36. Brainstem-Evoked Potentials in the Diagnosis of Posterior Fossa Tumors in Children

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Posterior fossa tumors, i.e., cerebellar astrocytomas, brain-stem gliomas, primitive neuroectodermal tumors (medullo-blastomas), and ependymomas, account for 50% of brain tumors in children. Neuroradiological modalities, i.e., com-puted tomographic (CT) scanning and magnetic resonance imaging (MRI) have revolutionized the diagnosis as well as the follow-up of these tumors. These methodologies, how-ever, though providing anatomical localization, do not reveal specific tumor diagnosis or differential tumor effects on the neural brainstem functions. Brainstem auditory evoked po-tentials (BAEP) are well established as a modality for assess-ing the functional integrity of brainstem structures. We pres-ent the first large prospective study of BAEP as a diagnostic

tool in children with posterior fossa tumors. Thirty-one children, aged 0 to 16 years, were assessed at presentation or after initial treatment.

Tumor type	No. Patients (male)	Normal	Delayed[a]	Dispersed[b]
Medulloblastoma	12 (9)	9	3	0
Brainstem glioma	9 (5)	0	2	7
Cerebellar astrocytoma	6 (2)	1	3	2[c]
Ependymoma	4 (3)	0	2	2

[a]Delayed = I:V interwave latency >4.6 msec (more than 3 standard deviations from the norm).
[b]Dispersed = I:V ratio >2.
[c]These patients had increased intracranial pressure at the time of study.

As depicted above, distinct BAEP patterns may be differentiated among brainstem glioma, astrocytoma, and ependymoma. Medulloblastoma is most likely to be associated with normal patterns, whereas brainstem glioma results in dispersed waveforms. Ependymomas, though they may look similar to medulloblastoma on CT, are far more likely to result in a delayed or dispersed pattern—never, in our experience, in normal ones. Thus, BAEPs provide a functional assessment of the effects of posterior fossa tumors on brainstem neural structures.