

Neuroimaging Abnormalities in Adult Medulloblastoma Undergoing Intensified Therapy

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Abstract. We report on radiological abnormalities resembling recurrent tumor in adult medulloblastoma receiving intensified chemotherapy and radiotherapy. Evidence provided in this paper confirms previous reports in the pediatric population and suggests that neuroradiologist and medical oncologists should be aware of new possible radiological findings related to aggressive treatments for brain tumors.

Two recent papers (1, 2) reported on neuroimaging abnormalities occurring in children undergoing high dose chemotherapy (HDC) with autologous hematopoietic stem cell transplantation (ASCT) plus radiotherapy for malignant brain tumors. Such findings, often resembling recurrent tumor and reported accordingly by the radiologist, were not actually related to the underlying disease, posing major diagnostic and therapeutic challenges. In fact findings were related to chemotherapy-induced injury determining MRI anomalies, sometimes presenting with a specific MRI pattern, as leukoencephalopathy syndrome (3, 4). All studies report data on the pediatric population.

We have reviewed the MRI findings of 14 adult patients with relapsed or high-risk medulloblastoma who received HDC with ASCT at our institution from 2001 to 2006. All patients (median age 33 years, range 19-44) had previously received craniospinal radiotherapy and, following HDC with ASCT, were evaluated with sequential MRI studies at 3/4 month intervals. Unusual MRI anomalies in keeping with those reported by Spreafico *et al.* (1) and Fouladi *et al.* (2) were documented in one case.

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Key Words: Medulloblastoma, neuroimaging, abnormality.

Case Report

A 39-year-old woman was referred to our Institution following partial resection of a large vermian mass resulting from grade IV medulloblastoma. She received intensive-dose sequential chemotherapy (5) followed by hyperfractionated accelerated radiotherapy to the craniospinal axis (plus boost to the posterior fossa) and subsequently two cycles of HDC consisting of thiotepa and thiotepa/carboplatin with ASCT. After treatment completion, neither signs of disease nor therapy-related alterations were present by MRI (Philips Gyroscan ACS-NT) study, including axial SE PD/T2WI and SE T1WI, coronal FLAIR T2WI and after contrast axial T1WI, coronal and sagittal T1WI were repeated. Four months later, an MRI scan documented multiple gadolinium-enhancing lesions on T1-weighted images in the white matter area of the cerebellum (Figure 1).

The pattern of enhancement was nodular and no mass effect was detectable. Despite the neuroimaging evaluation appeared suggestive of recurrent disease, the patient was well with non neurological or neurocognitive symptoms. In the absence of curative therapeutic options for recurrent disease, we decided to follow a wait-and-see policy. The brain abnormalities were unchanged at subsequent MRI studies and began to regress 15 months after their appearance.

Conclusion

Our experience confirms that confounding brain MRI findings can also be observed in adult patients treated with aggressive treatment strategies, including radiotherapy and myeloablative chemotherapy, for brain tumors. This phenomenon requires an alert follow-up before a therapeutic decision is made to avoid morbidity other than unforeseen responses to second-line chemotherapy regimens. Noteworthy, it is important that the neuroradiologist becomes aware of new possible radiological findings related to modern oncologic treatments.

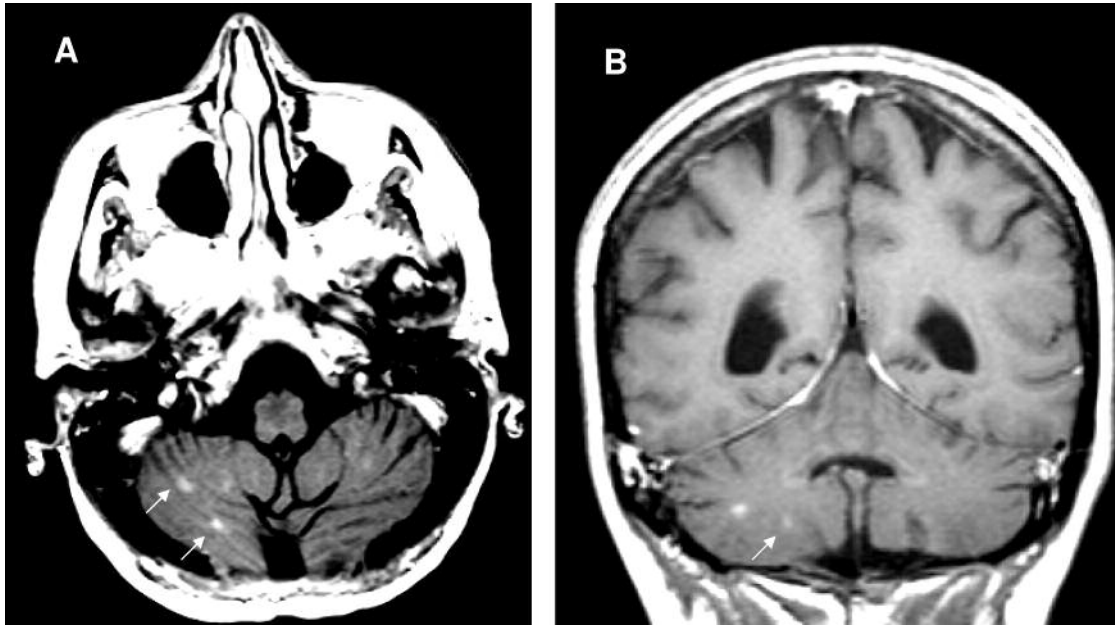


Figure 1. Axial (A) and coronal (B) magnetic resonance T1-weighted postcontrast images displaying nodular patterns of enhancement in the white matter of the left cerebellar hemisphere.

Acknowledgements

This work was supported by Oncologia Ca' Granda Onlus Fondazione and A.V.I.S. Monsummano Terme Onlus "Per Elisa Contro il Medulloblastoma"

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Received May 22, 2008
Revised September 15, 2008
Accepted October 1, 2008