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Histologic features and prognosis in pediatric medulloblastoma.

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Abstract

Because individual histologic features in childhood medulloblastoma alter survival likelihood, the recent 4th edition of the World Health Organization (WHO) Classification of Brain Tumors recognizes desmoplastic/nodular medulloblastoma, medulloblastoma with extensive nodularity, large cell medulloblastoma, and anaplastic medulloblastoma, in addition to medulloblastoma with no other distinguishing features. To identify features affecting survival likelihood, we investigated 33 histologic features in 556 childhood tumors diagnosed as medulloblastoma in the Childhood Brain Tumor Consortium (CBTC) database; all features have CBTC verified read-reread reliability and those features important in the classification of medulloblastoma and its WHO variants regardless of their measured reliability. Nineteen features had no effect on survival likelihood, and 8 features were too prevalent or too rare to measure their effect on survival. Nodules, balls, high cell density, and fine fibrillary stroma improved survival likelihood; necrosis and prominent nucleoli worsened survival likelihood. Of note, the presence of desmoplasia, currently a defining feature (along with nodules) for desmoplastic/nodular medulloblastoma, had no effect on survival likelihood. We conclude that the presence of nodularity in medulloblastoma is important to improved survival likelihood, particularly when combined with balls and fine fibrillary stroma. Given the "overlap" of desmoplastic/nodular medulloblastoma and nodular medulloblastoma, we suggest they be combined into a diagnosis of nodular medulloblastoma, with nodules, balls, and fine fibrillary stroma as defining criteria. We also suggest that because of the considerable overlap of anaplastic medulloblastoma and large cell medulloblastoma they be combined into 1 diagnosis of anaplastic/large cell medulloblastoma, with necrosis and prominent nucleoli among the defining criteria.

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