

## ABSTRACT

Br J Neurosurg. 2021 Aug 16:1-7. doi: 10.1080/02688697.2021.1961682. Online ahead of print.

### **Intracranial high-grade glioma with malignant progression of spinal intramedullary metastasis: an atypical presentation with review of literature.**

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**PURPOSE:** High-grade gliomas (grade 3 and grade 4) are known to be highly locally invasive and distant metastasis though known, rarely manifest clinically due to poor survival. Recently, due to increasing survival in view of early diagnosis at relatively young age, more cases of extra neural symptomatic metastasis are being diagnosed and treated. Among these, symptomatic spinal metastasis is even more rare. Dissemination of GBM to the spinal compartment, albeit uncommon, has an even poorer outcome, with most patients dying within 2-3 months after diagnosis of metastatic disease.

**MATERIALS AND METHODS:** Here, we present a rare case report of a 25-year-old female with transformed/histologically progressed tumour in cranial region along with ultra-rapid progression of the spinal disease following metastasis. Proper consent of the patient relatives was taken prior to production of material as patient had expired by the time of writing of this paper. We also present an extensive review of spinal metastasis secondary to intracranial high-grade gliomas starting from 1950. We conducted a thorough and exhaustive systematic search and review of the indexed databases available in PUBMED, COCHRANE and GOOGLE SCHOLAR with key words 'spinal metastasis of glioma', 'spinal metastasis', 'glioma progression', 'secondary glioma', multicentric glioma, 'secondary spinal metastasis' and formulated a comprehensive table of the studies that met the set standards. The studies that included (a) Number of cases, (b) Age and sex of patients, (c) operated primary or non-operated primary with spinal metastasis, (d) time period from the index cranial surgery, (e) outcome after diagnosis of spine metastasis and (f) histopathology of both cranial and spinal tumour either following surgery or autopsy have been elucidated herewith. We searched the databases with no particular time period. Out of 42 case reports and series, 28 studies were selected for our publication as they met the standards set, starting from 1950 to 2020.

**RESULTS:** In this case, the primary histopathological diagnosis post cranial tumour removal was Grade-3 anaplastic astrocytoma, whereas Spinal autopsy report done 16 months after the primary diagnosis showed Grade-4 GBM suggestive of secondary transformation (Secondary GBM), it showed same genome of IDH mutation and ATRX loss, neoplastic fibrillary and gemistocytic astrocytes with de-differentiation, foamy histiocytes as seen in primary lesion suggestive of progression and metachronicity rather than multicentricity or synchronicity. What is more peculiar and rare in our case is that the spinal disease was very malignant and it progressed in course of just two days to involve the whole spine. Key points Malignant ultra-rapid progression of spinal metastasis. Thorough review of literature Metachronicity of spinal metastasis Importance of the study This study presents a very atypical case of malignant progression of spinal

metastasis documented with successive MRI radiology scans in a span of mere two days. It is different from other studies in the sense such malignant progression in a span of few days has never been documented with radiographs. This manuscript also provides an exhaustive review of literature and draws comparisons among the same. This study compares → Time period to diagnosis of spinal metastasis following primary diagnosis, Outcome from diagnosis of spine metastasis, age along with other variables like histopathology of spinal metastasis if available, Treatment underwent, site of metastasis among different studies.

DOI: 10.1080/02688697.2021.1961682  
PMID: 34396889