CASE REPORT

Cervical Metastatic Glioblastoma Multiforme

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ABSTRACT

Glioblastoma multiforme (GBM) is the most common and most malignant primary brain tumour in adults. In spite of the hostile nature of glioblastoma multiforme (GBM), extracranial spread is not a common event. With improving management choices and survival times, reports of extracranial occurrence of GBM have increased. Most commonly these metastases are to the lungs, lymph nodes, neck, skull, scalp, liver, and bones; may be evident on routine follow-up images of the original lesion. Head and neck metastasis of GBM can be debilitating. We present a case of cervical metastasis of GBM and discuss possible mechanisms of extraneural spread of this tumour.

Key words: *Glioblastoma. Metastasis. Central nervous system neoplasms. Cervical metastases.*

INTRODUCTION

Glioblastoma multiforme is a high grade undifferentiated glial neoplasm with poor prognosis. Its metastasis to the extraneural sites is rare. The first case with the spread of extraneural metastasis was reported in 1928.[1] Since then very few cases of metastatic gliomas have been reported.[2] Metastasis to the liver, spinal cord and bone are also reported in addition to head and neck sites.[3]

It is noted that most cases of extracranial metastasis of glioblastoma have been observed after craniotomy and diversional CSF shunt procedures for treatment or diagnosis. Spontaneous extraneural metastasis of GBM is extremely rare.[1]

CASE REPORT

A 20 years old boy presented in Neurosurgical OPD of Liaquat National Hospital in August 2009 with complaints of headache and fits for 4 weeks. CT scan showed a large enhancing mass in the right fronto-temporal region. Craniotomy was performed in August 2009 with gross total resection. Histopathological examination revealed a high grade glial neoplasm with strong GFAP positivity and was reported as glioblastoma multiforme WHO grade 4. He received concurrent chemoradiation (6000c Gy external beam radiation therapy and two cycles of chemotherapy with temozolamite). Nineteen months later in February 2011, he presented again in the surgical OPD with an enlarged supraclavicular lymph node along with complaints of productive cough. Lymph node was excised and sent in Histopathology Laboratory.

Grossly the node was about 1 x 0.9 x 0.5 cm in size submitted entirely. Histopathological examination showed a node with highly pleomorphic, bizarre and multi-nucleated giant cells with frequent mitoses present in necrotic and haemorrhagic background (Figure 1). These cells showed strong positivity with GFAP (Figure 2) and vimentin antibody (Figure 3) by DAKO envision method and were negative for CKAE1/AE3, CK-7, CK-20, CK-5/6 and HMB-45. Finally, it was reported as metastatic high grade glioma. Further external beam radiation (5000c Gy) was given to patient's scalp and neck and 3 weeks of chemotherapy was also administered.

DISCUSSION

Intracranial tumours rarely lead to metastasis. It has been noted that the frequency of extracranial metastasis of cerebral gliomas is around 2%. Extraneural metastasis is generally observed in adults.[4]

There have been a variety of theories to explain extracranial metastasis, most of which occur after craniotomy or shunt operations for diagnosis and treatment and radiation therapy. Despite the theory of blood-brain barrier that sets apart the central nervous system from the body, extracranial metastasis can be found in the lung (60%), nodes (15%) and liver (22%).[1] After craniotomy, the direct permeation of the meningeal venous system by the tumour could be possible.[4,5]

Some authors reported that transfer of emboli could occur between the internal jugular vein, the thoracic duct and the right cervical lymphatic plexuses, so that craniotomy seems to be the most accepted cause of metastasis of the primary brain neoplasm.[1] In Pasquier's cohort, 8 patients were not submitted to craniotomy and Myer *et al*. reported a metastatic glioblastoma case without surgery on the brain; thus, the diffusion of the

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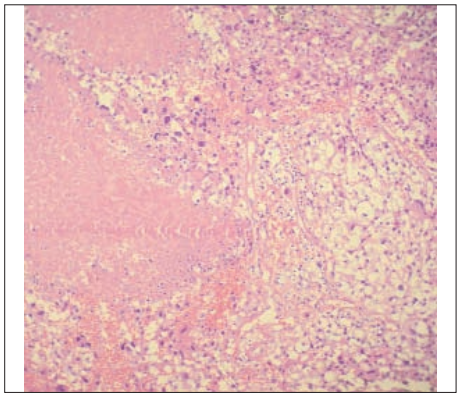

Figure 1: Section from lymph node shows bizzare pleomorphic tumour cells with necrotic background. (Hematoxylin and Eosin x 10).

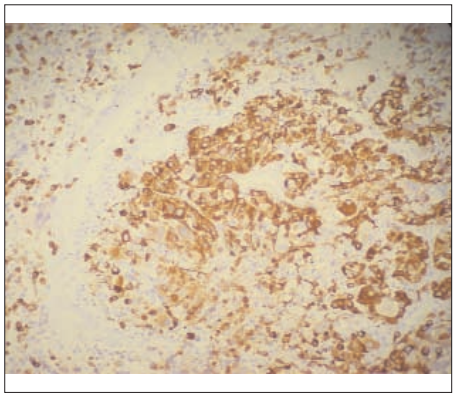

Figure 2: Section from same lymph node reveals tumour cells strongly positive with immunohistochemical stain GFAP. (Dako Envision method x 20).

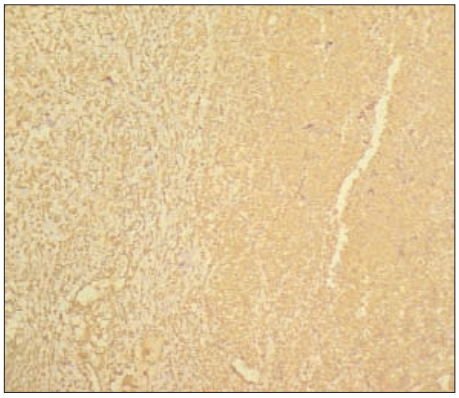

Figure 3: Lymph node tumour cells positive with immunohistochemical stain vimentin. (Dako Envision method, x 10).

disease could be explained by the vascular invasion caused by locoregional radiation therapy.[6-8]

In most cases of lymph node metastasis the patient has undergone repeated craniotomies and presumably the tumour gains access to lymphatics by dural or scalp extension through the surgical defect. However, these factors do not explain the extraneural metastasis in all patients, and there are reports of lymph node or distant metastasis before surgery, with no clinical or radiologic evidence of transgression of scalp or skull. In some patients the property of tumour cells themselves may predispose to metastases.[8]

Survival in extraneural glial metastasis is relevant to the age and general condition of the patient as well as to the primary lesion, effectiveness of treatment, localization of the metastatic lesion and response to treatment. The incidence in a 5 years survey of children is reported to be 30% to 40%. Dissemination in residual tumour is 45%.[6,9,10]

Age of patient, localization of metastatic lesion, early diagnosis, radical and prompt surgical treatment and radiotherapy in the early postoperative period play a leading role in the outcome. Radical excision, radiotherapy and chemotherapy should be applied as soon as possible in primary glial tumours.[8]

Metastasis to head and neck in patients with GBMs may rarely be seen on routine follow-up imaging studies and this information is important clinically. In addition to an assessment of the intracranial contents, neurologist should not omit a careful assessment of the extracranial structures visible on follow-up brain imaging. After surgery, radiation therapy and chemotherapy should be administered to metastatic glial tumours.

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