Extracranial Meningioma Metastasis: A Systematic Review of Clinical Characteristics, Management Strategies, and Outcomes

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Background: Meningioma is the most common type of intracranial neoplasm, accounting for approximately 40% of all primary brain tumors. Although these tumors are usually benign and slow-growing, extracranial metastasis can occur in less than 1% of cases. Due to the rarity, diagnosis can pose a challenge. In this systematic review, we summarize and analyze patient demographics, clinical characteristics, management strategies, and outcomes of patients with extracranial meningioma metastasis.

Project Methods: A systematic review was performed following the (PRISMA) guidelines. PubMed, Ovid EMBASE, Cochrane, Scopus, and Web of Science databases were searched. Clinical characteristics, management, and outcomes were analyzed.

Results: A total of 127 studies with 164 patients were included. There were 51% males and mean age of primary tumor diagnosis was 48 years (range, 8-91). Primary tumors were mostly located on the convexity of the brain (52%) and WHO grade 1 (38%) or grade 2 (37%). Histological findings were predominantly atypical (37%). Mean number of intracranial recurrences was 2 (range, 0-7) and occurred in 81% of cases. Average time between primary tumor and the first extracranial metastasis was 103 months (range, 2-450). The top three most common locations of metastases were the lungs (39%), spine (15%), and liver (12%). Most often, there was no change in grade (68%) from the primary tumor to the first metastasis. Gross total resection of the primary tumor was achieved in 76% of cases. Mean survival from primary diagnosis and survival from first metastasis was 118 and 31 months, respectively.

Conclusion/Impact: Mechanisms by which extracranial meningioma metastasis occur are still unclear, though do not appear to involve evolution into a more aggressive histologic type in most cases. In a patient with a history of intracranial meningioma recurrence and symptoms of lung, spine, or liver, dysfunction, extracranial meningioma metastasis should be considered within the differential.