LUPINE PUBLISHERS

Online Journal of Neurology and Brain Disorders

DOI: 10.32474/OJNBD.2020.04.000183

ISSN: 2637-6628

Case Report

# Whole Spine Metastasis from Supratentorial Glioblastoma Multiforme

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**Received:** June 17, 2020 **Published:** June 30, 2020

## Abstract

Glioblastoma multiforme (GBM) is a highly aggressive and one of the most common primary brain tumors in adults. Metastasis of intracranial glioblastoma via the cerebrospinal fluid to the spine is a rare occurrence with a poor prognosis. We hereby present a rare case of GM in a 28-year-old man, who developed intramedullary, extramedullary, as well as spinal leptomeningeal metastasis 6 months after surgery of supratentoriel glioblastoma multiforme.

**Keywords:** Glioblastoma; Intramedullary; Leptomeningeal; Spinal Metastasis

**Abbreviations:** GBM: Glioblastoma Multiforme; WHO: World Health Organization

## Introduction

GBM is categorized as grade 4 in the WHO scale and often occurs in the supratentorial white matter, mostly in the frontal, temporal, and parietal lobes [1]. However, leptomeningeal metastasis from primary intracranial GBM is a rare phenomenon and there is usually a long interval between the cerebral lesion and the spinal seeding. Although the best treatment involves maximal surgical resection followed by adjuvant radiotherapy and chemotherapy, the median survival time is less than two years [2]. We report a case of symptomatic leptomeningeal metastasis from primary intracerebral glioblastoma.

## Case Report

A 28-year-old man presented with history of headache, nausea, vomiting and generalized seizures. Neurological examination revealed no deficit, also general and other systemic examinations were unremarkable. Brain CT scan showed a left parietal irregular, heterogeneously enhancing lesion (Figure 1a). He underwent left parietal craniotomy and gross total removal. Histopathology was suggestive of GBM, World Health Organization (WHO) grade IV. The patient then underwent external beam radiotherapy for 6 weeks associated to chemotherapy (Temozolamide capsule 100 mg daily) with an uneventful course. Postoperative control CT scan during follow up was not suggestive of residual/recurrent disease (Figure 1b).

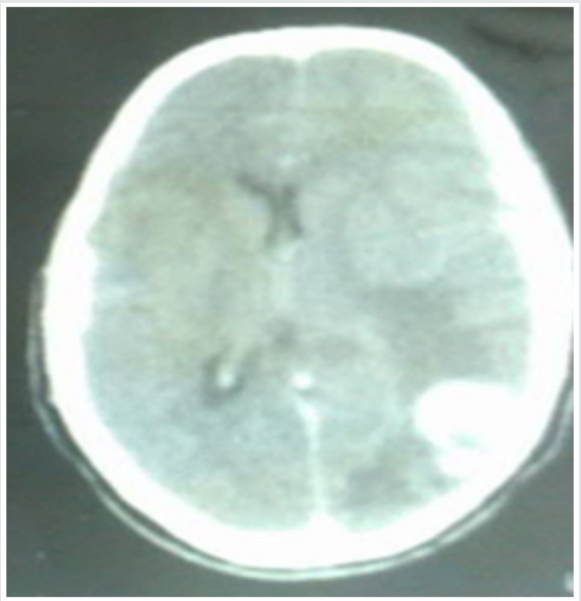

**Figure 1a:** Preoperative (a) axial cerebral CT scan showing the parieto temporal GBM.

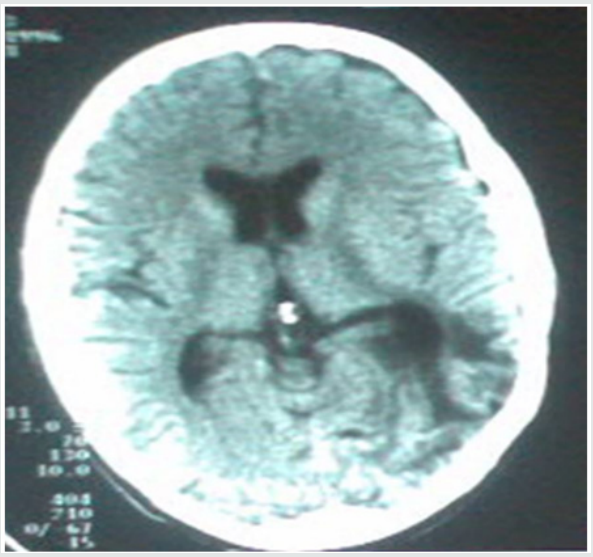

**Figure 1b:** Post-operative image after GTR.

After approximatively 6 months, the patient presented with gradually progressive weakness of lower limb, with numbness in both the lower limbs and bowel and bladder involvement. On neurological examination, spastic paraparesis with the sensory level at T9. MRI of the spine showed a multiple, enhancing, intramedullary lesion with cord expansion with diffuse leptomeningeal involvement all along the cervical and dorsal spine (Figure 2a & 2b). He underwent biopsy of the dorsal lesion and histopathology was suggestive of metastatic glioblastoma (WHO grade IV). Then the patient refuses radiotherapy and succumbed to his disease after a period of 4 months.

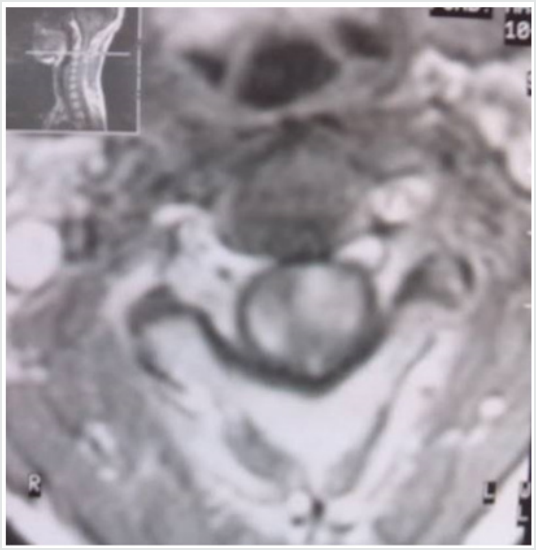

**Figure 2a:** Spinal MRI gadolinium enhanced T1-weighted images showing invasion of tumor through the pia mater into the medulla of the cervical spinal cord.


**Figure 2b:** Focal nodular intramedullary mass at T8/T9 level.

## Discussion

Glioblastoma multiforme is an aggressive, high-grade malignancy of glial cell origin, accounts for 16% of all primary brain tumors with a well-known tendency for intracranial spread but rarely for extracranial spread [1, 3]. Spinal intramedullary metastasis and entire spinal cord involvement from primary GBM is a rare event. CSF dissemination occurs in 15 to 25% of cases of supratentorial GBM. In the other hand, the rate of spinal metastasis from cerebral GBM has been reported to be 0.4-2% [4,5].

GBM predominates subcortically in the temporal and parietal lobes and can be multifocal with spinal leptomeningeal metastasis. Even tough, the common symptoms of spinal metastasis are radicular pain, sensory loss, followed by paraparesis or quadriparesis, bowel or bladder dysfunction, and sexual dysfunction [6,7]. The surgical management of leptomeningeal metastasis is still uncertain due to the rarity of these cases, although the mainstay of treatment is safe surgical decompression, followed by adjuvant radiotherapy in total dosage of 25-40 Gy, and intravenous or intrathecal chemotherapy [8-10]. Nevertheless, spinal metastasis of GBM have poor prognosis, with fatal outcome [11].

## Conclusion

It is important to consider the possibility leptomeningeal metastasis in a patient with intracranial GBM, to investigate and treat the patient accordingly. Even if safe surgical resection combined with chemo-radiotherapy the prognosis remains very poor, leading to a fatal outcome.

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**DOI:** 10.32474/OJNBD.2020.04.000183