Case Report

Spinal Cord Glioblastoma Multiforme: A Rare and Fatal Entity – A Case Report

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Abstract

Background: Spinal high-grade gliomas are extremely rare tumors, accounts for about 1.5% of all spinal tumors and have a poor prognosis with survival ranging from 2 to 26 months from presentation.

Case description: We report a 32 years old male with a history of one month of progressive tetraparesia. Image studies revealed an intramedullary C7 to T4 lesion. Laminectomy and microsurgical resection were performed, and anatomopathological exam confirmed a spinal glioblastoma multiforme (WHO grade IV). He received adjuvant treatment with radiotherapy and chemotherapy and died after 18-months of diagnosis.

Discussion: Literature findings showed only about 150 cases, limited to reviews, case series and reports. However, aggressive resection has not been shown to correlate with increased survival. Recent authors suggest that subtotal resection or biopsy with or without adjuvant therapy could be more beneficial. Debulking or biopsy followed by adjuvant focal radiation plus or minus temozolomide chemotherapy appears to be the most common multimodal approach.

Conclusions: Spinal glioblastoma is an extremely rare condition, with a few number of cases reported in literature, and currently treatment option fail to control this invariable fatal disease.

Keywords: Spinal cord glioblastoma, spinal tumor, high grade glioma

Introduction

Spinal glioblastoma multiforme (SGM) are extremely rare tumor. In spinal cord, intramedullary tumors correspond to 5-10% of all tumors, and SGM comprises only 1.5% of primary intramedullary tumors and 1-5% of all high-grade tumors [1-3]. Most cases are found in young adult patients, and cervical spine is the most common location [3,4]. Spinal cord tumors have the capacity to disseminate through cerebrospinal route to subarachnoid space and reach surrounding brain structures. Also, basal cisterns are blocked, increasing the protein in cerebrospinal fluid, and causing hydrocephalus. Most common sites of metastasis of these tumors are cerebellum, thalamus, septum pellucidum, and brainstem [4-7].

Typical presentation includes motor and sensory deficits, with or without sphincter dysfunction [5,6]. Literature data is poor to allow a clinical guideline, but currently a treatment option includes surgical resection...
followed by chemotherapy and radiation [5-7]. Here, we present a 32-years-old male with diagnosis of SGM. Our work has been reported in line with the SCARE criteria [8].

**Case Presentation**

A 32-year-old male patient presented with one-month history of back pain, urinary incontinence, loss of sensation, and weakness in his legs. Medical and surgical history didn’t reveal any important data. Neurological examination revealed tetraparesia (2/5 bilateral strength in lower extremities, and 3/5 bilateral strength in upper extremities). Pain, temperature, and tactile sensation were lost under C6 dermatome. Muscular tone and patellar and Achilles tendon reflexes were increased. Rectal sphincter was intact. Spine magnetic resonance imaging (MRI) showed an enlarged spinal cord between C2 and T7 with a not well defined, mildly enhancing intramedullary lesion at C7 to T4 with extensive perilesional edema (Figure 1).

![Figure 1](image_url)

**Figure 1:** Preoperative MRI. (A) Sagital T1-MRI with gadolinium showing a not well-defined enhancing between C7 and T4. (B) Sagital T1-MRI showing enlargement of spinal cord in cervical spine. (C) Sagital T2-MRI showing extension of lesion between C2 and T4. (D) Axial T1-MRI with gadolinium showing a central spinal cord enhancing.

He underwent a laminectomy between C2 and T5, and microsurgical resection of an about 4 centimeters extension intramedullary tumor. In the first day after surgery, he didn’t show any recovery of previous neurological deficit. He was discharged in the fourth postoperative day for rehabilitation neurological program. Anatomopathological examination confirmed the diagnosis of spinal glioblastoma multiforme, with methylated MGMT
(Figure 2). So, he was referred to oncology to adjuvant therapy. He received 60 Gy radiation local therapy, and chemotherapy with temozolamide at 75 mg/m² for 42 days. Neurological condition improved after six weeks, and he was able to walk with support. Clinical and neurological conditions became worst after twelve months, with progressive quadriplegia and sphincter disturbances. He died of pulmonary complications 18 months after diagnosis.

![Figure 2: Pathological findings of spinal glioblastoma. (A&B) Hematoxylin and eosin section showing tumor cells with increased cellularity, frequent mitosis, vascular proliferation and necrosis. (C) P53 immunostain is positive. (D&E) Tumor cells are immunoreactive to glial fibrillary acid protein (GFAP) and epidermal growth factor receptor (EGFR). (F) Ki-67 labeling index is high, upper to 30%.]

**Discussion**

SGM is an extremely rare tumors, with mean survival if 12 months in literature data. Typical presentation is the onset of both acute and insidious motor and sensory deficits, with or without any sphincter dysfunction. MRI with contrast reveals an irregular contrast enhancement area with surrounding edema [9,10]. Our case example had all of these literature data findings. Although literature-guiding management is limited to reviews, case series and reports, some prognostic factors have been established, as age less than 60-years-old. Extension of resection has not been associated with increased survival, and recent reports have been demonstrated biopsy or subtotal resection with adjuvant therapy has better outcome than radical resection. Debulking followed by focal radiation and temozolamide chemotherapy is the most recommended treatment for these tumors [10-12]. Our choice was based in this therapy line. Despite efforts in controlling the tumor growing, outcomes remain frustrating.

Most studies are been conducted regards genetic therapies. Genetic mutations have been correlated to SGM, as p16, BRAF, PTEN, p53 and H3F3A. Some studies have been demonstrated the relationship between isocitrate dehydrogenase (IDH) mutations or methylation of O6-methylguanine-DNA methyltransferase (MGMT) genes and effectiveness of some adjuvant therapies. Also, some potential targets have been tested, as oncolytic methods by virus delivery [9-11].

**Conclusion**

SGM are extremely rare and aggressive tumors, with overall median survival poor at 24 months. Also, none demographic or tumor related factors have been associated with outcomes. Extension of surgery not appears with better survival rates, and currently surgery plus radiation therapy and chemotherapy is the treatment of choice.
References