



# Role of Adjuvant Chemoradiotherapy for Duodenal Cancer

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## Background

- Duodenal cancer is a rare malignancy, and *en-bloc* surgical resection is considered as sole curative modality.
- Although the prognosis of duodenal cancer is reported to be better than those of other periampullary malignancies such as pancreatic and/or bile duct cancer, there is room for improvement of survival, and adjuvant treatment including chemotherapy or radiotherapy has been tried in several institutions. Its rarity, however, precludes prospective clinical trials for the confirmation of the role of adjuvant treatment.
- In this study, 24 patients treated for duodenal cancer with curative intent were analyzed, and the role of adjuvant chemoradiotherapy was investigated.

## Methods and Materials

### Eligibility

Accrual Period: January 1991 – December 2002

Newly diagnosed patients with duodenal adenocarcinoma who underwent *en bloc* resection

Number of patients: 24

Median duration of follow-up: 32 months (range;5-170)

### Treatment Scheme of Chemoradiotherapy



X: external beam radiation therapy (2 Gy/fx)

↑: intravenous 5-fluorouracil (500mg/m<sup>2</sup>), bolus injection

Maintenance chemotherapy: mainly 5-fluorouracil-based for 1 year

### Patient Characteristics

Variables	No. of patients (%)		p value
	Surgery*	Surgery+RT	
Age			
≤ 60 yr	7 (46.7%)	5 (55.6%)	1.0000
> 60 yr	8 (53.3%)	4 (44.4%)	
Sex			
Male	8 (53.3%)	6 (66.7%)	0.6785
Female	7 (46.7%)	3 (33.3%)	
Type of operation			
Whipple's operation	6 (40.0%)	4 (44.4%)	1.0000
PPPD	9 (60.0%)	5 (55.6%)	
T stage			
T1	1 ( 6.7%)	0 ( 0.0%)	0.6056
T2	1 ( 6.7%)	1 (11.1%)	
T3	1 ( 6.7%)	0 ( 0.0%)	
T4	12 (80.0%)	8 (88.9%)	
Pancreas invasion			
no	6 (40.0%)	2 (22.2%)	0.6570
yes	9 (60.0%)	7 (77.8%)	
Tumor size (cm)			
Median (range)	4 (1.2-8)	4 (2.5-9)	1.0000
N stage			
N0	10 (66.7%)	2 (22.2%)	0.0894
N1	5 (33.3%)	7 (77.8%)	
No. of examined LN			
Median (range)	13 (0 <sup>†</sup> -40)	13 (9-25)	0.6798
Stage			
I	2 (13.3%)	0 ( 0.0%)	0.0361
II	8 (53.3%)	2 (22.2%)	
III	5 (33.3%)	7 (77.8%)	
Differentiation <sup>‡</sup>			
W/D	6 (40.0%)	1 (12.5%)	0.1976
M/D	7 (46.7%)	5 (62.5%)	
P/D	2 (13.3%)	2 (25.0%)	

Abbreviations: PPPD= pylorus-preserving pancreatoduodenectomy; LN=lymph node; W/D=well differentiated; M/D=moderately differentiated; P/D=poorly differentiated.

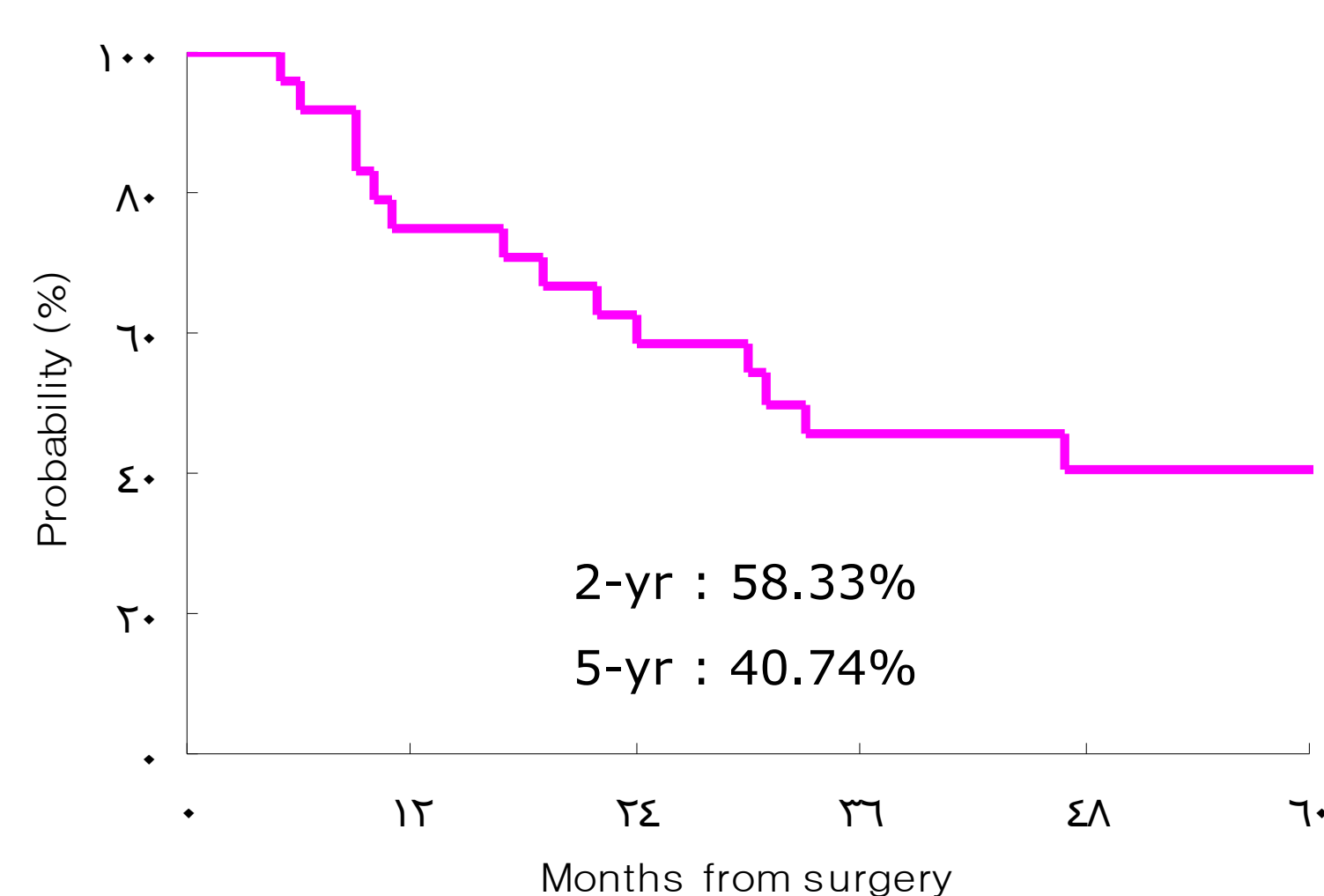
\*One patient received adjuvant chemotherapy.

†One patient whose tumor was confined to mucosa did not have lymph node dissection.

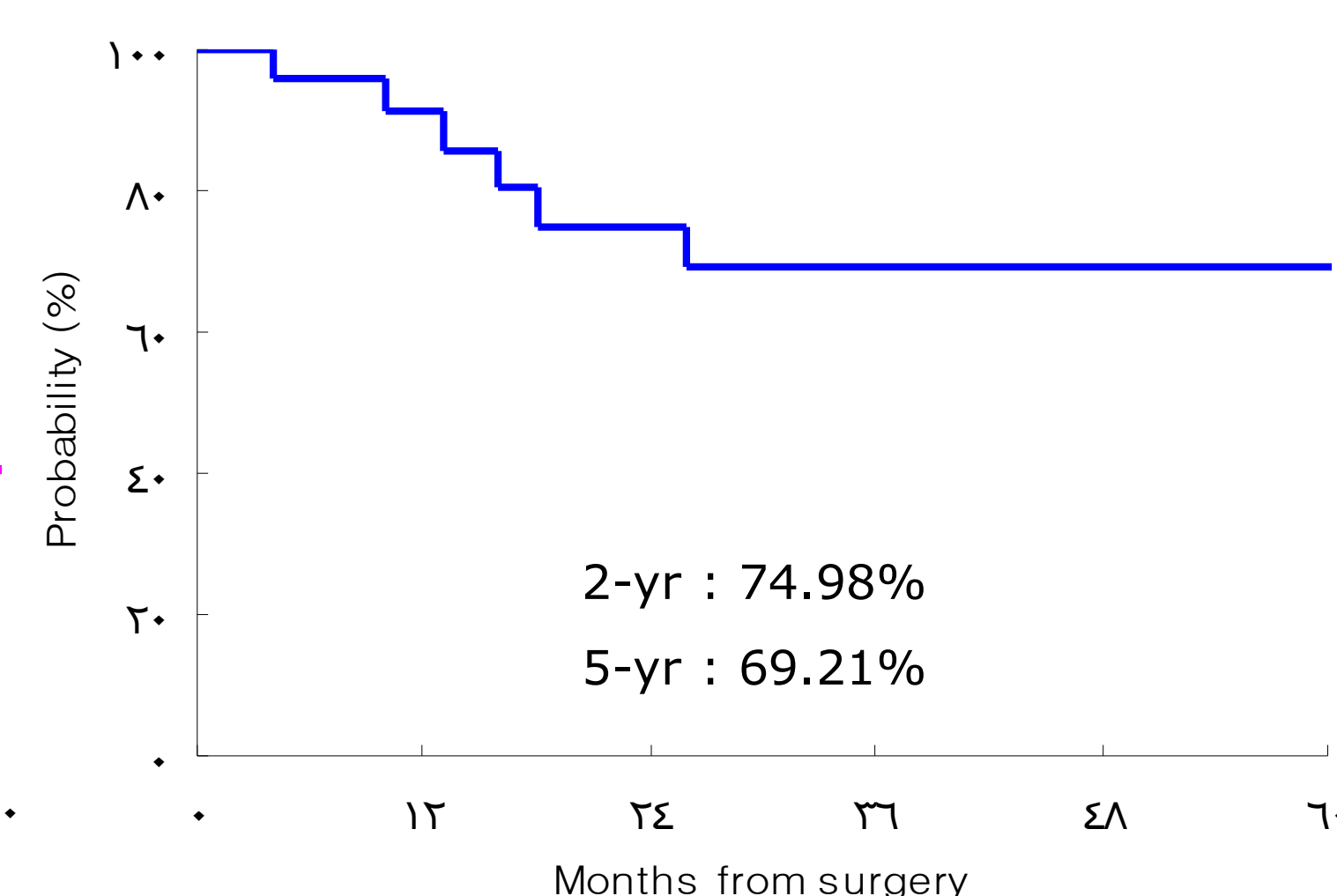
‡One patient who received RT had mucinous carcinoma.

## Results

### Overall Survival



### Loco-regional Relapse-free Survival



### Univariate Analysis for Overall and Loco-regional Relapse-free Survival

Variables	5-yr OS	p value	5-yr LRRFS	p value
Age				
≤ 60 yr	46.67%	0.2168	71.59%	0.5731
> 60 yr	33.33%		67.90%	
Sex				
Male	35.71%	0.5185	60.00%	0.5960
Female	45.00%		80.00%	
T stage				
T1-3	75.00%	0.1808	75.00%	0.7318
T4	33.33%		67.82%	
Pancreas invasion				
no	75.00%	0.0456	75.00%	0.7005
yes	23.44%		63.30%	
Tumor size				
≤ 4cm	44.87%	0.6606	64.62%	0.5731
> 4cm	36.36%		74.07%	
N stage				
N0	64.29%	0.0106	83.33%	0.1718
N1	16.67%		42.86%	
Stage				
I	100.00%	0.0297	100.00%	0.3423
II	56.00%		80.00%	
III	16.67%		42.86%	
Differentiation				
W/D	57.14%	0.6153	85.71%	0.3774
M/D	40.00%		70.00%	
P/D	25.00%		33.33%	
Radiotherapy				
no	46.67%	0.3799	64.20%	0.4188
yes	29.63%		80.00%	

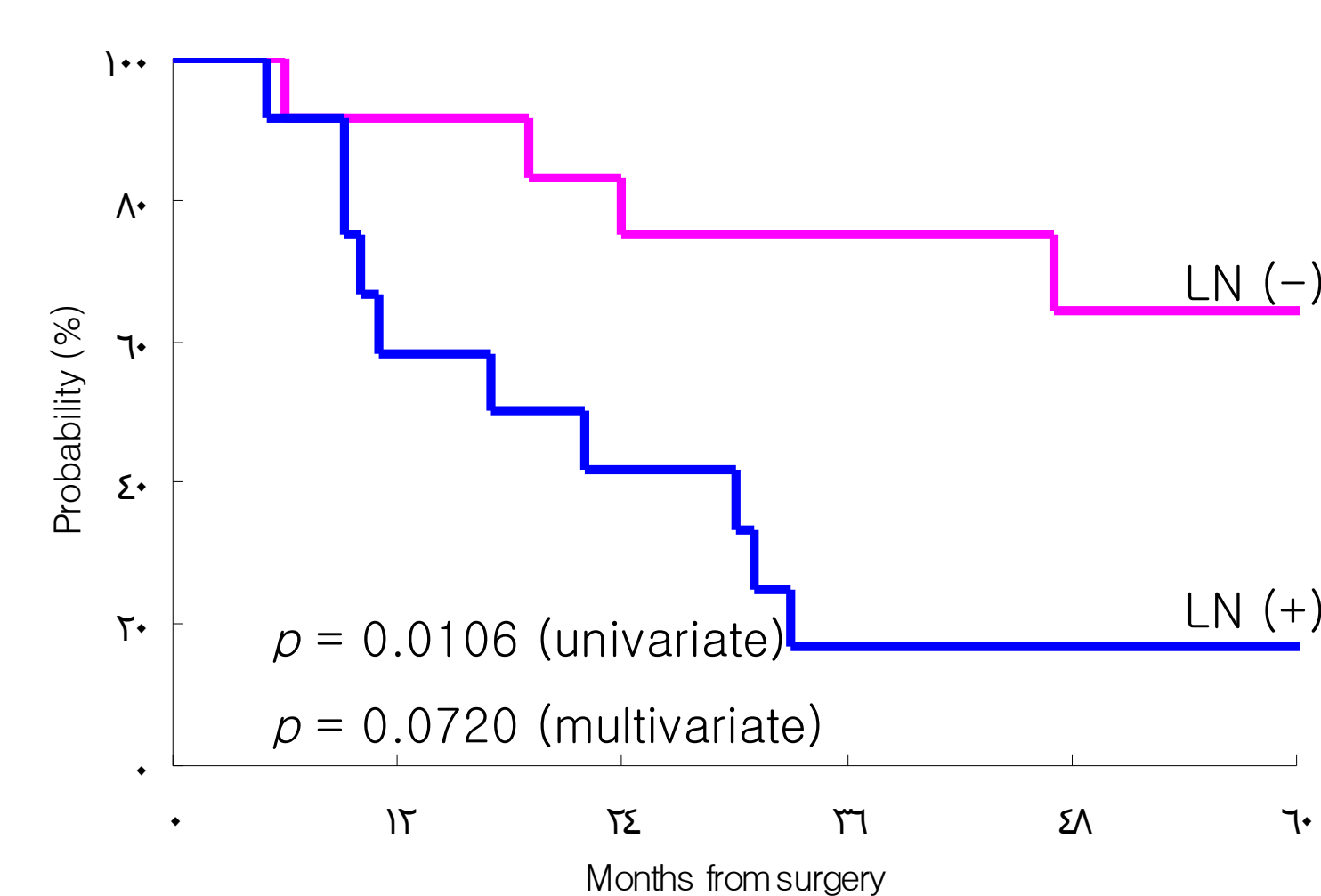
Abbreviations: OS=overall survival; LRRFS=loco-regional relapse-free survival; W/D=well differentiated; M/D=moderately differentiated; P/D=poorly differentiated.

### Multivariate Analysis for Overall and Loco-regional Relapse-free Survival

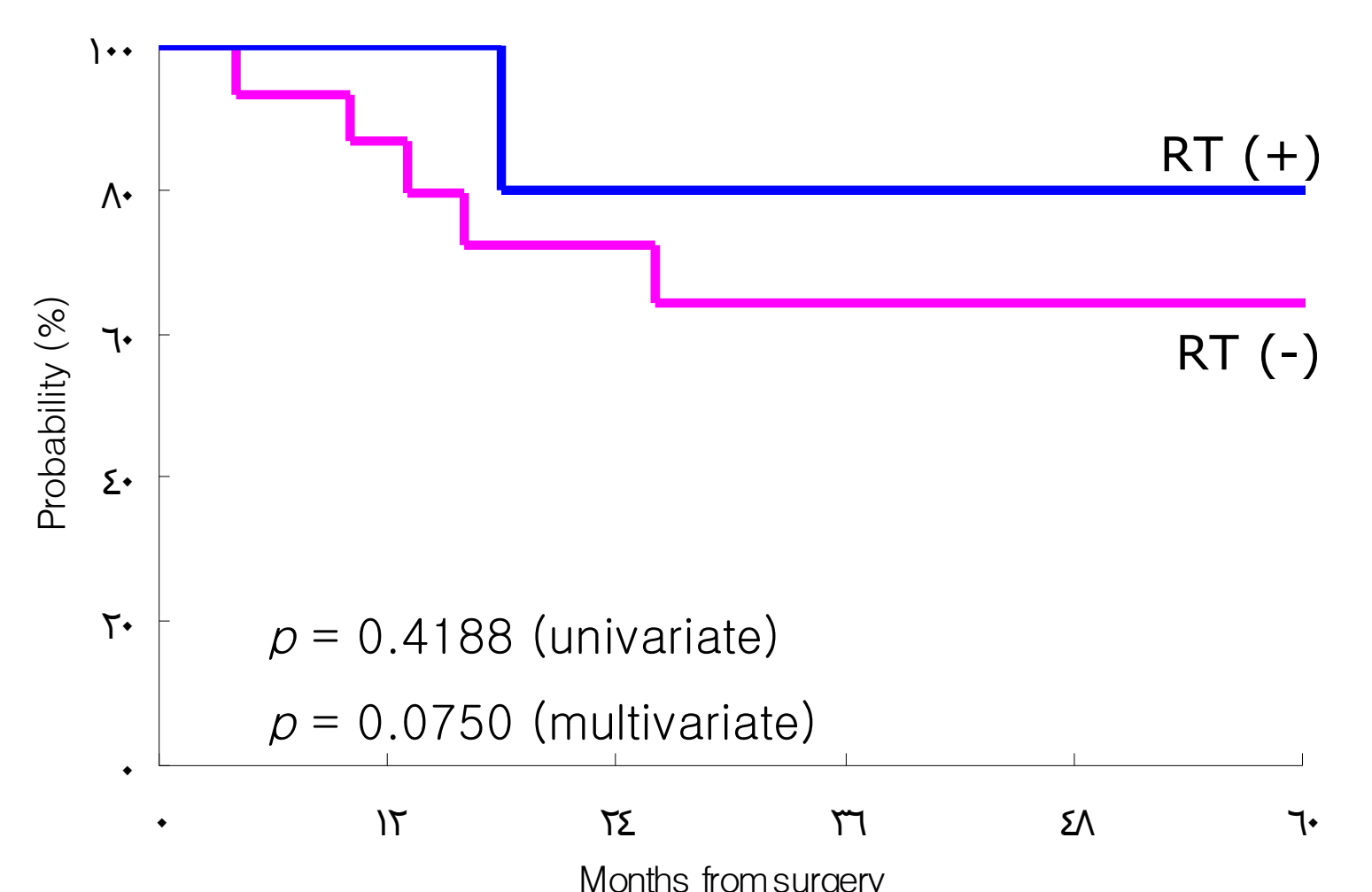
Variables	p value	
	OS	LRRFS
Age (≤ 60 yr vs. > 60 yr)	0.6929	0.1773
Pancreas invasion (no vs. yes)	0.1378	0.2703
Tumor size (≤ 4cm vs. > 4cm)	0.5114	0.1591
N stage (N0 vs. N1)	0.0720	0.1204
Differentiation (W/D vs. M/D vs. P/D)	0.7357	0.1041
RT (no vs. yes)	0.7619	0.0750

Abbreviations: OS=overall survival; LRRFS=loco-regional relapse-free survival; W/D=well differentiated; M/D=moderately differentiated; P/D=poorly differentiated.

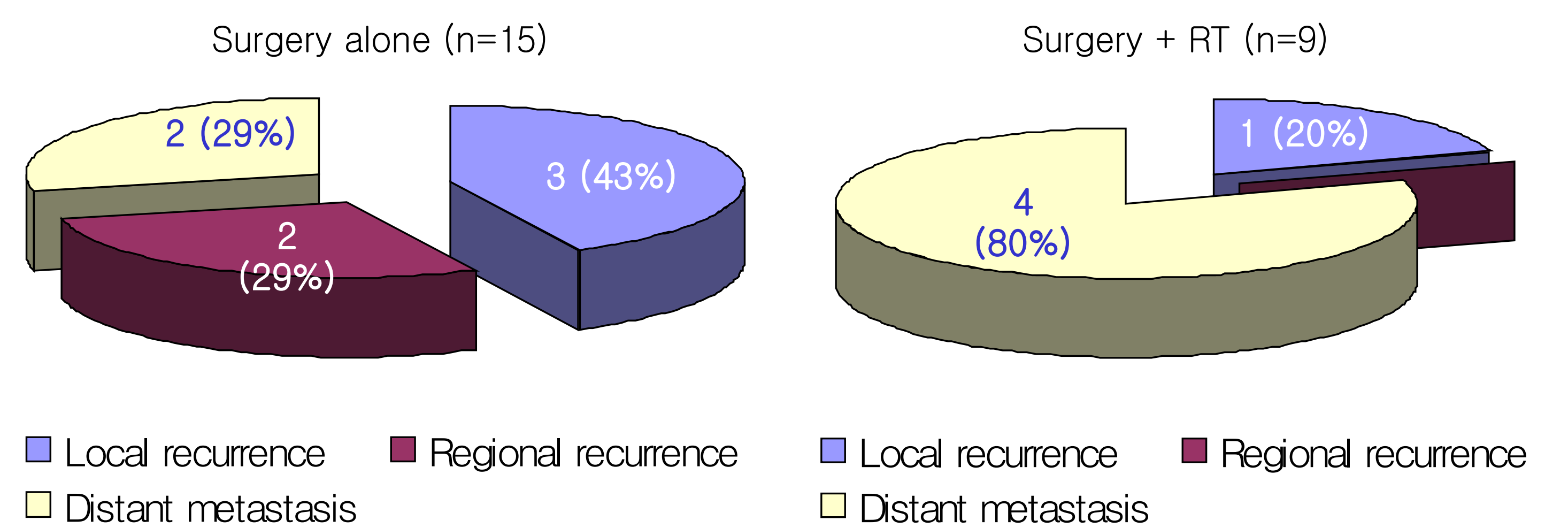
### Overall Survival



### Loco-regional Relapse-free Survival



### Patterns of Failure according to Treatment



### Complications during Chemoradiotherapy

RTOG toxicity criteria	No. of patients (%)			
	Gr 1	Gr 2	Gr 3	Gr 4
Abdominal pain/Diarrhea	3 (33)	2 (22)	0	0
Nausea/Vomiting	2 (22)	3 (33)	0	0

Abbreviation: RTOG=Radiation Therapy Oncology Group; Gr=grade.

## Conclusion

The adjuvant chemoradiotherapy is feasible and may enhance loco-regional control in advanced-staged duodenal cancer after curative resection.