II. Clinical Results in Patients treated Endoscopically in 2000

Table 21) Treatment details in patients with endoscopic treatment

Treatment details	Cases	(%)
Endoscopic treatment only	201	(96.6%)
Endoscopic treatment + Radiotherapy	1	(0.5%)
Endoscopic treatment + Chemotherapy	6	(2.9%)
Endoscopic treatment + Hyperthermia	0	
Endoscopic treatment + Chemoradiotherapy	0	
Total	208	(100%)

Treatment details	Cases	(%)
EMR	168	(80.8%)
EMR+PDT	3	(1.4%)
EMR+YAG laser	2	(1.0%)
EMR+MCT	0	
EMR+Esophageal stenting	0	
EMR+Other treatment	12	(5.8%)
Esophageal stenting	19	(9.1%)
Tracheal stenting	1	(0.5%)
Esophageal stenting + tracheal stenting	1	(0.5%)
Others	2	(1.0%)
Total	208	(100%)

EMR: endoscopic mucosal resection
PDT: photodynamic therapy
MCT:microwave coaguration therapy

Table 22) Endoscopic mucosal resection (EMR)

Method of EMR	Cases	(%)
One piece resection	88	(47.6%)
Piecemeal resection	89	(48.1%)
Unknown	8	(4.3%)
Total	185	(100%)

No. of lesions treated by EMR	Cases	(%)
1	102	(55.1%)
2	23	(12.4%)
3	12	(6.5%)
4	6	(3.2%)
5	2	(1.1%)
6	1	(0.5%)
7	1	(0.5%)
8	0	
9	0	
10 and/or over	0	
Unknown	38	(20.5%)
Total	185	(100%)

Radicality of EMR	Cases	(%)
Complete resection	130	(70.3%)
Non-complete resection	37	(20.0%)
Unknown	18	(9.7%)
Total	185	(100%)

Complications of EMR	Cases	(%)
None	159	(85.9%)
Perforation	2	(1.1%)
Bleeding	3	(1.6%)
Mediastinitis	0	
Stenosis	6	(3.2%)
Others	0	
Unknown	15	(8.1%)
Total	185	(100%)

Table 24) Histologic findings of EMR specimens (tumor size, histologic type, and depth of tumor invasion)

Size of lesion	Cases (%)
~ 9mm	13 (7.0%)
10 ~19mm	41 (22.2%)
20~29mm	22 (11.9%)
30~39mm	16 (8.7%)
40~49mm	2 (1.1%)
50~59mm	3 (1.6%)
60~69mm	1 (0.5%)
70mm~`	0
Unknown	87 (47.0%)
Total	185 (100%)

Histologic type of EMR specimen	Cases (%)
Squamous cell ca (SCC)	97 (52.4%)
Well diff. SCC	15 (8.1%)
Moderately diff. SCC	32 (17.3%)
Poorly diff. SCC	1 (0.5%)
Adenocarcinoma	1 (0.5%)
Barrett's carcinoma	0
Dysplasia	3 (1.6%)
Others	0
Unknown	36 (19.5%)
Total	185 (100%)

Pathological depth of tumor invasion (pT)	Cases (%)
pT0	0
pTis	56 (30.3%)
pT1a(lpm)	32 (17.3%)
pT1a(mm)	41 (22.2%)
pT1b(sm)	16 (8.6%)
Unknown	40 (21.6%)
Total	185 (100%)

Subclassification of histological depth of invasion in superficial cancer	Cases (%)
m1(ep)	56 (30.3%)
m2(lpm)	32 (17.3%)
m3(mm)	41 (22.2%)
sm1	6 (3.2%)
sm2	7 (3.8%)
sm3	2 (1.1%)
Unknown	41 (22.2%)
Total	185 (100%)

ep: epithelium
lpm: lamina propria mucosa
mm: muscularis mucosa
SCC: squares cell carcinoma

Table 25) Histologic findings of EMR specimens (intraepithelial spread, vessel invasion, multiple cancer, and multiple lesion)

Intraepithelial spread (ie)	Cases (%)
(-)	34 (18.4%)
(+)	21 (11.4%)
(+++) superficial spread	1 (0.5%)
Unknown	129 (69.7%)
Total	185 (100%)

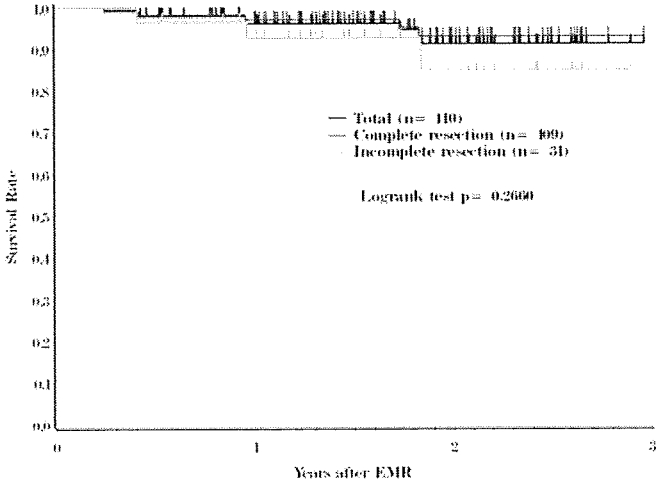
Lymphatic vessel invasion (ly)	Cases (%)
(-)	112 (60.5%)
(+)	11 (6.0%)
Unknown	62 (33.5%)
Total	185 (100%)

Blood vessel invasion (v)	Cases (%)
(-)	119 (64.7%)
(+)	5 (2.7%)
Unknown	60 (32.6%)
Total	185 (100%)

Multiple primary cancer	Cases (%)
(-)	53 (28.6%)
(+)	8 (4.3%)
Unknown	124 (67.0%)
Total	185 (100%)

Multiple malignant lesions	Cases (%)
(-)	56 (30.3%)
(+)	6 (3.2%)
Unknown	123 (66.5%)
Total	185 (100%)

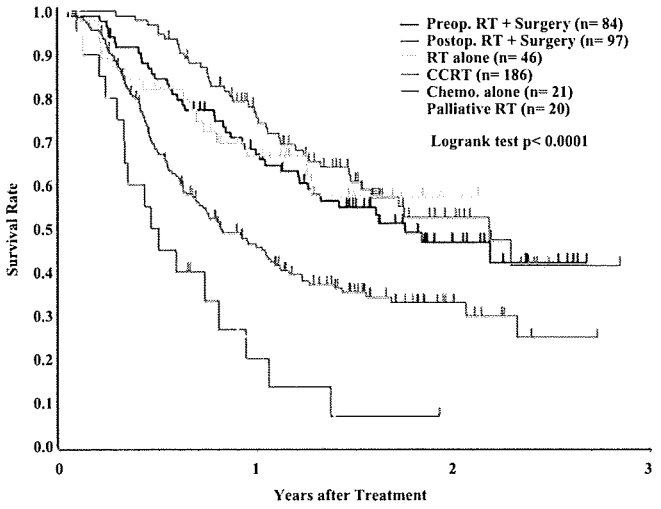
No. of multiple primary lesions	Cases (%)
2	3 (50.0%)
3	1 (16.7%)
5	0
Unknown	2 (33.3%)
Total	6 (100%)



	Years after EMR		
	1	2	3
Total	96.1%	91.2%	91.2%
Complete resection	97.1%	93.0%	93.0%
Incomplete resection	92.7%	85.0%	85.0%

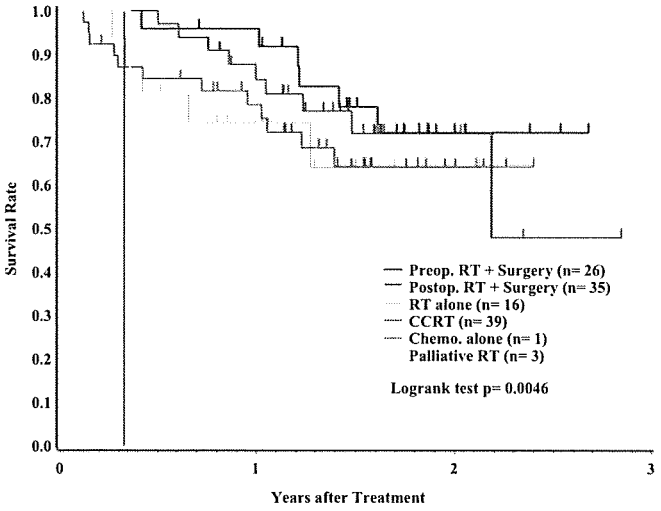
Figure 1 Survival of patients treated with EMR

III. Clinical Results in Patients treated with Chemotherapy and/or Radiotherapy in 2000



	Years after Treatment		
	1	2	3
Preop. RT + Surgery	67.0%	46.7%	42.1%
Postop. RT + Surgery	75.5%	52.5%	-
RT alone	66.6%	57.4%	-
CCRT	45.6%	32.8%	24.8%
Chemo. alone	20.0%	-	-
Palliative RT	25.0%	–	–

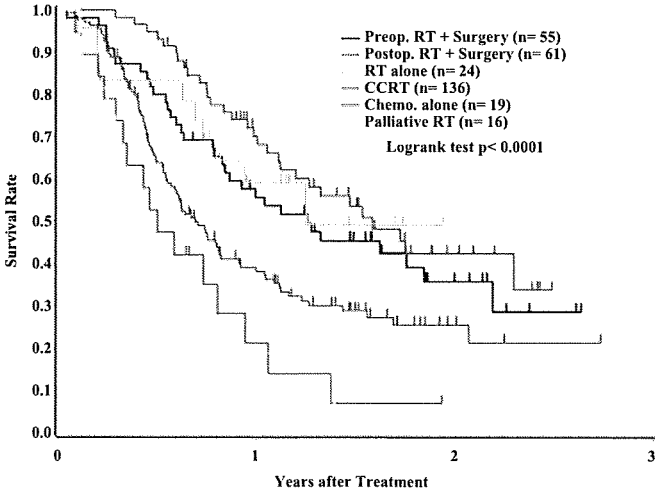
Figure 2 Survival of patients treated by chemotherapy and/or radiotherapy



	Years after Treatment		
	1	2	3
Preop. RT + Surgery	96.0%	72.0%	72.0%
Postop. RT + Surgery	84.3%	71.9%	–
RT alone	74.5%	63.8%	–
CCRT	78.4%	64.3%	–
Chemo. alone	–	–	–
Palliative RT	66.7%	–	–

Figure 3 Survival of patients treated by chemotherapy and/or radiotherapy (cStage I-IIA)

Figure 4 Survival of patients treated by chemotherapy and/or radiotherapy (cStage IIB-IVB)



	Years after Treatment		
	1	2	3
Preop. RT + Surgery	55.6%	35.8%	–
Postop. RT + Surgery	70.1%	42.3%	–
RT alone	59.1%	–	–
CCRT	38.2%	25.5%	21.2%
Chemo. alone	21.1%	–	–
Palliative RT	18.8%	–	–

V. Clinical Results in Patients treated with Esophagectomy in 2000

Table 34) Cases of esophagectomy (treatment, surgical procedure, and location of the tumor)

Treatment	Cases (%)
Esophagectomy	568 (52.4%)
Esophagectomy + radiotherapy*	108 (10.0%)
Esophagectomy + chemoradiotherapy**	186 (17.2%)
Esophagectomy + chemotherapy***	202 (18.7%)
Esophagectomy + endoscopic treatment	19 (1.8%)
Esophagectomy + other treatment	0
Total	1083 (100%)

*: + endoscopic treatment (1 cases)
**: + hyperthermia (9 cases), + endoscopic treatment (2 cases), + other treatment (1 case) + other treatment (2 case)
***: + endoscopic treatment (2 cases), + other treatment (1 case)

Surgical procedures	Cases (%)
Esophagectomy without reconstruction	4 (0.4%)
Esophagectomy + reconstruction (2-stage operation)	27 (2.5%)
Esophagectomy with reconstruction	1045 (96.5%)
Unknown	7 (0.6%)
Total	1083 (100%)

Location	Cases (%)
Pharynx	8 (0.3%)
Cervical esophagus	11 (4.3%)
Upper thoracic esophagus	119 (10.0%)
Middle thoracic esophagus	479 (49.6%)
Lower thoracic esophagus	263 (27.0%)
Abdominal esophagus	68 (5.5%)
EG junction	22 (0.8%)
Cardia	4 (0.2%)
Unknown	79 (2.4%)
Total	1083 (100%)

Table 35) Cases of esophagectomy (surgical approach and region of lymphadenectomy)

Approach	Cases (%)
Cervical approach	33 (3.0%)
Right thoracotomy	866 (80.0%)
Left thoracotomy	21 (1.9%)
Left thoracoabdominal approarch	29 (2.7%)
Laparotomy	21 (1.9%)
Transhiatal (without blunt dissection)	3 (0.3%)
Transhiatal (with blunt dissection)	46 (4.2%)
Sternotomy	15 (1.4%)
Others	8 (0.7%)
Unknown	41 (3.8%)
Total	1083 (100%)

Region of lymphadenectomy	Cases (%)
(-)	23 (2.1%)
C	23 (2.1%)
C+UM	11 (1.0%)
C+UM+MLM	4 (0.4%)
C+UM+MLM+A	421 (38.9%)
C+UM+A	3 (0.3%)
C+MLM	0
C+MLM+A	5 (0.5%)
C+A	6 (0.6%)
UM	11 (1.0%)
UM+MLM	14 (1.3%)
UM+MLM+A	323 (29.8%)
UM+A	3 (0.3%)
MLM	14 (1.3%)
MLM+A	115 (10.6%)
A	39 (3.6%)
Unknown	68 (6.3%)
Total	1083 (100%)

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

Table 36) Cases of esophagectomy (esophageal reconstruction)

Reconstruction route	Cases (%)
(-)	4 (0.4%)
Antethoracic	114 (10.5%)
Retrosternal	324 (29.9%)
Posterior mediastinal	311 (28.7%)
High intrathoracic*	132 (12.2%)
Low intrathoracic**	71 (6.6%)
Transhiatal	17 (1.6%)
Cervical	18 (1.7%)
Others	1 (0.1%)
Unknown	91 (8.4%)
Total	1083 (100%)

* with upper mediastinal anastomosis
** with middle/lower mediastinal anastomosis

Organs for esophageal replacement	Cases (%)
(-)	4 (0.4%)
Whole stomach	79 (7.3%)
Gastric tube*	799 (73.8%)
Jejunum	48 (4.4%)
Free junum**	25 (2.3%)
Colon	55 (5.1%)
Free colon	2 (0.2%)
Skin graft	0
Others	3 (0.3%)
Unknown	68 (6.3%)
Total	1083 (100%)

*: Free jujunum+gastric tube (2 cases), Gastric tube+other (1 case)
***: Free jejunum+colon (1 case)

Table 37) Cases of intrathoracic esophagectomy (location of the tumor and reconstruction route)

Location	Upper thoracic	Middle thortacic	Lower thoracic	Total thoracic
Reconstruction route	Cases (%)	Cases (%)	Cases (%)	Cases (%)
(-)	0	2 (0.4%)	2 (0.8%)	4 (0.5%)
Antethoracic	10 (8.4%)	73 (15.2%)	27 (10.3%)	110 (12.8%)
Retrosternal	43 (36.1%)	179 (37.4%)	76 (28.9%)	298 (34.6%)
Posterior mediastinal	53 (44.5%)	133 (27.8%)	80 (30.4%)	266 (30.9%)
High intrathoracic*	8 (6.7%)	61 (12.7%)	49 (18.6%)	118 (13.7%)
Low intrathoracic**	0	16 (3.3%)	22 (8.4%)	38 (4.4%)
Transhiatal	0	1 (0.2%)	3 (1.1%)	4 (0.5%)
Cervical	0	1 (0.2%)	0	1 (0.1%)
Others	0	0	0	0
Unknown	5 (4.2%)	13 (2.7%)	4 (1.5%)	22 (2.6%)
Total	119 (100%)	479 (100%)	263 (100%)	861 (100%)

Table 38) Cases of esophagectomy for external lesion of the thorax (location of the tumor and reconstruction route)

Location	Pharynx	Cervical esophagus	Abdominal esophagus	EGJ/Cardia
Reconstruction route	Cases (%)	Cases (%)	Cases (%)	Cases (%)
(-)	0	0	0	0
Antethoracic	0	1 (2.4%)	2 (2.9%)	1 (3.8%)
Retrosternal	1 (12.5%)	3 (7.3%)	11 (16.2%)	3 (11.5%)
Posterior mediastinal	5 (62.5%)	20 (48.8%)	14 (20.6%)	5 (19.2%)
High intrathoracic*	0	0	12 (17.6%)	1 (3.8%)
Low intrathoracic**	0	0	22 (32.4%)	9 (34.6%)
Transhiatal	0	0	7 (10.3%)	6 (23.1%)
Cervical	2 (25.0%)	15 (36.6%)	0	0
Others	0	0	0	1 (3.8%)
Unknown	0	2 (4.9%)	0	0
Total	8 (100%)	41 (100%)	68 (100%)	26 * (100%)

* E=G:22cases, G:4 casese

Table 42) Cases of esophagectomy (operative findings of cT and combined resected organs)

Macroscopic T-category (cT)	Cases	(%)
T0	62	(5.7%)
T1	242	(22.3%)
T2	195	(18.0%)
T3	388	(35.8%)
T4	121	(11.2%)
Unnkown	75	(6.9%)
Total	1083	(100%)

cT4 by lymphatic metastasis	Cases	(%)
(-)	931	(86.0%)
N1(T4)	27	(2.5%)
N2(T4)	15	(1.4%)
N3(T4)	10	(0.9%)
N4(T4)	15	(1.4%)
Nx(T4)	2	(0.2%)
Unnkown	83	(7.7%)
Total	1083	(100%)

Organs*	Cases	(%)
(-)	61	(28.6%)
Larynx	14	(6.6%)
Trachea	11	(5.2%)
Aorta	2	(0.9%)
Lung	15	(7.0%)
Pericardium	11	(5.2%)
Diaphragm	15	(7.0%)
Stomach	11	(5.2%)
Pancreas+spleen	10	(4.7%)
Thoracic duct	19	(8.9%)
Recurrent nerve	8	(3.8%)
Recurrent nerve (main trunk)	2	(0.9%)
Others	32	(15.0%)
Unknown	2	(0.9%)
Total of resected organs	213	(100%)
Total of cT4 cases	121	

*: Organs resected in addition to the esophagus

Table 43) Cases of esophagectomy (operative findings of the tumor feature and size)

Macroscopic type	Cases	(%)
0-Ip	18	(1.7%)
0-Ipl	41	(3.8%)
0-Isep	18	(1.7%)
0-IIa	64	(5.9%)
0-IIb	28	(2.6%)
0-IIc	131	(12.1%)
0-III	8	(0.7%)
0-V	14	(1.3%)
1p	18	(1.7%)
1c	10	(0.9%)
1pl	30	(2.8%)
1sep	0	
2	290	(26.8%)
3	261	(24.1%)
4s	23	(2.1%)
4ns	3	(0.3%)
5c	7	(0.6%)
5s	2	(0.2%)
5u	49	(4.5%)
Unknown	68	(6.3%)
Total	1083	(100%)

Size of tumor (mm)	Cases	(%)
- 9	12	(1.1%)
10 - 19	62	(5.7%)
20 - 29	134	(12.4%)
30 - 39	117	(10.8%)
40 - 49	187	(17.3%)
50 - 59	185	(17.1%)
60 - 69	110	(10.2%)
70 - 79	74	(6.8%)
80 - 89	57	(5.3%)
90 - 99	33	(3.1%)
100 -109	23	(2.1%)
110 -119	11	(1.0%)
120 -129	5	(0.5%)
130 -139	1	(0.1%)
140 -149	1	(0.1%)
150 -	4	(0.4%)
Unknown	67	(6.2%)
Total	1083	(100%)

Table 44) Histologic types of resected specimen and multiple primary cancers

Histologic types		Cases (%)
Not examined		2 (0.2%)
SCC	SCC	45 (4.2%)
	Well diff.	239 (22.1%)
	Moderately diff.	485 (44.8%)
	Poorly diff.	171 (15.8%)
Adenocarcinoma		32 (3.0%)
Barrett's adenocarcinoma		14 (1.3%)
Adenosquamous cell carcinoma		7 (0.6%)
Epidermoid carcinoma		0
Adenoid cystic carcinoma		0
Basaloid carcinoma		10 (0.9%)
Undiff. carcinoma (small cell)		8 (0.7%)
Undiff. carcinoma		1 (0.1%)
Sarcoma		0
So-called carcinosarcoma		11 (1.0%)
Pseudosarcoma		1 (0.1%)
True carcinosarcoma		0
Malignant melanoma		0
Dysplasia		1 (0.1%)
Other		7 (0.6%)
Unknown		49 (4.5%)
Total		1083 (100%)

Multiple primary cancer	Cases (%)
(-)	863 (79.7%)
(+)	132 (12.2%)
Unknown	88 (8.1%)
Total	1083 (100%)

Table 45) Pathological findings of resected specimen (residual cancer, intraepithelial spread, and infiltrative growth pattern)

Residual cancer cells at the transected stump

proximal (p)/distal (d)	Cases (%)
p / d (-)	956 (88.3%)
p / d (+)	41 (3.8%)
Unknown	86 (7.9%)
Total	1083 (100%)

Residual cancer cell in the cut surface of the esophageal wall (ew) of the resected specimen

ew	Cases (%)
ew(-)	889 (82.1%)
ew(+)	99 (9.1%)
Unknown	95 (8.8%)
Total	1083 (100%)

Intraepithelial spread (ie)

ie	Cases (%)
ie(-)	568 (52.4%)
ie(+)	423 (39.1%)
ie(++)superficial	28 (2.6%)
Unknown	64 (5.9%)
Total	1083 (100%)

Infiltrative growth pattern (inf)

inf	Cases (%)
infα	207 (19.1%)
infβ	591 (54.6%)
infγ	120 (11.1%)
Unknown	165 (15.2%)
Total	1083 (100%)

Table 46) Pathological findings of resected specimen (vessel invasion and skip metastasis)

Lymphatic vessel invasion (ly)		Cases (%)
ly0		312 (28.8%)
ly(+)	ly(+)	32 (3.0%)
	ly1	299 (27.6%)
	ly2-3	379 (35.0%)
Unknown		61 (5.6%)
Total		1083 (100%)

Blood vessel invasion (v)		Cases (%)
v0		484 (44.7%)
v(+)	v(+)	25 (2.3%)
	v1	271 (25.0%)
	v2-3	239 (22.1%)
Unknown		64 (5.9%)
Total		1083 (100%)

Skip metastasis in the esophageal wall (im-e)	Cases (%)
im-e (-)	900 (83.0%)
im-e (+)	88 (8.1%)
Unknown	95 (8.8%)
Total	1083 (100%)

Skip metastasis in the stomach wall (im-st)	Cases (%)
im-st (-)	958 (88.5%)
im-st (+)	28 (2.6%)
Unknown	97 (9.0%)
Total	1083 (100%)

Table 47) Pathological findings of resected specimen (pT)

Depth of tumor invasion

pT-categoly	Cases (%)
Not examined	4 (0.4%)
pT0	9 (0.8%)
pTis	14 (1.3%)
pT1a	81 (7.5%)
pT1b	222 (20.5%)
pT2	141 (13.0%)
pT3	469 (43.3%)
pT4	93 (8.6%)
Unknown	50 (4.6%)
Total	1083 (100%)

Subclassification of superficial carcinoma

Subclassification	Cases (%)
m1 (pTis)*	14 (4.4%)
m2 (pT1a)**	22 (6.9%)
m3 (pT1a)***	59 (18.6%)
sm1(pT1b)	29 (9.1%)
sm2 (pT1b)	69 (21.8%)
sm3 (pT1b)	86 (27.1%)
Unknown	38 (12.0%)
Total	317 (100%)

* ep = epithel
** lpm = lamina propria mucosa
*** mm = muscularis mucosa

Table 48) Pathological findings of resected specimen (pN)

Lymph node metastasis	Cases (%)
n(-)	419 (38.7%)
n1+)	129 (11.9%)
n2(+)	271 (25.0%)
n3(+)	124 (11.5%)
n4(+)	84 (7.8%)
Unknown	56 (5.2%)
Total	1083 (100%)

Number of lymph node metastases	Cases (%)
0	419 (38.7%)
1~3	338 (31.2%)
4~7	149 (13.8%)
8~	129 (11.9%)
Unknown	48 (4.4%)
Total	1083 (100%)

Table 49) Pathological findings of resected specimen (grade of lymph node metastasis corrected using number of metastases and fields of lymph node metastasis)

Grade of lymph node metastasis (corrected using number of metastases)

Grade of metastasis	Cases	(%)
gN0	419	(38.7%)
gN1(n1a)	113	(10.4%)
gN2(n1b)	12	(1.1%)
gN2(n2a)	163	(15.1%)
gN3(n1c)	3	(0.3%)
gN3(n2b)	75	(6.9%)
gN3(n3a)	44	(4.1%)
gN4(n2c)	32	(3.0%)
gN4(n3b)	35	(3.2%)
gN4(n3c)	43	(4.0%)
gN4(n4a)	10	(0.9%)
gN4(n4b)	25	(2.3%)
gN4(n4c)	48	(4.4%)
Unknown	61	(5.6%)
Total	1083	(100%)

Number of lymph node metastases
a : 1~3 nodes positive
b : 4~7 nodes positive
c : 8~ nodes positive

Fields of lymph node metastasis

Field of metastasis	Cases	(%)
n(-)	419	(38.7%)
C	37	(3.4%)
A+C	11	(1.0%)
A+B+C	73	(4.5%)
C+B	54	(1.4%)
A	136	(12.6%)
A+B	164	(15.1%)
B	135	(12.5%)
Unknown	54	(5.0%)
Total	1083	(100%)

A: mediastinal lymph nodes
B: abdominal lymph nodes
C: cervical lymph nodes

Table 50) Pathological findings of resected specimen (distant metastasis, stage, grade of dissection, and curability)

Distant metastasias (pM)	Cases	(%)
pM0	981	(90.6%)
pM1	23	(2.1%)
Unknown	79	(7.3%)
Total	1083	(100%)

Pathological stage	Cases	(%)
0	94	(8.7%)
I	128	(11.8%)
II	242	(22.3%)
III	279	(25.8%)
IVa	205	(18.9%)
IVb	23	(2.1%)
Unknown	112	(10.3%)
Total	1083	(100%)

Grade of dissection (D)	Cases	(%)
D0	61	(5.6%)
DI	136	(12.6%)
DII	352	(32.5%)
DIII	430	(39.7%)
Unknown	104	(9.6%)
Total	1083	(100%)

Curability (pathological)	Cases	(%)
Absolutely curative	626	(57.8%)
Relatively curative	286	(26.4%)
Absolutely non-curative	102	(9.4%)
Unknown	69	(6.4%)
Total	1083	(100%)

Table 51) Pathological findings of resected specimen (residual tumor, multiple cancers, and multiple lesions)

Residual tumor (R)	Cases (%)
R0	841 (77.7%)
R1	68 (6.3%)
R2	65 (6.0%)
Rx	109 (10.1%)
Total	1083 (100%)

Primary multiple cancers	Cases (%)
(-)	863 (79.7%)
(+)	132 (12.2%)
Unknown	88 (8.1%)
Total	1083 (100%)

Multiple malignant lesions	Cases (%)
(-)	816 (75.3%)
(+)	172 (15.9%)
Unknown	95 (8.8%)
Total	1083 (100%)

Number of malignant lesions	Cases (%)
0	816 (75.3%)
1	67 (6.2%)
2	68 (6.3%)
3	17 (1.6%)
4	4 (0.4%)
5 ~	5 (0.5%)
Unknown	106 (9.8%)
Total	1083 (100%)

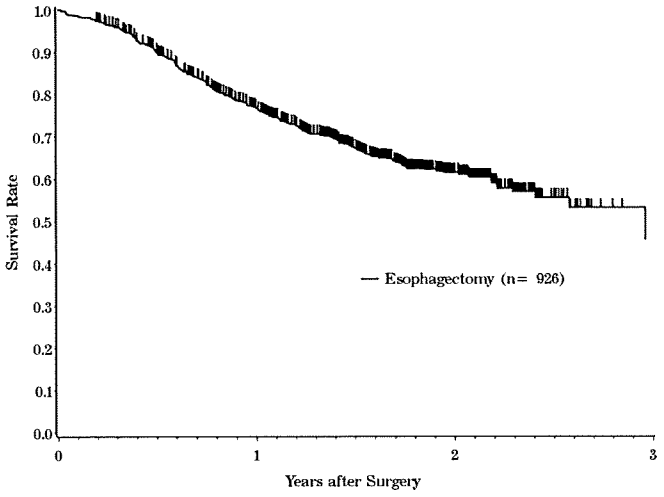
Table 52) Adjuvant therapy for cases of esophagectomy

Radiotherapy	Cases (%)
(-)	753 (69.5%)
Preoperative	109 (10.1%)
Pre+intraoperative (IOR)	4 (0.4%)
Pre+postoperative	12 (1.1%)
IOR	22 (2.0%)
IOR+postoperative	11 (1.0%)
Postoperative	126 (11.6%)
Time to recurrence	45 (4.2%)
Unknown	1 (0.1%)
Total	1083 (100%)

Doses of irradiation (Gy)	Cases (%)
0	753 (69.5%)
1 ~ 19	24 (2.2%)
20 ~ 39	64 (5.9%)
40 ~ 59	131 (12.1%)
60 ~ 79	75 (6.9%)
80 ~ 99	4 (0.4%)
100~	1 (0.1%)
Unknown	31 (2.9%)
Total	1083 (100%)

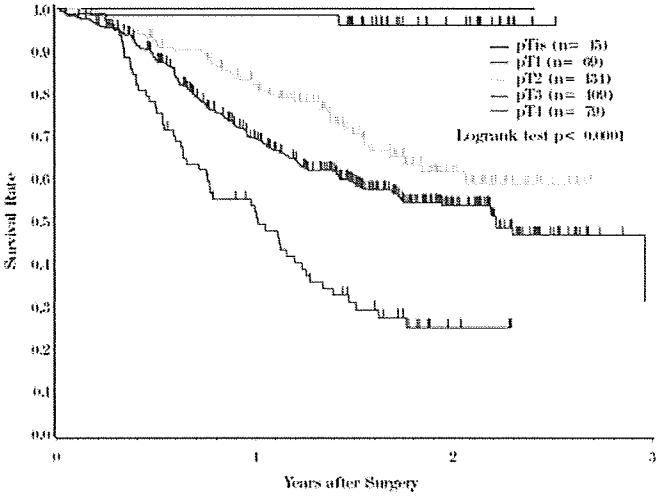
Chemotherapy	Cases (%)
(-)	651 (60.1%)
Preoperative	150 (13.9%)
Pre+intraoperative(IOR)	0
Pre+postoperative	31 (2.9%)
Intraoperative (IOR)	5 (0.5%)
IOR+postoperative	0
Postoperative	214 (19.8%)
Time to recurrence	31 (2.9%)
Unknown	1 (0.1%)
Total	1083 (100%)

Type of chemotherapy	Cases (%)
(-)	651 (60.1%)
Chemotherapy alone	226 (20.9%)
Concurrent chemoradiotherapy	162 (15.0%)
Sequential chemoradiotherapy	43 (4.0%)
Others	0
Unknown	1 (0.1%)
Total	1083 (100%)



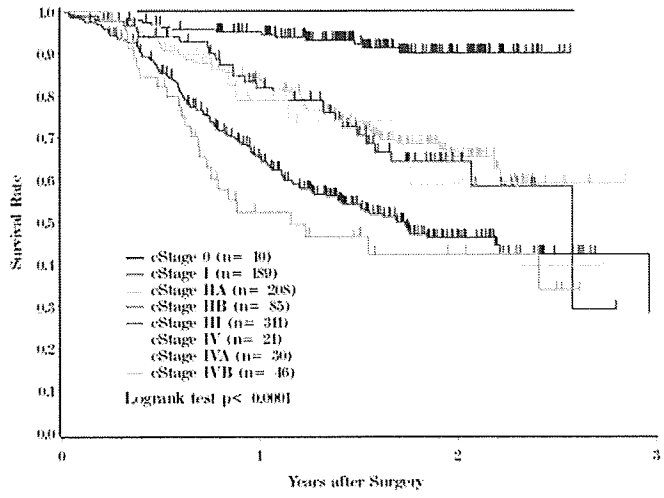
	Years after Surgery		
	1	2	3
Esophagectomy	76.8%	61.6%	45.6%

Figure 5 Survival of patients treated by esophagectomy



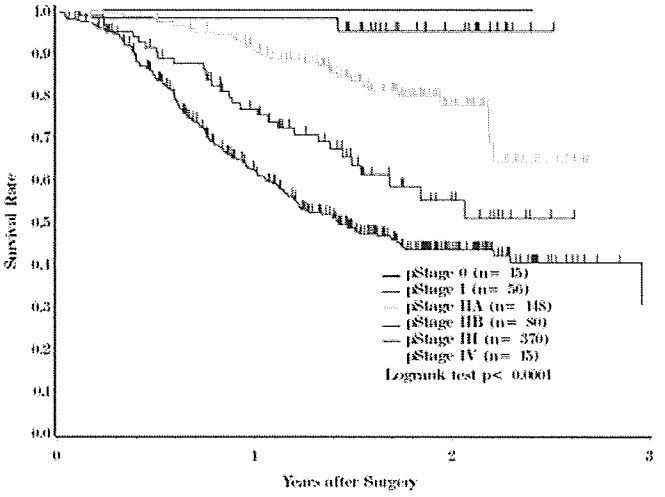
	Years after Surgery		
	1	2	3
pTis	100.0%	100.0%	-
pT1	98.4%	96.1%	96.1%
pT2	82.4%	61.5%	-
pT3	69.2%	53.6%	31.1%
pT4	52.2%	25.1%	25.1%

Figure 7 Survival of patients treated by esophagectomy in relation to the depth of tumor invasion (pT)



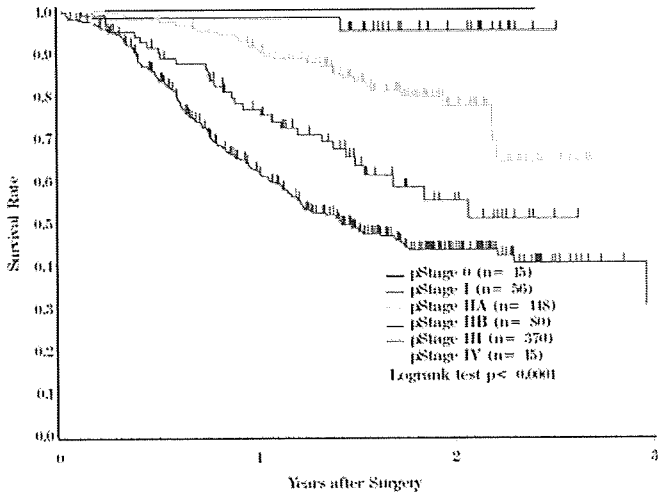
	Years after Surgery		
	1	2	3
cStage 0	100.0%	100.0%	100.0%
cStage I	95.0%	90.0%	90.0%
cStage IIA	83.8%	65.5%	59.2%
cStage IIB	81.8%	64.2%	–
cStage III	65.2%	46.1%	28.2%
cStage IV	57.1%	40.4%	–
cStage IVA	78.7%	59.1%	39.4%
cStage IVB	52.3%	42.2%	–

Figure 6 Survival of patients treated by esophagectomy in relation to clinical stage (cStage)



	Years after Surgery		
	1	2	3
pStage 0	100.0%	100.0%	-
pStage I	98.1%	95.1%	95.1%
pStage IIA	90.7%	77.4%	-
pStage IIB	76.5%	54.9%	-
pStage III	61.9%	43.3%	30.2%
pStage IV	33.5%	8.4%	-

Figure 8 Survival of patients treated by esophagectomy in relation to lymph node mentastasis (pN)



	Years after Surgery		
	1	2	3
pStage 0	100.0%	100.0%	-
pStage I	98.1%	95.1%	95.1%
pStage IIA	90.7%	77.4%	-
pStage IIB	76.5%	54.9%	-
pStage III	61.9%	43.3%	30.2%
pStage IV	33.5%	8.4%	-

Figure 9 Survival of patients treated by esophagectomy in relation to pathological stage (pStage)

External-Beam Radiotherapy for Clinically Localized Prostate Cancer in Osaka, Japan, 1995–2006

Time Trends, Outcome, and Risk Stratification

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Purpose: To establish an initial database of external-beam radiotherapy (EBRT) for clinically localized prostate cancer used in Osaka, Japan, and, by analyzing the results of the Osaka multicenter cooperative study, to determine time trends, outcome, and applicability of existing and the authors' original risk stratification methods.

Patients and Methods: Data of 652 patients with clinically localized prostate cancer (T1–4 N0 M0) were accrued from July to December 2007. These patients had been treated from 1995 through 2006 with consecutive definitive EBRT of ≥ 60 Gy at eleven institutions, mainly in Osaka. Altogether, 436 patients were eligible for analysis using several risk stratification methods, namely, those of D'Amico et al., the National Comprehensive Cancer Network (NCCN), and Seattle, as well as the authors' original Prostate Cancer Risk Index (PRIX).

Results: The number of patients showed a tenfold increase over 10 years, together with a rapid spread of the use of Gleason Score from 0% to > 90% of cases. The dominant RT dose fractionation was 70 Gy/35 fractions (87%). Hormone therapy had been administered to 95% of the patients and the higher PRIX corresponded to the higher rate of hormone usage. 3- and 5-year biochemical relapse-free survival (bRFS) rates were 85% and 70%, respectively. The D'Amico ($p = 0.132$), NCCN ($p = 0.138$), Seattle ($p = 0.041$) and PRIX ($p = 0.044$) classifications showed weak or no correlation with bRFS, while the own modified three-class PRIX (PRIX 0, 1–5, 6) showed a strong correlation ($p = 0.002$).

Conclusion: The use of prostate EBRT in Japan is still in its infancy, but is rapidly expanding. The short-term outcomes have been satisfactory considering the moderate RT dose. A very high rate of hormone usage may affect the outcome favorably, but also may compromise the usefulness of current risk stratification.

Key Words: Prostate cancer · Clinically localized · Risk classification · Radiation therapy · Prostate Cancer Risk Index (PRIX)

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Perkutane Strahlentherapie bei klinisch lokalisiertem Prostatakrebs in Osaka, Japan, 1995–2006. Zeitliche Entwicklung, Resultate und Risikostratifikation

Ziel: Erstellung einer ersten Datenbank zur perkutanen Strahlentherapie (EBRT) bei klinisch lokalisiertem Prostatakrebs in Osaka, Japan, und Ermittlung der zeitlichen Entwicklung, Resultate und Anwendbarkeit der existierenden und der eigenen Risikostratifikationsmethoden mittels Analyse der Ergebnisse der multizentrischen kooperativen Osaka-Studie.

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Patienten und Methodik: Daten von 652 Patienten mit klinisch lokalisiertem Prostatakrebs (T1–4 N0 M0) wurden von Juli bis Dezember 2007 erfasst. Diese Patienten waren zwischen 1995 und 2006 in elf Einrichtungen, vorwiegend in Osaka, mit konsekutiver definitiver EBRT von ≥ 60 Gy behandelt worden. Insgesamt 436 Patienten qualifizierten sich für die Analyse mittels mehrerer Risikostratifikationsmethoden, namentlich jener von D'Amico et al., National Comprehensive Cancer Network (NCCN) und Seattle sowie des eigenen Prostatakrebsrisikoindex (PRIX).

Ergebnisse: Die Anzahl der Patienten stieg binnen 10 Jahren um das Zehnfache, und gleichzeitig kam es zu einem rasch zunehmenden Einsatz des Gleason-Scores von 0% auf > 90% der Fälle. Die dominante RT-Dosisfraktionierung betrug 70 Gy/35 Fraktionen (87%). Eine Hormontherapie war 95% der Patienten verabreicht worden, und der höhere PRIX entsprach der höheren Rate des Hormoneinsatzes. Die 3- und 5-Jahres-Raten des biochemisch rezidivfreien Überlebens (bRFS) lagen bei 85% bzw. 70%. Die Klassifikationen von D'Amico et al. (p = 0,132), NCCN (p = 0,138), Seattle (p = 0,041) und PRIX (p = 0,044) zeigten eine schwache Korrelation mit dem bRFS, wogegen der eigene modifizierte Drei-Klassen-PRIX (PRIX 0, 1–5, 6) eine starke Korrrelation (p = 0,002) ergab.

Schlussfolgerung: Der Einsatz der Prostata-EBRT in Japan ist noch in der Anfangsphase begriffen, breitet sich aber rasch aus. Angesichts moderater RT-Dosen sind zufriedenstellende kurzfristige Resultate erzielt worden. Eine sehr hohe Rate von Hormonverabreichungen mag die Ergebnisse günstig beeinflussen, könnte aber auch die Nützlichkeit der gegenwärtigen Risikostratifikation gefährden.

Schlüsselwörter: Prostatakrebs · Klinisch lokalisiert · Risikostratifikation · Strahlentherapie · Prostatakrebsrisikoindex (PRIX)

Introduction

In Japan, or for that matter in many Asian countries, prostate cancer did not use to be a commonly occurring cancer or a common cause of cancer death. However, with the changes in lifestyle associated with westernization, the incidence of prostate cancer has been increasing dramatically during the past 2 decades [4, 5]. Since Japanese urologists have shown a preference for prostatectomy rather than radiation therapy (RT) for curative intervention, there are very few data on RT for prostate cancer in Japan [9, 14, 19, 21]. However, information, mainly from western countries, that RT can yield a clinical outcome comparable to that of prostatectomy, has recently become easily available not only to Japanese physicians but also to patients or the mass media via the internet. As a result, the rate of patients who wish to be and actually are treated with RT is rapidly increasing [13]. This tendency has prompted us to gather clinical evidence, especially practice-based, of the use and outcomes of prostate RT for an initial database, even though the application of this procedure in Japan is still in its infancy.

One special characteristic of prostate cancer treatment in Japan is the extremely high rate and long term of hormone therapy use. The main reason for this is likely to be the fact that there is no limit on the reimbursement by the Japanese health insurance system for the cost of hormone therapy once the patient is diagnosed with prostate cancer, regardless of any kind of accompanying therapy. In other words, one can receive hormone therapy from initial diagnosis until death, regardless of whether the therapy is administered pre- or postprostatectomy or of RT status. Moreover, medical insurance in Japan is based on a system of universal health coverage.

We recently proposed a new risk stratification method which we termed the Prostate Cancer Risk Index (PRIX), and which fully corresponds to the Partin Table [15] in terms of probability of pathologic lymph node involvement, and also corresponds to the other nomograms better than any existing risk-grouping method [20]. In this study, we accumulated as many data as possible of patients consecutively treated at main institutions in Osaka in an effort to establish an initial database for prostate external-beam radiotherapy (EBRT) in Japan, and to examine the time trends, outcome, and relative applicability of existing and our original risk stratification methods.

Patients and Methods

Collection of Data and Patient Characteristics

Between July and December 2007, eleven institutions, mainly in Osaka (eight in Osaka and one each in Kyoto, Hyogo and Aichi), Japan, participated in this study and their data were sent to Osaka University. The data thus collected were for 652 consecutive patients with clinically localized prostate cancer (T1–4 N0 M0), who had been treated with definitive EBRT of ≥ 60 Gy at one of the participating institutions from 1995 through 2006. Patients had been followed up every 3 months. No patient had received intensity-modulated radiotherapy (IMRT). Patients with postprostatectomy status were excluded. The data included age, T-classification (according to UICC 2002), pretreatment prostate-specific antigen (PSA) level, Gleason Score (GS), biochemical and clinical outcome, definition of biochemical failure, hormone therapy, EBRT dose and field, and acute and late toxicity. Data for 436 of the 652 patients were considered to meet the following criteria: T-classification was detailed as in "T2a" ("T2" was therefore ineligible) in terms of UICC 2002; all of the aforementioned data were complete except for those for clinical outcome and acute and late toxicity; the follow-up period was at least 6 months. The most frequent reason for ineligibility was omis-

Table 1. Patient characteristics stratified by PRIX. bRFS: biochemical relapse-free survival; HT: hormone therapy; PRIX: prostate cancer risk index; WPRT: whole pelvic radiation therapy.

Tabelle 1. Patientencharakteristika, stratifiziert mittels PRIX. bRFS: biochemisch rezidivfreies Überleben; HT: Hormontherapie; PRIX: Prostatakrebsrisikoindex; WPRT: Ganzbeckenbestrahlung.

PRIX	Patients (n)	Age (years)[a]	HT+ (%)	Duration of HT (months)[a]	WPRT+ (%)	Dose (Gy)[a]	Crude bRFS (%)
0	23	70 ± 5	16 (70)	30 ± 19	0 (0)	69.9 ± 0.9	100
1	47	73 ± 5	42 (89)	22 ± 15	1 (2)	69.5 ± 2.1	87
2	74	72 ± 5	67 (91)	24 ± 21	4 (5)	69.4 ± 2.2	84
3	60	72 ± 5	58 (97)	28 ± 19	6 (10)	69.6 ± 2.0	85
4	83	71 ± 6	82 (99)	28 ± 13	8 (10)	69.6 ± 2.0	87
5	81	71 ± 6	81 (100)	29 ± 18	7 (9)	69.4 ± 2.3	84
6	68	70 ± 7	68 (100)	31 ± 18	14 (21)	68.6 ± 3.6	72
Total	436	71 ± 6	414 (95)	27 ± 18	40 (9)	69.4 ± 2.4	84

[a]average ± standard deviation

Table 2. Various definitions of risk stratification for clinically localized prostate cancer. GS: Gleason Score; PSA: prostate-specific antigen.

Tabelle 2. Verschiedene Definitionen der Risikostratifikation für klinisch lokalisierten Prostatakrebs. GS: Gleason-Score; PSA: prostataspezifisches Antigen.

Group or title	Definition
D'Amico et al. [6]	Low risk: T1c, T2a and PSA ≤ 10 ng/ml and GS ≤ 6
	Intermediate risk: T2b or GS 7 or PSA 10–20 ng/ml
	High risk: T2c or PSA > 20 ng/ml or GS ≥ 8
National Comprehensive Cancer Network (NCCN) [12]	Low risk: T1–T2a and GS 2–6 and PSA < 10 ng/ml
	Intermediate risk: T2b–T2c or GS 7 or PSA 10–20 ng/ml
	High risk: T3a or GS 8–10 or PSA > 20 ng/ml
	Very high risk: T3b–T4
	(For intermediate- and high-risk group, patients with multiple adverse factors may be shifted into the next higher risk group)
Seattle [18]	Low risk: PSA ≤ 10 ng/ml, GS < 7, and stage < T2c
	Intermediate risk: PSA > 10 ng/ml or GS ≥ 7 or stage ≥ T2c (one intermediate risk factor)
	High risk: two or more intermediate risk factors
Prostate Cancer Risk Index (PRIX) [20]	PRIX is the sum of the following three factors:
	PSA ≤ 10 ng/ml: 0, PSA 10–20 ng/ml: 1, PSA > 20 ng/ml: 2
	GS 2–6: 0, GS 7: 1, GS 8–10: 2
	T1–T2a: 0, T2b–T2c: 1, T3–4: 2

sion of GS. Since GS was initially rarely used in the field of pathology in Japan, eligible patients were all treated between 1999 and 2006 (no GS was available for any patients treated between 1995 and 1998). The patient characteristics are shown in Table 1, and will be detailed in the Results section.

Risk Stratification

In this study, we used several existing and representative risk stratification methods, namely, those of D'Amico et al. [6], the National Comprehensive Cancer Network (NCCN) [12], and Seattle [18], as well as our original risk stratification method, PRIX [20]. The definitions associated with these methods are summarized in Table 2.

In a previous publication of ours [20], we examined the correspondence between PRIX and the Partin Table (1997) [15] or the Kattan Nomogram (2000) [11]. PRIX 0 corresponded to 1–2% of pathologic lymph node involvement according to the Partin Table, PRIX 1 to 3–4%, PRIX 2 to 7–10%, PRIX 3 to 14–18%, PRIX 4 to 24–29%, PRIX 5 to 32–37%, and PRIX 6 to 42%. PRIX clearly discriminated among risks with a relatively narrow range of probability and without any overlap among different PRIXs. The D'Amico, NCCN, and Seattle classifications, on the other hand, generally produce wide ranges with overlapping, especially for intermediate- and high-risk groups. As for the Kattan Nomogram, PRIX also yielded a relatively narrow range of 60-month recurrence-free probability, whereas D'Amico, NCCN, and Seattle classifications showed wide ranges of probability, especially for high-risk groups. PRIX fully corresponded to the Partin Table in terms of pathologic lymph node involvement, and corresponded to the other nomograms better than any current risk-grouping method. We therefore hypothesized that PRIX can function as a prognostic factor or contribute to patient selection for clinically localized prostate cancer.

Endpoint and Statistical Analysis

Biochemical relapse-free survival (bRFS) was used as the only endpoint in this study. Biochemical relapse and its date were defined as identical to the clinical judgment that had been made at a given institution. All the institutions had adopted one of the following definitions of biochemical relapse: (a) American Society for Therapeutic Radiology and Oncology (ASTRO) [1], (b) Phoenix [17], or (c) start of salvage therapy.

Kaplan-Meier curves were obtained for bRFS, and the log-rank test was used to compare bRFSs. A p-value < 0.05 was deemed statistically significant.

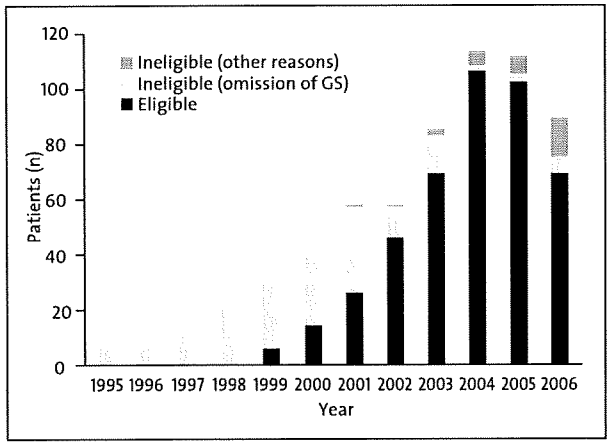
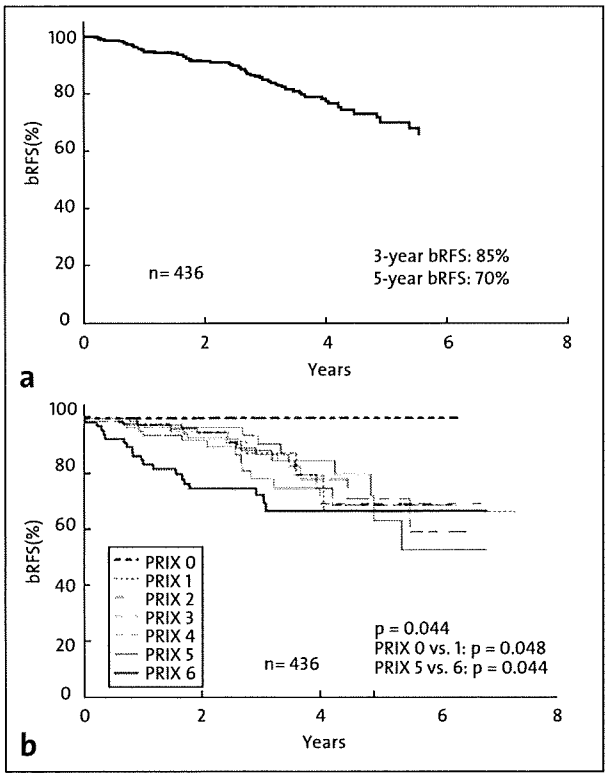


Figure 1. Time trends in the number of patients treated with definitive external-beam radiotherapy for prostate cancer at eleven institutions mainly in Osaka, Japan, 1995–2006 (n = 652).

Abbildung 1. Zeitliche Entwicklung bezüglich der Anzahl von Patienten, die sich 1995–2006 in elf Einrichtungen, hauptsächlich in Osaka, Japan, einer definitiven perkutanen Strahlenbehandlung wegen Prostatakrebs unterzogen (n = 652).



Figures 2a and 2b. Biochemical relapse-free survival (bRFS) rate for all 436 eligible, nonstratified patients (a), and for the same 436 patients stratified by Prostate Cancer Risk Index (PRIX) 0–6 (b).

Abbildungen 2a und 2b. Rate des biochemisch rezidivfreien Überlebens (bRFS) für alle 436 qualifizierten, nichtstratifizierten Patienten (a) sowie für dieselben 436 Patienten bei Stratifikation mit dem Prostatakrebsrisikoindex (PRIX) 0–6 (b).

Results

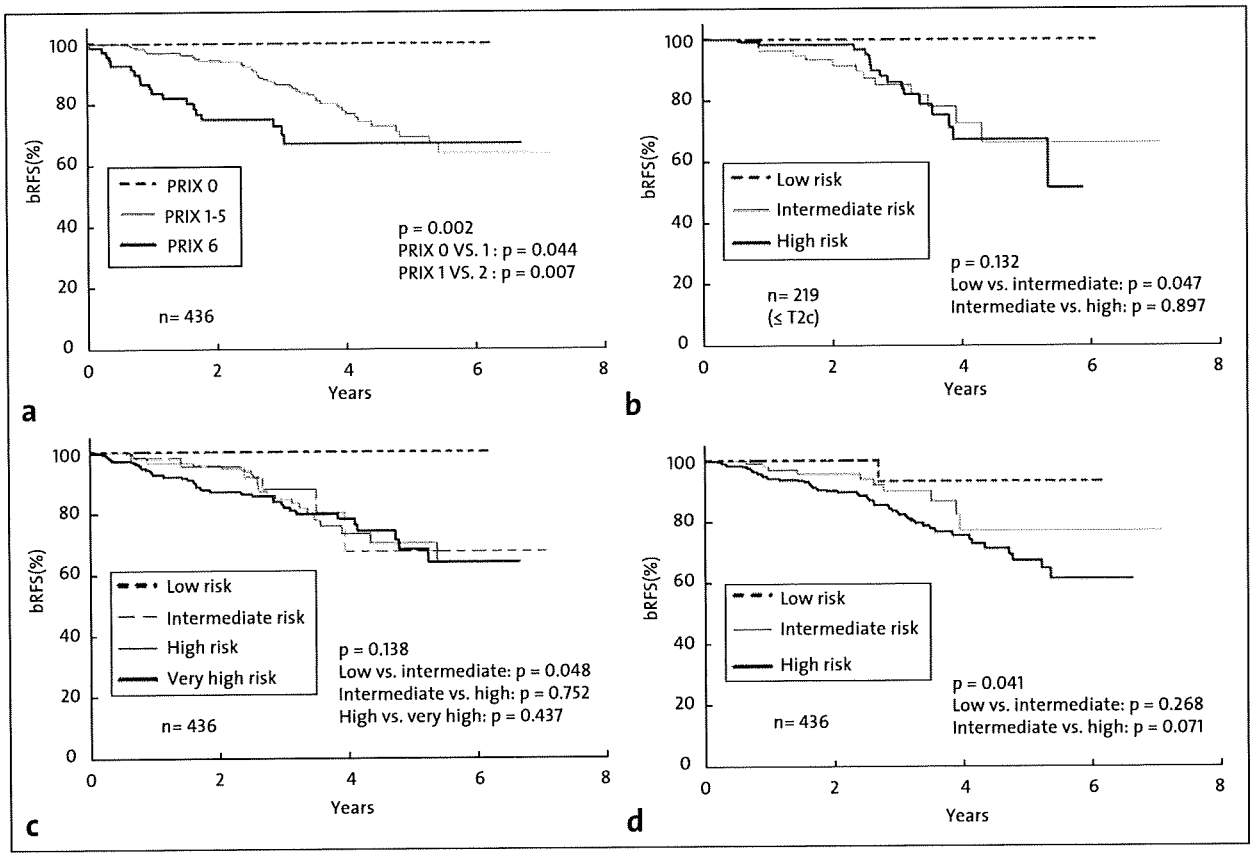
Figure 1 shows the changing trend in the number of patients who received definitive EBRT for the prostate, with a special focus on whether GS had been established. It represents all the patients (n = 652) initially enrolled in this study, including those who were subsequently considered ineligible for analysis. The number of patients showed a tenfold increase from 1995 to 2005, while, at the same time, the use of GS spread rapidly from 0% to > 90% of cases.

The characteristics of the patients who were eligible for analysis (n = 436) are shown in Table 1. T1 : T2 : T3 : T4 = 75 : 147 : 200 : 14, PSA ≤ 10 : 10–20 : > 20 ng/ml = 126 : 121 : 189, GS 2–6 : 7 : 8–10 = 97 : 167 : 172. Hormone therapy was administered to 95% of the patients, whereas 9% received whole pelvic RT. Nearly 90% of the patients were treated with 70 Gy in 35 fractions (60–66 Gy: 26 patients [6%]; 66–70 Gy: 15 patients [3%]; 70 Gy: 378 patients [87%]; 70–74 Gy: 17 patients [4%]).

A higher PRIX corresponded to a higher rate of hormone therapy usage. However, even in the case of PRIX 0 patients, 70% were treated with hormone therapy (the ratio was 100% for PRIX 6). Similarly, a higher PRIX mostly corresponded to a higher rate of whole pelvic RT usage (PRIX 0: 0%, PRIX 6: 21%). The mean RT dose for PRIX 6 was slightly smaller than for PRIX 0–5 (68.6 Gy vs. 69.4–69.9 Gy), but the difference was not statistically significant. No correlation was observed between PRIX and age or duration of hormone therapy.

The median follow-up period was 33 months (range 6–88, mean 35 months). The actuarial 3- and 5-year bRFS rates were 85% and 70%, respectively, for all 436 patients (Figure 2a). For the seven PRIX strata, 3- and 5-year bRFS rates were 100% and 100% for PRIX 0, 87% and 66% for PRIX 1, 78% and 69% for PRIX 2, 91% and 71% for PRIX 3, 88% and 68% for PRIX 4, 87% and 63% for PRIX 5, and 72% and 67% for PRIX 6, respectively (Figure 2b). Since PRIX 0 and 6 curves were obviously higher or lower than the others, while those for PRIX 1–5 did not differ from each other, we combined PRIX 1–5 into one group for the next analysis.

For the three PRIX strata (PRIX 0, 1–5, and 6), 3- and 5-year bRFS rates were 100% and 100% for PRIX 0, 86% and 69% for PRIX 1–5, and 72% and 67% for PRIX 6, respectively (Figure 3a). For comparison, when the patients were classified into three strata according to D'Amico's classification, the corresponding rates were 100% and 100% for the low-risk, 84% and 65% for the intermediate-risk, and 86% and 66% for the high-risk group (Figure 3b). For the four-stratum characterization according to NCCN's classification, the rates were 100% and 100% for the low-risk, 87% and 66% for the intermediate-risk, 84% and 69% for the high-risk, and 83% and



Figures 3a to 3d. Biochemical relapse-free survival (bRFS) rates stratified according to the Prostate Cancer Risk Index (PRIX) 0, 1–5, and 6 (a), D'Amico's classification (b), the National Comprehensive Cancer Network (NCCN) classification (c), and the Seattle classification (d).

Abbildungen 3a bis 3d. Raten des biochemisch rezidivfreien Überlebens (bRFS), stratifiziert nach dem Prostatakrebsrisikoindex (PRIX) 0, 1–5 und 6 (a) sowie den Klassifikationen von D'Amico et al. (b), National Comprehensive Cancer Network (NCCN; c) und Seattle (d).

Table 3. Univariate analysis using a log-rank test. GS: Gleason Score; PRIX: Prostate Cancer Risk Index; PSA: prostate-specific antigen; WPRT: whole pelvic radiation therapy.

Tabelle 3. Univariate Analyse unter Verwendung eines Log-Rank-Tests. GS: Gleason-Score; PRIX: Prostatakrebsrisikoindex; PSA: prostataspezifisches Antigen; WPRT: Ganzbeckenbestrahlung.

Variable	p-value
Age ≤ 70, ≥ 71 years	0.033*
< 66 Gy, ≥ 66 Gy	0.058
< 70 Gy, ≥ 70 Gy	0.367
Hormone +/–	0.746
WPRT +/–	0.982
T1–2, T3–4	0.238
PSA ≤ 10, > 10 ng/ml	0.035*
PSA ≤ 20, > 20 ng/ml	0.081
GS ≤ 6, ≥ 7	0.030*
GS ≤ 7, ≥ 8	0.097
PRIX 0, 1–6	0.033*
PRIX 0–5, 6	0.003*

*p < 0.05

67% for the very high-risk group (Figure 3c). Finally, when the patients were stratified into three groups according to Seattle's classification, the rates were 93% and 93% for the low-risk, 90% and 77% for the intermediate-risk, and 83% and 66% for the high-risk group (Figure 3d).

D'Amico's (p = 0.132), NCCN's (p = 0.138), and Seattle's (p = 0.041) classifications, as well as our seven-stratum PRIX (p = 0.044) showed weak or no correlation with bRFS, in contrast to three-stratum PRIX (PRIX 0, 1–5, 6), which showed a strong correlation (p = 0.002; Figures 2b, 3a to 3d). Each of these figures shows the p-values for paired log-rank comparison.

Univariate analysis using the log-rank test indicated that age ≤ 70 versus ≥ 71 years (p = 0.033, better for age ≥ 71), PSA ≤ 10 versus > 10 ng/ml (p = 0.035), GS ≤ 6 versus ≥ 7 (p = 0.030), PRIX 0 versus 1–6 (p = 0.033), and PRIX 0–5 versus 6 (p = 0.003) were all significant factors for bRFS (Table 3).

Discussion

Prostate cancer was not a common cancer in Japan until recently; however, its incidence and mortality are now

rapidly increasing [4, 5]. While radical prostatectomy has become widely accepted during the past 2 decades [2], the prevalence of definitive RT is still not satisfactory. Due to these circumstances, very few studies of RT for prostate cancer have been published in Japan and the data are for a relatively small number of patients treated with uncommon techniques including, for example, monotherapeutic high-dose-rate brachytherapy on 111 patients [21], carbon ion RT on 175 patients [9], and permanent brachytherapy using CT/MRI fusion method on 38 patients [19]. Even for a multiinstitutional study in conjunction with a patterns-of-care study project, only 283 patients were reported, whose data had been extracted from 66 institutions with the two-stage cluster sampling method [14].

While the data for definitive RT are thus still insufficient, the number of patients who are treated with RT or who want to be treated with RT is rapidly increasing [13]. Since establishment of treatment outcome criteria for RT in Japan has therefore become of the utmost importance, we collected clinical, practice-based data from multiple representative institutions in the Osaka district. The resultant information for 652 patients from eleven institutions represents, to the best of our knowledge, one of the largest sets of data for prostate RT in Japan.

The results of our study demonstrate that the number of patients who received definitive prostate EBRT showed a tenfold increase between 1995 and 2006, and, at the same time, use of GS evaluation has spread rapidly from 0% to > 90% of cases. Our study also showed a distinct characteristic of Japanese clinical practice, that is, a very high rate of neoadjuvant and/or adjuvant hormone therapy usage. In fact, 95% of all the patients, and even 70% of PRIX 0 or so-called low-risk patients, received hormone therapy. By contrast, data from the American College of Radiology National Patterns of Care Study show that only 51% of EBRT patients received hormone therapy [22]. A relatively low rate of whole pelvic RT administration (9%), compared to that in the USA (23%) [22], also seems to be a characteristic of Japanese clinical practice.

EBRT is becoming widely accepted during the current decade in Japan, thus following the trend in western countries. The data presented here, although still immature, are expected to enhance the current paucity of data regarding Japanese prostate EBRT, and to form the basis for a historical reference database for the coming era of three-dimensional conformal RT [7, 10] or IMRT [3, 8, 16]. At the same time, this study identified an important characteristic of Japanese prostate EBRT, that is, a very high rate of hormone therapy usage and a low rate of combining it with whole pelvic RT. The dominant dose fractionation observed in this study was 70 Gy/35 fractions. Under these circumstances, the so-called low-risk group or PRIX 0 showed obviously better bRFS than others, while the categorization of the so-called intermediate- or high-risk groups was not effective. We were able to demonstrate that PRIX 6 is clearly a prognostic factor for a worse bRFS, although the usefulness of subclassifications PRIX 1–5 remains questionable.

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