

Clinical Features and Prognosis of Lung Cancer with Brain Metastasis

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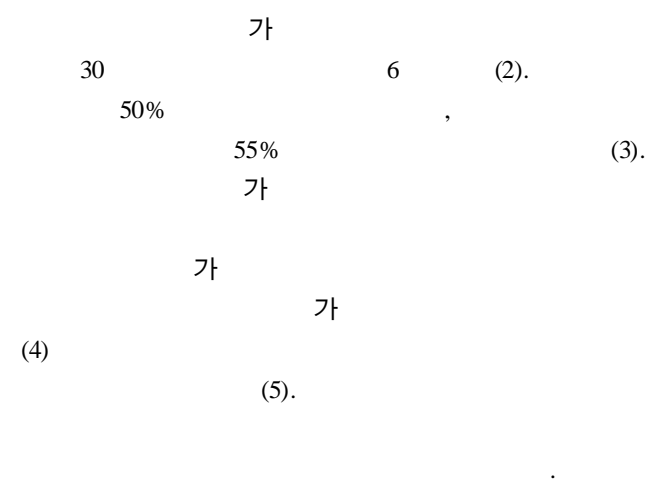
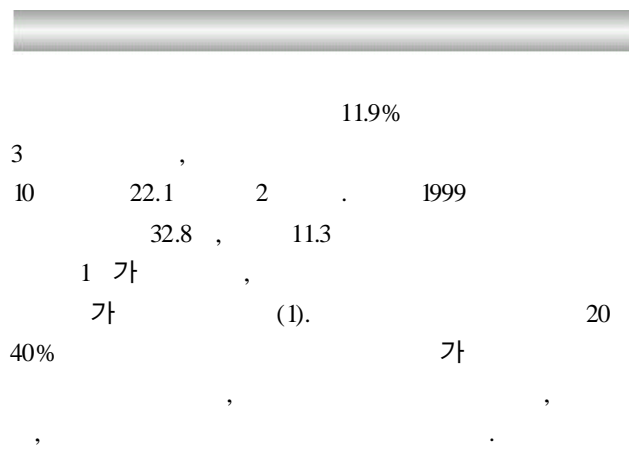
Purpose: Brain metastasis is estimated to occur in 20-40% of solid tumor patients and the most common primary tumor is lung cancer. Even though the prognosis of brain metastasis is grave and the 1-year survival rate is only 15%, symptom palliations are made with whole brain radiation therapy. We retrospectively evaluated the clinical features and prognostic factors of lung cancer with brain metastasis.

Materials and Methods: From January 1987 to October 1999, 50 lung cancer patients with brain metastasis underwent whole brain radiation therapy. We reviewed the improvement in neurologic symptoms and survival according to the following parameters; performance status, histological type, presence of brain metastasis at the initial diagnosis of lung cancer, presence of extracranial metastasis, multiplicity of brain lesion, presence of primary lung symptom and treatment modalities.

Results: The most frequent symptom with brain metastasis was a headache (50%). Palliation of the headache and other symptoms was achieved in 81% of the patients. Median overall survival after brain metastasis was 21 weeks and the 1 year survival rate was 15%. Patients without extracranial metastasis had a longer median survival than those with, 38 weeks versus 15 weeks, respectively (p=0.01).

Conclusion: In lung cancer with brain metastasis, neurologic symptoms can be palliated with whole brain radiation therapy, and in this study among such patients, absence of extracranial metastasis can be a good prognostic factor. (*Cancer Research and Treatment 2001;33: 250-255*)

Key Words: Lung cancer, Brain metastasis, Whole brain radiation therapy, Prognostic factors



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1) 63 (28-79)

38 , 12
 56 (9 141) .
 33 (66%), 17 (34%) .
 21 (42%), 7 (14%),
 3 (6%) , 2
 가 . 7 10
 가
 ECOG
 1 가 3 (6%), 2 가 36 (72%), 3
 가 8 (16%), 4 가 3 (6%) .
 가 27 (54%) ,
 가 가 23 (46%)
 . 6 (2
 44) . 24
 , 26 가 ,
 가 28 (56%), 2 가 22
 (44%) .
 가 25 (50%) , 가 23 (46%)
 2 .
 가 14 가 , 10 , 3 ,
 1 (Table 1).
 2) 가
 가 (Linear
 accelerator, 6MeV, NEC 1000X, Japan)
 3,000 cGy 2 10 ,
 43 , 7
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 . 3,000 cGy 43 5
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 가 28 3
 2 22 (44%)
 EP (etoposide, cisplatin) CAV (cyclophosphamide, adria-
 mycin, vincristine)가, EP FAM
 (5-FU, adriamycin, mitomycin)

Table 1. Patient characteristics

	No. of patients (%)
Age (years)	
Median (range)	63 (28-79)
Sex	
Male	38 (76)
Female	12 (24)
ECOG* performance status	
1-2	39 (78)
3-4	11 (22)
Histologic type	
Small cell lung cancer	17 (34)
Non small cell lung cancer	33 (66)
Adenocarcinoma	21 (42)
Squamous cell carcinoma	7 (14)
Bronchioloalveolar cell carcinoma	3 (6)
Unclassified	2 (4)
Brain metastasis on initial diagnosis	
Yes	27 (54)
No	23 (46)
Extracranial metastasis	
Absence	23 (46)
Presence	25 (50)
Bone	14 (28)
Liver	10 (20)
Adrenal gland	3 (6)
Skin	1 (2)
Unknown	2 (4)
Number of brain lesion	
Single	28 (56)
Multiple	22 (44)
Lung associated symptoms	
Presence	28 (56)
Absence	22 (44)
Treatment modalities	
WBRT [†] for brain metastasis	47 (94)
Complete	40 (80)
Incomplete	7 (14)
WBRT+metastasectomy	3 (6)
Post WBRT chemotherapy for primary lung cancer	
Yes	22 (44)
No	28 (56)

*Eastern Cooperative Oncology Group, [†] Whole brain radiation therapy

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3)

log rank test
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40
 (p=0.84)(Table
 3).
 3,000 cGy
 25
 (p=0.00)(Fig. 2).
 3



1)

28 (56%)
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 2
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 (50%), (39%), (20%),
 (15%), (11%), (11%), (11%)

2)

50 42
 가 , 34
 (81%) (75%)
 (83%) 가 , 가 가
 60%
 28% (Table 2).

21

, 1 15% (Fig. 1).

가

18 ,

Table 2. Clinical presentation of patients with brain metastasis and relief of specific symptoms (n=46)

	% of cases	% of response
Headache	50	60
Motor weakness	39	62
Nausea and vomiting	20	60
Mental change	15	75
Dizziness	11	71
Dysarthria	11	83
Amnesia	11	28

2
 28
 15
 (p=0.55).
 3)
 가 1 2 가 3 4 가 33
 24 가 (p=0.01),

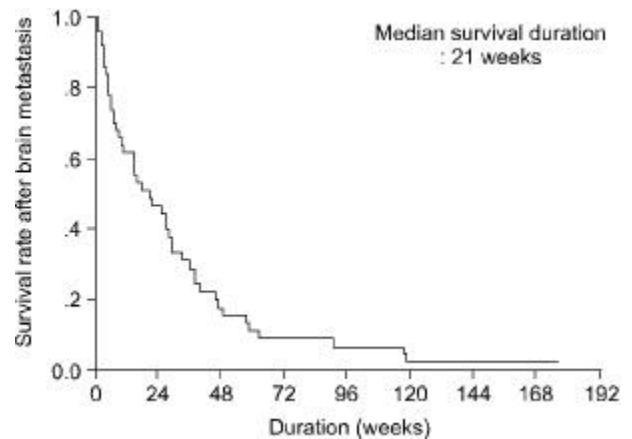


Fig. 1. Overall survival of lung cancer patients after brain metastasis (n=50).

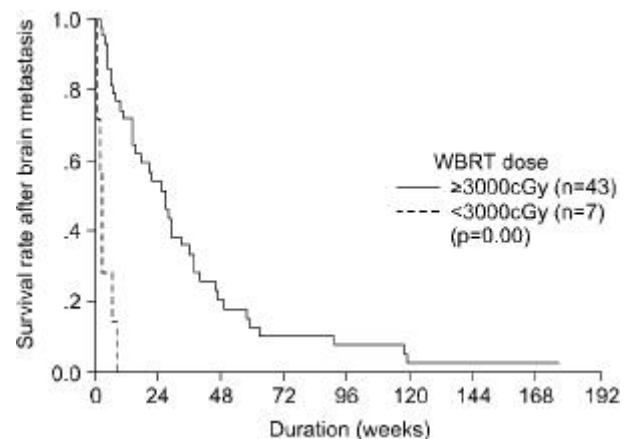


Fig. 2. Overall survival after brain metastasis according to irra-

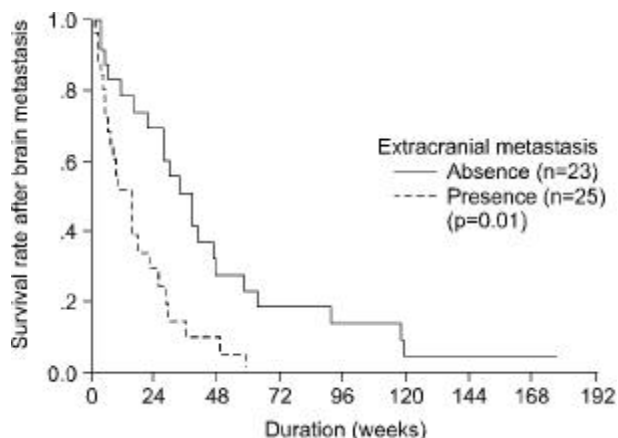


Fig. 3. Overall survival after brain metastasis according to extracranial metastases (n=48).

Table 3. Comparison of overall survival after brain metastasis according to clinical characteristics and treatment modalities

	Median survival (weeks)	Univariate analysis p-value	Multivariate analysis p-value
Age			
< 65	22	0.19	0.35
≥ 65	18		
PS (ECOG)			
1-2	27	0.04	0.16
3-4	15		
Histologic type		0.06	0.25
Small cell lung cancer	15		
Non small cell lung cancer	29		
Adenocarcinoma	33	0.26	
Non-adenocarcinoma	21		
Brain metastasis on initial diagnosis			
Yes	27	0.68	0.95
No	15		
Early metastasis*	7	0.13	0.22
Late metastasis†	18		
Extracranial metastasis			
Absence	38	0.00	0.01
Presence	15		
Number of brain lesion			
Single	18	0.70	0.63
Multiple	21		
Lung associated symptoms			
Presence	11	0.14	0.15
Absence	27		
Treatment modalities			
WBRT for brain metastasis	18	0.00	0.84‡
Complete	25		
Incomplete	3		
WBRT+metastasectomy	40		
Post-WBRT chemotherapy			
Yes	28	0.11	0.55
No	15		

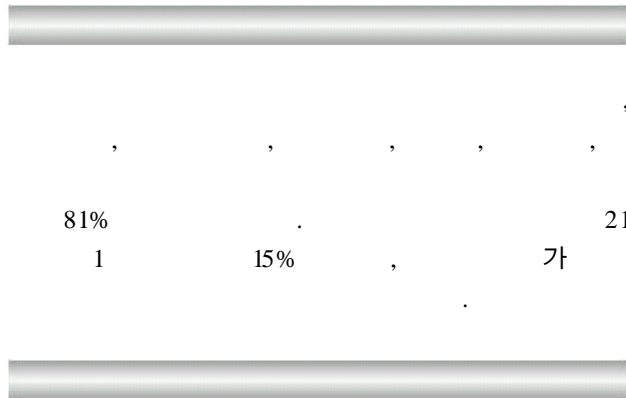
*Metastases within 360 days, †Metastases after 360 days, ‡Multivariate analysis for metastasectomy or not.

가 42 26 (p=0.04) 가
 가 27 61 (p=0.01)
 가 1 2 , 가
 가 15 가 38 가 (p=0.01)(Fig. 3).
 가 23 360
 가 7 18 가 (Table 3).

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 가 가

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 50 85%
 81% ,

(8 11). 28 3
 3 9 1 40 18
 3 20% (6 11), 5
 , 1 15% , 가
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 가 가 5 cm
 (12), 가 가
 (13).
 4,500 cGy (21).
 160 3,000 cGy Karnofsky 가
 88 (14). 70 , 가
 3,000 cGy 60 가 (22),
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 mitomycin, vindesine, (24)
 cisplatin (17), 가
 ifosfamide (18) 가
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 (23 25) . Bergqvist (13)
 3.5 1.9
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 (10 13), 가
 40



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