

* , † , ‡ , §
*§ . * . *§ . † . ‡ . *§

_____ :

_____ : 1989 9 1996 10 19

I 가 2 , II 가 6 , III 가 2 , IV 가 9 . 5

5 , 14 14 . 5 가 . 5

115 33 가 .

_____ : 15 (79%) 2 (10.5%) 2 (10.5%)

가 6 가 4 . , ,

5 47.4% 5 48.1% . , T , N ,

_____ : 5 47.4% 5 48.1% . 가

6MV 가

_____ 가 .¹⁾

_____ 1% .^{2, 3)}

2 15% 1989 9 1996

_____ 10 26

_____ 가 7 19

_____ 가 8 73 50 .

50% 가 15 가 4 .

_____ 20 50%, ECOG 0 2 1 .

10 30%, 가 16 36% 5 , 14 .

_____ .^{4, 5)} 5

I 2 , II가 6 , III 2 , IV가 9 .

3 V, VI

(retropharyngeal node) 2

_____ , (nasal cavity), (ethmoid),

_____ (skull base), (intracranial extension)

(Table 1).

Tel: 042)220-7860, Fax: 042)56-7621
E-mail: jiy65@cnuh.co.kr

Table 1. Clinical Data of 19 Patients with Nasopharyngeal Cancer

No	Age/ Sex	Stage	Pathology	ECOG	Disease Extent			RT [†] dose (Gy) Primary site/ LN	Re- sponse	CTx [§]	Failure				Out- come (M)
					CN*	Retroph [†]	local Extension				Date (M)	Site	Tx	Re- sponse	
1	43M	IVA (T4N1)	Sq [†]	1	IX X XII	-	Oropharynx, Skull base	73.8/ 59.4	PR	-	3	Brain	-	-	4DOD
2	21M	III (T2AN2)	Undiff*	1	-	-	Oropharynx, Nasal cavity	71/ 54	CR	-	52	NPC**	CTx #3 ND ^{††}	PR CR	115NED
3	73M	IVB (T4N3A)	Undiff	2	-	-	-	75.6/ 75.6	NR	-	2	NPC	-	-	8DOD
4	54M	IIB (T2BN1)	Undiff	1	-	-	Nasal cavity	64.8/ 54	CR	-	3	Inguinal Liver, Spleen	-	-	4DOD
5	50M	I (T1N0)	Undiff	1	-	-	-	64.8/ 50.4	CR	-	21	NPC	CTx (FCL #7) RT 36 Gy	CR	48DOI
6	8M	IVA (T4N2C)	Undiff	2	-	-	Sphenoid, Ethmoid, Skull base	59.4/ 55.8	CR	-	-	-	-	-	75NED
7	52M	IIB (T2BN0)	Undiff	1	-	-	Oropharynx, Nasal cavity	64.8/ 50.4	CR	PostRTx #3 EAP-II	9	Bone Liver	RT 15 Gy	NR	13DOD
8	45F	IVB (T4N3A)	Undiff	2	III IV V VI VII	Y	Nasal cavity	64.8/ 75.6	CR	Concurrent #2 EAP-II PostRTx #2 EC, #2 EP	14	Lung	CTx #6 ICE	CR	75NED
9	67M	IIB (T2BN0)	Undiff	0	-	-	Oropharynx	64.8/ 50.4	CR	-	-	-	-	-	70NED
10	59M	IIB (T2BN0)	Sq	1	-	-	Nasal cavity	64.8/ 50.4	CR	-	-	-	-	-	68NED
11	56M	IVB (T2BN3B)	Undiff	0	-	Y	Oropharynx, Nasal cavity	70.2/ 59.4	CR	-	4	Bone	Palliative RT	-	5DOD
12	37F	IIB (T2BN1)	Undiff	1	-	-	Oropharynx	64.8/ 59.4	CR	-	33	NPC, Brain	FSRT ^{‡‡} 62.5 Gy	-	46DOD
13	63F	IIB (T2AN0)	Undiff	1	-	-	Nasal cavity, Ethmoid	64.8/ 50.4	PR	-	2	Nasal Cavity	Op	CR	53NED
14	70M	IVA (T4N2)	Sq	1	-	-	Nasal cavity, Skull base, Sphenoid, Ethmoid, Intracranial	71.2/ 50.4	NR (P ^{§§}) PR (LN)	Induction #4 FCL PostRTx #5 FCL	10	NPC	CTx	NR	10DOD
15	65F	IVA (T4N2)	Undiff	1	-	-	Oropharynx, Nasal cavity, Ethmoid, Skull base	70.2/ 59.4	CR	-	12	NPC	-	-	17DOD
16	46M	IVA (T4N1)	Sq	1	-	-	Intracranial	64/ 64	CR	Concurrent #5 FCL PostRTx #7 BUF	-	-	-	-	32NED
17	29M	III (T3N1)	Undiff	1	-	-	Nasal cavity, Sphenoid	70.2/ 55.8	CR	-	-	-	-	-	33NED
18	52M	IVA (T4N1)	Sq	0	V VI	-	-	64.8/ 59.4	CR	Induction #3FP	-	-	-	-	38NED
19	49M	I (T1N0)	Undiff	1	-	-	-	59.4/ 50.4	CR	-	-	-	-	-	33NED

*cranial nerve, [†]retropharyngeal node, [‡]radiotherapy, [§]chemotherapy, [¶]treatment, [†]squamous cell carcinoma, [¶]undifferentiated carcinoma, ^{**}nasopharynx, ^{††}neck dissection, ^{‡‡}fractionated stereotactic radiotherapy, ^{§§}primary site

59.4 73.8 Gy (64.8 Gy)
 50.4 75.6 Gy (55.8 Gy)
 3 cm
 45 50.4 Gy
 5
 가 (Table
 1). 가 2 6
 115 5
 115 가 33
 가 SAS
 Kaplan-Meier
 Log-rank test

3.
 4 , 15 8
 가 4
 4
 115 , 1
 48 (intercurrent
 disease)
 4 , 75
 , 5
 , 13 , 1
 (nasal septum) 2
 53

1.
 15 (79%) 2
 (10.5%) 2 (10.5%)
 (Table 1).

2.
 5 47.4% 5
 48.1% I 5 100%, II 50%,
 III 100%, IV 44% (Fig. 1). , T , N

4.
 7 (37%), 2 (11%)
 (trismus)가 1

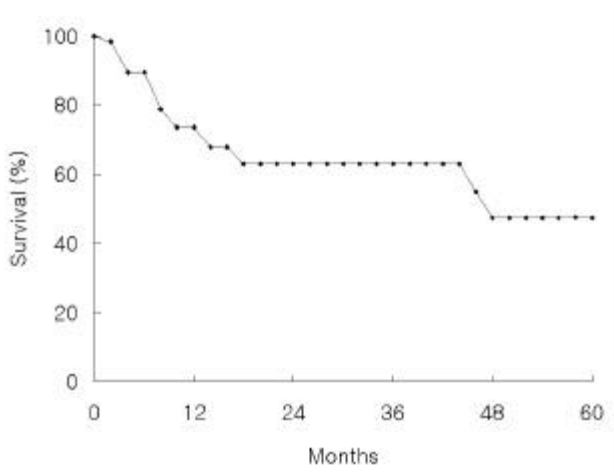


Fig. 1. Overall survival in patients with nasopharyngeal cancer.

48.1% (6, 8, 10)
 6MV 가 가
 , T , N ,
 가 가
 가
 가 (oblique) 75.6 Gy

5 :

(both lateral) 50.4 Gy 가 ⁸⁾ 8

Gy 50.4 Gy 7

Lhermitte's sign , 1

45 Gy 45 Gy IV (T4N1) 1 5 가

, 7

가 (freedom from local recur-¹⁷⁾

가 53 rence) 4 21 (10.2)

(air cavity) 가 ¹⁸⁾

(air cavity) ¹¹⁾

가 가

30 60% 5 20%

T1-2 60 65 Gy, T3-4

65 70 Gy가 20

50% 가

65 70 Gy

Yan ¹²⁾ 90 Gy 92 70 Gy

90 T1-2 , , , (temporal lobe)

45% 17% , T3-4 67% 52% (heavy charged particle)

5.5% 17.5% 가 (gammaknife)

가 가 (brain necrosis)

가 ^{19, 20)} 가

Wang ¹³⁾ 58

5 T1-2 55%, T3-4 가 가

45% 60 (fractionated SRT)

T1-2 89%, T3-4 77% ²¹⁾ 3

Ang ¹⁴⁾ 가 (concomittant boost)

가 Wang ¹⁵⁾ 60

64 Gy 10 15 Gy arc 가

65 70 Gy 60%

91%

가 (stereotactically guided conformal radiotherapy)

가 가 가

가

¹⁶⁾ , , , ,

가 ²²⁾

(stereotactically guided conformal radiotherapy)

가
 15 (79
 %) 2 (10.5%)
 2 (10.5%) 5
 47.4% 5 48.1% , T
 , N , , , , ,

1. Flores AD, Dickson RI, Riding K, et al. Cancer of the nasopharynx in British Columbia. *Am J Clin Oncol* 1986;9: 281-291
2. Shim YS, Yang HS. The clinico-statistical & follow up study of the nasopharyngeal malignant tumors. *Korean J Otolaryngol* 1981; 24:187- 199
3. Shin YS, Kim JH, Kim KR, Park CW, Lee HS, Ahn KS. Clinical study of malignant tumors of the nasopharynx. *Korean J Otolaryngol* 1989;32:879-887
4. Tang SG, Lin FJ, Chen MS, Law CC, Leung WM, Hong JH. Prognostic factors of nasopharyngeal carcinoma: a multivariate analysis. *Int J Radiat Oncol Biol Phys* 1990; 19:1143- 1149
5. Mesic JB, Fletcher GH, Goepfert H. Megavoltage irradiation of epithelial tumors of the nasopharynx. *Int J Radiat Oncol Biol Phys* 1981;7:447-453
6. Park CI, Koh KH, Kim CS, Kim NK. The radiotherapy result of the nasopharyngeal carcinoma. *J Korean Soc Ther Radiol* 1983;1:85-94
7. Chung WK, Cho JS, Park SJ, et al. An analysis on factors affecting local control and survival in nasopharyngeal carcinoma. *J Korean Soc Ther Radiol* 1999;17:91-99
8. Nho YJ, Cho JG, Ahn SD, et al. Radiation therapy of nasopharyngeal carcinoma. *J Korean Soc Ther Radiol* 1997; 15:305-313
9. Qin DX, Hu YH, Yan JH, et al. Analysis of 1379 patients with nasopharyngeal carcinoma treated with radiation. *Cancer* 1988;61:1117- 1124
10. Moench HC, Phillips TL. Carcinoma of the Nasopharynx: Review of 146 patients with emphasis on radiation dose and time factors. *Am J Surg* 1972;124:515-518
11. Cho MJ, Choi EK, Kang WS, Park CI. A study on rebuildup of 6MV X-ray by the cavity. *J Korean Soc Ther Radiol* 1989;7:113- 121
12. Yan JH, Qin DX, Hu YH, et al. Management of local residual primary lesion of nasopharyngeal carcinoma (NPC): are higher doses beneficial? *Int J Radiat Oncol Biol Phys* 1989;16:1465- 1469
13. Wang CC. Accelerated hyperfractionated radiation therapy of carcinoma of the nasopharynx: Techniques and results. *Cancer* 1989;63:2461-2467
14. Ang KK, Peters LJ, Weber RS, et al. Concomitant boost radiotherapy schedules in the treatment of carcinoma of oropharynx and nasopharynx. *Int J radiat Oncol Biol Phys* 1990;19:1339- 1345
15. Wang CC. Improved local control of nasopharyngeal carcinoma after intracavitary brachytherapy boost. *Am J Clin Oncol* 1991;14:5- 8
16. Slevin Nj, Wikson JM, Filby HM. Intracavitary radiotherapy boosting for nasopharynx cancer. *Br J Radiol* 1997;70:412- 414
17. Jang JY, Cho MJ, Kim KH, et al. Initial experience for 3D conformal boost treatments in carcinoma of the nasopharynx. *Korean J Head & Neck Oncol* 2000;16:172- 176
18. Hong S, Wu HG, Chie EK, et al. Neoadjuvant chemotherapy and radiation therapy compared with radiation therapy alone in advanced nasopharyngeal carcinoma. *Int J Radiat Oncol Biol Phys* 1999;45:901-905
19. Feehan PE, Castro JR, Phillips TL, et al. Recurrent locally advanced nasopharyngeal carcinoma treated with heavy charged particle irradiation. *Int J Radiat Oncol Biol Phys* 1992;23:881-884
20. Kondziolka D, Lunsford LD. Stereotactic radiosurgery for squamous cell carcinoma of the nasopharynx. *Laryngoscope*. 1991;101:519-522
21. Ahn YC, Kim DY, Huh SJ, et al. Fractionated stereotactic radiation therapy for locally recurrent nasopharyngeal cancer : report of three cases. *Head Neck* 1995;21:338-345,
22. Kim KH, Kim JS, Jang JY, et al. The comparison of DVH between multiple arc FSRT and conformal FSRT. *J Korean Soc Ther Radiol* 1999;17:261-267

Abstract

Results of Radiation Therapy in Nasopharyngeal Cancer

Moon-June Cho, M.D.^{*§}, Ji-Young Jang, M.D.^{*}, Jun-Sang Kim, M.D.^{*§}, Byung-Kook Kim, M.D.[†]
Chang-Joon Song, M.D.[‡] and Jae-Sung Kim, M.D.^{*§}

^{*}Departments of Therapeutic Radiology, [†]Otolaryngology, [‡]Diagnostic Radiology,
College of Medicine, Cancer Research Institute [§], Chungnam National University, Taejon, Korea

Purpose : This is a retrospective study to evaluate the results of radiation therapy in nasopharyngeal carcinoma.

Materials and Methods : From September 1989 to October 1996, 19 patients with nasopharyngeal carcinoma completed planned radiation therapy course. Stages were I in 2 patients, II in 6, III in 2 IV in 9 patients, respectively. Pathology was squamous cell carcinoma in 5 patients, undifferentiated cell carcinoma in 14 patients. Fourteen patients were treated with radiation therapy only. Five patients received chemotherapy. The follow-up period ranged from 5 months to 115 months with a median of 33 months. Follow-up was possible in all patients.

Results : Responses to radiation therapy were complete response in 15 patients, partial response in 2, and no response in 2, respectively. Patterns of failure were as follows : locoregional recurrence in 6 patients and distant metastasis in 4 patients. The sites of distant metastasis were bone, liver and lung. Five year survival rate was 47.8% and five year disease free survival rate was 48.1%. Stage, T-stage, N-stage, central nervous system involvement, pathology type, performance status, response, radiation dose, chemotherapy were not significant prognostic factors.

Conclusion : 5-year survival rate was 47.8% and 5-year disease free survival rate was 48.1%. The advances in radiation therapy techniques and chemotherapy are needed.

Key Words : Nasopharyngeal cancer, Radiation therapy