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CASE REPORT

Meningioma with Purely Intratumoral Hemorrhage Mimicked Intracerebral Hemorrhage: Case Report and Literature Review

Ruei-Hong Lin[1], Chiung-Chyi Shen[1]

[1]*Department of Minimally Invasive Skull Base Neurosurgery, Neurological Institute, Taichung Veterans General Hospital, 1650 Taiwan Boulevard Section 4, Taichung, Taiwan 40705, ROC*

Meningiomas are the most common non-glial intracranial tumor with an incidence of 2.3–5.5/100,000 people, accounting for 20–30% of all primary adult brain tumor diagnoses. Meningiomas associated with hemorrhage are rare; the reported incidence is 0.5–2.4%. We share a case experience of meningioma with purely intratumoral hemorrhage. The initial image study of the intratumoral hemorrhage mimicked intracerebral hemorrhage. A 63-year-old woman with initial presentation of headache, dizziness, nausea, and vomiting has brought to the emergent department. The brain computed tomography showed a 5.3 cm hyperdense lesion over the left occipitotemporal area. Under the impression of intracerebral hemorrhage with unknown etiology, the brain magnetic resonance imaging was done for tumor survey and showed lobulated enhanced mass over left T-O area. Tumor with bleeding with skull bone invasion was first considered. The surgical pathology revealed atypical meningioma with focal clear cell change (World Health Organization Grade II), which is separated with the brain by pia meter. Meningiomas associated with hemorrhage are rare; the reported incidence is 0.5–2.4%. The clinical features about increasing bleeding tendency: (i) age >70 years old or <30 years old; (ii) the location of meningiomas locate at intraventricle or convexity; (iii) histopathalogical type: Meningotheliomatous, malignant, fibrous, and angioblastic type. Most reported intracranial hemorrhages associated with meningiomas are found in the subarachnoid and subdural spaces. There are several hypotheses for the possible mechanism of tumoral bleeding. The tumoral bleeding in meningioma is a rare event. The incidence depended on the location and the histopathological finding. There might be other indicators but still need more research.

Key words: Intratumoral hemorrhage, intracerebral hemorrhage, meningioma

INTRODUCTION

Meningiomas are the most common nonglial intracranial tumor with an incidence of 2.3–5.5 per 100,000 people,[1,5,6] accounting for 20–30% of all primary adult brain tumor diagnoses.[8,9] They are mostly benign, slow-growing, and highly vascular tumors. Spontaneous intracranial hemorrhage occurs in 5.1% of all brain tumors,[13] mostly in pituitary adenomas, highly vascularized tumors such as medulloblastoma, neuroblastoma, ependymoma, oligodendroglioma, or metastatic tumors.[2,11,13,14,18] Meningiomas associated with hemorrhage are rare; the reported incidence is 0.5–2.4%.[10-13] Most reported intracranial hemorrhages associated with meningiomas are found in the subarachnoid and subdural spaces.[10,14-32]

Purely, intratumoral hemorrhage was much rarer event. In this report, we share a case experience of meningioma with purely intratumoral hemorrhage. The initial image study of the intratumoral hemorrhage mimicked intracerebral hemorrhage.

CASE REPORT

A 63-year-old woman visited our emergent department due to acute onset of headache. Otherwise, dizziness, nausea, and vomiting were also complained. Her vital signs were within

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Corresponding Author: Dr. Chiung-Chyi Shen, Department of Minimally Invasive Skull Base Neurosurgery, Neurological Institute, Taichung Veterans General Hospital, 1650 Taiwan Boulevard Section 4, Taichung 40705, Taiwan, ROC. Tel: (886) 4-23592525 ext. 4074; Fax: +886- 4-23741218. E-mail: ccshen@vghtc.gov.tw

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normal limit and the neurologic examination showed no abnormalities. She only took medication for Type II diabetes mellitus control since 5 years ago. At the emergent department, the brain computed tomography showed a 5.3 cm hyperdense lesion over the left occipitotemporal area [Figure 1a] with partial skull bone erosion [Figure 1b]. Under the impression of intracerebral hemorrhage with unknown etiology, she was admitted to intensive care unit for further survey.

Because of skull bone erosion, the possibility of tumor involvement was considered initially. After discussion with the patient and the family, pre- and post-contrast brain computed tomography was repeated in the next day after admission. The brain computed tomography revealed huge mass lesion about 5.3 cm in size at left T-O junction with adjacent skull bone erosion, and partial enhancement and partial hemorrhage were noted [Figure 1a and c]. Tumor growth with bleeding was favored. The brain magnetic resonance imaging was done for tumor survey and showed lobulated enhanced mass with isointensity in T1-weighted (T1W) and T2W series and acute hemorrhage [Figure 2a-c]. Tumor with bleeding with skull bone invasion was suspected, and hemangiopericytoma, metastasis, or other intra- or extra-axial tumor was considered. There was difficult to differentiate which kind of tumor is.

After discussion with the patient, an elective operation for left T-O craniotomy with removal of the brain tumor was planned. During operation, the skull bone was involved by the tumor and sent for pathology. The tumor was attached to the dura and tumor biopsy was done for frozen section. The frozen section report favored meningioma, and malignant meningioma might be considered. Due to the highly possibility of malignancy, en-bloc resection with some brain parenchyma was performed smoothly. After the operation, the patient recovered smoothly, and no neurological deficit was noted.

The surgical pathology revealed atypical meningioma with focal clear cell change (World Health Organization Grade II), and the labeled index of immunohistochemical stain for Ki-67 is about 10%. No psammoma body is seen, and brain tissue is also seen, which is separated with tumor by pia meter. No intratumoral necrosis is identified.

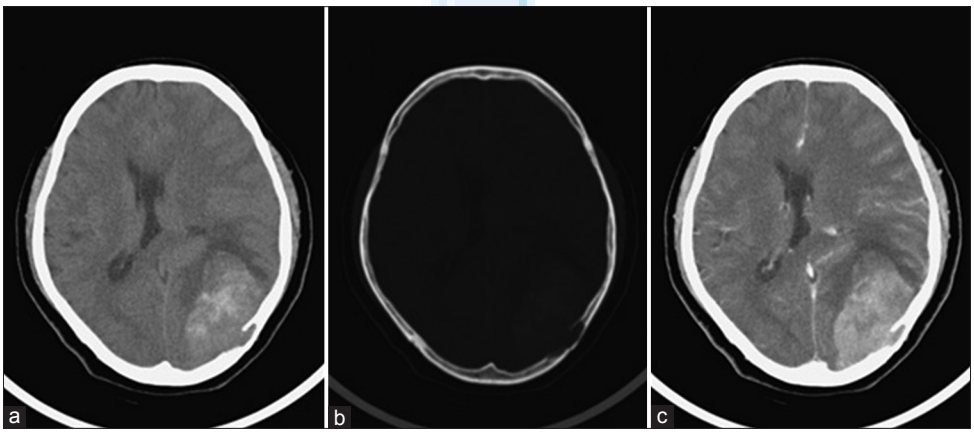

Figure 1: Brain computed tomography. (a) Precontrast imaging. Heterogeneous hyperdense mass lesion at left occipital area. (b) Bone window imaging. Skull bone erosion at left occipital area. (c) Postcontrast imaging. Enhanced mass lesion at left occipital area

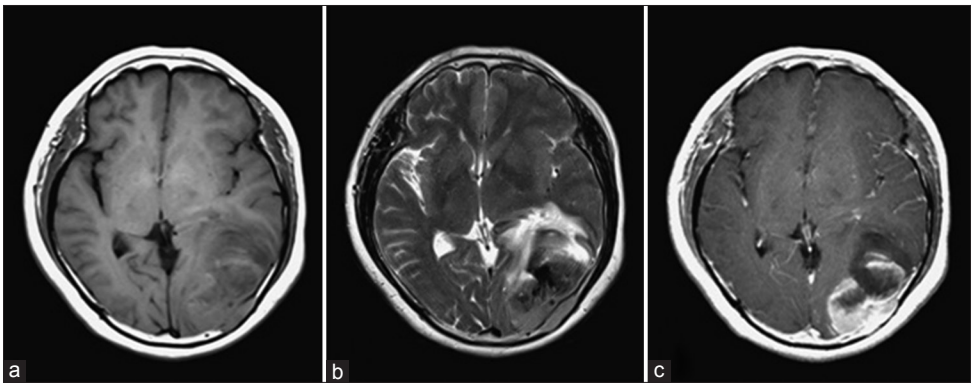

Figure 2: Magnetic resonance imaging. (a) T1-weighted image. Iso-intense signal at the peripheral area of the mass lesion. Iso- to mildly hypo-intense signal at the central area of mass lesion. (b) T2-weighted image. Iso-intense signal at the peripheral area of the mass lesion. Hypointense signal at the central area of mass lesion. (c) T1-weighted image with gadolinium enhancement. Gadolinium enhancement at the peripheral area of the mass lesion

The patient discharged after radio-oncologist consultation on the postoperative day 12.

DISCUSSION

Spontaneous intracranial hemorrhage occurs in 3.9% of all brain tumors,[14] mostly in pituitary adenomas, highly vascularized tumors such as medulloblastoma, neuroblastoma, ependymoma, oligodendroglioma, or metastatic tumors.[11,13,14,18] Meningiomas associated with hemorrhage are rare; the reported incidence is 0.5–2.4%.[10-13] However, in another clinical study, 2 of 126 meningiomas showed radiological macroscopic hemorrhages and 9 of 126 meningiomas showed microscopic hemorrhages.[33] The clinical features about increasing bleeding tendency:[3] (i) Age >70 years old or <30 years old; (ii) the location of meningiomas locate at intraventricle or convexity; (iii) histopathological type: Meningotheliomatous, malignant, fibrous, and angioblastic type. In this case, the meningioma located at convexity and the histopathological type is atypical meningioma.

Most reported intracranial hemorrhages associated with meningiomas are found in the subarachnoid and subdural spaces.[10,14-31] There is association between the location of meningioma and the hemorrhage type. Subdural hemorrhage was present in 49.2% of convexity meningioma. Subarachnoid hemorrhage was present in 67.4% of tumor locations other than the convexity, parasagittal, and falcine regions.[3] Purely, intratumoral hemorrhage was much rarer event. In this case, the intact pia meter separated the brain parenchyma and the tumor. No subarachnoid hemorrhage or subdural hemorrhage was noted.

The characteristics in magnetic resonance imaging might provide some information about the risk of tumoral bleeding. Hyperintensity on T2W magnetic resonance imaging might be an indicator but had not been fully established.[10] Hyperintensity on T2W magnetic resonance imaging also indicate the tumor's soft consistency[34,35] and high proliferative nature.[7,36] The signal on T2W is not an independent indicator, and there is doubt in some situations. For example, the fibrous meningioma had hemorrhage tendency but presents relatively hypointense in T2W magnetic resonance imaging.[34]

The mechanism of tumoral bleeding is unclear. There are several hypotheses for the possible mechanism:[4,14] (1) Tumor grows rapidly and the abnormal newborn vessel is too fragile to rupture because of the extension and distortion by tumor.[13] (2) Inadequate proliferation of tumoral vessels results in necrosis and bleeding. (3) The peritumoral normal vessels are invaded by tumor. (4) The degeneration, thrombosis, cell embolus of tumoral vessels lead to bleeding. (5) Other factors: Vessel occlusion by radiotherapy, abnormal blood coagulation, hepatopathy and anti-coagulation treatment and trauma might result in tumoral bleeding.

Tumoral bleeding is associated with higher morbidity and mortality rates. Mortality rates of hemorrhagic meningiomas have been found to be 21.1% overall and 9.5% in surgically treated patients.[3] The mortality rate is different between the types of tumoral bleeding, but no statistical significance was noted.[3] There was no comparison between pure intratumoral bleeding and other types of tumoral bleeding. We suppose the pure intratumoral bleeding might result in better clinical outcomes, because of (1) limited amount of hematoma, and (2) no brain parenchymal injury. Massive tumoral bleeding must lead to extra-tumoral hematoma. There was no established evidence, and the hypothesis still needs large study to discuss.

CONCLUSION

The tumoral bleeding in meningioma is rare event. The incidence depended on the location and the histopathological finding. There might be other indicators but still need more research.

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Conflicts of interest

There are no conflicts of interest.

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