Diagnostic Pathology

Oral presentation

Late effects of radiation on central nervous system

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Aims

Primary germ cell tumors of the nervous system account for only 1% of all brain tumors. Traditionally, the treatment of intracranial germinomas has been craniospinal irradiation, which led to a long-term survival of more than 90%. The doses applied have had a wide range, with the mean dose of approximately 36 Gy. The potential late irradiation effects include growth retardation, endocrine deficits and second malignancies. The longest reported interval for late delayed irradiation reactions was 7 1/2 years.

Methods

A 14-year-old boy presented in a pediatric clinic in 1983 with a beginning bitemporal hemianopsia. A tumour in the suprasellar region was diagnosed and classified after an incomplete resection as a germinoma. The remaining tumor mass was irradiated. After an uneventful period of 3 years, the tumour dissemination along the liquor way was suspected. The radiation encompassed the entire spinal axis and cranium and resulted in a long-term remission with a good quality of life for 17 years. In 2004, a hyperdense structure protruding in the forth ventricle was seen in MR scans. Three months later, the patient was found dead in his bed.

Results

On post mortem examination there were no pathologic findings on the inner organs. Intoxication was ruled out. Within the dorsal part of the brain stem an exuberant formation of a collagen rich scar, which corresponded in a position to the structure seen in MR scans, was found. A marked microglia activation was evident in CR 3/34 immunostaining.

Conclusion

For the first time active persistent changes in the irradiated brain areas were described 17 years after the last radiation therapy of germinoma.