

5 UICC TNM

Nodal Staging by Number of Metastatic Lymph Node and Comparison with Nodal Staging of 5th UICC TNM Classification in Gastric Cancer

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Purpose: The nodal staging of the 5th edition of the Union Internationale Contra la Cancer (UICC) TNM classification in 1997 was changed based on the number of metastatic lymph nodes. We attempted to classify nodal status according to the number of involved lymph nodes and compare with the nodal staging of the 5th UICC TNM classification in order to evaluate the rationality of the new nodal staging system.

Methods: The authors retrospectively analyzed 427 patients with gastric cancer who underwent curative resection from 1993 to 1996 at the Department of Surgery, Korea University College of Medicine. Cumulative survival rates were calculated by the Kaplan-Meier method. The difference between each nodal status was evaluated by the log rank test and the generalized Wilcoxon test.

Results: There were statistical differences between 0 and 1 lymph node involved, between 7 and 8, and between 15 and 16. We classified the nodal status into 4 groups according to the number of involved lymph nodes based on the following: group 1 with no lymph node involved, group 2 with 1-7, group 3 with 8-15 and group 4 with more than 15. There was a significant survival difference among the 4 groups with no survival difference between the number of positive lymph nodes in each group. We compare our results with the nodal staging of the UICC TNM classification and found that there were differences between group 2 (1-7 positive lymph nodes) and pN1 of TNM (1-6 positive lymph nodes) and between group 3 (8-15) and

pN2 (7-15).

Conclusion: We were able to classify nodal status into 4 groups according to the number of involved lymph nodes. There was little difference compared with the new nodal staging of the 5th UICC TNM classification, which suggested that the nodal classification of the UICC TNM classification based on the number of metastatic lymph nodes is acceptable. Further analysis of a larger sample size may be necessary. (J Korean Surg Soc 2002;63:206-213)

Key Words: Gastric cancer, Nodal staging, UICC TNM classification

: , , UICC TNM

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가 가
 (1) 가 .
 가 ,
 가
 가
 (2) 4 Union Internationale Contra
 la Cancer (UICC)(3) (4)
 ,
 (5,6)
 1997 5 UICC TNM
 pN0 (0), pN1 (1-6), pN2 (7-15),
 pN3 (16) (7)
 가 (8-11)

가

5 UICC TNM

1) 1993 3 1996 12 585 60 , 7 , 6 , 2 83 427

2) 가 SAS (Statistical Analysis System) (SAS Release 6.12, SAS Institute Inc., Cary, NC, USA) 2000 8 31 가 427 5.3 90.3 (47.0 ±23.9) 273 , 110 , 44 89.7% Kalplan-Meier Log-Rank Generalized Wil- P<0.05 가 coson Bon- fernii 가 5% 가

1)

21 82

55.6±

Table 1. Case characteristics (n=427)

Gender	
Male	276 (64.7%)
Female	151 (35.3%)
Age(years)	
Mean	55.6± 11.4
Range	21 82
Tumor location	
Upper third	38 (8.9%)
Middle third	150 (35.1%)
Lower third	239 (56%)
Depth of invasion	
Tis	1 (0.2%)
T1	150 (35.2%)
T2	102 (23.9%)
T3	167 (39.1%)
T4	7 (1.6%)
Number of dissected nodes	
Mean	32.7± 14.0
Range	7 104
Lymph node involvement	
Node negative	203 (47.5%)
Node positive	224 (52.5%)
Number of involved nodes	
Mean	6.9± 6.5
Range	1 32
Histologic type	
Well differentiated	47 (11.0%)
Moderately differentiated	191 (44.7%)
Poorly differentiated	127 (29.7%)
Signet ring cell	54 (12.6%)
Mucinous	8 (1.9%)
UICC TNM Stage (4th ed. 1987)	
0	1 (0.2%)
IA	17 (29.7%)
IB	65 (15.2%)
II	75 (17.6%)
IIIA	83 (19.4%)
IIIB	65 (15.2%)
IV	11 (2.6%)
Type of resection	
Subtotal	321 (75.2%)
Total	106 (24.8%)

11.4 , 276 (64.7%), 151 (35.3%)
 1.8 : 1 . ,
 Table 1 .
 7 104 32.7 ± 14.0
 가 203 (47.5%)
 , 224 (52.5%)
 1 32
 69 ± 6.5 .
 2)
 가
 Fig. 1 .
 가 0 0.0125
 1 , 가 1
 2, 3, 4, 5, 6, 7 가
 P > 0.05 가
 8 0.0005 .
 0 가 1 1, 2, 3, 4, 5, 6,
 7 가 7 8
 15
 16 .
 1
 203 (47.5%), 2 가 1 7
 150 (35.2%), 3 가 8
 15 49 (11.4%), 4 가 16
 25 (5.9%) (Table 2).
 3)
 Log-Rank Wilcoxon
 (P=0.001)

Table 2. Group resulting from analysis (n=427)

Group	No. of positive lymph Node	No. of case (%)
1	0	203 (47.5%)
2	1 7	150 (35.2%)
3	8 15	49 (11.4%)
4	16	25 (5.9%)

2 Log-Rank 0.8894, Wilcoxon 0.9700
 3 Log-Rank 0.1626, Wilcoxon 0.2259
 가 . 4 Log-Rank
 0.0001, Wilcoxon 0.0001 가 가
 가 .
 5)
 1 1 2 ,
 1 3 1 4
 가 (P=0.001). 2
 2 3 2
 4 가 (P=0.001).
 3 4 P=0.0625
 가 (Fig. 3).
 6) 5 UICC TNM

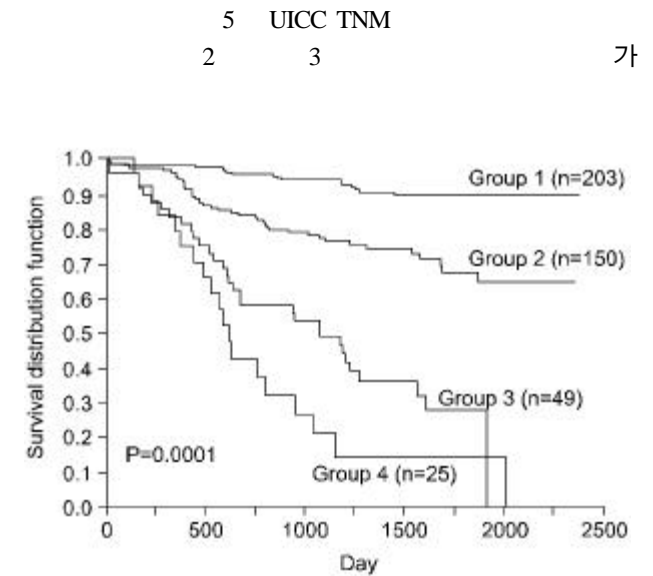


Fig. 2. Survival curves according to group.

Table 3. Comparison with nodal staging of 5th UICC TNM classification

Group	Study No. of positive lymph node	5th UICC TNM	
		Nodal staging	No. of positive lymph node
Group 1	0	N0	0
Group 2	1 7	N1	1 6
Group 3	8 15	N2	7 15
Group 4	16	N3	16

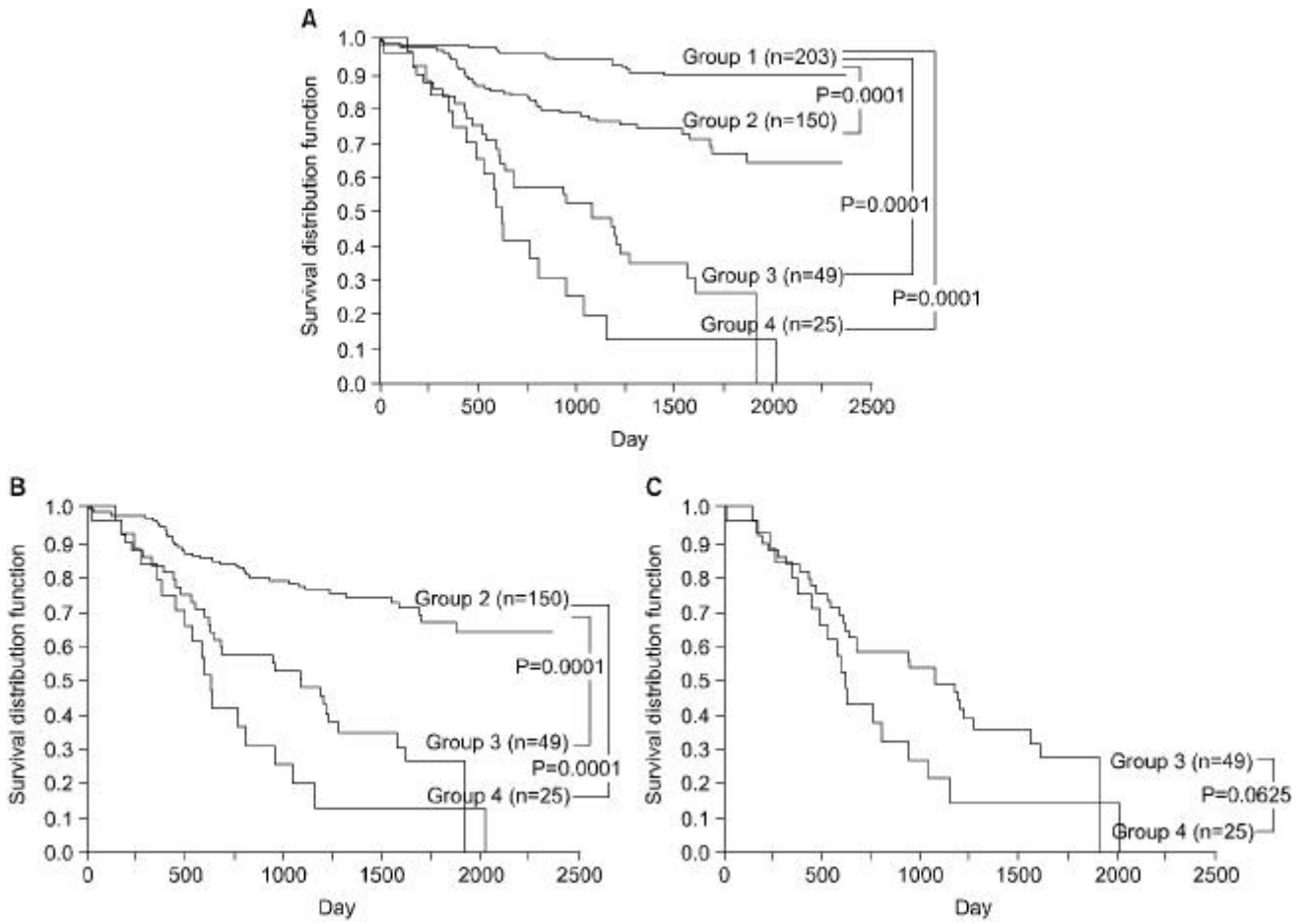


Fig. 3. Survival differences between each group. (A) There is a significant differences between group 1 and group 2, 3 and 4. (B) There is a significant differences between group 2 and group 3 and 4. (C) There is a significant differences between group 3 and group 4.

7 8 5 UICC TNM German Gastric Cancer study 가 TNM/Prognostic
 pN1 pN2 가 (Table 3). 6 7 System committee of the UICC
 1997 5 가

pN0 (0), pN1 (1 6), pN2 (7 15), pN3 (> 15)
 (.7)
 (.4) Adachi(14)
 level 1 (perigastric), level 2
 (intermediate), level 3 (distant)
 (.12) , 가
 ,
 (.14-17)

.(5)
 가 .(13) UICC TNM 4 , (13)
 가

가 (5) N0
 0, N1 1 7, N2 8 15, N3 16
 1997 5 UICC TNM
 pN0 (0), pN1 (1 6), pN2 (7 15), pN3
 (> 15) N1-pN1, N2-pN2
 5 UICC TNM
 가 5
 가 UICC TNM
 가
 가
 UICC(3) (4)
 가가 가
 (9-11) (25) Hermanek (26) 가 가
 가 pN Bunt
 (27) 가 가
 (18-19) Roder (22) 가
 가 (stage migration)
 가 pN 가
 (6) 가 0 (stage-specific survival rates)
 1 2, 3 가
 가 (28)
 가
 1997 UICC TNM
 15
 가 (26)
 Isozaki (23) 427 7
 104 32.7 ± 14.0
 , Makino (16) N1 1 32 6.9
 ± 6.5
 가 Ichikura (24) 가
 5 UICC TNM
 가
 가
 가 D2
 가 (13)
 D2 30 35 , D3
 가 40 47
 (29-31)

가 (16,17)

	1993	1996
427		
5 UICC TNM		
	0 1 , 7 8 ,	
	15 16	
1	0 , 2	1
7 ,	3 8 15	4 16
	4	5 UICC TNM
	pN1 (1 6)	
pN2 (7 15)		2 3
가		가

REFERENCES

- 1) Yi SH, Kim HC, Lee SH, Park HC, Yoon C, Joo HJ, et al. Multivariate analysis of prognostic factor in gastric cancer. *J Korean Surg Soc* 1999;56:75-83.
- 2) Lee HK, Kim YH, Cho SJ, Yang HK, Lee KU, Choe KJ, et al. Influence of nodal yields on staging of gastric cancer and on survival. *J Korean Surg Soc* 2001;60:172-9.
- 3) Hermanek P, Sobin LH. UICC TNM classification of malignant tumours. 4th ed. Berlin: Springer-Verlag; 1987.
- 4) Japanese Gastric Cancer Association. Japanese classification of gastric carcinoma. 13th ed. Tokyo: Kanehara; 1999.
- 5) Lee JH, Kim SJ, Yu HJ, Kim JP. Ratio of involved lymph nodes to resected lymph nodes as a prognostic factor of gastric cancer. *J Korean Surg Soc* 1998;55:76-83.
- 6) Yoo CH, Noh SH, Kim YI, Min JS. Comparison of prognostic significance of nodal staging between old (4th edition) and new (5th edition) UICC TNM classification for gastric carcinoma. *World J Surg* 1999;23:492-8.
- 7) Sobin LH, Wittekind CH. UICC TNM classification of Malignant Tumors. 5th ed. New York: Wiley-Liss; 1997.
- 8) Hermanek P, Altendorf-Hofmann A, Manasmann U, Dworak O, Wittekind Ch, Hohenberger W. Improvements in staging of gastric carcinoma from using the new edition of TNM classification. *Eur J Surg Oncol* 1998;24:536-41.
- 9) Kodera Y, Yamamura Y, Shimizu Y, Torii A, Hirai T, Yasui K, et al. The number of metastatic lymph nodes: A promising

- prognostic determinants for gastric carcinoma in the latest edition of TNM classification. *J Am Coll Surg* 1998;187:597-603.
- 10) Roder JD, Bottcher K, Busch R, Wittekind C, Hermanek P, Siewert JP. Classification of regional lymph node metastasis from gastric carcinoma. *Cancer* 1998;82:621-31.
- 11) Funii K, Isozaki H, Okajima K, Nomura E, Niki M, Sako S, et al. Clinical evaluation of lymph node metastasis in gastric cancer defined by the fifth edition of the TNM classification in comparison with the Japanese system. *Br J Surg* 1999;86:685-9.
- 12) Kim JP, Kim YW, Yang HK, Noh DY. Significant prognostic factors by multivariate analysis of 3926 gastric patients. *World J Surg* 1994;18:872-7.
- 13) Yu W, Choi GS, Whang I, Suh IS. Comparison of five systems for staging lymph node metastasis in gastric cancer. *Br J Surg* 1997;84:1305-9.
- 14) Adachi Y, Oshir T, Okuyama T, Kamakura T, Mori M, Maehara Y, et al. A simple classification of lymph node level in gastric carcinoma. *Am J Surg* 1995;169:382-5.
- 15) Okusa T, Nakne Y, Boku T, Takada H, Yamamura M, Hioki K, et al. Quantitative analysis of the number of metastatic lymph nodes in patients with gastric cancer. *J Surg Oncol* 1990;170:488-94.
- 16) Makino M, Moriwaki, Yonekawa M, Oota M, Kimute O, Kaibara N. Prognostic significance of the number of metastatic lymph nodes in patients with gastric cancer. *J Surg Oncol* 1991;47:12-6.
- 17) Kodera Y, Yamamura Y, Shimizu Y, Torii A, Hirai T, Yasui K, et al. Lymph node status assessment for gastric carcinoma: Is the number of metastatic lymph nodes really practical as a parameter for N categories in the TNM classification? *J Surg* 1998;69:15-20.
- 18) Kim JP, Yang HK, Oh ST. Is the new UICC staging system of gastric cancer reasonable? (Comparison of 5-year survival rate of gastric cancer by old and new UICC stage classification.) *Surg Oncol* 1992;1:209-13.
- 19) Shiu MH, Moore E, Sanders M, Huvos A, Freedman B, Goodbold J, et al. Influence of the extent of resection on survival after curative treatment of gastric cancer, A retrospective multivariate analysis. *Arch Surg* 1987;122:1347.
- 20) Okusa T, Nakane Y, Boku T, Takado H, Yamamura M, Hioki K, et al. Quantitative analysis of nodal involvement with respect to survival rate after curative gastrectomy for carcinoma. *Surg Gynecol Obstet* 1990;170:488-94.
- 21) Roder JD, Böttcher K, Siewert JR, Busch R, Hermanek P, Meyer HJ. German Gastric Carcinoma Study Group. Prognostic factors in gastric carcinoma study 1992. *Cancer* 1993;72:2089-97.
- 22) Roder JD, Böttcher K, Busch R, Wittekind C, Hermanek P, Siewert JR. for the German Gastric Carcinoma Study Group. Classification of regional lymph node metastasis from gastric

- cancer. *Cancer* 1998;82:621.
- 23) Isozaki H, Okajima K, Kawashima Y, Yamada S, Nakada E, Nishimura J. Prognostic value of the number of metastatic lymph nodes in gastric cancer with radical surgery. *J Surg Oncol* 1993;53:247
 - 24) Ichikura T, Tomimatus S, Okusa Y, Uefuji K, Tamakuma S. Comparison of the prognostic significance between the number of metastatic lymph nodes and nodal stage based on their location in patients with gastric cancer. *J Clin Oncol* 1993; 11:1894-900.
 - 25) Bunt AMG, Hermans J, van de Velde CJH, Sasako M, Hoef-sloot FAM, Fleuren G, et al. Cooperating Investigators. Lymph node retrieval in randomized trial on western-type versus Japanese-type surgery in gastric cancer. *J Clin Oncol* 1996;14: 2289-94.
 - 26) Hermanek P. pTNM and residual tumor classification: problems of assessment and prognostic significance. *World J Surg* 1995;19:184.
 - 27) Bunt AMG, Hogendoorn PCW, van de Valde CJH, Bruijn JA, Hermans J. Lymph node staging standards in gastric cancer. *J Clin Oncol* 1995;13:2309-16.
 - 28) Bunt AMG, Hermans J, Smit VTHBM, van de Velde CJH, Fleuren GJ, Bruijn JA. Surgical/pathologic-stage migration confounds comparisons of gastric cancer survival rates between Japan and Western countries. *J Clin Oncol* 1995;13: 19-25.
 - 29) Elias D. Reflection and proposal for the worldwide standardization of lymphadenectomy for gastric cancer. *J Surg Oncol* 1999;71:120-2.
 - 30) de Manzoni G, Verlato G, Gugliemi A, Laterza E, Genna M, Cordiano C. Prognostic significance of lymph node dissection in gastric cancer. *Br J Surg* 1996;83:1604-7.
 - 31) Bonenkamp JT, Songun I, Hermans J, Sasako M, Welvaart K, Plukker JT, et al. Randomized comparison of morbidity after D1 and D2 dissection for gastric cancer in 996 Dutch patients. *Lancet* 1995;345:743-8.
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