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Review of Splenectomy, Pancreas-preserving Splenectomy, Pancreatosplenectomy for Combined Radical Total Gastrectomy

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Purpose: Splenectomy, pancreas-preserving splenectomy, pancreato-splenectomy are common combined operations of a total gastrectomy for gastric cancer. We attempted to determine the efficacy of these procedures after comparing and analyzing the complication rate and the five-year survival rate from the gastric cancer patients.
Methods: 121 advanced gastric cancer patients, except T4 patients, underwent radical total gastrectomy accompanied with splenectomy. and analyzed the clinical findings eg. age, sex, location of tumor, histological differentiation, lymph node metastasis, number of dissected LN, complication and the 5-year survival rate.
Results: 44 out of 121 patients underwent a pancreato-splencetomy, 53 patients underwent a pancreas-preserving splenectomy, and 24 patients underwent a simple splenectomy. There were no statistical difference in the patient's age, sex, location of tumor, histological differentiation, lymph node metastasis, the number of dissected LN and the 5 year-survival rate in stage II, IV with each operation. However, a pancreas-preserving splenectomy showed a better 5-year survival rate (53.7%) than a simple splenectomy (25.0%) and pancreato-splenectomy (32.1%) in stage III. The complication rate was 25% in a simple splenectomy, 17% in a pancreas-preserving splenectomy, 30% in a pancreato-splenectomy. Diabetes mellitus occurred in 3 patients who underwent a pancreato-splenectomy, in 1 patient with an iatrogenic splenic vein excision during a pancreas-preserving splenectomy.
Conclusion: A pancreas-preserving splenectomy is the best choice in stage IIIa total gastrectomy patients with the lowest complication rate. (**J Korean Surg Soc 2002;63:397-402**)

Key Words: Gastric cancer, Total gastrectomy, Pancreas-preserving splenectomy
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1   2   D2+
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(LN11)(*1*)   (LN10)(*1*)
,(*2,3*)

Kanai(*4*)   .
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Maruyama   (*5*)
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1)

1994   6   1998   12

180   .   T4
121   24
, 53
, 44
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T4   .

2)

Maruyama(5)   .
D2
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TA #55
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1997   UICC
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3)

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2002   2   28   .

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42.4±24.3   (1   90.6   )
67   ,
1   17
,   66   .

4)

SPSS   10   ,
Kaplan Meier   ,   Log rank
test   ,   P   0.05
.

121   26   78
,   52.7± 12.3   .   ,

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1/3   2
13   (54.2%),
36   (67.9%),   33   (75%)

.

,   IIIb
26.4%,   40.9%

Table 1. Patients' characteristics

	S* (n=24)	PPS† (n=53)	PS‡ (n=44)	P-value
Characteristic	No. of patient (%)§			
Age (yr)	54.6± 10.6	50.7± 12.7	53.9± 12.6	0.312
Sex (M/F)	17/7	34/ 19	32/ 12	0.641
Tumor size (cm)	6.2±3.0	5.7±2.5	7.1±2.5	0.016‖
Location of tumor				0.058
Upper third (U)	1 (4.2)	8 (15.1)	4 (9.1)	
Middle third (M)	7 (29.2)	8 (15.1)	3 (6.8)	
Low third (L)	1 (4.2)	0 (0.0)	0 (0.0)	
More than 2 areas	2 (8.3)	1 (1.9)	4 (9.1)	
More than 2 areas including U area	13 (54.2)	36 (67.9)	33 (75.0)	
Stage				0.278
II	6 (25)	17 (32.1)	7 (15.9)	
IIIa	8 (33.3)	17 (32.1)	10 (22.7)	
IIIb	6 (25)	14 (26.4)	18 (40.9)	
IV	4 (16.7)	5 (9.4)	9 (20.5)	

S* = splenectomy only; PPS† = pancreas-preserving splenectomy; PS‡ = pancreatosplenectomy; § = data are given as number of patients, percentage, except for age and tumor size; ‖ = significant.

Table 2. Pathologic results

Parameter	S* (n=24)	PPS† (n=53)	PS‡ (n=44)	P-value
	No. of patient (%)			
LN metastasis				0.291
N0	6 (25.0)	13 (24.5)	7 (15.9)	
N1	9 (37.5)	21 (39.6)	10 (22.7)	
N2	6 (25.0)	16 (30.2)	21 (47.7)	
N3	3 (12.5)	3 (5.7)	6 (13.7)	
Depth of invasion				0.049‖
T1	0 (0.0)	0 (0.0)	0 (0.0)	
T2	0 (0.0)	5 (9.4)	0 (0.0)	
T3	24 (100)	48 (90.6)	44 (100)	
Differentiation				0.164
Well diff.	3 (12.5)	6 (11.3)	1 (2.3)	
Mod. diff.	2 (8.3)	13 (24.5)	7 (15.9)	
Poorly diff.	8 (33.3)	21 (39.6)	18 (40.9)	
Signet ring cell	11 (45.8)	13 (24.5)	18 (40.9)	

S* = splenectomy only; PPS† = pancreas-preserving splenectomy; PS‡ = pancreatosplenectomy; ‖ = significant.

Table 3. Number of dissected nodes

LN group	S*	PPS†	PS‡	P-value
	mean±SD No. of dissected nodes			
N1	28.6±11.9	33.0±12.8	27.5±15.7	0.120
N2	14.8±7.6	14.3±7.5	14.9±7.9	0.935
N3	3.7±3.6	2.5±2.8	3.2±2.8	0.284
Total	46.9±15.1	50.5±15.6	46.3±19.4	0.277

S* = splenectomy only; PPS† = pancreas-preserving splenectomy; PS‡ = pancreatosplenectomy.

Table 4. Tumor metastatic rate to LN 10, LN 11 according to each operation

Lymp node	S* (n=24)	PPS† (n=53)	PS‡ (n=44)
	No. of patient (%)		
LN 10	0 (0%)	5 (9.4%)	8 (18.2%)
LN 11	3 (12.5%)	7 (13.2%)	15 (34.1%)

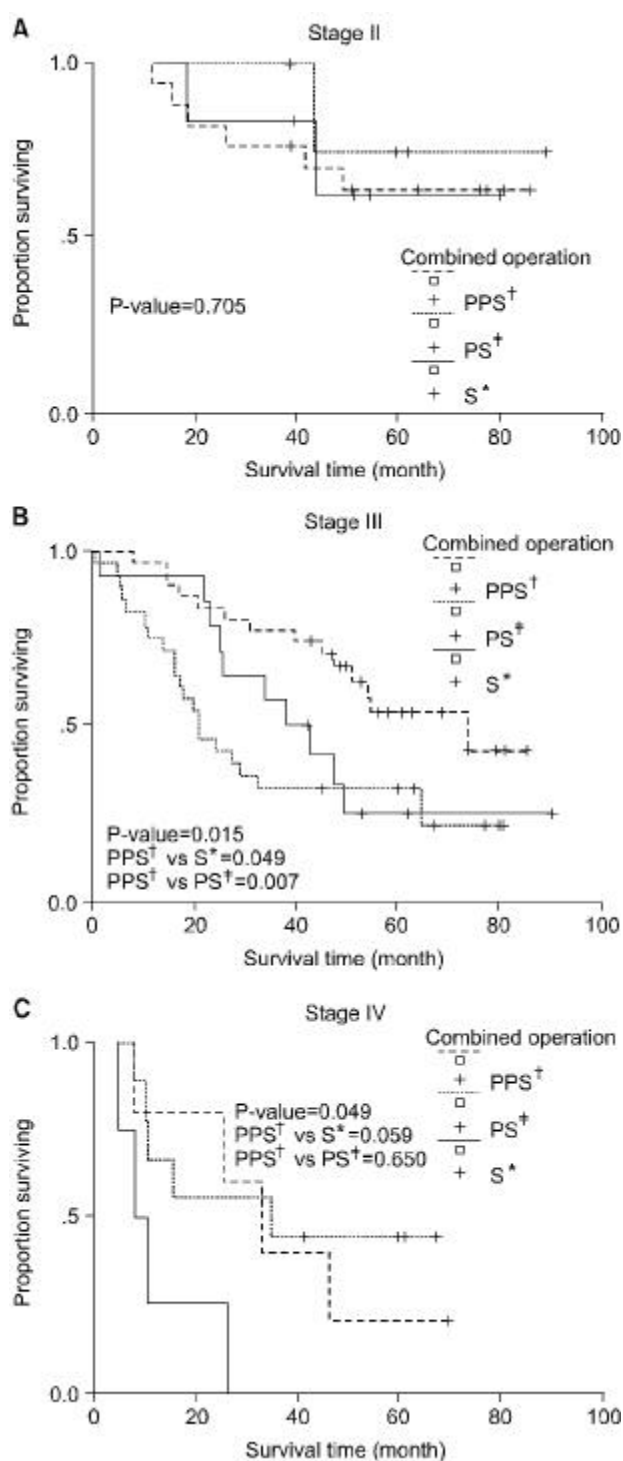S* = splenectomy only; PPS† = pancreas-preserving splenectomy; PS‡ = pancreatosplenectomy.

Fig. 1. Survival of each operations according to stages. S* = splenectomy only; PPS† = pancreas-preserving splenectomy; PS‡ = pancreatosplenectomy.
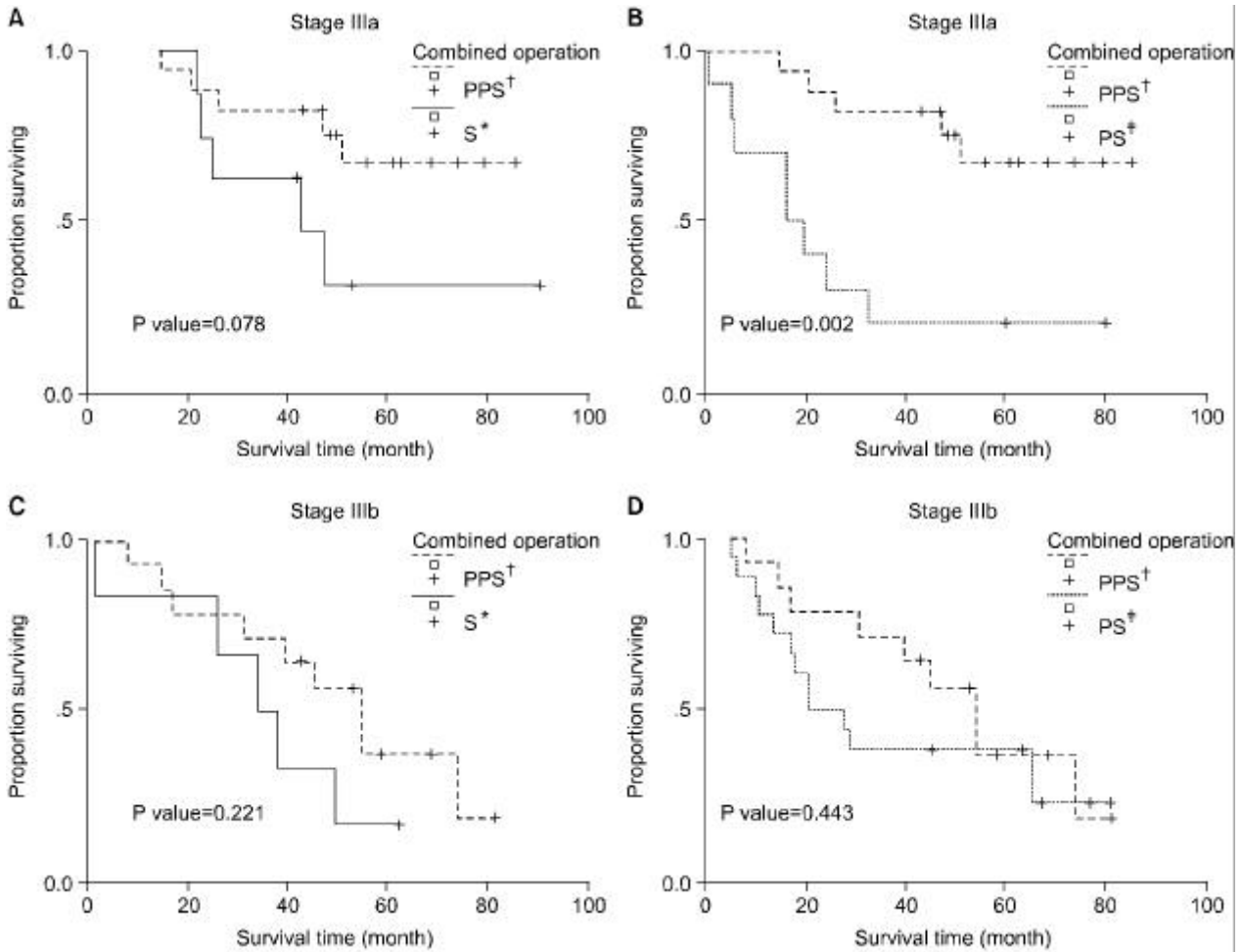
(Table 1).

Fig. 2. Survival of stage IIIa and IIIb according to PPS and PS. PPS[†] = pancreas-preserving splenectomy; PS[‡] = pancreatosplenectomy.

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(Table 2). 1 , 2 , 3

,
(Table 3). (LN 10)
(LN 11) LN 10
9.4%, 18.2%
, 11
13.2%, 34.1%
(Table 4).
II ,
III (25.0%),
(53.7%) (32.1%) 5
(Fig. 1). III IIIa IIIb
IIIa

Table 5. Complications

	S* (n=24)	PPS[†] (n=53)	PS[‡] (n=44)	P-value
Complications		No. of patient (%)		
Infection	1	4	4	
Lung complication	2	3	5	
Pancreatic fistula	1	0	0	
DM	0	1	2	
Leakage	0	1	2	
Hemorrhage	2	0	0	
Total	6 (25%)	9 (17%)	13 (30%)	0.317

S* = splenectomy only; PPS[†] = pancreas-preserving splenectomy;
PS[‡] = pancreatosplenectomy.

(67.1%)   .(*5*)

(20.0%)   5   , IIIb

(Fig. 2).

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(Table 5).   , 5   ,

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,   1/3   2

5   ,(*1,6,7*)

Maruyama   (*5*)   IV   9   (20.5%)

,   IIIb   18   (40.9%)

.   14   (26.4%)

.

(*1,8*)   .   1/3

10   11

.(*9*)   15%, 12%   ,(*11*)

,   10   11

(*8,10*)   9.4%, 13.2%   18.2%,

.(*1*)   34.1%   ,

,   11   34.1%

,

.

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1967   Kanai   ,

(*4*)   D2   III   5

(5-YSR 25.0%, 53.7%, 32.1%),

10   11   74.7%   .

,   64.5%

,   III   10   11

9.4%   13.2%   ,

.   0%, 12.5%

Maruyama   (*5*)   1987

,

.   10   11   ,   ,   ,   IIIb   18

(40.9%)   14   (26.4%)

,   IIIb

.

,   IIIb   IV

10   11

,(*1, 12*)   IIIb

.   III   IIIa   IIIb
5   IIIa
67.1%,
20.0% (P=0.00 1)

,   IIIb
37.5%,   38.9% (P=0.442)
.   IIIb   IIIa

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IIIa   Kinoshita
(*13*)
,   IIIb

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LN 11   ,

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