Cutaneous Metastases of the Glioma

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Abstract: Low grade glioma (LGG) is a very common primary brain neoplasm with a very good prognosis and the median survival of patients is approximately 8 years. With the development of current treatments such as surgery resection, radiotherapy, and chemotherapy, the recurrence rate and the distant metastasis rate of LGGs are largely decreased. Extracranial metastases are seldom happened. However, the authors present a pathologically proven patient with scalp metastasis, which was metastasized from LGG occurring site to the surgical scar 8 months following initial craniotomy and chemotherapy. The histopathologic examination of the primary site and the recurrent under the scalp are exactly similar. This grade of glioma was increased along with cutaneous metastases. A discussion of a series of the extracranial metastases of the glioma, especially for the surgical considerations, is also provided advice for the cutaneous metastases of the glioma.

Key Words: Cutaneous, glioma, metastases, review

Glioma is the highly aggressive and chemoresistant primary brain tumor, which always has extremely poor prognosis.1,2 Despite the rapid development of the multimodal therapy, most of those tumors recur.3 Compared with the recurrence rate of gliomas, the number of the metastasis of this tumor is few, especially for extracranial metastasis.4 Extracranial metastases to some organs such as pleura, lung, heart, lymph nodes, kidneys, liver, and bone marrow are contingently reported.4,5 However, cutaneous metastases have seldom reported. Here, we report a rare patient with scalp metastasis of the low grade glioma.

CLINICAL REPORT

A 32-year-old man presented with 2 months history of headache. He has a healthy body and has not any history of disease. Neurological and physical examination on admission demonstrated normal cranial never function, sensation, and strength. Computed tomography revealed a large cystic mass in the bilateral frontal lobe. Magnetic resonance imaging showed a 5 × 6 cm multiloculated cystic lesion had signal intensities as same as that of cerebrospinal fluid on T1-weighted imaging and T2-weighted imaging (Fig. 1A-C). The edge of the tumor showed a ring-like enhancement. Then, he denied having the recent history of infection after examining minutely to his history. The preoperative diagnosis was glioma.

The patient underwent the craniotomy through subfrontal approach and the horseshoe operative incision. Cut open the dura and operated cystic cavity puncture, yellow-colored thin fluid was aspirated from the cyst. The mixed density of tumor was completely removed with the help of microscopic instruments. After careful hemostasis, the wound was closed in the ordinary manner. Histologic examination of the tumor was (right frontal

FIGURE 1. (A–C) Preoperative magnetic resonance imaging: a 5 × 6 cm multiloculated cystic lesion had signal intensities as same as that of cerebrospinal fluid on T1-weighted imaging and T2-weighted imaging. (C) Histologic examination showed that there are polygonal tumor cells, round nuclear, different size, and part of bright the cytoplasm. Besides, focal area of cells is intensive, with blood vessel growth, and more sand body (×200).

FIGURE 2. (A) Photograph showing cutaneous isolated metastasis from glioma. (B, C, D) Postoperative computed tomography and magnetic resonance imaging after second the surgery showing mixed high and low density and the gas density. (E, F) Histologic examination showed that there are polygonal tumor cells, round and atypia nuclear, different size, part of bright the cytoplasm, clear cell boundary, dense part of the cell, and nuclear fission. External brain tumor cells between the muscle fiber (×200).
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Brief Clinical Studies

The region of the scalp were possibly ignored by the surgeons. However, he experienced sharp headache for 3 hours. Computed tomography was repeated 8 months postoperatively showing a 7 × 6 × 2 cm tumor on the temporals and multiple masses accompanied hemotoma in the frontal lobe (Fig. 2A-B). The patient underwent the craniotomy approach as same as the first operation. After the scalp cut, there is a 7 × 6 × 2 cm tumor which was combined with temporals closely. Then, a 1.8 × 1 × 0.5 cm tumor was found on the dura mater and a 6 × 6 × 1.5 cm tumor was found in the frontal lobe (Fig. 2C-D). There are also some scattered tumors in the intracranial. The vast majority of tumors were removed. Histopathologic examination showed (head), anaplastic astrocytoma (AA) WHO III level, especially the pathologic image have exactly similarity with inspection organization pathologic image after first operation (Fig. 2E-F).

DISCUSSION

Prior to 1979, Liwnicz et al described in detail brain tumors with extracranial metastases.

The radiotherapy and chemotherapy were used to avoiding the tumor recurrence and metastasis after operation. The stereotactic radiotherapy is the mainstream of the radiotherapy. The principle of stereotactic radiotherapy is that high energy rays were focused on the point in the intracranial and destroyed it through the stereotactic techniques. The stereotactic radiotherapy not only avoids the damage of the neural structures but also destroys the tumor. Temozolomide (TMZ) is a new effective chemotherapy drug for gliomas, specially apply to high grade glioma, AA, and morphic GBM treatment. Due to its advantages of quick absorption and easily through the blood–brain barrier, TMZ easily get the favor of the neurosurgeon. According to the literature reports, the ratio of TMZ’s plasma to brain ridge liquid is close to 30% to 40%. The effects of TMZ on tumor cells are nucleic acid, protein and peptide nucleophilic area, also tumor cells of each phase.

There are some pathogenic mechanisms can be explain its occurrence. First, the most logical explanation is that the implantation of tumor tissues through the surgical instruments during surgery. The region of the scalp were possibly ignored by the radiotherapy and few affected by TMZ. Second, dura mater was possibly invaded by tumor, and tumor growth along the dura extending to the scalp. Third, postoperative neovascularization of the dura contributes to the metastasis of the tumor cells as the invasion of those vascellum, or the metastasis of the blood. And fourth, the famous mechanism of disease progression is extending to the scalp.