

Intracranial Metastases

Intracranial metastases make up about 15% of intracranial tumors (just behind gliomas and meningiomas in terms of incidence). Their incidence is increasing. Intracranial metastases often occur in: lung cancer, breast cancer, renal cancer, GIT cancer, and melanoma. The metastatic foci are typically located in the **cerebral or cerebellar hemisphere** with 80% of them metastasizing to the supratentorial region (supplied by the middle cerebral artery). Intracranial metastases are mainly forming after **hematogenous spread**.

Clinical Manifestations

The symptoms of the disease depend on the location of the metastases in the brain, but they are caused by both the direct pressure from the metastasis on an affected region of the brain and the overall **increase in intracranial pressure**. The most common symptom is **headache**, especially at the beginning of the development of the cancer. It can also be a disturbance of motor skills, impaired cognitive functions, and personality changes. Dementia can be a characteristic of multiple foci. In several cases, the **first symptom may be an epileptic seizure**.

Diagnostics

Especially MRI and CT with contrast are utilized. On CT, intracranial metastases appear as **hypodense lesions with hyperdense margins** (abscesses can look similar, and angiography can be used to differentiate to them). A general examination of the patient with evidence of primary disease is necessary (i.e., chest X-ray, abdominal ultrasound, skeletal scintigraphy, whole body PET).

Therapy

Surgical Therapy

Surgery is always indicated for a **single metastasis**, especially in a case when it is the first manifestation of malignancy. The metastatic focus should be in an operable location with a good general condition of the patient and expected survival of 6 months after the procedure. In case of multiple metastases, the surgery is not indicated unless they can be removed in one craniotomy. The condition of the primary disease also affects the decision. The average survival period after surgery and adjuvant radiotherapy is 40 weeks (with radiotherapy alone - 15 weeks; without any treatment - 4 weeks).

radiosurgical Procedure

Gamma knife is used for the removal metastatic foci up to 3 cm. LINAC can be used for foci over 3 cm. Currently, radiosurgical procedures are preferred particularly in the case of multiple metastases. The gamma knife is indicated in cases of metastatic foci up to 3cm, deep metastatic foci, and tumors in functionally important regions of the brain.

Radiotherapy

Irradiation of the entire skull is preferred for multiple metastases and for metastases of small cell bronchogenic carcinoma. This is due to the presumed dissemination of the tumor even in single metastatic focus.

Supportive Care

Patients may be given corticosteroids, which helps to reduce the intracranial pressure. Anticonvulsants are prescribed for those who suffer from epileptic seizures. Anticoagulants are often taken by patients to prevent thrombosis.

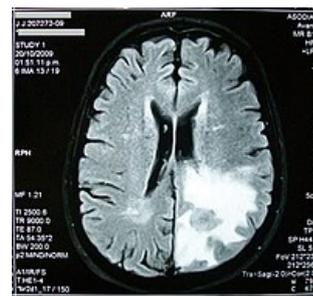
Links

Source

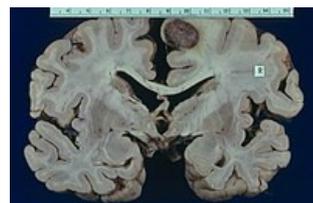
- BENEŠ, Jiří. *Studijní materiály* [online]. ©2010. [cit. 2009]. <<http://jirben.wz.cz>>.

References

- ZEMAN, Miroslav, et al. *Speciální chirurgie*. 2. edition. Praha : Galén, 2004. 575 pp. ISBN 80-7262-260-9.



MRI: metastatic tumor in the brain



Findings in a brain section: tumor metastasis of papillary thyroid carcinoma

- SAMEŠ, Martin, et al. *Neurochirurgie : Učebnice pro lékařské fakulty a postgraduální studium příbuzných oborů*. 1. edition. Praha : Maxdorf, 2005. 127 pp. pp. 79. ISBN 80-7345-072-0.
- BEDNAŘÍK, Josef, et al. *Klinická neurologie : Část speciální*. 1. edition. Triton, 2010. 1430 pp. ISBN 978-80-7387-389-9.