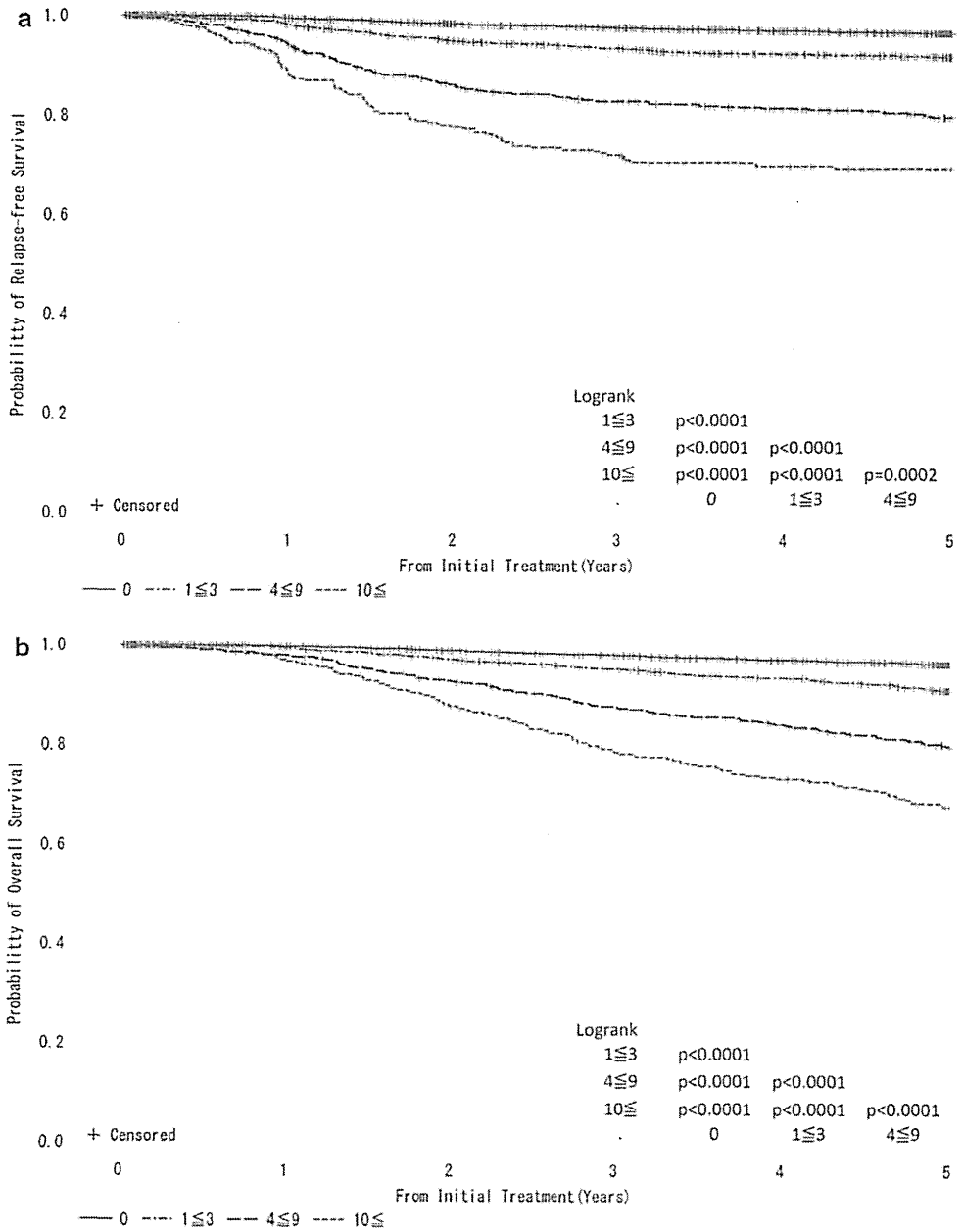

Fig. 5 a, b Kaplan–Meier curves for relapse-free and overall survival of cases without neoadjuvant therapy by the number of metastatic lymph nodes. *P* values were calculated using the log rank test

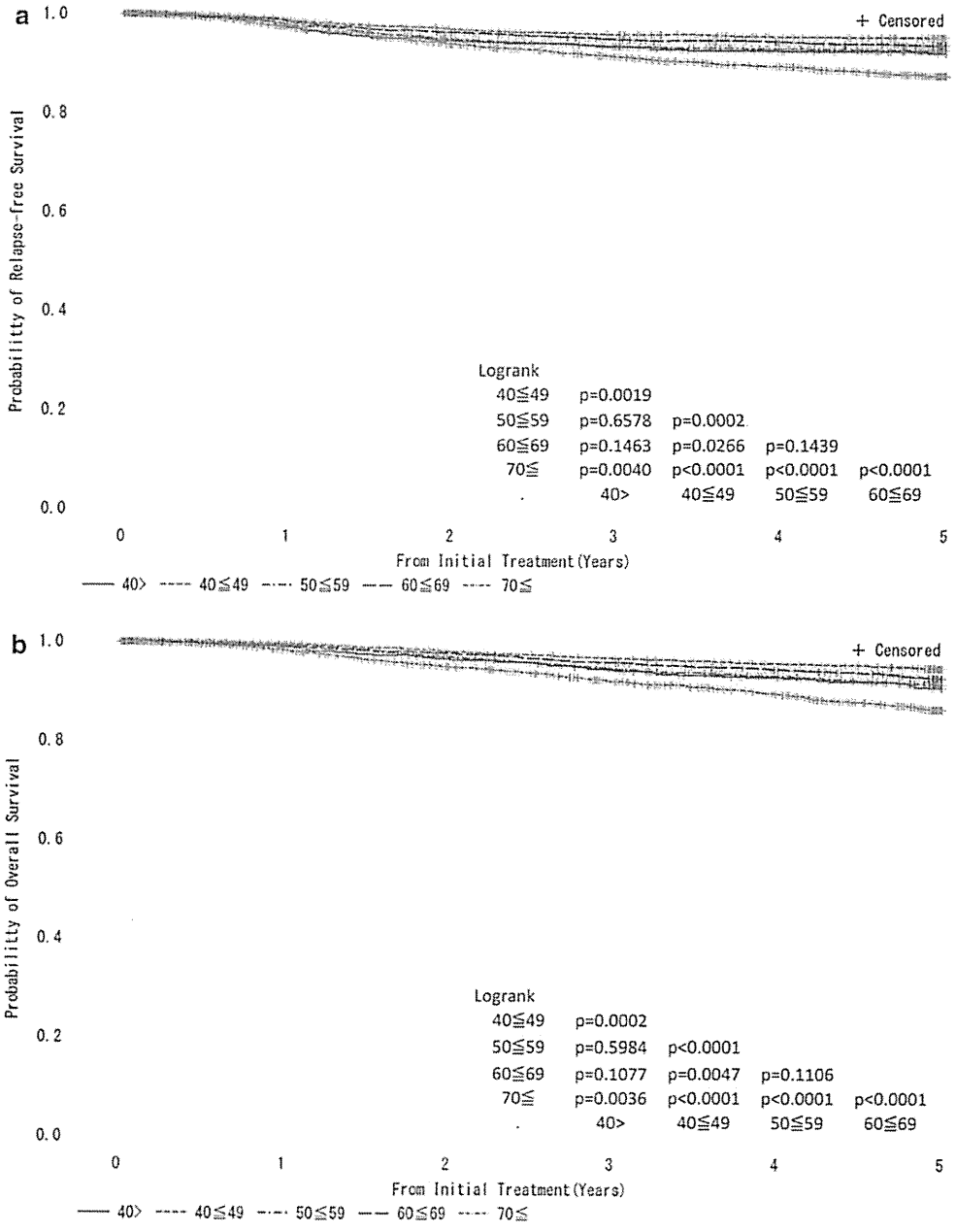

Fig. 6 a, b Kaplan–Meier curves for relapse-free and overall survival of all cases by age. *P* values were calculated using the log rank test

Table 1 Patient characteristics

Age		
Mean	SD	
57.36	12.81	
Tumor size(cm)		
Mean	SD	
2.64	2.12	
Tumor size[a]	Count	(%)
T0	118	1.18
Tis	914	9.17
T1a	61	0.61
T1b	836	8.38
T1c	2923	29.32
T2	3346	33.56
T3	459	4.6
T4	550	5.52
Unknown	764	7.66
N[a]		
N0	7616	76.38
N1	1791	17.96
N2	270	2.71
N3	121	1.21
Unknown	173	1.74
M[a]		
M0	9425	94.52
M1	257	2.58
Unknown	289	2.9
Stage[a]		
0	841	8.43
I	3386	33.96
II	3635	36.46
III	752	7.54
IV	257	2.58
Unknown	1100	11.03
ER		
Positive	7245	72.66
Negative	2325	23.32
Unknown	401	4.02
PgR		
Positive	5945	59.62
Negative	3594	36.04
Unknown	432	4.33
HER2		
Positive	1407	14.11
Negative	7351	73.72
Unknown	1213	12.17

ER estrogen receptor, *PgR* progesterone receptor, *HER2* human epidermal growth factor receptor 2

[a] The TNM classification was identified by the UICC staging system

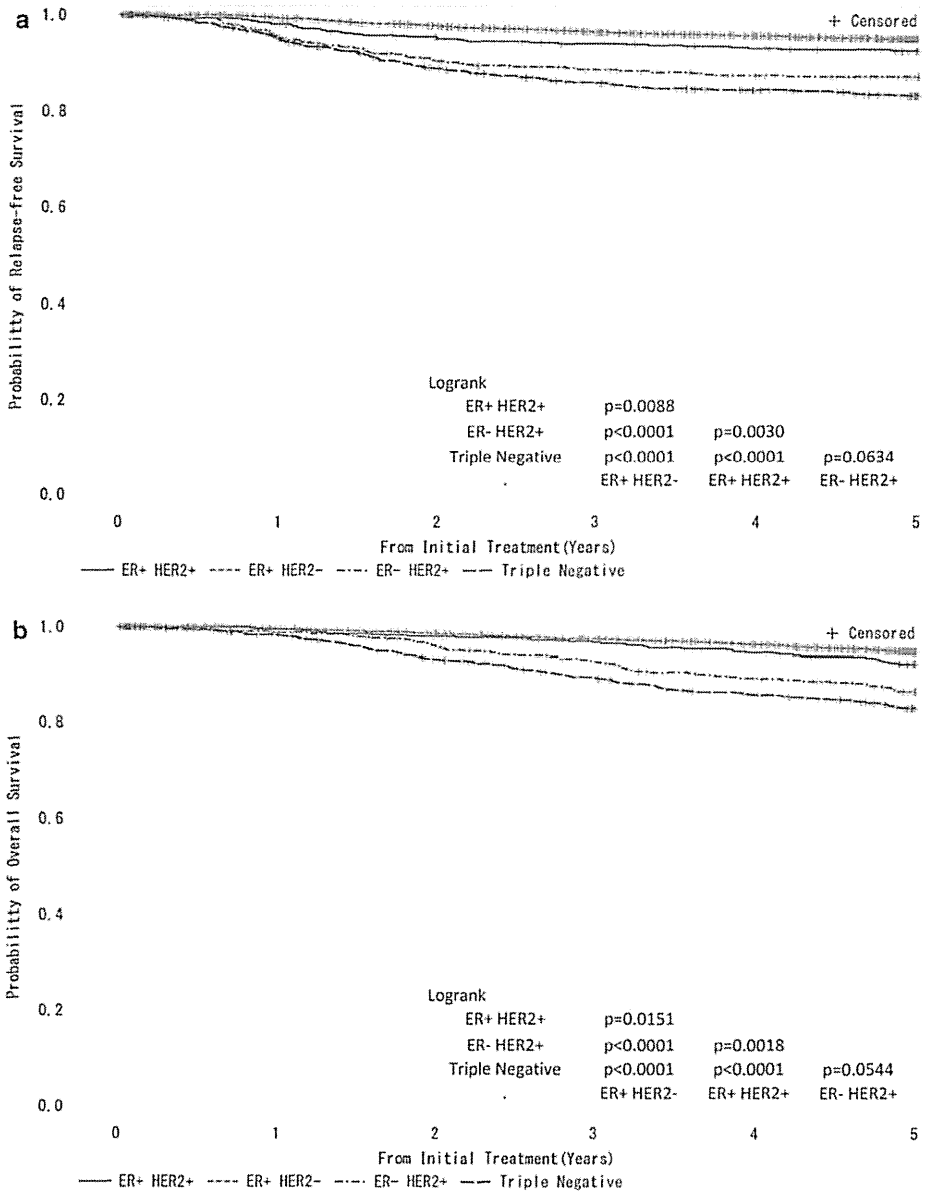

Fig. 7 **a**, **b** Kaplan–Meier curves for relapse-free and overall survival of T1–T4, any N and M0 cases with respect to estrogen receptor (ER) status and HER2 (human EGFR-related 2) amplification status. *P* values were calculated using the log rank test. Relapse-free survival and overall survival of patients with respect to combined ER and HER2 status

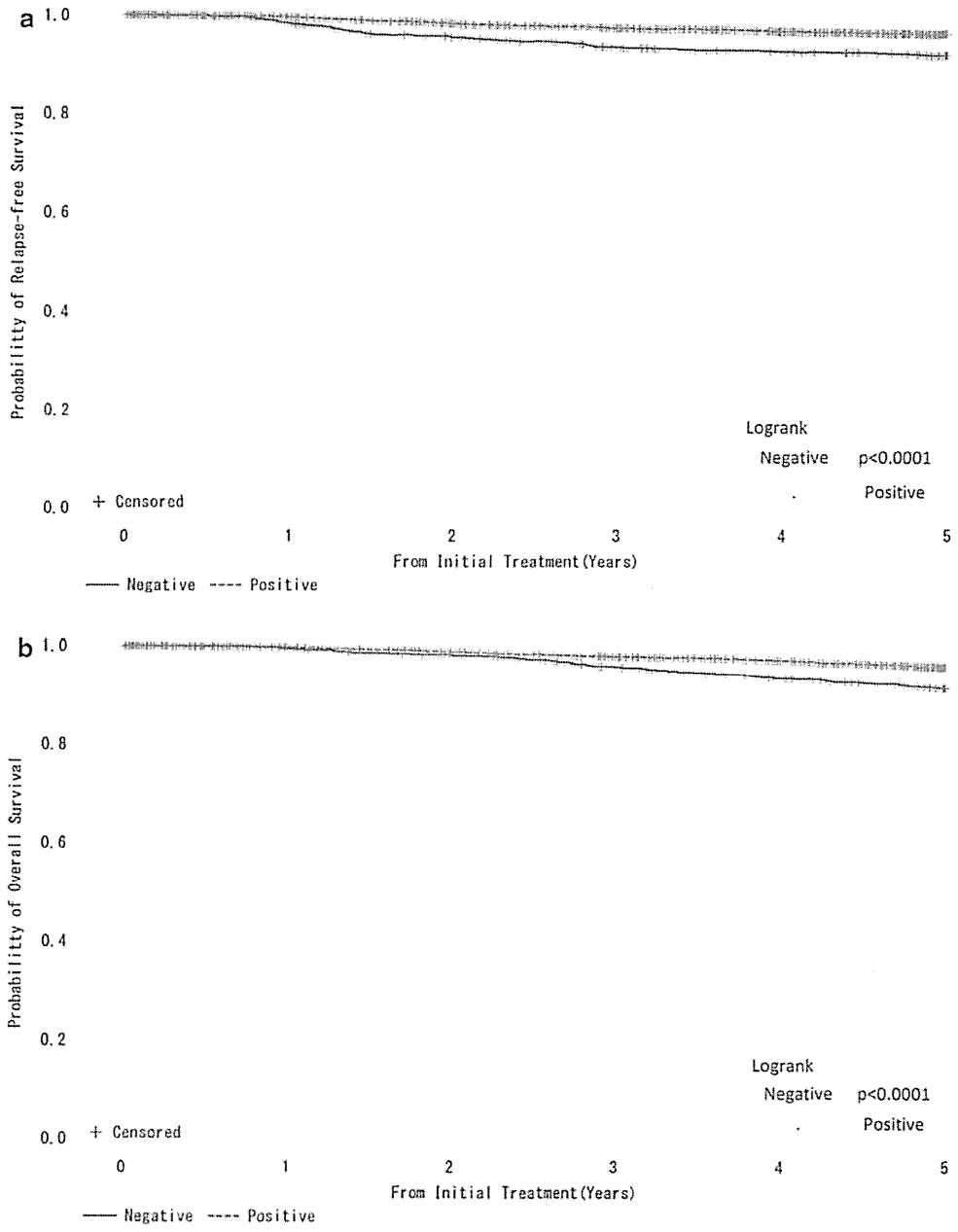

Fig. 8 a, b Kaplan–Meier curves for relapse-free and overall survival of ER-positive and M0 cases by progesterone receptor (PgR) status. *P* values were calculated using the log rank test

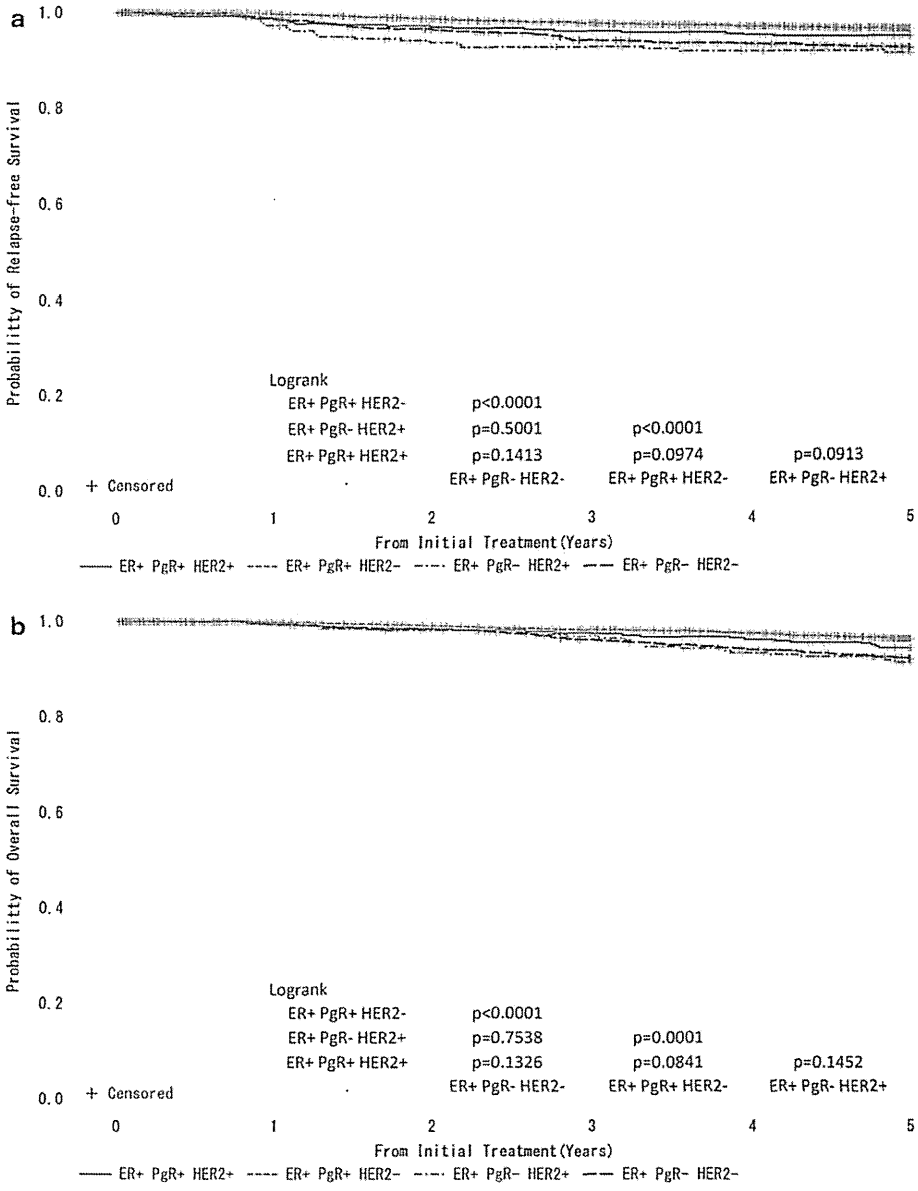

Fig. 9 a, b Kaplan–Meier curves for relapse-free and overall survival of ER-positive and M0 cases with respect to PgR and HER2 amplifications. *P* values were calculated using the log rank test

Acknowledgments The authors thank all the affiliated institutes participating in the Breast Cancer Registry of the JBCS for their efforts to register the patients' data. We extend our gratitude to staff members working at the three major institutions that contributed extensively to the present study: Sagara Hospital (Kagoshima), National Cancer Center Hospital (Tokyo), and Breastopia Namba Hospital. We also thank Dr. Muneaki Sano, a former director of Niigata Cancer Center Hospital, for his dedication to establishing the new registration system, and the staff members engaged in the registration on the Japan Clinical Research Support Unit (J-CRSU) and the Public Health Research Foundation. This work was partly supported by JSPS KAKENHI Grant Numbers 15H04796.

Compliance with ethical standards

Conflict of interest The authors declare that they have no competing interests.

References

1. Sobin LH, Wittekind Ch, editors. TNM classification of malignant tumors (UICC). 6th ed. New York: Wiley; 2002. ISBN 10: 0471222887.

2. Tavassoli FA, Devilee P, editors. World health organization classification of tumours: tumours of the breast and female genital organs. 4th ed. Lyon: IARC Press; 2003. ISBN 10: 9283224124.
3. Kurebayashi J, Miyoshi Y, Ishikawa T, Saji S, Sugie T, Suzuki T et al. Clinicopathological characteristics of breast cancer and trends in the management of breast cancer patients in Japan: based on the Breast Cancer Registry of the Japanese Breast Cancer Society between 2004 and 2011. Breast Cancer 2015; doi:10.1007/s12282-015-0599-6.
4. The Japanese Breast Cancer Society. https://www.med-amc.com/jcs_society/member/login/?societyCode=jbcs.
5. National cancer center. http://ganjoho.jp/professional/index.html.
6. World Health Statistics: a wealth of information on global public health. World Health Organization 2014. ISBN-13: 978-92415 64717.
7. Cabinet Office, Government of Japan. http://www8.cao.go.jp/kourei/whitepaper/w-2014/zenbun/pdf/1s1s_1.pdf.

Breast Cancer (2016) 23:62–72
DOI 10.1007/s12282-015-0646-3

SPECIAL ARTICLE

Comprehensive prognostic report of the Japanese Breast Cancer Society registry in 2006

Takayuki Iwamoto[1] · Naohito Fukui[2] · Takayuki Kinoshita[3] · Keisei Anan[4] · Naoki Niikura[5] · Masaaki Kawai[6] · Naoki Hayashi[7] · Kouichiro Tsugawa[8] · Kenjiro Aogi[9] · Takanori Ishida[10] · Hideji Masuoka[11] · Shinobu Masuda[12] · Kotaro Iijima[13] · Seigo Nakamura[14] · Yutaka Tokuda[5]

Received: 20 May 2015 / Accepted: 13 July 2015 / Published online: 13 October 2015

Keywords Breast cancer · Prognosis · Report · Japan · Registry · 2006 · The Japanese Breast Cancer Society

Preface

The prognostic study for the Japanese Breast Cancer Society (JBCS) registry in 2006 was finally published here (Figs. 1, 2, 3, 4, 5, 6, 7, 8, 9, Sup. Table 1–9). The JBCS registry has been started from 1975. To 2003, for 29 years, 188,265 cases have been registered. With the cooperation of the Non-Profit Organization Japan Clinical Research Support Unit (J-CRSU) and the Public Health Research Foundation, we have moved to the new system by the web registration from 2004.

In 2006, the number of the registry for institutions was 352 and cases were 22,005. The number of institutions in this prognostic study was 134 and cases were 8788, with 39.9 %. An assessment of 5-year prognosis for cases registered in 2006 has been carried out, and here we report the results thanks to a number of efforts and cooperation. We believe that it is necessary to further promote the registry for contributions to improving breast cancer care and prognosis.

Background characteristics of the patients are summarized in Table 1. The 5-year disease-free survival (DFS) was

Electronic supplementary material The online version of this article (doi:10.1007/s12282-015-0646-3) contains supplementary material, which is available to authorized users.

✉ Yutaka Tokuda
tokuda@is.icc.u-tokai.ac.jp

[1] Department of Breast and Endocrine Surgery, Okayama University Hospital, Okayama, Japan

[2] The Japan Clinical Research Support Unit and the Public Health Research Foundation, Tokyo, Japan

[3] Department of Breast Surgery, National Cancer Center Hospital, Tokyo, Japan

[4] Department of Surgery, Kitakyushu Municipal Medical Center, Kitakyushu, Japan

[5] Department of Breast and Endocrine Surgery, Tokai University School of Medicine, 143 Shimokasuya, Isehara, Kanagawa 259-1193, Japan

[6] Department of Breast Surgery, Miyagi Cancer Center, Natori, Japan

[7] Department of Breast Surgery, St. Luke's International Hospital, Tokyo, Japan

[8] Division of Breast and Endocrine Surgery, Department of Surgery, St. Marianna University School of Medicine, Kawasaki, Japan

[9] Department of Breast Surgery, Shikoku Cancer Center, Matsuyama, Japan

[10] Department of Surgical Oncology, Graduate School of Medicine, Tohoku University, Sendai, Japan

[11] Sapporo-kotoni Breast Clinic, Sapporo, Japan

[12] Department of Pathology, Nihon University School of Medicine, Tokyo, Japan

[13] Department of Breast Oncology, Cancer Institute Hospital, Tokyo, Japan

[14] Division of Breast Surgical Oncology, Department of Surgery, Showa University, Tokyo, Japan

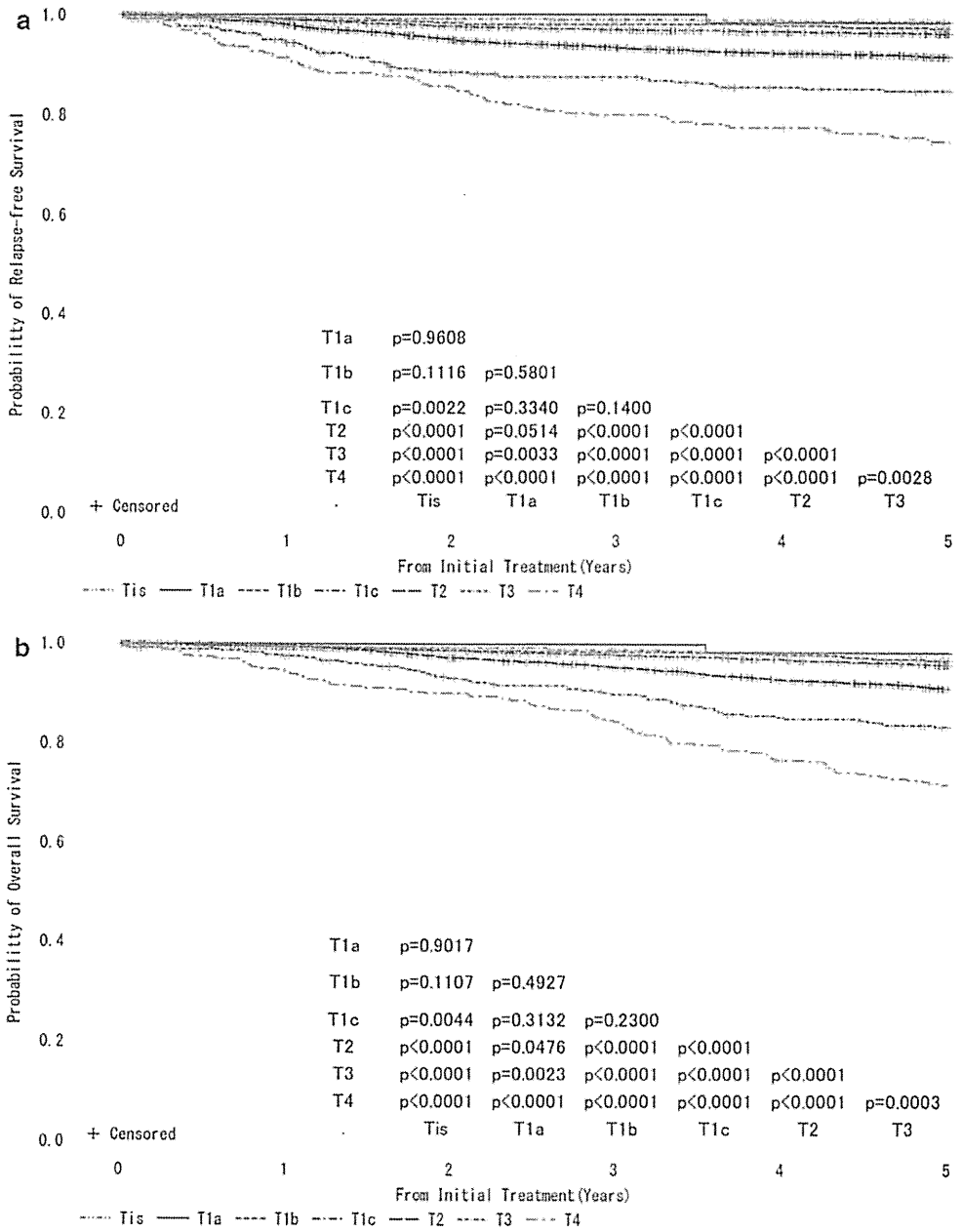

Fig. 1 a, b Kaplan–Meier curves for relapse-free and overall survival of all cases by tumor classification (cT-category). *P* values were calculated using the log rank test. *Tis* non-invasive ductal carcinoma, lobular carcinoma in situ, or Paget disease, *T1a* ≤0.5 cm, *T1b* 0.5 < tumor ≤ 1.0 cm, *T1c* 1.0 < tumor ≤ 2.0 cm, *T2* 2.0 < tumor ≤ 5.0 cm, *T3* >5.0 cm, *T4* tumor of any size with direct extension to the chest wall and/or skin (ulceration or skin nodules) or inflammatory carcinoma

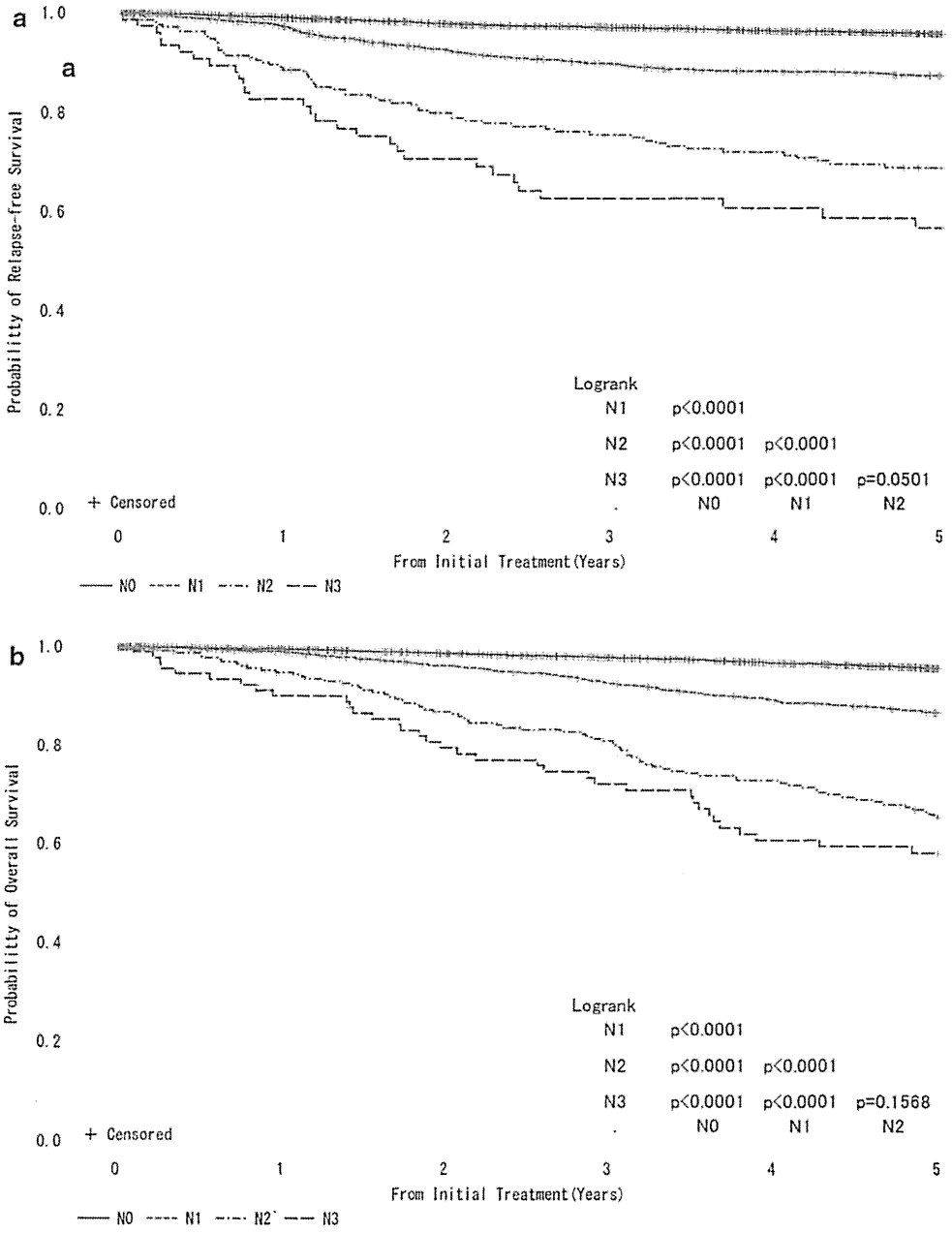

Fig. 2 a, b Kaplan–Meier curves for relapse-free and overall survival of all cases by regional lymph nodes status (cN-category) *N0* no regional lymph node metastases, *N1* metastases in movable ipsilateral level I, II axillary lymph node(s), *N2* metastases in ipsilateral level I, II axillary lymph nodes that are clinically fixed or matted OR Metastases in clinically detected ipsilateral internal mammary nodes in the absence of clinically evident axillary lymph node metastases, *N3* metastases in ipsilateral infraclavicular (level III axillary) lymph node(s) with or without level I, II axillary lymph node involvement OR Metastases in clinically detected ipsilateral internal mammary lymph node(s) with clinically evident level I, II axillary lymph node metastases OR Metastases in ipsilateral supraclavicular lymph node(s) with or without axillary or internal mammary lymph node involvement. *P* values were calculated using the log rank test

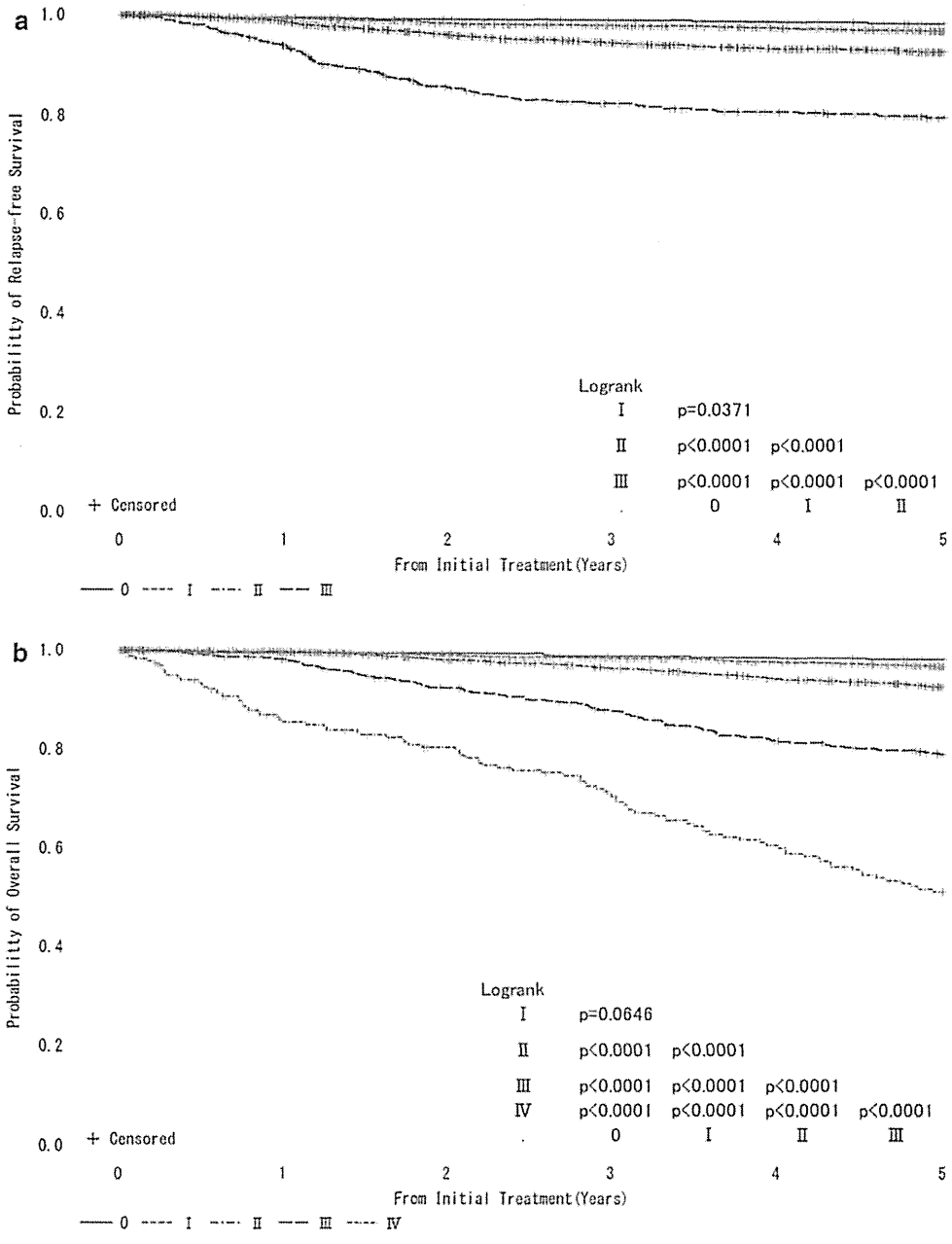

Fig. 3 a, b Kaplan–Meier curves for relapse-free and overall survival of all cases by clinical stage (UICC). *P* values were calculated using the log rank test

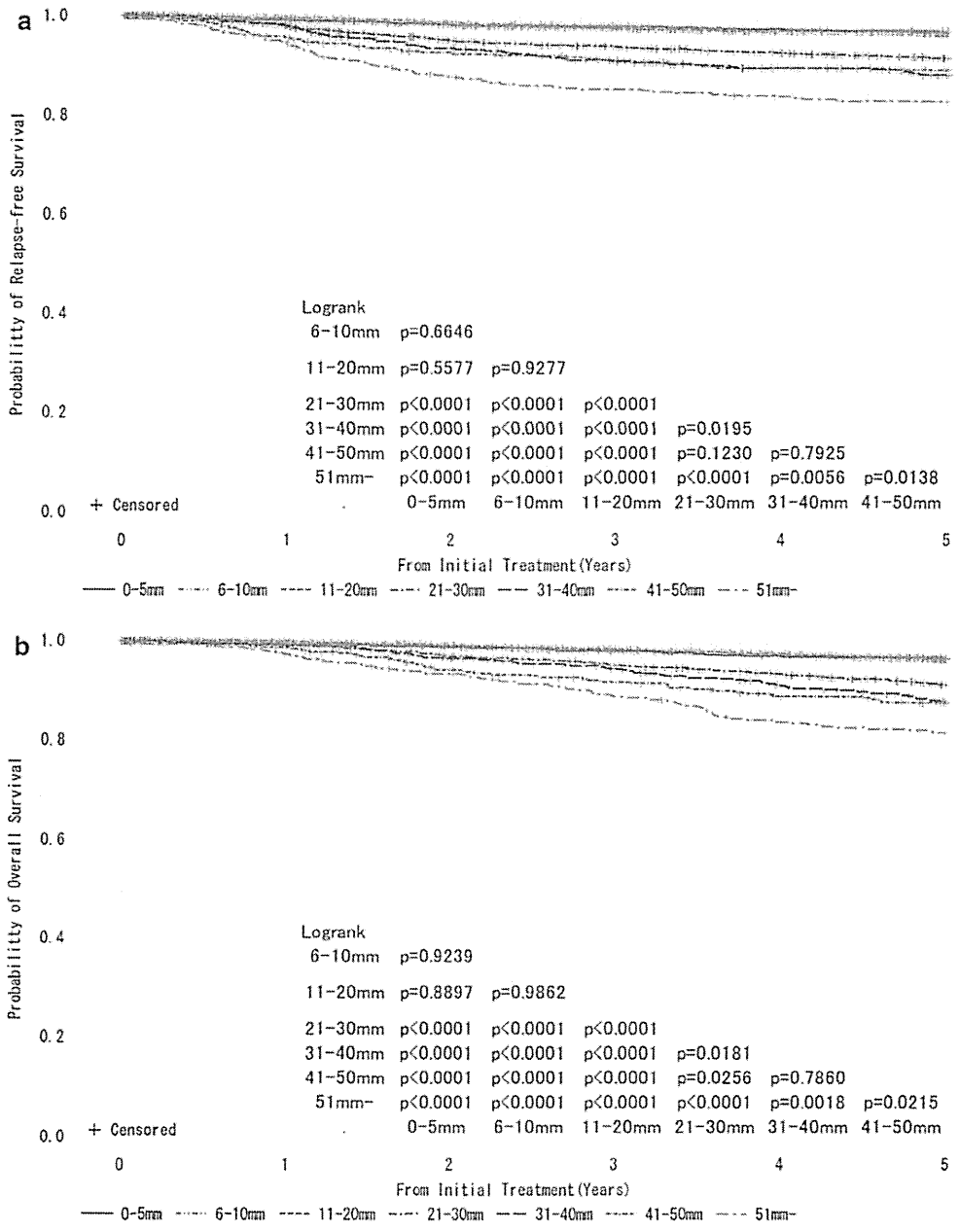

Fig. 4 **a**, **b** Kaplan–Meier curves for relapse-free and overall survival of cases without neoadjuvant therapy by pathological tumor size (pT size). Tumor size is a marker of invasiveness. *P* values were calculated using the log rank test

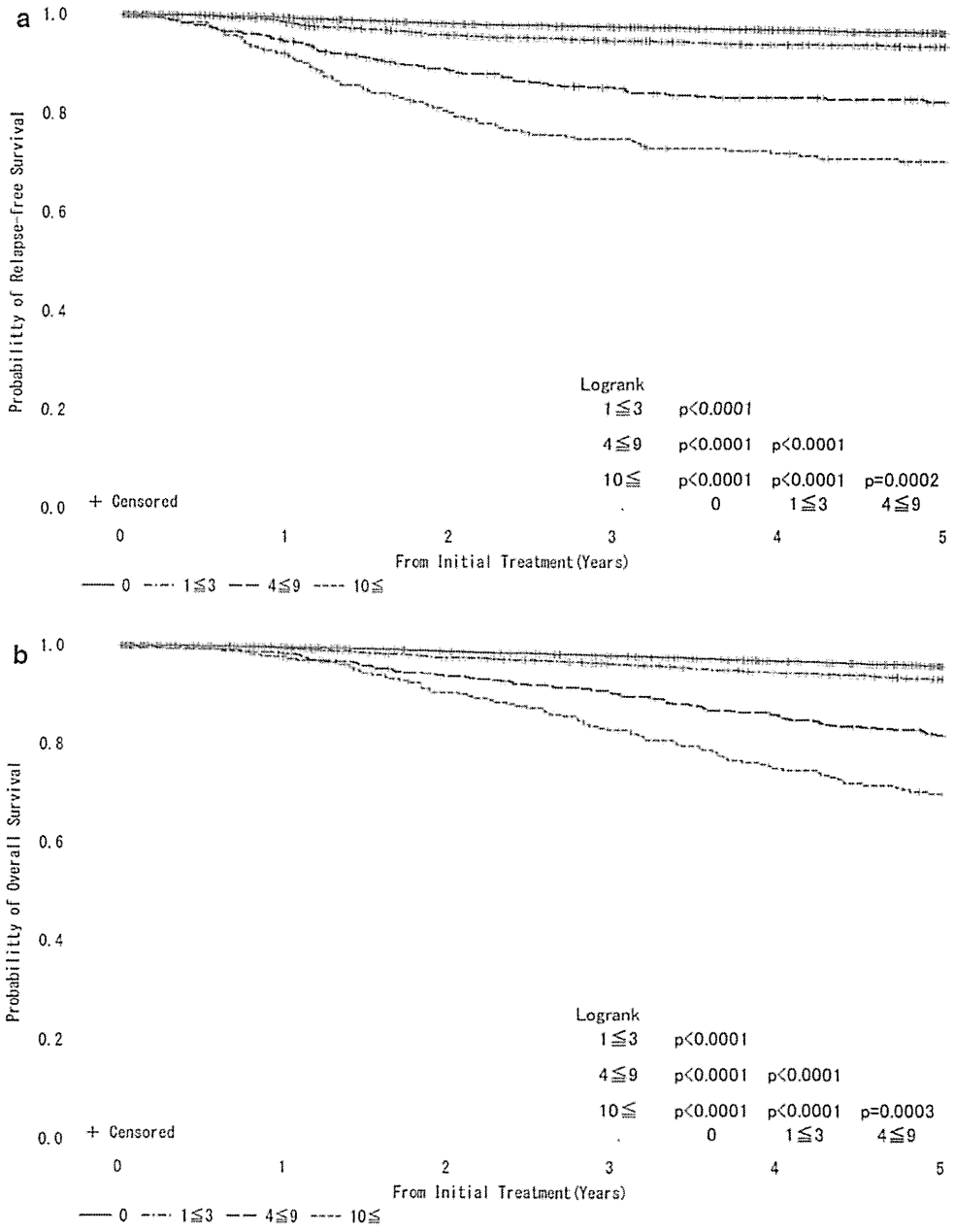

Fig. 5 a, b Kaplan–Meier curves for relapse-free and overall survival of cases without neoadjuvant therapy by the number of metastatic lymph nodes. *P* values were calculated using the log rank test

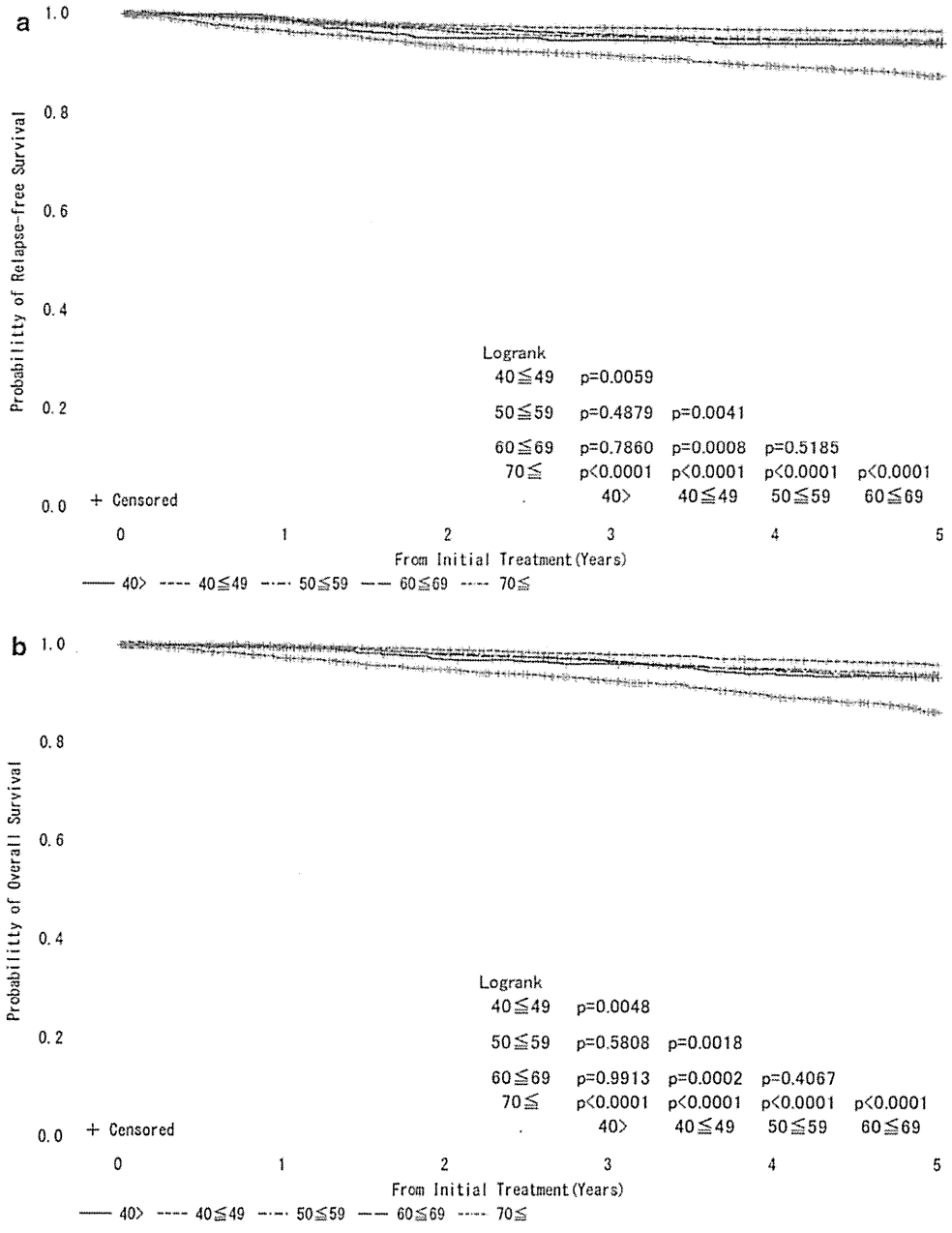

Fig. 6 a, b Kaplan–Meier curves for relapse-free and overall survival of all cases by age. *P* values were calculated using the log rank test

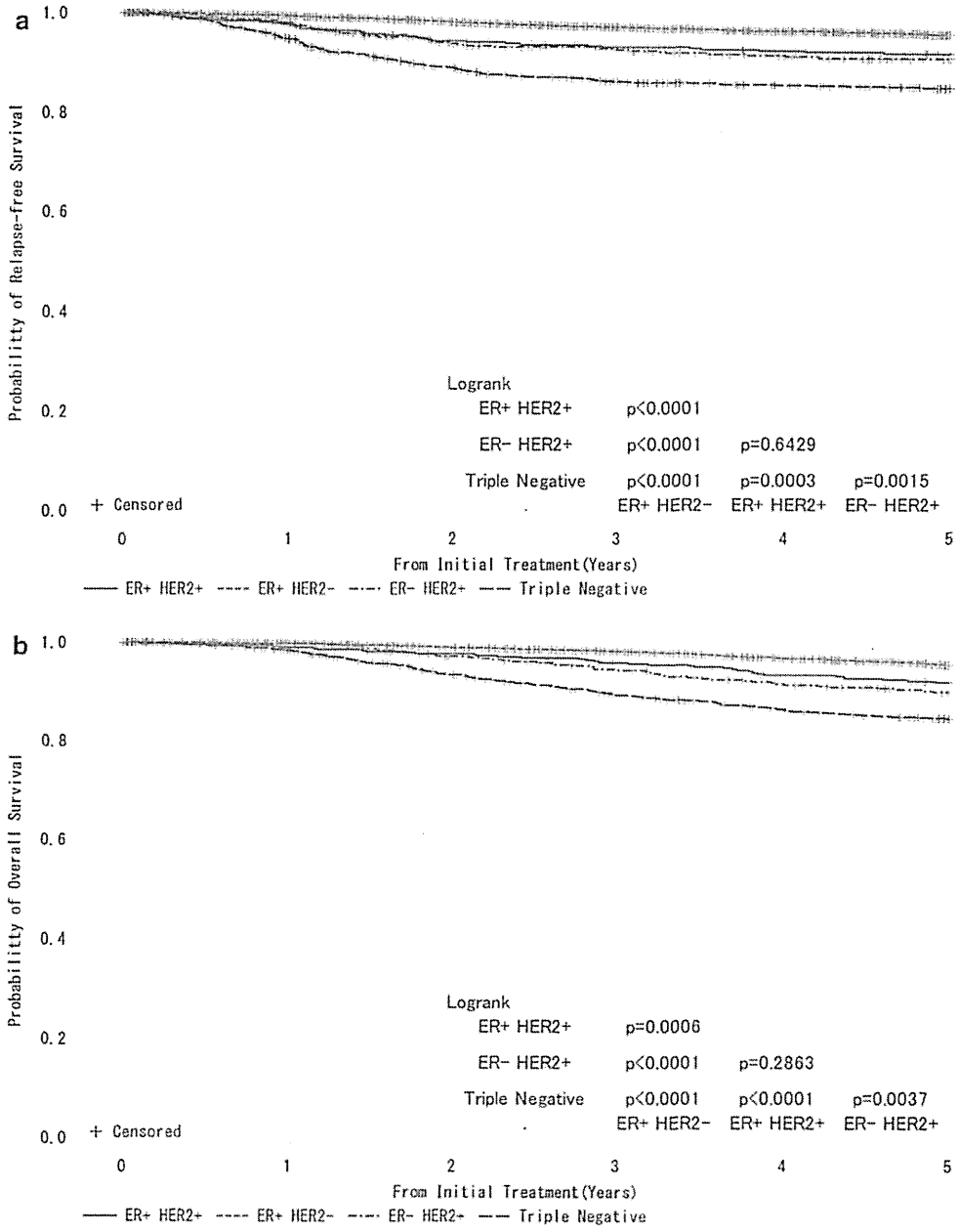

Fig. 7 **a**, **b** Kaplan–Meier curves for relapse-free and overall survival of T1–T4, any N and M0 cases with respect to estrogen receptor (ER) status and HER2 (human epidermal growth factor receptor 2) amplification status. *P* values were calculated using the log rank test. Relapse-free survival and overall survival of patients with respect to combined ER and HER2 status

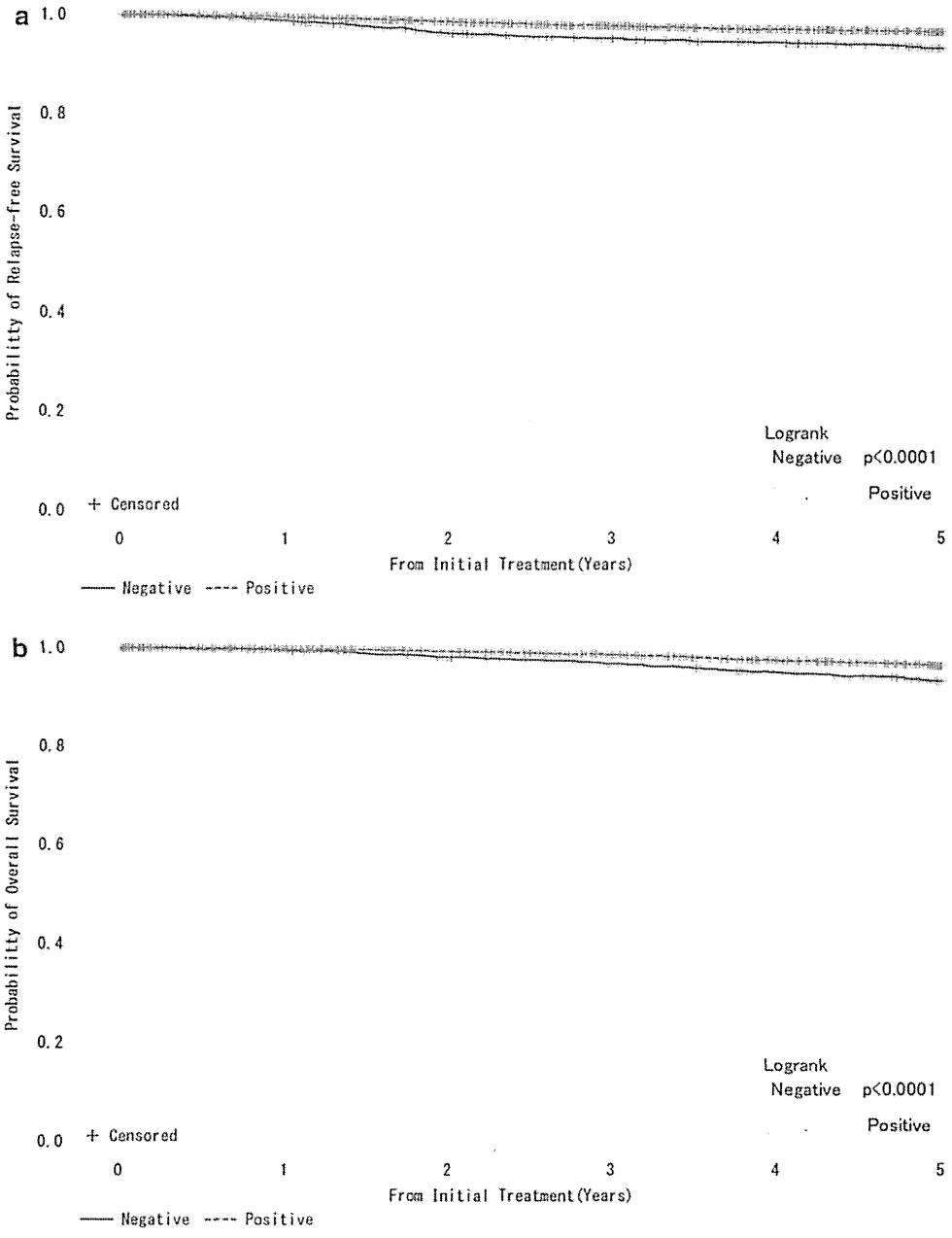

Fig. 8 a, b Kaplan–Meier curves for relapse-free and overall survival of ER-positive and M0 cases by progesterone receptor (PgR) status. *P* values were calculated using the log rank test

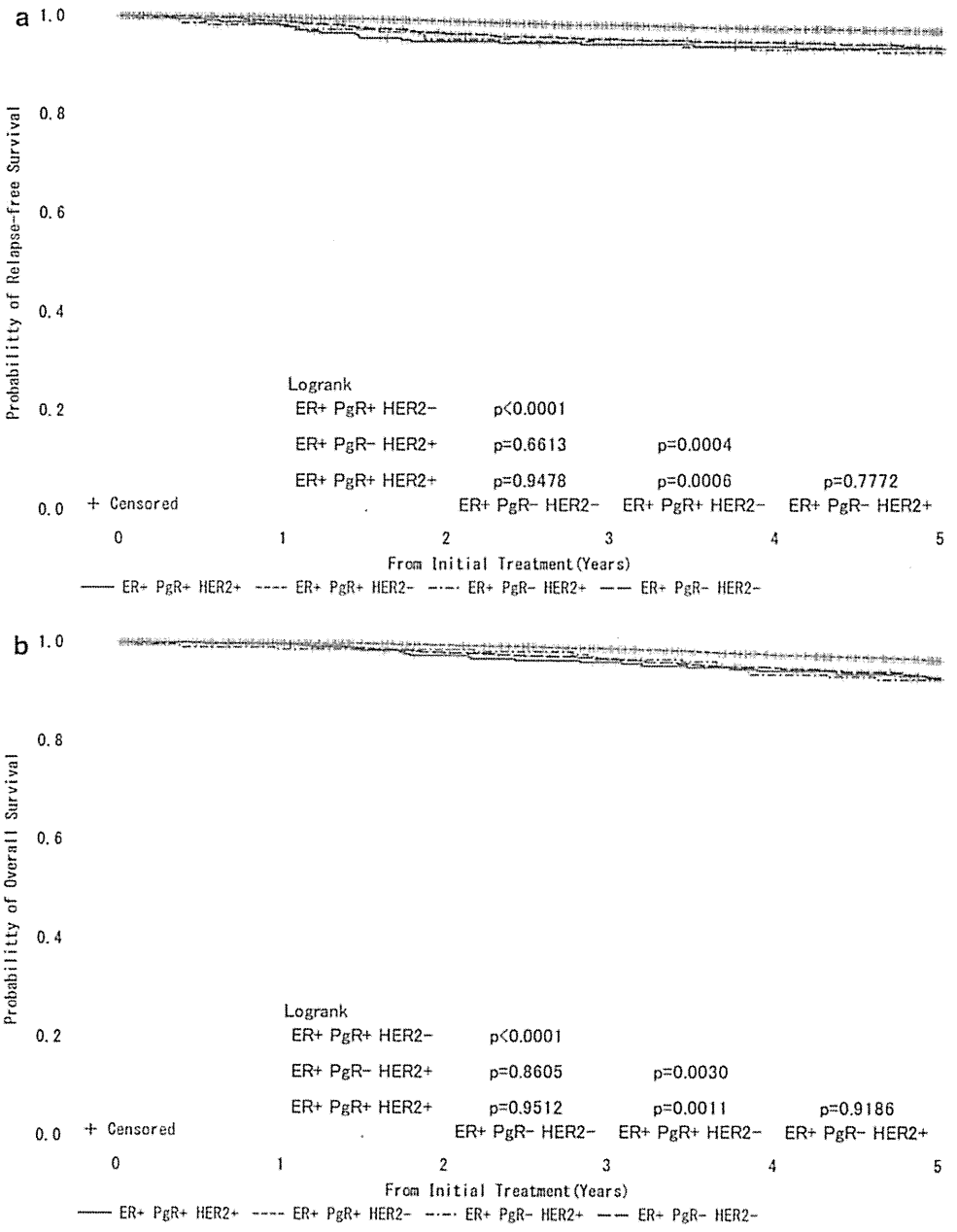

Fig. 9 a, b Kaplan–Meier curves for relapse-free and overall survival of ER-positive and M0 cases with respect to PgR and HER2 amplifications. *P* values were calculated using the log rank test

Table 1 Patient characteristics

Age		
Mean	S.D.	
57.42	12.94	
Tumor size(cm)		
Mean	S.D.	
2.60	2.05	
Tumor size	Count	%
T0	95	1.08
Tis	729	8.3
T1a	68	0.77
T1b	742	8.44
T1c	2599	29.57
T2	3043	34.63
T3	369	4.2
T4	390	4.44
Unknown	753	8.57
N		
N0	6758	76.90
N1	1614	18.37
N2	236	2.69
N3	92	1.05
Unknown	88	1.00
M		
M0	8464	96.31
M1	217	2.47
Unknown	107	1.22
Stage		
0	700	7.97
I	3010	34.25
II	3336	37.96
III	622	7.08
IV	217	2.47
Unknown	903	10.28
ER		
Positive	6514	74.12
Negative	2077	23.63
Unknown	197	2.24
PgR		
Positive	5168	58.81
Negative	3404	38.73
Unknown	216	2.46
HER2		
Positive	1230	14.00
Negative	6759	76.91
Unknown	799	9.09

The TNM classification was identified by the UICC staging system

ER estrogen receptor, *ER* estrogen receptor, *PgR* progesterone receptor, *HER2* human epidermal growth factor receptor 2

93.5 %, and the 5-year overall survival (OS) was 92.7 % at a median follow-up of 60.0 months (range 0.0–60.0). The TNM classification and histological classification were registered according to the UICC staging [1] and WHO classification systems [2], respectively. The present report includes age- and subtype-based analyses in addition to the traditional TNM classification-based analyses.

In addition to TNM classifications, estrogen receptor (ER), progesterone receptor (PgR), and human epidermal growth factor receptor 2 (HER2) statuses, which are strong prognostic factors, have become frequently used to determine the therapeutic strategy in the clinical setting. Note that during the study period, not only the cutoff level of ER, PgR and HER2 positivity, but also test procedures for immunostaining and HER2 gene amplification have not yet been standardized, and trastuzumab had been gradually spread in daily clinic in Japan. For ER-negative/HER2-positive patients, DFS improved from 85.0 % in 2004 to 90.9 % in 2006, and OS from 85.02 to 89.88 %, respectively.

We appreciate the considerable support that we have received and would like to ask for continuing understanding and support of the registry.

Acknowledgments This work was supported partly by JSPS KAKENHI Grant Numbers 15H04796. The authors thank all the affiliated institutes participating in the Breast Cancer Registry of the JBCS for their efforts to register the patients' data. We extend our gratitude to staff members working at the three major institutions that contributed extensively to the present study: Sagara Hospital (Kagoshima), National Cancer Center Hospital (Tokyo), and Niigata Cancer Center Hospital (Niigata). We would like to ask for support from as many institutions as possible in the future to improve response rates in our survey on breast cancer prognosis. We also thank Dr. Muneaki Sano, a former director of Niigata Cancer Center Hospital, for his dedication to establishing the new registration system, and the staff members at the Japan Clinical Research Support Unit (J-CRSU) and the Public Health Research Foundation.

Compliance with ethical standards

Conflict of interest The authors declare that they have no competing interests.

References

1. Greene FL, Page DL, Fleming ID, et al. AJCC Cancer Staging Manual. 6th ed. New York: Springer; 2002.
2. World Health Organization. Tumours of the Breast and Female Genital Organs. Oxford: Oxford University Press; 2003.