

Table 1. Patient's clinical and tumor characteristics

	Overall (n = 105)	Deterioration group (n = 25)	No remarkable change group (n = 55)	Good recovery group (n = 25)	p value
Age (years)	67.0 ± 14.1	71.0 ± 12.2	66.7 ± 11.5	64.6 ± 11.5	0.24
Men/Women (n)	59/46	11/14	31/24	16/9	0.34
KPS at admission (median)	57.9 ± 15.7 (60)	61.2 ± 10.9 (60)	59.6 ± 18.6 (60)	50.4 ± 8.4 (50)	0.01
Extent of resection (n)					0.14
Gross and near total resection	65	14	30	21	
Partial resection	23	6	15	2	
Biopsy	17	5	10	2	
Treatments (n)					0.10
Surgery only	5	1	4	0	
Surgery + RT or TMZ or Bev	10	4	6	0	
Surgery + RT concomitant TMZ	70	15	33	22	
Surgery + RT concomitant TMZ + Bev	20	5	12	3	
Tumor location (n)*					
Frontal	35	10	19	6	0.49
Parietal	23	7	8	8	0.15
Temporal	42	9	22	11	0.85
Occipital	7	3	3	1	0.46
Others	17	5	8	4	0.83
Tumor hemisphere (n)					0.16
Right	45	11	24	10	
Left	49	9	25	15	
Bilateral	11	5	6	0	
Tumor size (mm)	44.5 ± 13.8	48.0 ± 14.0	42.6 ± 13.1	50.0 ± 9.8	0.14
Lengths of hospital stay (days)	60.3 ± 16.4	59.2 ± 16.8	62.3 ± 18.7	57.0 ± 8.8	0.40

Values are mean ± standard deviation. KPS; karnofsky performance status, TMZ; temozolomide, RT; radiation therapy, Bev: Bevacizumab. *Some patients have a combined tumor location.

Table 2. Comparison of the patients with deterioration and good recovery in pre-, intra-, and post-operative factors.

	Deterioration group (n = 25)	Good recovery group (n = 25)	p value	Effect size
Preoperative factors				
Length from initial symptoms to surgery (days)	67.3 ± 45.8	37.8 ± 19.9	0.01	0.83
Initial Symptoms (n) *				
Motor paralysis and muscle weakness	5	13	0.03	0.34
Cognitive dysfunction	14	10	0.25	0.23
Headache	3	3	1.00	0.19
Visual field defect	3	1	0.60	0.00
Dysphagia	0	1	1.00	0.14
Fatigue	0	1	1.00	0.14
Intraoperative factors				
Surgery time (minutes)	555.0 ± 133.9	526.9 ± 127.7	0.47	0.22
Bleeding volume (ml)	692.0 ± 588.3	644.3 ± 529.3	0.78	0.09
Transfusion volume (ml)	117.9 ± 234.5	73.0 ± 210.5	0.51	0.20
Infusion volume (ml)	4086.0 ± 1144.5	4096.0 ± 1108.5	0.98	0.01
Fluid balance (ml)	1317.0 ± 771.3	796.3 ± 929.9	0.05	0.60
Postoperative factors **				
Fever (n)	6	4	0.73	0.10
Infection (n)	4	2	0.67	0.12
Pneumonia (n)	1	0	1.00	0.14
Cerebral hemorrhage (n)	9	4	0.20	0.23
Ischemic stroke (n)	5	1	0.10	0.24
Motor paralysis (decreases BRS 2 stage or more) (n)	9	1	< 0.01	0.43
Length from surgery to chemoradiotherapy (days)	19.1 ± 8.8	17.0 ± 4.3	0.28	0.30
RT and TMZ tolerance (n)				
RT interruption or discontinuation	3	1	0.11	0.29
TMZ interruption or discontinuation	8	3	0.14	0.28

Values are mean ± standard deviation. * patients with GBM have more than one type of symptoms.

** patients with GBM have more than one type of symptoms were collected at 7 days after surgery.

BRS: Brunstrom recovery stage.

Table 3. Comparison of the patients with deterioration and good recovery in rehabilitation-related factors.

	Deterioration group (n = 25)	Good recovery group (n = 25)	p value	Effect size
Length up to rehabilitation onset (days)	2.6 ± 1.5	3.4 ± 2.3	0.17	0.39
Length up to sitting training onset (days)	4.8 ± 2.9	5.6 ± 5.1	0.54	0.19
Length up to walking training onset (days)	13.2 ± 16.7	8.4 ± 7.9	0.20	0.37
Motor paralysis of (median of BRS)				
admission	4.9 ± 1.2 (5)	4.4 ± 1.4 (5)	0.26	0.20
after surgery	3.7 ± 1.4 (4)	4.3 ± 1.3 (5)	0.19	0.22
discharge	4.0 ± 1.4 (4)	5.5 ± 0.9 (6)	< 0.01	0.55
No motor paralysis (n)				
admission	6	9	0.53	0.11
after surgery	2	9	0.04	0.32
discharge	2	10	0.02	0.36
Change from admission to discharge (n)				
Deterioration of motor paralysis	13	1	< 0.01	0.57
Sever cognitive disorder or depression	10	0	< 0.01	0.50
Rehabilitation discontinue (refusal) (n)	1	0	1.00	0.14

Values are mean ± standard deviation. Motor paralysis was showed the Brunstrom recovery stage (BRS) of lower limb. After surgery showed at 7 days after surgery.

Table 4. Hematologic and non-hematologic toxicity during chemoradiotherapy in the patients with deterioration and good recovery.

	Deterioration group (n = 25)			Good recovery group (n = 25)			p value	Effect size
	Grade 0	Grade 1 - 2	Grade 3 - 4	Grade 0	Grade 1 - 2	Grade 3 - 4		
Hematologic toxicity n (%) *								
Leukopenia	10 (45)	9 (41)	3 (14)	15 (60)	9 (36)	1 (4)	0.26	0.29
Neutropenia	18 (78)	2 (9)	3 (13)	16 (67)	4 (17)	4 (17)	0.91	0.14
Lymphocytopenia	4 (17)	11 (48)	8 (35)	7 (29)	14 (58)	3 (13)	0.26	0.33
Thrombocytopenia	3 (13)	20 (87)	0 (0)	5 (20)	20 (80)	0 (0)	0.48	0.17
Anemia	3 (13)	21 (87)	0 (0)	4 (16)	19 (76)	2 (8)	0.18	0.35
Non-hematologic toxicity n (%)								
Constipation	9 (39)	14 (61)	0 (0)	14 (56)	10 (40)	1 (4)	0.36	0.26
Fatigue	6 (30)	14 (70)	0 (0)	20 (80)	5 (20)	0 (0)	< 0.01	0.50
Fever	11 (46)	13 (54)	0 (0)	22 (88)	3 (12)	0 (0)	< 0.01	0.45

*Missing 1 patients for neutropenia and lymphocytopenia in the good recovery group and missing 1-5 patients for each toxicity in the deterioration group

Table 5. Multiple regression analysis using the gain of BI score from admission to discharge for all patients (n = 89)

Variables	β	95% CI	p value
Change of motor paralysis after surgery	0.42	6.5 to 13.7	< 0.01
Fatigue	-0.29	-23.1 to -7.0	< 0.01
KPS at admission	-0.41	-1.1 to -0.5	< 0.01
Length up to walking training onset	-0.28	-11.0 to -3.1	< 0.01
Age	-0.10	—	0.18
Extent of resection	0.06	—	0.41
Fluid balance	-0.05	—	0.48
Fever	-0.12	—	0.08
Length from initial symptoms to surgery	-0.04	—	0.55

β is the standardization coefficient.