

# 뇌반구에 위치한 양성신경교종의 악성전환에 대한 임상적 연구\*

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= Abstract =

## Malignant Transformation of Hemispheric Low-Grade Gliomas : Clinical Analysis and Prognostic Factors

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**Introduction :** It has been reported that the survival of low - grade glioma patients depends upon the time of malignant transformation. The authors presents the clinical analysis of histologically proven trasformed gliomas.

**Materials and Method :** A total 92 patients who were consecutively treated and histologically confirmed hemispheric low - grade gliomas between 1980 and 1998 were analyzed and followed. All cases meet the criteria of WHO glioma classification of grade .

**Results :** The mean follow - up period was 73 months. Twenty two among 92 cases(24%) were histologically proven to be transformed into malignant ones. The mean time to transformation was 56 months. The 5 - year and 10 - year survival rates of the transformed group were 66% and 30% respectively and significantly different from the survival rates of the non - transformed group( $p=0.0018$ ). Among clinical factors at presentation, the initial tumor volume had a tendency to be larger in the transformed group than that of the non - transformed group and became significant when it was divided into more than  $30\text{ cm}^3$  or not( $p=0.02$ ). Among therapeutic factors, the extent of removal had no influence on the rate of malignant transformation. But postoperative radiation therapy were more frequently given to the pre - transformed group than the non - transformed group and the frequency was significantly different( $p=0.02$ ).

**Conclusions :** The authors had found that the initial tumor volume and radiation therapy could be clinical prognostic factors for the malignant transformation of low - grade gliomas.

**KEY WORDS :** Low - grade glioma · Malignant transformation · Tumor volume · Radiation therapy.

서 론

가

23)

1/4

가

가

가

## 대상 및 방법

15 (16%)

### 1. 대상

1980 1998 3

grade 92

가 , ,  
가

가 가  
xanthoastrocytoma),  
(ependymoma),  
toma)

가

(pleomorphic  
(ganglioglioma),  
(pilocytic astrocy-

19

WHO

가 3

73 3 199

64 1

(conventional external beam radiation)

가 60

### 2. 연구방법

3  
ume(cm<sup>3</sup>)=1/2 × (d<sub>1</sub>\*d<sub>2</sub>\*d<sub>3</sub>) (d<sub>1</sub>, d<sub>2</sub>, d<sub>3</sub>  
)

95%

Chi - square test

Kaplan - Meier

Log rank

## 결 과

### 1. 최초 진단시 수술 전 임상적 특징

33.7 (4~61 )

가 57

35

37.1 ± 13.82

33.1 ± 14.60

(p=0.26)

74 (80%)

6 ,

12

(p=0.62).

(Table 1).

### 2. 악성전환의 양상 및 생존기간

22

56 (4~152 )

15 ,

6 ,

1

42 ,

25 ,

3

(Table 1).

1 , 10 , 6 ,

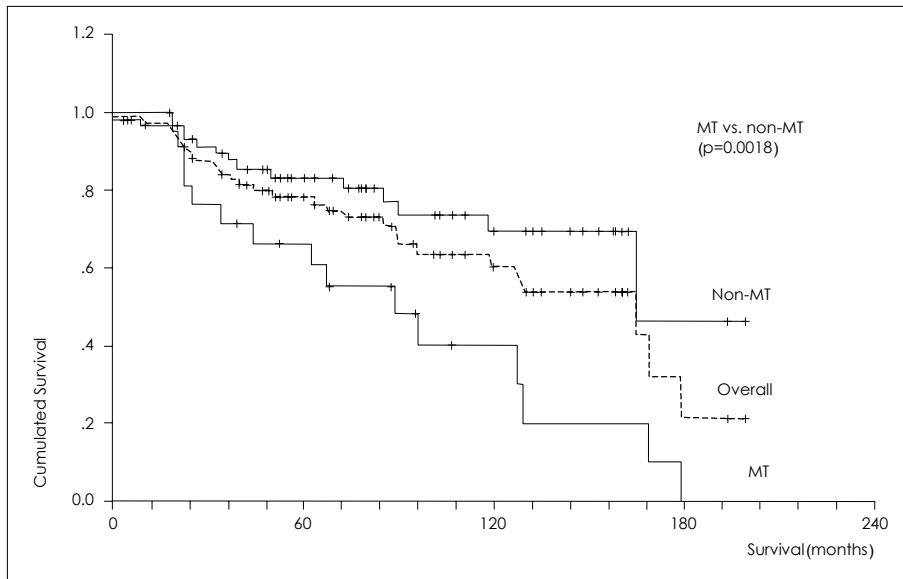
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**Table 1.** Features and influence on malignant transformation of clinical characteristics in low grade glioma patients(N=92)

Clinical characteristics	Number of patients		p-value
	MT group	Non-MT group	
Sex			
male	13	44	0.28
female	9	26	
Preoperative N/D			
(+)	6	12	0.62
(-)	16	58	
Initial histology			
Astrocytoma	15	42	0.55
Oligodendroglioma	6	25	
Mixed glioma	1	3	

\*abbreviation ; MT=malignant transformation, N/D=neurological deficit



**Fig. 1.** Kaplan-Meier survival curve of low grade glioma patients. \*abbreviation ; MT=malignant transformation

**Table 2.** Radiological features of low grade glioma and its influence on malignant transformation (N=64)

Radiological Features	Number of patients		p-value
	MT group	Non-MT group	
Contrast Enhancement			
(+)	9	18	0.30
(-)	8	29	
Tumor volume			
<30cm <sup>3</sup>	3	25	0.02
30cm <sup>3</sup>	14	22	

\*abbreviation ; MT=malignant transformation

가 28  
가 128  
5 79%, 10 33%  
89, 5  
66%, 10 30% 148  
83% 69% (Fig. 1).

### 3. 수술전 방사선학적 소견

64 27 (42%)  
9 (53%), 18 (38%)  
(Table 2).  
56.3cm<sup>3</sup>,  
43.5cm<sup>3</sup>  
(p=0.34 by T test).  
30cm<sup>3</sup>

**Table 3.** Effect of therapeutic factors on malignant transformation of low grade glioma (N=92)

Therapeutic Factors	Number of patients		p-value
	MT group	Non-MT group	
Extent of Resection			
GTR+NTR	5	23	0.27
STR	7	20	
PR+Bx	10	17	
Postoperative Radiation			
(+)	19	41	0.02
(-)	3	29	

\*abbreviation ; MT=malignant transformation, GTR=gross total removal, NTR=near total removal, STR=subtotal removal, PR=partial removal, Bx=biopsy

30cm<sup>3</sup> 가 14 (82%)  
22 (47%)  
(Table 2).

### 4. 치료 인자의 영향

(gross total or near total removal, 95%),  
(subtotal removal, 50% 95%)  
(partial removal or biopsy)  
가 23 (33%),  
가 43 (61%) 5 (23%) 12  
(55%)  
(Table 3).  
가 19 (86%)

41 (59%)  
(Table 3).

고찰

20 30~40 10~ 24% 4 152

13) 13)15) 1)18) 3)10) Kreth 10)

가 20cc 가 15~45% 4~7 10 30cc 가 1)2)11)12)19)20)21)24)26)28) 10) 23) afqat 23) 가 가 . Sh- 가 가 . Recht 22) 89 , 5 66%, 10 30% 148 , 83%, 69% 가 , 가 13~86% 가 가 2.6~5 (Table 4)<sup>11)12)16)21)26-28)</sup> 가 가 20)

**Table 4.** Malignant transformation of low grade glioma in the literature

Author(year)	No. of pts	No. of confirmed transformation	Rate of progression(%)	Median time to recurrence
Muller <sup>6)</sup> (1977)	137	72	86	2.6 years
Laws <sup>11)</sup> (1984)	461	79	49	n.s
Piepmeyer <sup>20)</sup> (1987)	60	8	13	4.75 years
Soffietti <sup>26)</sup> (1989)	85	24	79	5 years
Steiger <sup>27)</sup> (1990)	50	10	20	n.s
Vertosick <sup>28)</sup> (1991)	25	8	87	n.s
McCormack <sup>12)</sup> (1992)	53	7	86	4.5 years

\*abbreviation ; No.= number, n.s= not studied

5) 73 24% 56

Nowell<sup>17)</sup> Clonal hypothesis 30cc

가 , 가

subline clone

가

Sidransky<sup>25)</sup> 17 가 cell cycle arrest, differentiation, apoptosis

Ellison<sup>8)</sup> 가 가 p53 del Acro<sup>7)</sup> heterozygosity

p53 homozygosity , Ma-

kos<sup>14)</sup> p53 17p DNA hypermethylation

13, 22, 6, 1 가 multiple tumor

p53 suppressor 1(MTS1)

4)9) Von Deimling<sup>30)</sup> 19q (epi-

10 dermal growth factor receptor, EGFR)

29) Cavenee<sup>6)</sup> 가

가

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