



Neurological Manifestations Associated with Metastatic Brain Tumour

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DESCRIPTION

Neurological manifestations associated with metastatic brain tumour arise from the disruption of normal brain function caused by secondary cancer growth within the cranial cavity. These tumours develop when malignant cells spread from a primary cancer elsewhere in the body and establish abnormal growths in brain tissue. Because the brain controls essential physical, sensory and cognitive processes, even small lesions can result in noticeable neurological changes. The nature and severity of symptoms depend on lesion location, size, number and the degree of surrounding swelling. Headache is one of the most frequently reported neurological symptoms. It often results from increased pressure within the skull due to expanding tumour mass or associated swelling. These headaches may differ from typical primary headache disorders, becoming progressively more persistent or severe. They are sometimes more pronounced in the morning or worsen with actions that increase internal pressure, such as bending or coughing. While headache alone is not diagnostic, its progression often prompts further neurological investigation.

Seizures are a common presenting feature, particularly when metastatic lesions involve the cerebral cortex. Abnormal electrical activity triggered by irritation of brain tissue can lead to seizure episodes that vary in intensity and presentation. Some individuals experience brief lapses in awareness, while others may have more extensive motor involvement. In patients without a prior seizure history, the sudden onset of seizure activity often leads to discovery of brain involvement. Motor deficits frequently develop when metastatic brain tumour affects regions responsible for voluntary movement. Weakness may appear on one side of the body, affecting the face, arm or leg. Coordination difficulties can interfere with walking and balance, increasing the risk of falls. Fine motor tasks such as writing or buttoning clothing may become challenging, reducing independence in daily activities. Sensory disturbances are also common. Patients may experience numbness, tingling or altered sensation in specific body areas. These symptoms occur when pathways responsible for transmitting sensory information are affected by

tumour growth or swelling. Visual disturbances may arise if optic pathways or visual processing centers are involved. Individuals may report blurred vision, double vision or partial loss of visual fields, which can significantly impact safety and quality of life.

Cognitive and behavioral changes are among the most distressing manifestations for patients and their families. Difficulties with memory, attention and processing speed may develop gradually. Individuals may struggle to concentrate, follow conversations or complete familiar tasks. Behavioral changes such as irritability, emotional instability, reduced motivation or personality alteration can occur, particularly when frontal or temporal regions are involved. These changes may be misinterpreted as psychological conditions, delaying neurological assessment. Speech and language impairment may arise when metastatic lesions affect language-related areas of the brain. Patients may have difficulty finding words, forming sentences or understanding spoken language. Communication challenges can lead to frustration, social withdrawal and reduced participation in daily interactions. The progression of neurological symptoms is often more rapid than in many primary brain conditions. Sudden worsening of neurological status may reflect lesion growth, increased swelling or complications such as bleeding within the tumour. Prompt recognition of symptom changes is essential to initiate appropriate evaluation and management. Symptom burden significantly affects daily functioning and emotional well-being. Fatigue is common and may result from neurological impairment, systemic cancer or treatment effects. Sleep disturbances, reduced endurance and emotional stress further complicate the clinical picture. Management therefore extends beyond addressing tumour growth and includes supportive measures aimed at maintaining function and comfort. Treatment of neurological manifestations focuses on symptom control alongside disease-directed therapy. Medication may be used to reduce swelling, manage seizures and alleviate pain. Rehabilitation services support recovery of mobility, speech and cognitive function. Psychological support assists patients and caregivers in coping with changes in independence and identity. Understanding the neurological manifestations associated with metastatic brain tumour allows clinicians to

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anticipate patient needs, guide treatment decisions and provide clear information regarding expected changes. Early recognition and comprehensive symptom management contribute to

improved quality of life and support patient dignity throughout the course of illness.