Recurrence of cerebellar pilocytic astrocytoma in children

Recurrence of cerebellar pilocytic astrocytoma in children after gross total resection is uncommon, and reported rates vary between 0% [1] and 29% [2]

Some have advocated no surveillance after GTR, [3] but, in practice, it is likely that MRI scans are being obtained for the reassurance of both the clinician and the patient/ patient's family. There have been recent reports suggesting that where recurrence does occur, the tempo of tumor progression is slow and that MRI surveillance could be safely reduced, with resultant cost and time savings [4] [5].

Kim et al. proposed a surveillance schedule which reduces postoperative scans to 6, yielding a significant projected cost savings. Their schedule involves MRI in the immediate postoperative period, at 3 months, and at 1, 2, 5, and 10 years [6].

Dodgshun et al. propose a slight modification to their suggested schedule, with scans in the immediate postoperative period, at 3–6 months postoperatively, and at 1, 2, 3.5, and 5 years postoperatively.

Not infrequently, the advanced degenerative changes, including vascular fibrosis, and recent and old haemorrhages, may mimic vascular pathology. Sometimes, the neoplastic piloid tissue can resemble reactive gliosis, related to long-standing non neoplastic lesions. Not infrequently, PA exhibits histological features typical for anaplasia, including necrosis, mitoses and glomeruloid vascular proliferation that can suggest a diffuse high-grade glioma. However, even those PAs that lack distinct histological features of anaplasia can behave unpredictably, in a more aggressive manner, with leptomeningeal spreading. Genetic alterations resulting in aberrant signalling of the mitogen-activated protein kinase (MAPK) pathway have been considered to underlie the development of PAs. The most commonly identified KIAA1549-BRAF fusion is important for appropriate tumour molecular diagnosis.

Matyja et al. summarize the clinicopathological presentation of PAs, with emphasis on their heterogeneous morphology, based on their own experience in the field of surgical neuropathology and the literature data. Diagnosis of pilocytic tumours requires careful analysis of clinical, histopathological and molecular features to avoid misinterpretation of these benign neoplastic lesions [7].

Case series

53 patients with CPAs that had preoperative imaging and >2 years post-operative imaging follow-up available. Pilocytic astrocytomas with brainstem involvement and patients with neurofibromatosis type I were excluded. Preoperative tumor volumes were calculated. The dates and reports of the examinations were tabulated. The median number of follow-up examinations was 9 over a median follow-up time of 6.05 years (2.07-12.28 years). Two consecutive MR examinations over at least a 3 month span demonstrated the smallest negative likelihood ratio of future recurrence (0.15). There was no association of recurrence with preoperative tumor volume. Among the 35 patients with gross total resection of their tumor and greater than two negative follow-up examinations, one recurrence (2.9 %) was identified, occurring 6.4 years after initial resection. Gross totally resected pediatric CPAs can recur, but this is exceedingly rare. Frequent surveillance (every 3-6 months) is suggested in

patients with CPAs until absence of tumor is concluded on imaging and documented on two consecutive studies spaced at least 3 months apart. The likelihood of recurrence thereafter is low [8].

Case reports

Aydemir et al. present a cerebellar PA in a 3-year-old male patient with cystic components and massive calcification areas. The residual tumor grew rapidly after the first operation, and the patient was operated on again. A histopathological examination revealed polar spongioblastoma-like cells. Massive calcification is not a common feature in PAs and can lead to difficulties in radiological and pathological differential diagnoses [9].

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