Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Medicine

Brain Metastasis from Pulmonary Adenocarcinoma: Case Report

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DOI: 10.36347/sjmcr.2023.v11i09.025 | **Received:** 04.08.2023 | **Accepted:** 10.09.2023 | **Published:** 13.09.2023

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Abstract **Case Report**

The contemporary management of brain metastases has become progressively more complex as the number of available treatment options increases. The increase in survival seen with improved systemic treatments, and the low morbidity associated with neurosurgical intervention, warrant aggressive and thoughtful management of CNS metastases. Multidisciplinary and collaborative treatment of patients with cancer leads to multifaceted approaches but also the expectation that the treatment of brain metastases should not excessively delay or interfere with the treatment of systemic disease.

Keywords: Brain metastasis, adenocarcinoma, lung cancer.

INTRODUCTION

Cerebral metastases are a leading cause of morbidity and mortality in individuals with cancer and are the most frequently encountered tumors in neuro-oncology. The incidence of intracranial metastases continues to increase as advancements in neuroimaging lead to improved detection of symptomatic and asymptomatic lesions, and developments in immunotherapy and targeted systemic treatments lengthen survival.

CASE REPORT

A 59 year old male, smoker, he was diagnosed with pulmonary ADK one week earlier, referred to our department for behavioral disorder. Clinical examination showed a full awareness with Karnsofky scale 100%. Neurological examination revealed patient with no deficit. The brain MRI showed a right frontal mass iso signal in T1WI which enhanced after gadolinium with double components cystic and fleshy. With peri lesion edema (Fig 1). The whole-body CT scan showed an abnormal mass shadow in his upper right lung near the apex. The patient underwent total tumor excision with margins resection. At surgery, the lesion was gray, firm, and vascular. Histological examination revealed brain metastasis of pulmonary ADK. Post-operatively, the neurological examination improved, while the brain CT scan confirmed total tumor resection (Figure 2). He received radiation and chemotherapy. Three months later patient was asymptomatic.

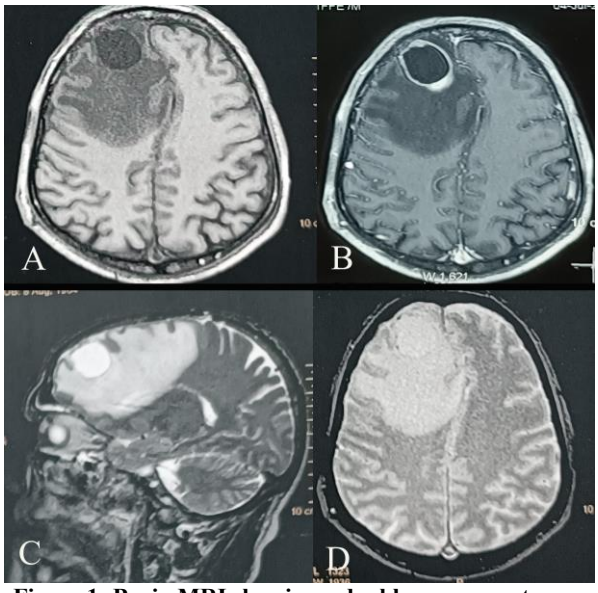

Figure 1: Brain MRI showing a double component mass cystic and fleshy, iso signal in T1WI (A), with contrast enhancement (B), the cystic component hyper signal in T2WI (C), with no hemorrhagic signal (D)

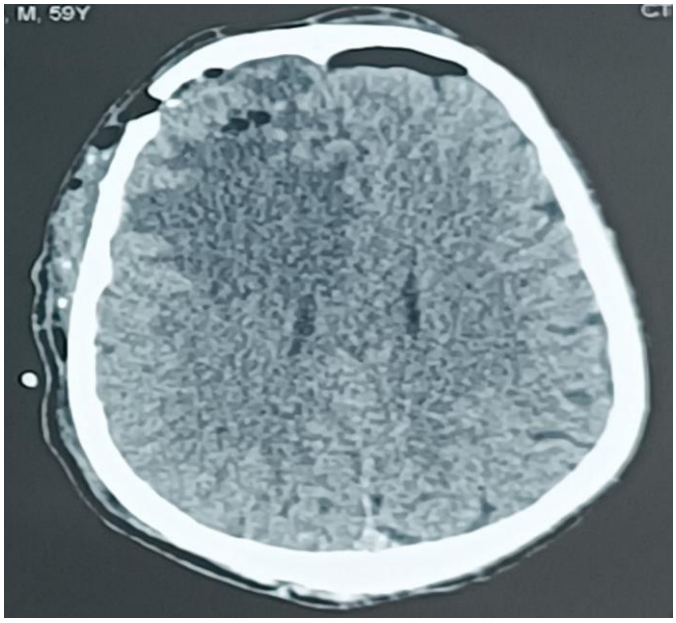

Figure 2: Post-operative Brain Ct scan showing total mass resection

DISCUSSION

Cerebral metastases are the most common brain tumors in adults, exceeding the incidence of primary malignant brain tumors by a factor of 4 [1]. Most tumors arise from lung, breast, and renal cell tumors; however, melanoma, followed by lung, breast, and renal cell carcinoma exhibits the greatest propensity to develop brain metastases. The incidence of cerebral metastases from lung carcinoma has declined in recent decades, while an increase in melanoma, renal cell carcinoma, and colorectal cancers has been observed [2]. Characteristically, breast and renal cell carcinoma tend to present as a single metastasis within the brain, whereas melanoma and lung cancer have an increased incidence of multiplicity [3]. The greatest incidence of brain metastases is seen in the fifth to seventh decades of life and affects males and females equally. However, lung carcinoma is the source of most metastatic tumors in males, and breast carcinoma the most frequent source in females [4]. Lung cancer can be divided in small cell lung cancer and non-small cell lung cancer, and non-small cell lung cancer could be divided into squamous cell carcinoma, adenocarcinoma and large cell carcinoma [5]. The goals of treating brain metastases are (1) to establish a histologic diagnosis, (2) to relieve neurologic symptoms and prevent further decline, and (3) to provide long-term control of intracranial disease [6]. The preoperative neurologic status should be considered, because patients with marked neurologic deficits have been shown to have a shorter median survival time than patients who are neurologically intact. However, as alluded to previously, it is important not to exclude patients from surgery on this basis alone; there are many patients whose neurologic deficits improve following resection of the offending tumor. One way to determine the potential for recovery is to assess the response of the deficit to corticosteroid administration. Patients whose neurologic deficits are likely to improve after resection usually demonstrate an improvement after treatment with corticosteroids, whereas patients who will not improve postoperatively do not have such a response to corticosteroids. In general, a surgical patient should have an expected survival of at least 3 months, be able to withstand anesthesia, and have a KPS score of 70 or greater. Patients who have major cardiac, pulmonary, renal, or hematologic diseases may be better suited for nonsurgical treatment. Whole-brain radiation following surgical resection of brain metastases leads to improved local and distant tumor control. However, the decrease in tumor recurrence found with WBRT is not associated with an attendant improvement in survival or functional outcomes. Sawaya and colleagues found that patients who were relatively young (age 40 years), with a KPS score of 100 and a metastasis in noneloquent brain, had a 5% risk of a major complication, whereas, at the opposite extreme, for a relatively old patient (age 65 years) with a low KPS score (of 50) and a tumor in eloquent brain, this risk rose to 23%. As discussed, en bloc resections of metastases in eloquent and noneloquent locations were not associated with increased operative morbidity or mortality.

CONCLUSION

The management of brain metastases in lung cancer requires a collaborative, multidisciplinary approach among radiation oncologists, medical oncologists, and neurosurgeons. Given the impact of brain metastases on both prognosis and quality of life, the effective coordination of local and systemic therapies remains a priority, especially as extracranial disease control in lung cancer improves.

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