Case Report

Intracerebral hemorrhage as initial presentation of metastatic choriocarcinoma: A case report✩✩,✩,*

Tiantian Zhou, BSb, Shun Zhang, MDa, Yuanyuan Qin, MDa,*, Wenzhen Zhu, MDa

a Department of radiology, Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology
b Department of radiology, the Third People's Hospital of Hubei Province

ARTICLE INFO

Article history:
Received 25 July 2020
Revised 5 September 2020
Accepted 8 September 2020

Keywords:
Intracerebral hemorrhage
Choriocarcinoma
Metastasis

ABSTRACT

Metastatic brain tumors are the rare cause of intracerebral hemorrhage in the young. In this study, we present a case of a 24-year-old woman who suffered from brain and lung metastatic choriocarcinoma with intracerebral hemorrhage as initial presentation. Head computed tomography showed an irregular hematoma of the right frontal lobe and enlarged within 1 month. Chest X ray showed a mass in the right lung. This patient responded well with combined treatment with craniotomy for evacuation of hematoma, multidrug chemotherapy and lobectomy. This case report discusses a rare phenomenon of hemorrhage metastasis in the brain from choriocarcinoma. The better knowledge of this entity would facilitate earlier diagnosis and improve the outcome.

© 2020 Published by Elsevier Inc. on behalf of University of Washington.
This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/)

Introduction

Intracerebral hemorrhage (ICH) in the young is usually caused by arteriovenous malformations and aneurysms. Metastatic brain tumors are not frequently the cause. Among them, lung cancer, melanoma, and choriocarcinoma are most frequently quoted for their tendency to hemorrhage [1]. With an incidence of 1.92 in 40,000 pregnancies [2], choriocarcinoma is the most malignant tumor of gestational trophoblastic neoplasia (GTN) derived from any form of previously normal or abnormal pregnancy [3]. It grows rapidly and metastasizes to the lung, liver, and, less frequently, to the brain [4].

Abbreviations: ICH, Intracerebral hemorrhage; GTN, gestational trophoblastic neoplasia; HCG, human chorionic gonadotropin; EMA-CO, etoposide, methotrexate, actinomycin D, cyclophosphamide and vincristine; CT, computed tomography; MRI, magnetic resonance imaging; MRA, magnetic resonance angiography; DSA, digital subtraction angiography; FIGO, International Federation of Gynecology and Obstetrics; WHO, World Health Organization.

✩ The patient consented to publication of the case, and the study was approved by the Ethics Committee of Tongji Hospital (Wuhan, China). There is no conflicts of interest.
✩✩ Competing Interests: The authors declare that they have no conflict of interest.
* Funding: This study was funded by the National Natural Science Foundation of China (no. 81878390).
*Corresponding author.

E-mail address: qinyuanyuan-1021@163.com (Y. Qin).
https://doi.org/10.1016/j.radcr.2020.09.012
1930-0433/© 2020 Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/)
Fig. 1 – Head CT images showed an irregular hematoma in the frontal lobe for the first admission

Here we present a case of a 24-year-old woman who suffered from brain and lung metastatic choriocarcinoma with ICH as initial presentation and responded well with combined treatment with surgery and multidrug chemotherapy.

Case report

A 24-year-old woman was admitted to a local community hospital due to sudden headache and left limb weakness 6 hours ago. No history of hypertension could be identified. Head computed tomography (CT) showed an irregular hematoma of the right frontal lobe (Fig. 1). Laboratory findings revealed that serum β-human chorionic gonadotropin (β-HCG) level was elevated to 2266 mIU/mL, and CA199 level about 37.13 U/mL. She received mannitol dehyration and brain protective treatment, and was suggested to shift to general hospital for further treatment.

Two weeks after discharge from the local hospital, the patient was transferred to our center for sudden seizure 1 day ago. On presentation, she was in normal mental state with bilateral pupils equal and reacting. Left abduction of both eyes was limited. Her forehead wrinkles were symmetric with tongue deviation to the left. The muscle strength of left limb was grade IV, the right limb grade V. She had a normal delivery with a healthy baby 2 years ago and an abortion 1-year ago. She placed an intrauterine device 7 months ago and had a regular menstrual period for last 2 months.

During hospitalization, she presented 2 epileptic attacks with an elevation of serum β-HCG from 63,148 to 98,0893 ng/mL. With an intrauterine device and a regular menstrual period, gynecological ultrasonography also showed normal reproductuve system with no indication of pregnancy or ectopic pregnancy. Based on all these findings in a young woman, trophoblastic or germ cells tumors were strongly indicated. Head CT showed a new hemorrhage spot with inhomogeneous density on the edge of chronic hemorrhage foci (Fig. 2) and rapidly enlarged 10 days after admission (Fig. 3A) with much more heterogenous intensity. Head MRA (Fig. 3B) and digital subtraction angiography found no aneurysm or arterial venous malformation. Brain metastasis with ICH was impressed. Chest X ray showed a mass about 6cm in diameter in the right lung. Lung metastases were also impressed. Abdominal and pelvic CT scan found nothing abnormal.

Gynecological examination found a little dark red blood in vagina and thickening of the posterior wall of vagina. Biopsy showed that the vagina was covered with squamous epithelial polyps and matured differentiation. The subepithelial small vessel of vagina was dilated and congested, with focal hemorrhage. Based on these serial studies, the diagnosis of metastatic choriocarcinoma (brain and lung) was made, International Federation of Gynecology and Obstetrics stage IV, WHO risk factor 14 (high-risk).

The patient underwent first cycle of combinational etoposide, methotrexate, actinomycin D, cyclophosphamide and vincristine (EMA-CO) chemotherapy and received craniotomy for evacuation of hematoma afterwards. Histological examinations confirmed the diagnosis of brain metastasis of chorio-

Fig. 2 – Two weeks after discharge from the local community hospital, head CT demonstrated a new hemorrhage spot with inhomogeneous density on the edge of chronic hemorrhage foci

Fig. 3 – During the second hospitalization, the hematoma (A) rapidly enlarged 10 days after admission. (B). Head MRA found no aneurysm or arterial venous malformation
carcinoma (Fig. 4). After surgery, she underwent 6 cycles EMA-CO chemotherapy, following which her serum β-HCG level decreased rapidly. Compared with the baseline before any treatment (Fig. 5A), the diameter of the mass in lower lobe of right lung reduced gradually after second cycle (Fig. 5B), sixth cycle (Fig. 5C), and seventh cycle (Fig. 5D) of chemotherapy. Eight months later, her serum β-HCG level was within normal range (<0.1 mIU/ml). Then she received a partial lower lobectomy by thoracoscopic surgery and resected the mass of the right lung completely (Fig. 5E).

Long-term follow-up with evaluation of serum β-HCG levels every 3 months and CT of her chest and MRI of her brain every 6 months showed no evidence of disease. She is free of disease for 2 years. The patient consented to publication of the case.

Discussion

Choriocarcinoma usually develops within or outside the uterus following a gestational event. It constitutes the most aggressive entity among GTN. In females, 50% choriocarcinoma occur after hydatidiform mole, 25% after previous abortion, 22.5% in normal pregnancies, and 3% in subsequent to ectopic pregnancies [4,5]. The diagnosis of gestational choriocarcinoma is commonly seen during the first 6 months postpartum [6,7], but more than 2 years after normal pregnancy or abortion could also be found [3]. The onset of this woman reported was 1 year after abortion, resulting in greater difficulty for early diagnosis.

Rapid hematogenous spread to multiple organs is characteristic of choriocarcinoma. Favorable organs of involvement are the lung (94%) and vagina (44%), followed by the liver (28%) and brain (28%) [8]. The disease often presents with symptoms related to metastatic spread, as the primary tumor may remain very small or even regress spontaneously after metastases [3]. In patients with brain metastasis, they presented primarily with headaches, subarachnoid or ICH, epilepsy, or focal neurologic signs. As reported in our case, nearly all the patients with brain metastasis have concurrent pulmonary or vaginal involvement or both [4]. The presumed mechanism was that the source of cerebral metastases was originated from pulmonary metastases [9]. In rare cases, oncotic aneurysms could be found [3,4,6]. However, in our case, there was no remarkable findings on angiography. Alternatively, we found that a hematoma with inhomogenous density enlarged rapidly in a short time, indicating a predilection to invade and erode the vessel wall of the metastases, which can result in recurrent bleeding within the tumor [5].

In women at childbearing age, metastatic choriocarcinoma must be considered in the differential diagnosis of ICH because the clinical and radiological presentations are multiple. It is very difficult to differentiate the imaging appearances from those due to cerebrovascular disease [10]. However, apart from clinical and radiological signs, the key diagnostic feature of choriocarcinoma is an elevated serum β-HCG [2]. Elevation of β-HCG in the serum of a patient with a history of normal or abnormal pregnancy suggests the diagnosis of choriocarcinoma.

It is important to capture and treat patients as soon as possible because this tumor has a tendency to hematogenously spread and rapidly grow. The prognosis of this disease has been greatly improved by the introduction of effective cytotoxic chemotherapy. The EMA-CO therapy is considered the most effective treatment regimen for patients in high-risk group (International Federation of Gynecology and Obstetrics score >7 and Stage IV), producing long-term survival rate as high as 95% [2]. Patients with brain metastases at initial diagnosis of GTN have a high survival rate with intravenous
multidrug chemotherapy treatment without concomitant whole-brain radiotherapy [11]. This strategy, coupled with neurosurgery for hemorrhagic complications or increased intracranial pressure, can continue to be recommended in practice.

In conclusion, this case report discusses a rare phenomenon of hemorrhage metastasis in the brain from choriocarcinoma. The better knowledge of this entity would facilitate earlier diagnosis and improve the outcome. In addition, our case demonstrated that combined treatment with surgery and multidrug chemotherapy is the best choice regarding survival for high-risk patients.

REFERENCES

[1] Grisold W, Oberndorfer S, Struhal W. Stroke and cancer: a review. Acta Neurologica Scandinavica 2009;119:1–16.
[2] Ngan HYS, Seckl MJ, Berkowitz RS, Xiang Y, Golfer F, Sekharan PK, et al. Update on the diagnosis and management of gestational trophoblastic disease. Int J Gynaecol Obstet 2018;143(Suppl 2):79–85.
[3] Zairi F, De Saint Denis T, Thines L, Bourgeois P, Lejeune JP. Ruptured cerebral oncocytic aneurysm from choriocarcinoma: report of two cases and review of the literature. Acta Neurochir (Wien) 2011;153:353–7.
[4] Huang CY, Chen CA, Haieh CY, Cheng WF. Intracerebral hemorrhage as initial presentation of gestational choriocarcinoma: a case report and literature review. Int J Gynecologic Cancer 2007;17:1166–71.
[5] Kidd D, Plant GT, Scaravilli F, McCartney ACE, Stanford M, Graham EM. Metastatic choriocarcinoma presenting as multiple intracerebral haemorrhages: the role of imaging in the elucidation of the pathology. J Neurol Neurosurg Psychiatry 1998;65:939–41.
[6] Wang D, Shu H, Zhang Q, Zhang H, Qing C, Wang H. Brain metastasis of choriocarcinoma presenting as multiple intracranial hematomas: A case report. Medicine (Baltimore) 2018;97:e12275.
[7] Song L, Li Q, Yin R, Wang D. Choriocarcinoma with brain metastasis after term pregnancy: a case report. Medicine (Baltimore) 2018;97:e12904.
[8] Weir B, MacDonald N, Mielke B. Intracranial vascular complications of choriocarcinoma. Neurosurgery 1978;2:138–42.
[9] Athanassiou A, Begent RH, Newlands ES, Parker D, Rustin GJ, Bagshawe KD. Central nervous system metastases of choriocarcinoma. 23 years’ experience at Charing Cross Hospital. Cancer 1983;52:1728–35.
[10] Lappin JM, Darke S, Dufou J, Kaye S, Farrell M. Fatal stroke in pregnancy and the puerperium case series. Stroke 2018;49:3050–3.
[11] Gavanier D, Leport H, Massardier J, Abbas F, Schott AM, Hajri T, et al. Gestational trophoblastic neoplasia with brain metastasis at initial presentation: a retrospective study. Int J Clin Oncol 2019;24:153–60.