Molecular markers relating to malignant progression in Grade II astrocytoma.

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OBJECT: Astrocytoma may progress rapidly or remain stable for many years. To clarify whether molecular characteristics could be prognostic factors, several cell cycling-associated molecular alterations in the diffuse astrocytoma have been investigated. METHODS: Thirty-three patients in whom WHO Grade II astrocytoma had been initially diagnosed were assigned to 1 of 3 groups. Group 1 consisted of 10 patients with malignant progression; the tumor had recurred within 5 years and histological analysis had confirmed that the tumor progressed to Grade III or IV. Group 2 consisted of 10 patients in whom there was no malignant progression; the tumor recurred within 5 years, but histological analysis confirmed that the tumor remained at Grade II. Group 3 consisted of 13 patients who did not experience recurrence within 5 years. Expression of Ki 67, TP53, p27, and p21 was examined using immunohistochemical analysis for the tumor samples obtained during the first and second (in recurrent cases) surgeries. Exons 5, 7, and 8 of TP53 were scanned by DNA sequencing.

RESULTS: The Ki 67 labeling index expression was significantly higher in Group 1 (even though it was similar between initial and recurrent tumors) than that of Group 3 (p < 0.05). However, there was no difference between Group 2 (both initial and recurrent tumors) and Group 3. The TP53 protein accumulation was also higher in Group 1 than in Group 2 or 3 (p < 0.05); a difference in TP53 expression was not found between Groups 2 and 3. The p27 and p21 was expressed in all cases, but no predictive values were found. The p53 mutation was found only in 6 cases in Group 1. CONCLUSIONS: Overexpression of TP53, TP53 mutation, and Ki 67 labeling index could be molecular markers in astrocytomas predicting malignant progression.

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