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# Brain metastases presenting as depression without any focal neurological deficits: A case report

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**Abstract**

Brain metastases are a common complication of cancer and the most common type of brain tumours. Primary cancers such as lung, breast, and melanoma are most likely to metastasise to the brain. Other malignancies such as prostate and head and neck cancers rarely result in brain metastases. Most patient's initial manifestations are neurological. The most common symptoms include headache, weakness, alterations of higher brain functions, focal neurological deficits and seizures, which are caused due to a local mass, cerebral oedema and increased intracranial pressure. It is usually diagnosed between the 5th and 7th decade of life. Here we present a case report of a middle-aged female with brain metastases with unusual clinical presentation of depression without any neurological deficits.

**Keywords:** Brain, Neurological, MRI, CT.

**Case report**

A 47-year-old female with no underlying comorbidity presented in outpatient department of this hospital with complaints of low mood for last 2 months. She reported that her sleeping was disturbed in that it frequently took her several hours to fall asleep, that some nights she could not fall asleep at all, and if she did, she slept for only a few hours. Her family members also noticed that She had episodes of crying spells intermittently. Her

husband also acknowledged that she was keeping herself from participating in family events. since last one month she also starts having headache. Headache was of moderate intensity, throbbing and shooting in character, more prominent during early morning and was associated with nausea and vomiting. She has been following a psychiatrist for last 2 months, she was being treated with SSRI. On presentation her blood pressure was 118/79, oxygen saturation 98%, pulse 78bpm. Patient's higher mental functions were normal, her cranial nerves were normal, Motor and sensory examination was normal along with cerebellar functions. Deep tendon reflexes were 2+ all over. There were no meningeal signs. Fundus examination revealed no signs of increased intracranial tension. Respiratory, cardiovascular system and abdominal examination was unremarkable. Baseline Lab parameter was normal. Non contrast CT head showed multiple ring lesion (Fig.1). MRI Brain showed multiple rings enhanced lesion (Fig.2 and 3). CECT CHEST showed mass lesion in right upper lobe of lung. Malignancy markers were within normal range except CA 125 which was 325, normal being less than 56. Sputum analysis for tuberculosis was negative. Interferon Gamma Release Assay was negative. Neurocysticercosis serology negative. Bronchoscopy guided lung biopsy was suggestive of adenocarcinoma lung.

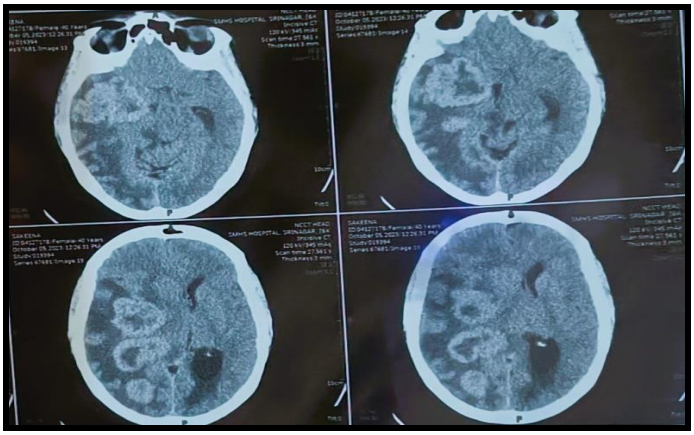

Fig. 1: NCCT head

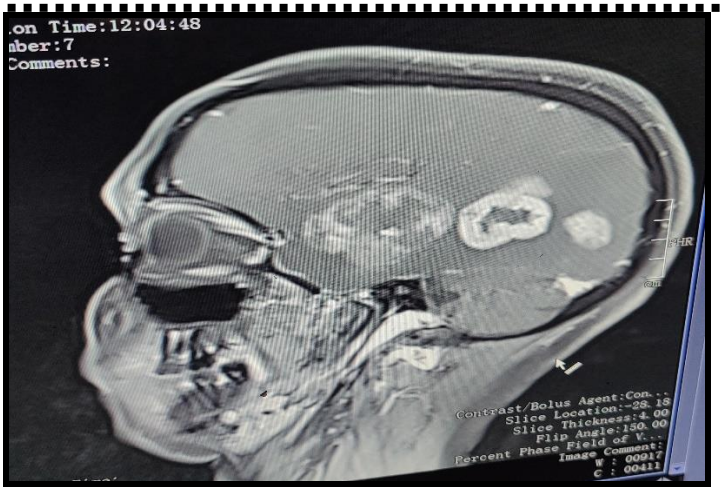


Fig. 2: MRI brain

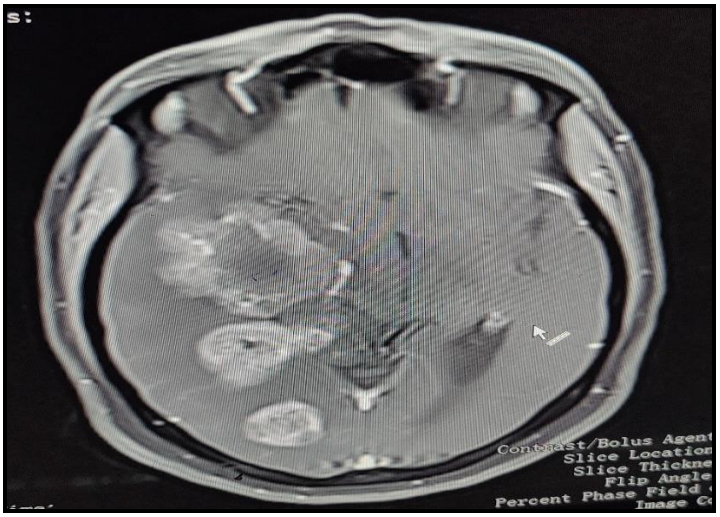

Fig. 3: MRI brain

**Introduction**

Brain metastases are a common complication of cancer and the most common type of brain tumor. Anywhere from 10% to 26% of patients who die from their cancer will develop brain metastases.[1] Primary cancers such as lung, breast, and melanoma are most likely to metastasize to the brain and account for 67%–80% of all cancers. Small-cell lung cancer has a high propensity to spread to the brain. A cancer can metastasize to a single locationor to multiple locations in the brain.it can also spread to CSF or to leptomeninges. This type of metastasis is known as leptomeningeal disease(LMD),or leptomeningeal carcinomatosis and has a poor prognosis.

In the United States, an estimated 98,000 to 170,000 cases occur each year.[2] Metastatic cancer passes through the bloodstream and enters the central nervous system through a breakdown of the blood-brain barrier. Clonal cells then proliferate, causing local invasion, displacement, inflammation, and edema. Distribution throughout the central nervous system is more common in areas of high blood flow; however, different histological subtypes tend to have different distributions of location within the brain.[3]

Differential diagnosis of Brain metastases include Tuberculoma, Neurocysticercosis, Lymphoma, Abscess, Demyelination, Primary tumour - glioma/ependymoma

**Clinical presentation of brain metastasis**

Signs and symptoms caused by brain metastases can vary based on the location, size and rate of growth of the metastatic tumours.

Approximately 60% of patients with brain metastases have subacute symptoms. Symptoms are usually related to the location of the tumour. About 85% of the lesions are in the cerebrum, 15% are in the cerebellum, and 5% are in the brainstem.

Headache (42%) and seizure (21%) are the 2 most common presenting symptoms. 35% of patients have cognitive dysfunction, and 30% have motor dysfunction. Nausea and vomiting together with papilledema are suggestive of intracranial hypertension. About 10% of patients present with haemorrhage. Metastases commonly derive from choriocarcinoma, melanoma, bronchogenic carcinoma, thyroid carcinoma, and renal carcinoma bleeding; most of these haemorrhages are intramural.

**Treatment**

The first step in the management of newly diagnosed brain metastases is the treatment of intracranial edema. Oral or intravenous steroids (such as dexamethasone) are commonly used. A loading dose of 10 mg intravenous (IV) dexamethasone followed by 4 mg IV every six hours is one dosing regimen. After the initial clinical response, which can occur rapidly, the dose may be tapered to avoid many of the adverse effects of long-term high dose steroid administration.

Following the initiation of steroids, definitive management may be initiated. Treatment options include surgical resection (for limited brain metastases in patients with good performance status and surgically accessible lesions), whole-brain radiotherapy, and stereotactic radiosurgery. Whole-brain radiotherapy is given by daily radiotherapy treatments (usual 10 to 15) targeting the whole brain. Radiosurgery is a more precise form of radiotherapy which delivers a large dose only to the area of the brain metastasis, usually in a single fraction. Each of these treatments has distinct advantages as well as a unique side effect profile. A multidisciplinary treatment team of a neurosurgeon, radiation oncologist, and neuro-oncologist should participate in the formulation of the treatment plan together with the patient.

The historical standard in patients with good performance status has been surgical resection. Local recurrence following surgical resection remains high, with one trial recently reporting 12-month freedom from local recurrence of 43% following surgical resection and observation.[4] Local control can be improved with post-operative radiosurgery or whole-brain radiotherapy.[4][5] Postoperative therapy should remain an individualized treatment recommendation, taking into account the number of non-resected metastases, tumor histology, follow-up, and patient preference. Whole-brain radiotherapy following surgical resection of brain metastases can increase intracranial control compared to postoperative stereotactic radiosurgery but results in poorer neuro-cognitive outcomes.[5]

For patients either not eligible for surgical resection of brain metastases or who elect for non-surgical therapy, stereotactic radiosurgery offers an excellent option for controlling a limited number of intracranial metastases. Although first used in combination with whole-brain radiotherapy as a way to intensify local treatment, stereotactic radiosurgery is now commonly used as a stand-alone therapy. While ultimate control of brain metastases varies with dose and lesion size[6], lesions less than one centimetre have high local control with single-fraction radiosurgery.[7] For larger lesions, multi-fraction treatments are sometimes employed.[8] Stereotactic radiosurgery is considered standard for patients with one to four brain metastases, but emerging data indicate it may be an acceptable treatment for patients with up to ten brain metastases.[9]

For patients with poor performance status or many brain metastases, the standard of care is whole-brain radiotherapy. Whole-brain radiotherapy provides control of individual brain metastases as well as reduces the risk of failure in the brain at a new site. These benefits must be weighed against its potential neurocognitive side effects which occur for many patients to a varying degree. Emerging data suggest that for patients with extremely poor performance status, whole-brain radiotherapy may have a minimal benefit over steroids alone.[10] Therefore, in the management of brain metastases, treatment decisions will need to be made on an individual patient level, taking into account the goals of treatment in a particular situation as well as the acceptable side effect profile. From the ESMO Guidelines patients presenting with stage 4 lung malignancies should also undergo a prophylactic cranial irradiation (PCI). If they don't wish to, a serial MRI/CT scan is recommended as follow up assessment.

Magnetic resonance imaging (MRI) of the brain is considered to be the investigation of choice in patients with clinical suspicion of brain metastasis because it has a high sensitivity and specificity. Computed tomography scan of the brain or PET (positron emission tomography) are the other options. Most metastatic lesions are hypo intense on T1-weighted images. On T2-weighted images most lesions are hyper intense. Stereotactic biopsy for the diagnosis of metastatic brain tumours is a valuable diagnostic resource, with a mortality rate of less than 1% Especially if lesions are located deep in the brain or in highly specialized regions such as language area, primary motor area, visual area and when the primary tumours has not been identified in other studies.

**Conclusions**

Patients with metastatic brain cancer can have variable signs and symptoms that must be optimally managed to provide the best quality of life. The most common symptoms include focal deficits, fatigue, seizures, cognitive impairment, and headaches. The pathophysiology is usually related to compression and edema, which can be mediated with steroids. Steroids have many side-effects, however, and patients should be monitored judiciously. Our case was unique in that with such diffuse brain lesions there were no focal neurological deficits and was having symptoms of depression only hence was being treated for her depression.

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