Analysis of meningiomas with rhabdoid component: Relationship with prognosis and tumor recurrence. Clinical, cellular, and genetic perspectives

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Background: Rhabdoid meningiomas (RM) are tumors that present with a wide range of histological features and chromosomal copy number alterations, making the disease course unpredictable. To study this further, we analyzed a series of 305 patients from existing literature and examined 33 samples from 23 patients at diagnosis and recurrence. These samples were sent to our laboratory from various hospitals in Spain. Our analysis revealed two distinct subgroups of RM based on their genetic profile. The first subgroup had single chromosomal losses, while the second subgroup had combined losses and gains of multiple chromosomes. The latter subgroup exhibited a higher frequency of grade 3 tumors and worse clinical outcomes.
Methods: A retrospective study was conducted in Spain by collecting recurring and non-recurring RM samples from various hospitals. The study included anatomopathological and molecular genetic analysis using FISH and copy number matrices. Statistical significance was achieved using SPSS software with the Chi-square and Mann-Whitney U test, and the log-rank test was used to draw Kaplan-Meier survival curves.
Results: The two genetic profiles that were discovered had different clinical outcomes, with the ones that recurred showing greater genetic instability. Simply having less than 50% rhabdoid cells and a low grade is not enough to assume a good prognosis. All women who had chromosome 17q gain died. Loss of BAP1 was observed in 2/3 of all relapses. Patients who were diagnosed with MRs for the first time had greater progression-free survival. Immediate treatment after the initial surgery was linked to less recurrence.
Conclusions: The study of chromosomal alterations can improve diagnosis, survival prediction, and recurrence rates for patients with rare meningioma subtypes.

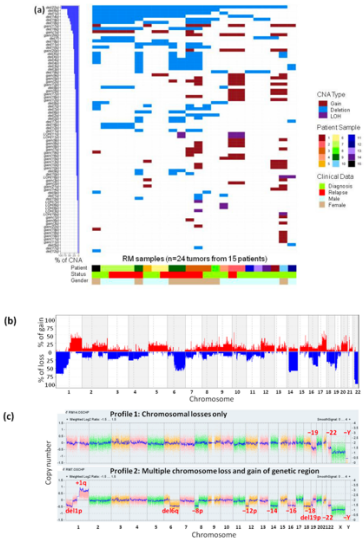

Figure1: Whole genome plots illustrating chromosomal alterations detected in adult RM.