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Clinical Analysis of Perforated Gastric Cancer

Hang Ju Cho, MD., Wook Kim, MD., Chang Joon Ahn, MD., Cho Hyun Park, MD., Seung Man Park, MD., Hae Myung Jeon, MD., Hyung Min Jin, MD., Keun Woo Lim, MD., Seung Nam Kim, MD. and Woo Bai Park, MD.

Purpose: Generalized peritonitis caused by a free perforation of gastric cancer is a rare condition, which occurs in 1-4% of all gastric cancer patients. To assess the characteristics of the patients and investigate the optimal treatment of choice, the data from 51 patients previous recent 10 years were retrospectively analyzed.

Methods: Between 1988 and 1997, 51 patients underwent surgical treatment for perforated gastric cancer. The clinicopathological features and survival rates of the resected group (n=39) and the non-resected group (n=12) were analyzed.

Results: The incidence was 0.78% and the mean age was 57 years. The most common tumor location was in the lower 1/3 in the resected group (n=21, 53.8%) and in the upper 1/3 in the non-resected group (n=6, 50%). Borrmann type 3, the poorly differentiated type, and a positive serosa invasion were more common in both groups. Liver and peritoneal metastases were observed in 2 cases (5.2%) and 7 cases (14.3%) in the resected group, and 4 cases (33.4%), and 3 cases (25%) in the non-resected group, respectively. Resectability found in 76.5%: 27 cases of a subtotal gastrectomy and 12 cases of a total gastrectomy. A limited lymph node dissection (D₁,D₁) was performed in 14 cases (35.9%) and an extended dissection (D₂,D₂) was performed in 25 cases (64.1%). The 5-year survival rate of stage I was 80%, 40% in stage II, 14% in stage III and 0% in stage IV, and the overall 5 year survival rate was 20.5% in the resected group and 0% in the non-resected group. The depth of invasion, lymph node metastasis and tumor stage significantly influenced the survival rate of the patients.

Conclusion: Because a perforation of the gastric cancer may develop in every stage, surgeons must take care of these patients by the same way as with non-perforation cases. (J Korean Surg Soc 2003;64:28-32)

Key Words: Gastric cancer, Perforation, Surgical treatment

Department of Surgery, College of Medicine, The Catholic University of Korea, Seoul, Korea

1% , 1-4%
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 Tel: 032-340-7022, Fax: 032-340-2668
 E-mail: kimwook@hfh.cuk.ac.kr
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1988 1997 10 가
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 (n=39)
 (n=12)
 , 39
 TNM 5 (10)
 chi-square test
 , log-rank test
 Cox's proportional hazard
 model P < 0.05
 Kaplan-Meier

(8) : 가 32 ,
 9 가 7 , 3
 (P=0.005).
 2) (Table 2)
 39 가 12 , 가 27
 , 2

Table 1. Clinicopathological characteristics of the patients with perforated gastric cancer

Variables	No of patients (%)		P-value
	Resection (n=39)	Local repair (n=12)	
Age			0.037
Range (yr)	24 - 74	44 - 84	
Mean	57.9 ± 11.0	57.0 ± 14.0	
Sex			N.S.
Male	36 (89.3%)	7 (58.3%)	
Female	3 (10.7%)	5 (41.7%)	
Location			0.003
Upper 1/3	1 (2.6%)	6 (50%)	
Middle	17 (43.6%)	4 (33.4%)	
Lower	21 (53.8%)	2 (16.6%)	
Gross type			N.S.
Borrmann 1	0 (0%)	0 (0%)	
2	6 (14.3%)	1 (8.3%)	
3	29 (71.4%)	7 (58.3%)	
4	4 (10.7%)	4 (33.4%)	
Histologic type			N.S.
Differentiated	17 (39.3%)	4 (33.4%)	
Undifferentiated	22 (60.7%)	8 (66.7%)	
Depth of invasion			0.007
Serosa negative	11 (28.6%)	0 (0%)	
Serosa positive	28 (71.4%)	12 (100%)	
LN metastasis			N.C.
Negative	8 (21.4%)		
Positive	31 (78.6%)		
Liver metastasis			0.002
Negative	37 (94.8%)	8 (66.7%)	
Positive	2 (5.2%)	4 (33.4%)	
Peritoneal metastasis			0.005
Negative	32 (85.7%)	9 (75%)	
Positive	7 (14.3%)	3 (25%)	

N.S. = non-specific; N.C. = not calculated.

1) (Table 1)
 (1) : 51 40 가 13
 가 , 60 가 12 , 50 가 11 , 70 가 8 ,
 80 가 3 , 20 가 3 , 30 가 1 ,
 57.9 ± 11.0 , 57.0 ± 14.0
 (P=0.037), 43 ,
 8 5.4 : 1 , 12 : 1,
 1.4 : 1
 (2) : 1/3
 (21)가 , 가 6
 가 , (P=0.003).
 (3) : Borrmann 3 29
 가 ,
 Borrmann 3 7 가
 (4) : 22 ,
 8 17 , 4
 (5) : 가
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 12 11 , 0
 (P=0.007),
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 (6) : 31
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 (7) : 가 37 ,
 8 가 2 , 4
 , (P=0.002).

Table 2. Type of operation

Operation type	No. of patients
Gastrectomy	
Subtotal	27
Total	12
Lymph node dissection	
Limited (D ₀ D ₁)	14
Extended (D ₂ D ₃)	25
Local repair	
debridement & primary closure	7
+gastrectomy	5

Table 3. Factors influencing 5 year survival rate in 39 patients with resected perforated gastric cancer

Variables	No. of patients	5-yr survival	P-value
Age (yr)			N.S.
Range/mean	27 84/57.9±11		
≤60	26 (67%)	23.0%	
>60	13 (33%)	15.3%	
Sex			N.S.
Male	36 (89.3%)	22.2%	
Female	3 (10.7%)	NC	
Location			N.S.
Upper 1/3	1 (2.6%)	NC	
Middle	17 (43.6%)	11.76%	
Lower	21 (53.8%)	28.57%	
Gross type			N.S.
Borrmann 1	0 (0%)	NC	
2	6 (14.3%)	16.7%	
3	29 (71.4%)	17.2%	
4	4 (10.7%)	25.0%	
Histologic type			N.S.
Differentiated	17 (39.3%)	23.5%	
Undifferentiated	22 (60.7%)	18.2%	
Depth of invasion			0.0002
Serosa negative	11 (28.6%)	54.6%	
Serosa positive	28 (71.4%)	7.1%	
LN metastasis			0.0005
Negative	8 (21.4%)	62.5%	
Positive	31 (78.6%)	9.68%	
Liver metastasis			N.S.
Negative	37 (94.8%)	17.8%	
Positive	2 (5.2%)	NC	
Peritoneal metastasis			N.S.
Negative	32 (85.7%)	24.2%	
Positive	7 (14.3%)	NC	
LN dissection			N.S.
Limited (D ₀ D ₁)	14 (35.9%)	28.6%	
Extended (D ₂ D ₃)	25 (64.1%)	16.0%	
Curability			N.S.
Curative	23 (59.0%)	27.3%	
Non-curative	16 (41.0%)	11.8%	
Stage			0.0002
I	5 (10.7%)	80%	
II	5 (17.9%)	40%	
III	20 (50.0%)	14%	
IV	9 (21.4%)	0%	

N.S. = non-specific, N.C. = not calculated.

12 7
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가 (D₀, D₁)
(14, 35.9%), D₂
39 23 (59%),
16 (41%), 가
2 가, 가
7
가
12
, 4, 3
가, 5 가
3)
51 39 5
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, (Table 3). 5
12 0%, 39 5
20.5% (Fig. 1). 5
54.6%, 7.1% (P=0.0002),
62.5%, 9.7%
(P=0.0005). 5 I 80%, II 40%,
III 14%, IV 0% (Fig. 2)
(P=0.0002). Cox's Proportional Hazard Model
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(Table 4).

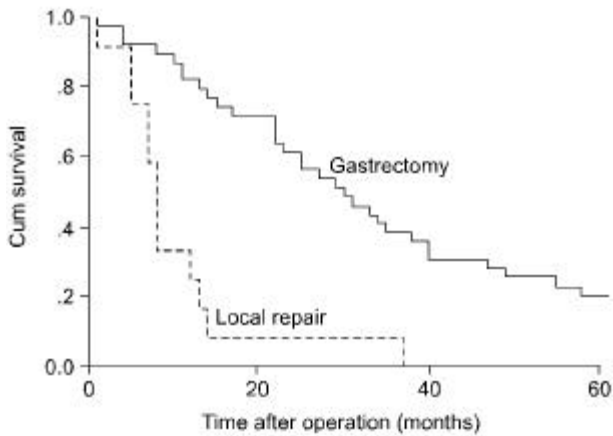


Fig. 1. 5 year survival rate of the patients with perforated gastric cancer according to the resectability.

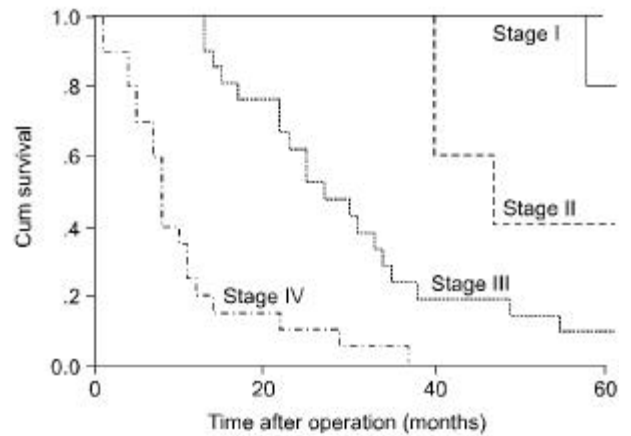


Fig. 2. 5 year survival rate of the patients with perforated gastric cancer according to the tumor stage (P=0.0002).

Table 4. Multivariate analysis by the Cox's proportional hazard model

Variable	P-value	Relative risk (95% confidence interval)
Depth of invasion	0.0131	6.9553 (1.5019 32.2095)
Lymph node metastasis	0.0019	2.7195 (1.4463 5.1136)
Stage	0.0144	4.6554 (1.7233 6.2055)

III
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 , 가
 , (3,5,6,11)
 가 (1,4,7)
 가
 가 가
 51 5
 Lehnert (8)
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 51 2
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 Borrmann-3
 4 58 82% (2)
 Gertsch (7) 1/3 (56%), Adachi (2)
 1/3 (44%)
 Borrmann 3 70.6%, 1/3 45.1% 가
 Adachi
 (2) 55%, Gertsch (7) 94%

가 , ,
 , 1 4%
 , (1-4)
 0.3%, 1.7% (8)
 가 60 가 가 (2,4)
 3 : 1 (2,7)
 10 6,455
 51 0.78% ,
 5.4 : 1, 57
 가
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 50
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 가
 51 40 (78.4%)가

70.6% 가 . 80 82%

78.4% 가 . 21.6%

가

가

가 Lehnert

(8)

가 가

, 1963 Heimlich(12)

가 , 1966 Wilson(9)

14 5

4 1

Gertsch (7) 34 30

16%

50% , Adachi (2) 155

128 (83%) 30

7%

70%

, III

25 , 7

, IV 8 , 3

가 가 ,

가 , 가

(2, 13)

(2, 10, 13)

(14) Gertsch (14)

PCNA labeling index

5 Adachi (2) I 93%, II

49%, III 38%, IV 6.9%

I 80%, II 40%, III 14%, 4 0%

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