

*, †, ‡, §

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: 1986 7 1996 6 10
 47 16 80
 52 가 33 (70%), 가 14 (30%) . WHO 1 ()
) 3 (6%), 2 () 30 (64%), 3 () 13 (28%)
 1 (2%) (1997)
 T1, T2a, T2b, T3, T4 11 (23%), 6 (13%), 9 (19%), 7 (15%), 14 (30%)
 N0, N1, N2, N3 7 (15%), 14 (30%), 21 (45%), 5 (10%) Stage I, IIA, IIB, III, IVA,
 IVB 2 (4%), 2 (4%), 10 (21%), 14 (30%), 14 (30%), 5 (11%)
 42 5 가 가 6MV 10MV Xray 9 MeV
 6120- 7920cGy(: 7020cGy) Cisplatin+
 5-Fluorouracil(25), Cisplatin+ Pepleomycin(17) 1 3
 Kaplan-Meier Generalized Wilcoxon test
 Cox
 : 2 89%, 5 81% . 5 60%(; 6-132 , ; 32)
 (P=0.006, P=0.003) (P=0.012, P=0.008)
 2
 가,
 N 가
 : , ,

1)

2)
 가 3, 4)
 1%
 7 25% 5 7)

가 1% 가 가
 1) 10 0.2 0.5
 가
 1999 1 26 1999 5 27 가 5 50%
 : , Tel : Fax :

8 :

2, 8)
 20 50%, 10 30%, 가 16
 36% 8 13)
 가
 1986 7 1996 6 10
 47 5) 가
 16 80
 49 52 47 5 (10%)
 가 33 (70%), 가 14 (30%)

X- , ,
 CT 38 , MR 7
 WHO 14) 1 (
) 3 (6%), 2 (
 30 (64%), 3 () 13 (28%) 1 (2%)
 (Table 1).
 15)
 T1, T2a, T2b, T3, T4 11 (23%),
 6 (13%), 9 (19%), 7 (15%), 14 (30%) . T4 14 8
 (57%) CT MR
 11 (79%)
 5 (36%) . IX, X ()
 47 5) 가 VI, XII (4),
 III, V, VIII (3)
 N0, N1, N2, N3 7 (15%), 14 (30%), 21 (45%),
 5 (10%) Stage I, IIA, IIB, III, IVA, IVB
 2 (4%), 2 (4%), 10 (21%), 14 (30%), 14 (30%), 5
 (11%) (Table 2). 가
 31 (66%) . 30 (64%), 29
 (62%) . 13 (28%)
 11 (23%) (Table 3).

Table 1. Patient Characteristics

Characteristics	No. of Patients
Age (years)	
Median	52
Range	16 - 80
Sex	
Male	33
Female	14
Histology	
Squamous cell cancer	
keratinizing	3
nonkeratinizing	30
Undifferentiated	13
Not informed	1
Neoadjuvant CTX	
Cisplatin + Peplomycin	17
Cisplatin + 5 Fluorouracil	25
not performed	5
CTX-RT interval (days)	
Mean	11
Range	0 - 73
RT dose (cGy)	
Median	7020
Range	6120 - 7920
RT period (days)	
Median	59
Range	47 - 122
Follow-up (months)	
Median	32
Range	6 - 132

Abbreviations : CTX; chemotherapy, RT; radiotherapy

42
 25 Cisplatin 5-FU가 17 Cisplatin
 Peplomycin . 26 3 , 14
 2 , 2 1 . 5
 가
 11 (, 0 73) 가
 6MV 10MV X-ray 9MeV

Table 2. Distribution of Patients by T or N Stage of 1997 AJCC

	No. of Patients					Total (%)
	N0	N1	N2	N3a	M3b	
T1	2 (I)	3 (IIB)	5 (III)	1 (IVB)	0 (IVB)	11 (23)
T2a	2 (IIA)	1 (IIB)	3 (III)	0 (IVB)	0 (IVB)	6 (13)
T2b	0 (IIIB)	6 (IIB)	2 (II)	1 (IVB)	0 (IVB)	9 (19)
T3	0 (III)	1 (III)	3 (III)	3 (IVB)	0 (IVB)	7 (15)
T4	3 (IVA)	3 (IVA)	8 (IVA)	0 (IVB)	0 (IVB)	14 (30)
Total (%)	7 (15)	14 (30)	21 (45)	5 (10)	0	47 (100)

Table 3. Presenting Symptoms and Signs

Symptoms & Signs	No. of Patients (%)
Neck mass	31 (66)
Nasal symptoms	30 (64)
obstruction	16 (34)
bleeding	14 (30)
Ear symptoms	29 (62)
hearing disturbance	16 (34)
fullness	6 (13)
pain	5 (11)
discharge	2 (4)
Headache	13 (28)
Cranial nerve deficit	11 (23)
Throat pain	4 (9)

Table 4. Significance of Factors Affecting Local Control, Overall Survival and Disease Free Survival

Factors	P values*		
	Local control	Overall S.	DFS
Age	NS	NS	NS
Sex	NS	NS	NS
Histologic type	NS	NS	NS
CN invasion	0.004	NS	NS
Stage group	NS	0.006	0.003
T-stage	NS	NS	NS
N-stage	NS	0.012	0.013
CTX	NS	NS	NS
CTX-RT interval	NS	NS	NS
Radiation dose	NS	0.012	0.008
RT Period	NS	NS	NS

*Multivariate analysis by Cox proportional hazard model. Abbreviations : S; survival, DFS; disease free survival, NS; not significant, CN; cranial nerve, CTX; chemotherapy, RT; radiotherapy

(bilateral parallel opposing field)
 . 5000cGy 6000cGy 1 2
 . 6120
 7920cGy(: 7020cGy) 4500 cGy
 X-
 9MeV 600 2400(; 1445)cGy
 가 3cm
 100%가 (anterior single field)
 180 200cGy
 1 5 3
 III, IVA, IVB 1
 63
 59
 Kaplan-Meier ¹⁶⁾
 Cox
 Generalized
 Wilcoxon(Breslow) Generalized savage(Mantel- Cox) ¹⁸⁾
 37
 7 3
 가
 2
 32 6
 132
 1.
 2 89%, 5 81%
 5 4 (80%) 2

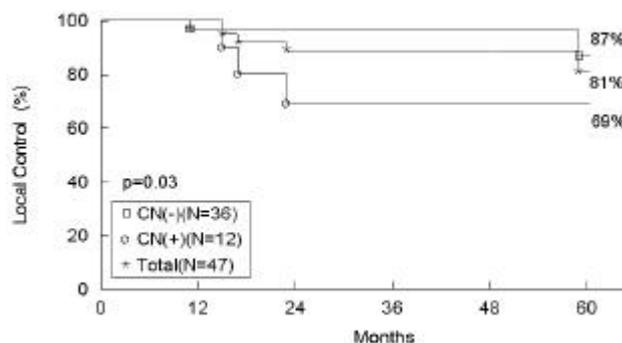


Fig. 1. Local control rate of nasopharyngeal cancer by cranial nerve (CN) involvement.

(P=0.004) 가 (Table 4).
 11 3 (27.3%)
 36 2 (5.5%)
 5
 가 (87% vs 69%, P=0.03, Fig. 1).

T1, T2a, T2b, T3, T4 9%(1/11), 0%(0/6), 11%(1/9), 0%(0/7),
 21%(3/14) . N N0,
 N1, N2, N3a 0% (0/7), 14%(2/14), 19%(4/21), 40%(2/5)
 가 40
 5900cGy 12 3 , 5900cGy

8 :

28 4 (75% vs 86% $P=0.74$)

2.

47 5 60%
 32 (; 6 132)
 (P=0.006) (P=0.012)
 T N
 N (P=0.038)가 가 (Table 4). T
 T1-2 T3-4 T1-3 T4
 $P=0.05, P=0.07$ 5%

(I + IIA, B) (III + IVA, B)
 5 85%(11/14) 50%(17/33)($P=0.06$)
 I + IIA, B + III IVA, B 5
 76%(21/28) 36%(7/19)($P=0.01$) (Fig. 2).
 III (T3N2) 63% 5
 70Gy (76% vs 36%, $P=0.012$)
 가 (Fig. 3).5 64%
 32 가 ($P=0.003$)
 (P=0.008) 가 5
 I + II(T1-2N0-1) 73%, III(T3N2) 86%,
 I + II + III(T1-2N0-2) 78%, IVA- B(T4N3a, b) 42%
 I + II + III IV
 (78% vs 42%, $P=0.008$).
 70 Gy (71% vs 48%,
 $P=0.015$) (Fig. 4).

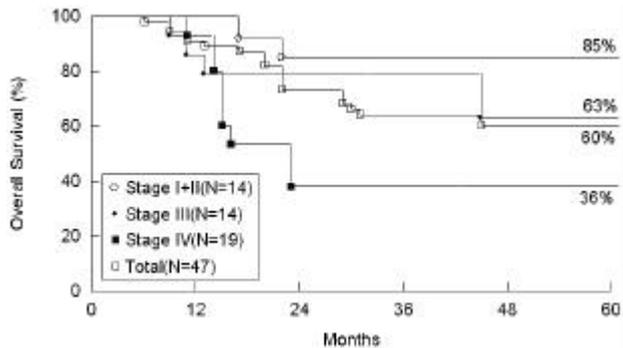


Fig. 2. Overall survival rate of nasopharyngeal cancer by stage.

3.

47 5
 1 T4N2(IVA)
 (3 6th, 12th)
 3
 T2bN1, T4N2(;V,VII), T4N2(
 ; VI)
)가 1 T1N3a(IVB)
 (120cGy per fraction, BID)
 64.8Gy 72Gy
 8
 45 Gy가 5 , 3 53, 64.8, 67.2 Gy
 9
 3 , 가 3 , 3
 2 3

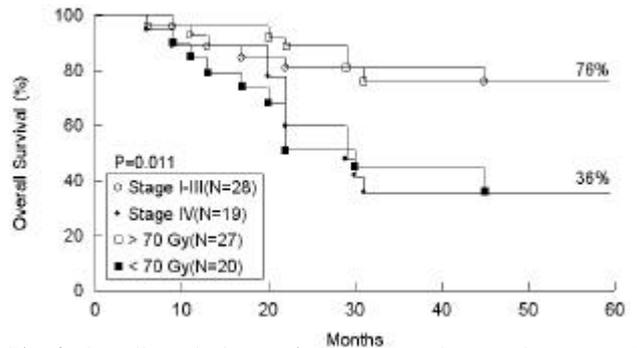


Fig. 3. Overall survival rate of nasopharyngeal cancer by stage and radiation dose.

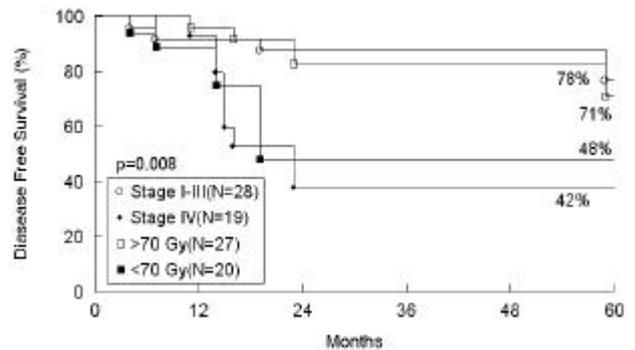


Fig. 4. Disease free survival rate of nasopharyngeal cancer by stage and radiation dose.

가 .

4. 가 (43%)²⁹⁾ 가^{36 38)} Santos

(40%) . Sanguinetti²⁾

15% . 2 1 378 (Stage IV; 75%)

synthyroid . 5 48% 5

71% . T , 가

가 N 가

5, 6) , , 가

19) 10 70 T 가

40 50 가

16 80 49 (가

; 52) . 2.4:1 .

5, 6) .

가²⁰⁾ .

21 23) . 8, 10, 34, 40 Tokars⁴⁴⁾ 96

5600 6000cGy 56 72%

6700cGy 39% . Mesic⁹⁾

T1, T2, T3, T4 85 95%, 80 90%, 251 T1-2 7000cGy 94% ,

60 75%, 40 60% 9, 20, 24 28) T1, 6000cGy 76% . T3-4

T2, T3, T4 11 10 (91%), 15 14 (93%), 7 .

7 (100%), 14 11 (79%) , Valentini⁴⁵⁾ T1, T2 6000cGy 7000cGy

가 T3-4 7000cGy

5 N0, N1-2, N3 . Vikram⁴²⁾ 6700cGy

90 100%, 80 90%, 60 80% 9 11, 24 27) 7700cGy . Yan

N0, N1, N2, N3 7 7 (100%), 14 12 43) 7000cGy 가

(86%), 21 17 (81%), 5 3 (60%) 9000cGy 92 7000cGy 90

가 T1 T2

45% 17% T3 T4 67%

T , N 52% . 5.5%

가 17.5% 가 Perez²⁰⁾

2, 20, 25 31) T4

9, 25, 26, 32 34) 6500 7500cGy 46) Perez²⁰⁾

Perez²⁰⁾ 가 7500cGy

가 Perez²⁰⁾

9, 25, 33) Applebaum³³⁾ Santos²⁹⁾

Hoppe³⁵⁾ 가 . Sanguinetti²⁾

8 :

6000cGy 36% Peters⁵⁸⁾
 5 63%
 44%(P=0.15)
 7020cGy(; 6120 7920cGy)가 45-50% 7 13%
 가 9 (19%) 8
 5 3 T4 , 1 T2bN1(IIB) 가
 7200cGy 4 11 ,^{20, 37)} 가
 1 T1N3a . Perez²⁰⁾
 가 . 가 Dickson
 가⁴⁾
 6cm 가
 72Gy 11 . Mesic⁹⁾
 Wong⁴⁷⁾ (T) (N) N 가 가
 Hoppe³⁵⁾ . Chu⁴⁰⁾ 가
 가 T
 48) conformal T
 가
^{23, 49, 50)} Wang⁵⁰⁾ 60 , N 가 가
 58 T1,
 T2 5 89% 55%, T3, T4 가
 77% 45% 가
 가
^{51, 53)} Yamashita⁵⁴⁾ 22%
 37 42 49% 5
 22% 24% 가 . Tannock⁵⁵⁾
 140 methotrexate, bleomycin,
 cisplatin 2 51
 . Rossi⁵⁶⁾ 229
 116 , 113
 6 vincristine, cyclophosphamide, doxorubicin
 . 4 55.8% 57.7%
 가 67.3% 58.5% 가
 . Dimery⁵⁷⁾
 78%, 44%
 7%,

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An Analysis on Factors Affecting Local Control and Survival in Nasopharyngeal Carcinoma

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Purpose : This study was performed to find out the prognostic factors affecting local control, survival and disease free survival rate in nasopharyngeal carcinomas treated with chemotherapy and radiation therapy.

Materials and Methods : We analysed 47 patients of nasopharyngeal carcinomas, histologically confirmed and treated at Chonnam University Hospital between July 1986 and June 1996, retrospectively. Range of patients' age were from 16 to 80 years (median; 52 years). Thirty three (70%) patients was male. Histological types were composed of 3 (6%) of keratinizing, 30 (64%) of nonkeratinizing squamous cell carcinoma and 13 (28%) of undifferentiated carcinoma. Histological type was not known in 1 patient (2%). We restaged according to the staging system of 1997 American Joint Committee on Cancer. Forty seven patients were recorded as follows: T1; 11 (23%), T2a; 6 (13%), T2b; 9 (19%), T3; 7 (15%), T4; 14 (30%), and N0; 7 (15%), N1; 14 (30%), N2; 21 (45%), N3; 5 (10%). Clinical staging was grouped as follows: Stage I; 2 (4%), IIA; 2 (4%), IIB; 10 (21%), III; 14 (30%), IVA ; 14 (30%) and IVB; 5 (11%). Radiation therapy was done using 6 MV and 10 MV X-ray of linear accelerator. Electron beam was used for the lymph nodes of posterior neck after 4500 cGy. The range of total radiation dose delivered to the primary tumor was from 6120 to 7920 cGy (median; 7020 cGy). Neoadjuvant chemotherapy was performed with cisplatin + 5-fluorouracil (25 patients) or cisplatin + epirubicin (17 patients) with one to three cycles. Five patients have not received chemotherapy. Local control rate, survival and disease free survival rate were calculated by Kaplan-Meier method. Generalized Wilcoxon test was used to evaluate the difference of survival rates between groups. Multivariate analysis using Cox proportional hazard model was done for finding prognostic factors.

Results : Local control rate was 81% in 5 year. Five year survival rate was 60% (median survival; 32 months). We included age, sex, cranial nerve deficit, histologic type, stage group, chemotherapy, elapsed days between chemotherapy and radiotherapy, total radiation dose, period of radiotherapy as potential prognostic factors in multivariate analysis. As a result, cranial nerve deficit ($P=0.004$) had statistical significance in local control rate. Stage group and total radiation dose were significant prognostic factors in survival ($P=0.006$, $P=0.012$), and in disease free survival rates ($P=0.003$, $P=0.008$), respectively. Common complications were xerostomia, tooth and ear problems. Hypothyroidism was developed in 2 patients.

Conclusion : In our study, cranial nerve deficit was a significant prognostic factor in local control rate, and stage group and total radiation dose were significant factors in both survival and disease free survival of nasopharyngeal carcinoma. We have concluded that chemotherapy and radiotherapy used in our patients were effective without any serious complication.

Key Words : Nasopharyngeal carcinoma, Radiotherapy, Prognostic factors