Case Report

Symptomatic Leptomeningeal and Entirely Intramedullary Spinal Cord Metastasis from Supratentorial Glioblastoma: A Case Report

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Background: *Leptomeningeal with intramedullary spinal cord metastasis rarely occur. Most patients have dramatically poor prognosis. The causes of metastasis remain unclear and there is still no principle management for this aggressive tumor.*
Case Report: *The presentation report demonstrates the clinical features, the radiographic study and the histological characteristics in a 46-year-old woman who underwent surgical removal of a supratentorial glioblastoma and developed symptomatic spinal metastasis. The pathological report confirmed the diagnosis by laminectomy and intramedullary tumor biopsy. The analysis of the possible factors of metastasis and the management of this circumstance are discussed.*
Conclusion: *Spinal cord metastasis of Glioblastoma is one of the most poor prognostic factors. The most important precipitating factor is the location of the tumor which is located near the cerebrospinal fluid cistern. Magnetic resonance imaging of the whole spine should be considered in this group of patients.*

Keywords: *Leptomeningeal, Spinal Cord Metastasis, Supratentorial Glioblastoma*

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According to recently data, cerebrospinal fluid (CSF) spreading or leptomeningeal seeding of supratentorial glioblastoma occur infrequently. Approximately 10%-35%[1,2] of these cases have leptomeningeal seeding. Nevertheless, symptomatic intramedullary spinal cord metastasis seems to be rare[2-5]. Factors that affect the metastasis have been reported in some literatures[2]. The prognoses in these patients is quite poor. In this presentation, a case of spinal cord metastasis of supratentorial glioblastoma which was previously treated by surgical and radiation will be presented. Surgical intervention, pathological diagnosis and prognosis are discussed in this paper.

Case Report

In September 2009, a 46-year-old woman presented at the emergency unit with alteration of consciousness after developing a complex partial seizure. A MRI brain scan revealed a heterogenous ring enhancing mass at the left temporal lobe size 4 cm in diameter with peri-tumoral edema (Fig. 1). Gross total tumor removal was performed and the patient fully recovered consciousness. A pathologic study showed classic morphology of glioblastoma (WHO gr. IV) (Fig.

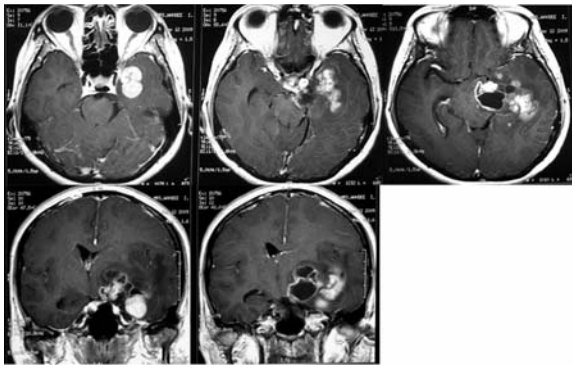

Fig. 1 Post-contrast axial and coronal T1-weighted MRI show mixed solid-cystic mass at left medial temporal lobe with heterogenous enhancement, mass enclosed with subarachnoid space at basal cistern

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2). A postoperative adjuvant external beam radiation treatment was performed three weeks after surgery with a dose of 55 Gy in 30 fraction. During radiation the patient developed a headache but this symptom subsided after treatment with corticosteroid.

Two months after surgical removal, the patient developed progressive paraparesis and paraparesthesia below T2 level. A MRI on the whole spine revealed multiple intramedullary ring enhancement from the cervical cord to the conus medullaris with whole spinal cord edema (Fig. 3 and 4). Maximal cord enlargement at C_6-T_1 level was also seen in the MRI. The author decided to provide a laminectomy from C_6-T_1 as well as a myelotomy for tumor biopsy. The histological feature was reported metastatic malignant glioma, compatible with glioblastoma (grade IV of WHO classification) (Fig. 5). Palliative radiation was planned to be carried out, but the patient and her family refused any further treatment, including radiation.

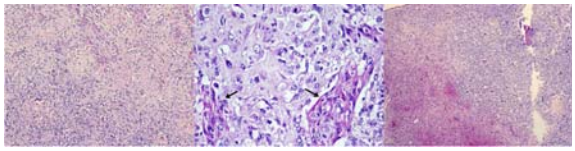

Fig. 2 Histopathology of brain tumor reveal (left) hypercellularity with nuclear atypia, (middle) microvascular proliferation, (right) necrosis compatible with glioblastoma (WHO gr. IV)

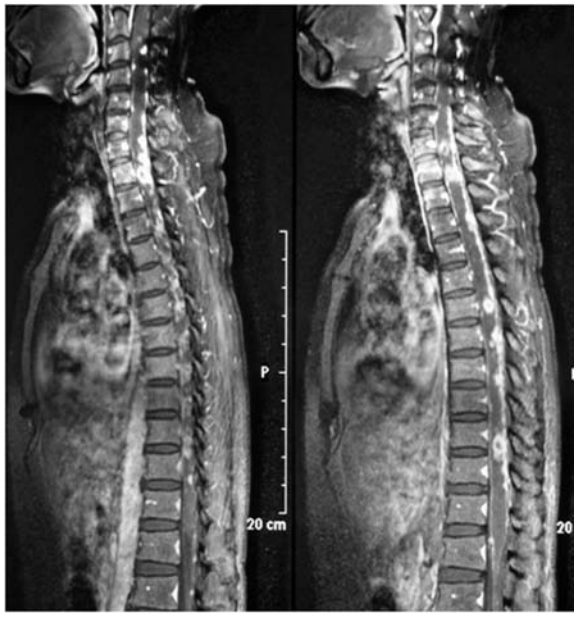

Fig. 3 Post-contrast sagittal T1-weighted MRI show multiple ring enhanceingenhancing lesion with leptomeningeal thickening extended from cervical cord to conus medullaris

Discussion

Glioblastoma is one of the most common primary brain tumors. Leptomeningeal seeding of glioblastoma was first described in 1931[1]. Incidences according to autopsy study is 15-35%[1,2] while symptomatic lesion is uncommon. Moreover intramedullary metastasis occurs rarely[3,6-8]. Most of these patients had a poor prognosis even though aggressive adjuvant therapies were used[7-11].

In the literature, the precipitating causes have been mentioned; namely, the location of tumors which located near the CSF cistern, infratentorial lesion in younger patients[2,12,13]. The case in question had a tumor at the medial temporal area located near to the basal cistern and may have dispersed during surgical removal. The author proposes this is the most important factor to precipitate the metastasis. Patients may be asymptomatic while the tumor initially spreads to the leptomeningeal space until the tumor invades into the intramedullary area or develops to be a mass in the subarachnoid space. From this concern, the patients who have tumors located near the CSF cistern should be considered during surgical removal including the

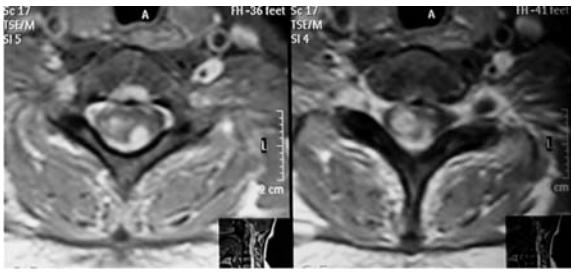

Fig. 4 Post-contrast axial T1-weighted MRI show intramedullary enhancing lesion at C7-T1 level

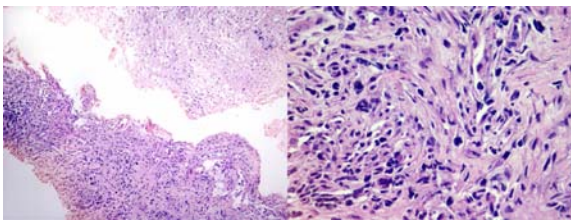

Fig. 5 Histopathology of spinal cord tumor reveals (left) hypercellularity with nuclear atypia (right) numerous mitosis

surgical technique should be applied to protect and prevent tumor to expose CSF space. Furthermore, whole spinal magnetic resonance imaging (MRI) should be performed for early detection of the metastasis. CSF cytology has been proposed in the literature for the diagnosis of CSF spreading of glioblastoma but the rate of false negatives is still a problem. Treatment of spinal cord metastasis of glioblastoma has been varied; whole spinal irradiation is most commonly used. Lindsay proposed whole spinal irradiation plus intravenous CCNU (Lomustine) with disease free interval for 7 months[14]. Intrathecal chemotherapy has also been proposed in the literature, metrotrexate and cytosine arabinoside are mostly used with recurrence free for 3-26 weeks[6,15,16]. Depending on short survival rate, the side effects due to chemotherapy should be considered on a case by case basis.

Prognosis of spinal metastasis of glioblastoma has shown to be very poor. Most patients died between 2-9 months after a spinal metastasis diagnosis[2,5,9,10]. Onset of the metastasis were proposed to early onset and late onset. Late onset metastasis (more than one year after diagnosis) was proposed to relate with primary lesion recurrent[2].

Conclusion

Glioblastoma (WHO gr. IV) is the most common primary malignant brain tumor and the treatment outcome depends on multiple factors including age of patient, primary or secondary glioblastoma, volume of residual tumor and leptomeningeal metastasis as this paper reports. Leptomeningeal metastasis or CSF seeding can be found infrequently and intramedullary cord metastasis is rare and associated with a poor prognosis. All treatment including surgical removal, radiation therapy and chemotherapy, still have a short survival rate. The most important factor in spinal cord metastasis is the location of the tumor which effaces the CSF cistern. MRI of whole spine is indicated in this group of patients.

Acknowledgement

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Potential conflicts of interest

None.

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รายงานการแพร่กระจายของเนื้องอกกลัยโอบลาสโตมาในสมองมาที่เนื้อไขสันหลังตลอดแนว

ดิลก ตันทองทิพย์, ภัทรวิทย์ รักษ์กุล

ภูมิหลัง*: ภาวะการกระจายของเนื้องอกกลัยโอบลาสโตมาในเนื้อสมองมาที่ส่วนของไขสันหลังนั้น เป็นภาวะที่พบได้น้อยมาก พยาธิสรีรวิทยาของภาวะนี้รวมทั้งปัจจัยเสี่ยงที่จะทำให้สามารถพบภาวะนี้ได้มากขึ้นนั้นยังไม่ทราบชัดเจน ก่อนหน้านี้มีรายงานอยู่บ้างในต่างประเทศว่าพยากรณ์โรคในผู้ป่วยกลุ่มนี้ไม่ดี และการดูแลรักษายังไม่ได้ข้อสรุปที่ชัดเจน*

กรณีศึกษา*: รายงานนี้กล่าวถึงลักษณะทางคลินิก ภาพถ่ายรังสี และพยาธิวิทยาในผู้ป่วยหญิง อายุ 46 ปี ซึ่งได้รับการรักษาโดยการผ่าตัดเนื้องอกกลัยโอบลาสโตมาในเนื้อสมองใหญ่ และต่อมาได้ตรวจพบการกระจายตัวของเนื้องอกมาที่ไขสันหลัง ซึ่งได้รับการตรวจพิสูจน์ทางพยาธิวิทยาโดยการส่งตรวจชิ้นเนื้อ จึงได้รายงานถึงปัจจัยเสี่ยงที่เป็นไปได้ในผู้ป่วยรายนี้ และผู้ป่วยที่มีรายงานในต่างประเทศ รวมถึงการพยากรณ์โรค*

สรุป*: ภาวะการกระจายตัวของเนื้องอกกลัยโอบลาสโตมาจากเนื้อสมองมาที่ไขสันหลังนั้น เป็นหนึ่งในการพยากรณ์โรคที่ไม่ดี ปัจจัยส่งเสริมให้เกิดภาวะนี้ในผู้ป่วยรายนี้ซึ่งตรงกับรายงานในต่างประเทศ คือการที่มีเนื้องอกที่ติดหรือชิดกับช่องทางเดินน้ำหล่อสมอง ซึ่งในผู้ป่วยกลุ่มนี้ผู้นิพนธ์เห็นควรให้มีการตรวจภาพถ่ายเอ็มอาร์ไอของไขสันหลังตลอดแนว เพื่อให้การรักษาได้เร็วขึ้น รวมถึงบอกการพยากรณ์ของโรคได้*