



Clinical Profile and Epidemiology of Meningioma

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DESCRIPTION

Meningioma is a primary brain tumour that originates from the meninges, the protective layers covering the brain and spinal cord. It represents one of the most frequently diagnosed intracranial tumours in adults, accounting for a substantial proportion of cases identified through neuroimaging. While these tumours are typically slow-growing and often benign, they can cause considerable neurological impairment depending on their size, location, and interaction with surrounding neural structures. Women are affected more often than men, suggesting a possible influence of hormonal factors, and incidence tends to increase with age, particularly among middle-aged and older adults. Nonetheless, meningiomas can also appear in younger populations, occasionally producing severe symptoms that require prompt intervention. The formation of meningiomas is linked to abnormal proliferation of arachnoid cap cells, specialized cells within the meninges. These cells can begin dividing uncontrollably, leading to the development of a discrete mass that presses against the brain or spinal cord. The slow expansion of many tumours often allows the nervous system to compensate for changes, delaying the onset of noticeable symptoms. However, as the tumour enlarges, pressure on adjacent neural tissue or blood vessels can result in clinical manifestations that affect daily functioning and quality of life. Clinical presentation varies depending on tumour location. Lesions along the convexity of the brain can produce seizures, localized weakness, or sensory disturbances due to cortical compression. Tumours located at the skull base may involve cranial nerves, resulting in vision disturbances, facial numbness, hearing loss, or difficulty with swallowing. Parasagittal and falx meningiomas can affect motor function and gait, while posterior fossa lesions may disrupt coordination and balance. Cognitive and behavioral changes may occur with frontal or temporal lobe involvement, manifesting as memory difficulties, reduced concentration, or altered personality. Symptoms often develop gradually, though sudden changes can occur if bleeding or swelling arises around the tumour. Diagnosis relies primarily on imaging studies, which are essential for assessing tumour size, location, and involvement of nearby structures. Magnetic

resonance imaging provides detailed visualization of soft tissue, allowing clinicians to identify characteristic features of meningioma, such as well-circumscribed masses and enhancement patterns after contrast administration. Computed Tomography (CT) can complement Magnetic Resonance Imaging (MRI) by highlighting calcifications or changes in the skull that may accompany tumour growth. Radiographic assessment is crucial for differentiating meningiomas from other intracranial lesions, including gliomas, metastases, or vascular abnormalities.

Although most meningiomas are benign, histological evaluation is important for determining tumour grade and predicting potential recurrence. Atypical and anaplastic variants exhibit increased cellular density, nuclear atypia, and higher mitotic activity, which are associated with more aggressive behavior. Genetic factors, including mutations or deletions affecting tumour suppressor genes such as NF2, contribute to development and progression. Environmental influences, such as previous exposure to ionizing radiation, have also been linked to elevated risk, underscoring the multifactorial nature of meningioma formation. Treatment planning is guided by clinical presentation, tumour size, location, and patient health status. Asymptomatic tumours may be monitored through periodic imaging to detect changes in size or morphology. Symptomatic lesions or those exhibiting growth typically require surgical intervention. Complete resection is preferred whenever feasible, as it reduces the likelihood of recurrence. In cases where complete removal is not possible due to proximity to critical structures, adjunctive radiation therapy may be employed to manage residual disease. Long-term follow-up is essential for early detection of recurrence and for monitoring the patient's neurological function over time.

In summary, meningiomas are common intracranial tumours that arise from the meninges and display a wide spectrum of clinical behavior. Their slow growth and often benign nature are tempered by potential neurological complications arising from compression of neural structures. Accurate diagnosis through imaging, histological classification, and careful monitoring are essential for effective management. Understanding the

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epidemiological patterns and clinical profiles of meningiomas enables clinicians to identify at-risk populations, anticipate

potential symptoms, and provide interventions that optimize neurological function and quality of life.