

## METASTATIC BRAIN TUMOURS<sup>1</sup>

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### ABSTRACT

*Clinically, secondary malignancies of the cerebrum represent more than 50% of all brain tumours. It has been shown that cerebral metastases occur in 15-30% of all diagnosed cancer patients. Most are from lung (44%), breast (10%), kidney (7%), melanoma (3%), and undetected primary neoplasms (10%). Paediatric ones are very rare and are most commonly from neuroblastoma, rhabdomyosarcoma and Wilms tumours. The route of metastasis is hematogenous. Clinical symptoms include epilepsy, headache, graded changes in neurological status to coma and death.*

*By performing imaging studies with CT, MRI, and PET scans, we aim to clarify the tumour process and localization and plan the surgical approach. The treatment is complex, including surgical intervention, symptomatic medication, radiotherapy and chemotherapy. With surgical management, we try to prolong the patient's quality and length of life.*

*In a large percentage of cases, metastatic tumours are life-threatening and their correct diagnosis and subsequent timely therapeutic management are of utmost importance. Combined medical, surgical and radiotherapeutic approaches give encouraging results in prolonging the patient's life.*

**Key words:** brain, therapeutic approach, brain metastases

### INTRODUCTION

Intracerebral metastases are one of the most common clinical malignancies, accounting for more than half of brain tumours [1, 4]. Clinicopathologically, they represent abnormal uncontrolled development of cells from the nervous system, meninges, and all cellular structures in the brain. The aetiology is diverse and complex.

In 15-30% of patients with cancer, metastases to the central nervous system occur, with primary foci in the lung (44%), breast (10%), kidney and gastrointestinal tract (6-7%), and malignant melanoma (3%) [7, 9].

Clinical symptoms include headache, limb weakness or paralysis, nausea and vomiting, convulsive seizures and fits, ataxia, disorientation, visual and speech disturbances [1, 2].

**The aim of our study** is to review the clinical symptomatology, aetiology, and treatment of non-brain metastases and to present two case reports of patients with brain metastases.

### MATERIALS AND METHODS

Diagnosis of metastatic tumours in the brain includes, first of all, the patient's symptomatology and the presence of another malignant process in the body, diagnosed or not.

This is followed by CT with or without contrast enhancement, MRI with or without contrast enhancement, the aim of contrast studies being to illustrate the blood vessels in the brain that are in close proximity to the tumour or are feeding the tumour, for more precise surgical treatment [6, 7]. Also, it is of key importance to take a biopsy for histological verification and typification. Lumbar puncture is of limited use, but can be included in studies [1, 3, 5].

### RESULTS

After conducting imaging studies, blood tests and taking a detailed status and history of the patient's condition, clinical manifestation of symptoms and the presence of Ca process, when

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a metastatic formation is present in the brain, cerebellum or spinal cord, its removal is most often done surgically.

The therapeutic management depends on the size, number and location of the tumour, whether it compresses important brain structures, where the primary focus is, the general condition of the patient and side effects [7, 8, 9].

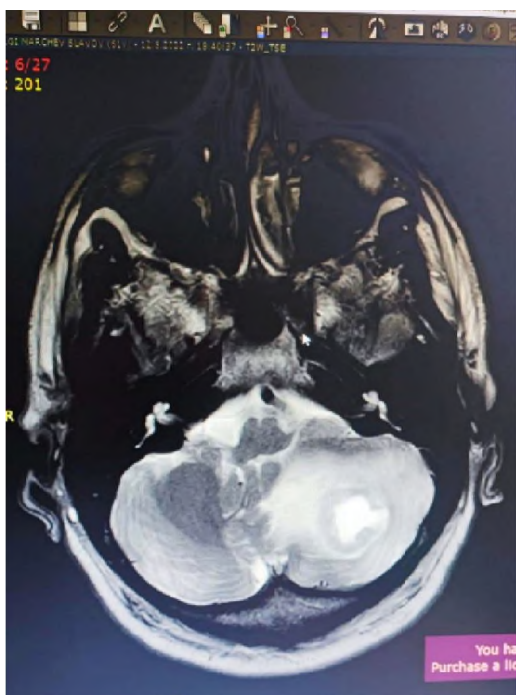
Surgically, the aim is to remove as much of the formation as possible and take material for biopsy and verification [10].

Through new surgical methods and technologies, such as neuronavigation, intraoperative monitoring, and microsurgical technique under optical magnification, the risk of complications is significantly reduced.

Besides surgical treatment, the treatment includes courses of chemo- or radiotherapy, Gamma knife, Cyberknife, True beam, and drug therapy corticosteroids, diuretics, and antiepileptic drugs [5, 6].

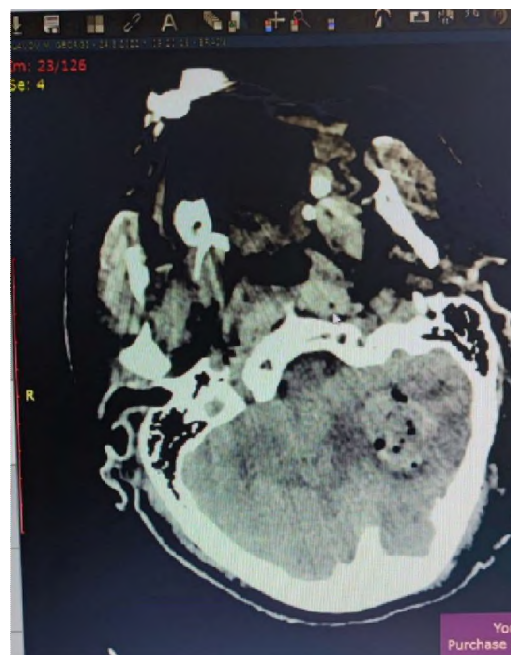
### CLINICAL CASE 1

A man of age corresponding to his actual age was admitted to the neurosurgery department. The patient complained of dizziness, severe headache and ataxia. After performing MRI of the brain, a metastatic mass in the cerebellum was detected, leading to the presentation of this symptomatology (Fig. 1).



**Fig. 1** MRI, Patient 1, before surgery

The patient was operated on by a team of neurosurgeons, and through neuronavigation, microsurgical technique under optical magnification, intraoperative monitoring and meticulous haemostasis, the tumour formation was removed. Postoperatively, a control CT of the brain was performed without the presence of haemorrhage (Fig. 2). The patient was verticalized, with regression in somatic and neurological status and discharged 6 days after the surgical intervention.



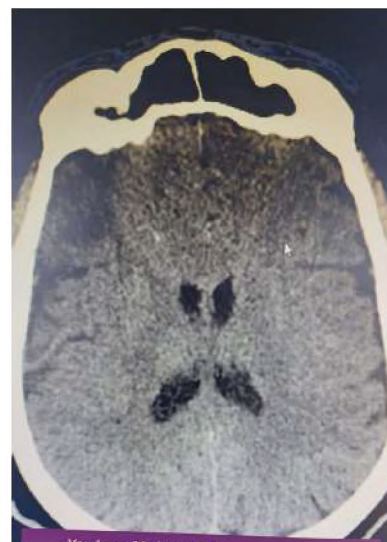
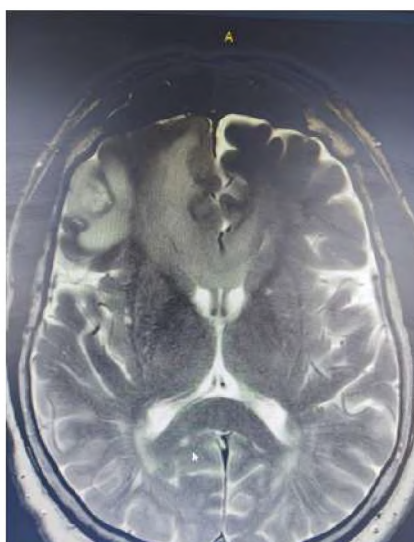
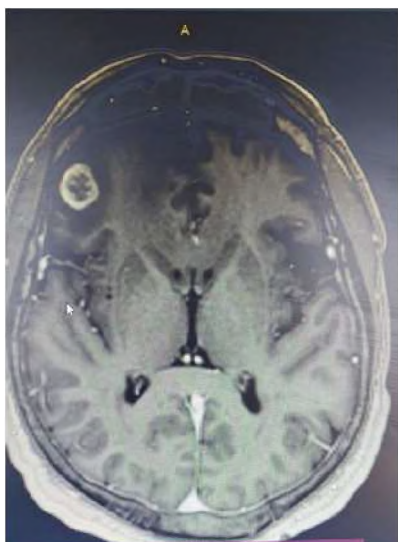
**Fig. 2** CT, Patient 1, after surgery

### CLINICAL CASE 2

A man of apparent age consistent with his actual age was admitted to the neurosurgery department with the development of spontaneous generalized seizure. The patient had no other complaints, with a co-morbidity of long-standing hypertension, which he had treated as prescribed.

On admission to the department, he underwent an imaging-diagnostic study, MRI, which revealed a metastatic formation in the right frontal lobe that led to the onset of these seizures (Figs. 3, 4). The patient was operated on by a team of neurosurgeons and through neuronavigation, microsurgical technique under optical magnification, intraoperative monitoring and meticulous haemostasis, the tumour formation was removed.

Postoperatively, a control CT scan of the brain was performed without the presence of haemorrhage and the patient was discharged 5 days after surgery with regression in symptomatology and improvement in neurological status (Fig. 5).



**Fig. 3** MRI, Patient 2, before surgery

**Fig. 4** MRI, Patient 2, before surgery

**Fig. 5** CT, Patient 2, after surgery

## CONCLUSION

Intracranial metastases are life-threatening entities, so it is important to diagnose them on time, choose the therapeutic management and conduct drug therapy to prolong the patient's life and improve his or her neurological condition [6,10].

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