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Case Report

Hemorrhagic brain metastasis from small-cell carcinoma of the urinary bladder

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ABSTRACT

Background: Small-cell carcinoma of the urinary bladder (SCCB) accounts for 1% of all bladder tumors. We present a rare case of hemorrhagic metastatic brain tumor from SCCB diagnosed by navigation-guided endoscopic biopsy.

Case Description: A 76-year-old man presented with sudden onset of aphasia and right hemiplegia from 3 weeks previously. He had a medical history of prostate cancer and SCCB. Computed tomography showed a mixed density mass in the left basal ganglia. On magnetic resonance imaging, the mass showed mixed intensity in both T1-weighted images and T2-weighted images, suggesting subacute hemorrhage. The mass was partially enhanced with gadolinium. The patient underwent endoscopic hematoma evacuation and partial removal of the tumor. Histopathological diagnosis was neuroendocrine carcinoma, which was consistent with SCCB metastasis. After surgery, the patient underwent whole-brain radiation therapy of 30 Gy. His general condition gradually deteriorated, however, and he died 4 months after surgery.

Conclusion: Our patient had a rare case of brain metastasis derived from SCCB which presented with cerebral hemorrhage. Navigation-guided endoscopic biopsy was useful for the diagnostic sampling of deep localized brain tumors with hemorrhage.

Keywords: Hemorrhagic brain metastasis, Navigation-guided endoscopic biopsy, Small-cell carcinoma of the urinary bladder

INTRODUCTION

Small-cell carcinoma of the urinary bladder (SCCB) is a very rare neuroendocrine tumor, accounting for only about 1% of all bladder cancers.[3] The biological behavior of SCCB is more aggressive than bladder urothelial carcinoma.[13] Here, we report a case of a hemorrhagic metastatic brain tumor from SCCB diagnosed by navigation-guided endoscopic biopsy.

CASE DESCRIPTION

A 76-year-old man was referred to our outpatient department with the complaints of sudden onset of aphasia and right hemiplegia from a few weeks previously. He underwent transurethral resection of SCCB 2 years before the current presentation. After three courses of preoperative

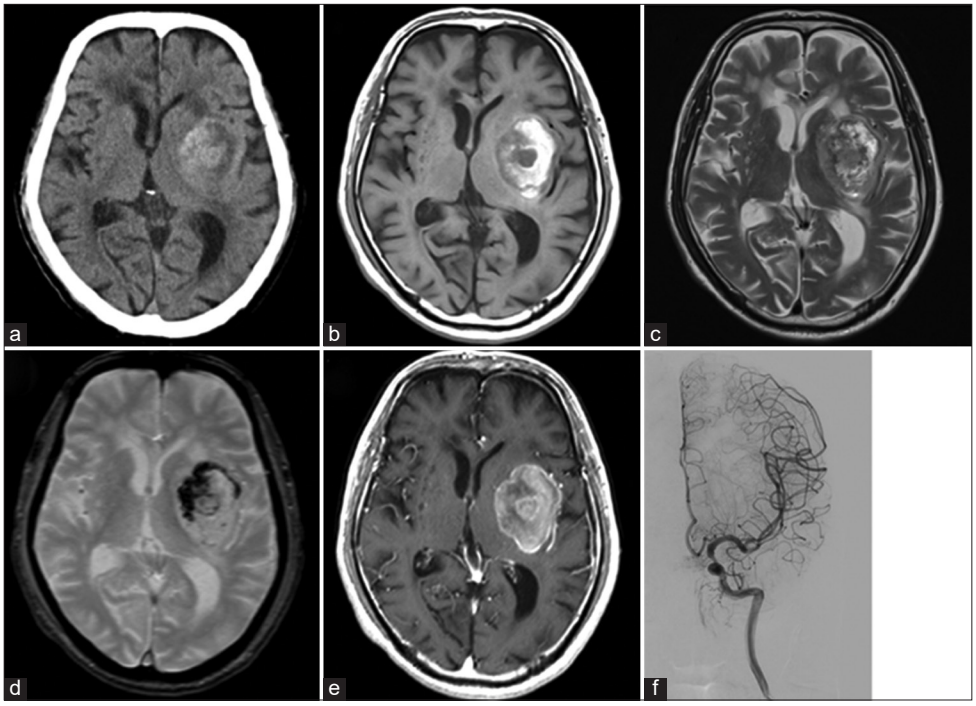

Figure 1: Preoperative computed tomography scan (a) shows a mixed density mass in the left basal ganglia. On magnetic resonance imaging, the mass shows mixed intensity in T1-weighted images (b), T2-weighted images (c), and T2*-weighted images (d), suggesting subacute hemorrhage. The mass is partially enhanced with gadolinium (e), cerebral angiography (f) shows no tumor stains.

chemotherapy with irinotecan and carboplatin, the patient underwent total cystectomy. After the surgery, no local or systemic metastasis was observed in periodic positron emission tomography. He had not been examined with brain magnetic resonance imaging (MRI) for screening after total cystectomy. On admission, Glasgow Coma Scale was 14 (E4V4M6), and physical examination revealed motor aphasia and right hemiparalysis (manual muscle test, 3/5). Head computed tomography (CT) showed a 40 mm diameter round, mixed-density lesion in the left basal ganglia [Figure 1a]. On MRI, the mass showed mixed intensity in T1-weighted, T2-weighted, and T2*-weighted imaging, suggesting subacute hemorrhage [Figures 1b-d]. The mass was partially enhanced with gadolinium [Figure 1e]. Cerebral angiography revealed no mass stain [Figure 1f]. Systemic CT showed no recurrence of SCCB or obvious metastasis to other organs.

Hematoma evacuation and partial tumor removal were performed by navigation-guided endoscopy. After removal of the hematoma, the solid tumor was partially removed [Figure 2]. Postoperative magnetic resonance images also showed that the mass was partially excised [Figure 3].

Hematoxylin and eosin staining showed diffuse sheets of small atypical cells with blood vessels [Figure 4]. The atypical cells were enlarged in a round shape with increased chromatin volume. Atypical transitional cells were not apparent. The tumor cells were immunoreacted for CAM5.2, CD56, synaptophysin, chromogranin A, and thyroid transcription factor 1 [Figure 4]. Histopathological diagnosis was neuroendocrine carcinoma, which consisted of metastasis from SCCB.

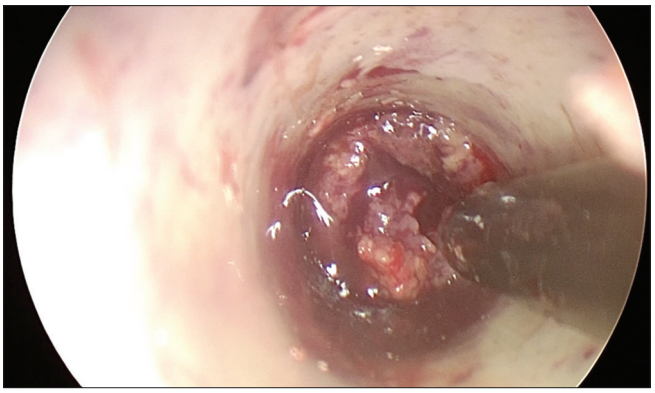

Figure 2: Surgical view shows a solid tumor after removal of the hematoma.

His aphasia and right hemiplegia did not improve after the surgery. Whole-body scintigraphy showed no other metastases. The patient was diagnosed with single-organ metastasis to the brain and he underwent whole-brain irradiation (30 Gy/10 fraction), but no additional chemotherapy was administered in consideration of his

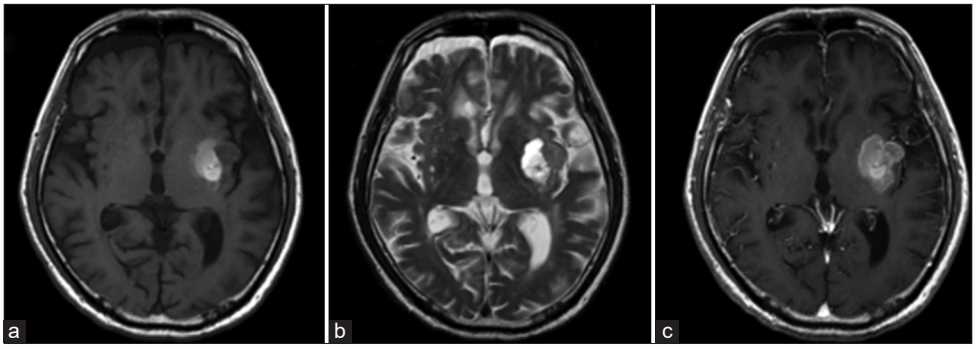

Figure 3: Postoperative T1-weighted images (a), T2-weighted images (b), and contrast-enhanced T1-weighted images (c) show that the mass is partially excised.

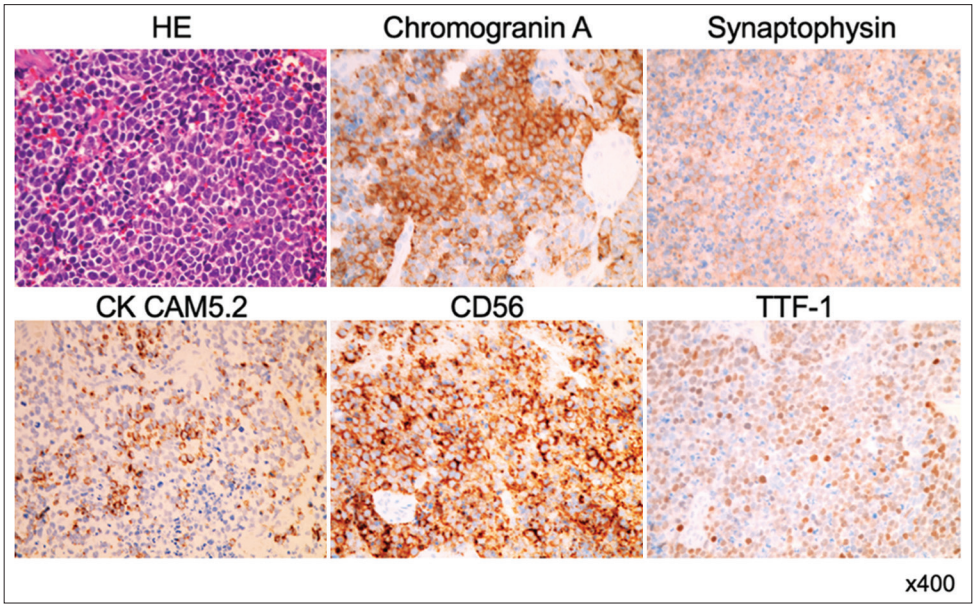

Figure 4: Photomicrographs of the surgical specimen stained with hematoxylin and eosin show dense sheets of malignant small round cells with hyperchromatic nuclei. Immunohistochemical stains show that tumor cells are immunoreacted for synaptophysin, chromogranin A, CK CAM5.2, CD56, and thyroid transcription factor 1.

low Karnofsky performance status (40 scores). The patient was transferred to a rehabilitation hospital, but his general condition gradually deteriorated and he died 4 months after surgery.

DISCUSSION

SCCB is a type of neuroendocrine carcinoma with similar histopathological features to that of small-cell carcinoma of the lung. It accounts for 1% of all bladder tumors, with a strong male predominance.[3] The mean age of the patients with SCCB is 65 years, ranging between 57 and 74 years in reported cases, and it occurs more frequently in smokers.[2,13] The biologic behavior of SCCB is more aggressive than that of bladder urothelial carcinoma.[3] SCCB is associated with a high frequency of distant metastases and very poor prognosis, with median overall survival of 28 months.[2]

Due to its low disease incidence, the optimal therapeutic strategy of SCCB remains uncertain. Neoadjuvant chemotherapy, followed by surgical resection and adjuvant chemotherapy, has shown better outcomes in retrospective studies.[6,8,11] The most common sites of metastasis are the lymph node (28.6%), liver (23.8%), bones (23.8%), lungs (9.5%), and the brain (7.9%).[2] The frequency of brain metastasis in SCCB is lower than that of small-cell carcinoma of the lung, so prophylactic whole-brain irradiation is not recommended.[2]

Intracerebral hemorrhage (ICH) derived from brain metastasis was present in 14% of all reported cases of brain metastasis.[12] ICH from brain metastasis has been suggested to occur in high proliferative and vascular tumors such as malignant melanoma, renal cell carcinoma, choriocarcinoma, and bronchogenic carcinoma.[9,12] This is the first known

case report of hemorrhagic brain metastasis of SCCB. Isaka *et al*. reported that brain metastatic lesion of SCCB showed abundant vascular stains on cerebral angiography and that hemostasis was very difficult during surgery.[4] Based on these findings, brain metastatic lesions of SCCB may be prone to causing hemorrhage.

At the subacute stage of cerebral hemorrhage, the surrounding blood–brain barrier is disrupted by the hemorrhage, and neovascularization without blood–brain barrier causes contrast enhancement in the hemorrhage site and its surrounding area.[1,7] Histopathological diagnosis should, therefore, be considered if the tumor and hemorrhage cannot be distinguished by imaging alone. Compared with conventional stereotactic biopsy, navigation-guided endoscopic biopsy enables intraoperative visualization of the lesion, collection of a sufficient amount of specimen, and confirmation of hemostasis.[5,10] Especially in the case of tumors with hemorrhage, visualization of the tumor using endoscopy is important because the removal of hemorrhage is expected to cause dislocation in the navigation system.

CONCLUSION

Our patient presented a rare case of hemorrhagic brain metastasis of SCCB. Navigation-guided endoscopic biopsy was useful for the diagnostic sampling of intraparenchymal brain tumors with hemorrhage.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Aksoy D, Bammer R, Mlynash M, Venkatasubramanian C, Eyngorn I, Snider RW, *et al*. Magnetic resonance imaging profile of blood-brain barrier injury in patients with acute intracerebral hemorrhage. J Am Heart Assoc 2013;2:e000161.
2. Bex A, Sonke GS, Pos FJ, Brandsma D, Kerst JM, Horenblas S. Symptomatic brain metastases from small-cell carcinoma of the urinary bladder: The Netherlands cancer institute experience and literature review. Ann Oncol 2010;21:2240-5.
3. Choong NW, Quevedo JF, Kaur JS. Small cell carcinoma of the urinary bladder: The mayo clinic experience. Cancer 2005;103:1172-8.
4. Isaka T, Maruno M, Sato M, Kinoshita M, Nishida T, Kiyohara H, *et al*. Brain metastasis from small-cell neuroendocrine carcinoma of the urinary bladder. Brain Tumor Pathol 2002;19:117-22.
5. Ishikawa E, Yamamoto T, Matsuda M, Akutsu H, Zaboronok A, Kohzuki H, *et al*. Intraparenchymal brain-lesion biopsy guided by a rigid endoscope and navigation system. Surg Neurol Int 2015;6:149.
6. Ismaili N. A rare bladder cancer-small cell carcinoma: Review and update. Orphanet J Rare Dis 2011;6:75.
7. Keep RF, Zhou N, Xiang J, Andjelkovic AV, Hua Y, Xi G. Vascular disruption and blood-brain barrier dysfunction in intracerebral hemorrhage. Fluids Barriers CNS 2014;11:18.
8. Lynch SP, Shen Y, Kamat A, Grossman HB, Shah JB, Millikan RE, *et al*. Neoadjuvant chemotherapy in small cell urothelial cancer improves pathologic downstaging and long-term outcomes: Results from a retrospective study at the MD Anderson cancer center. Eur Urol 2013;64:307-13.
9. Ma R, Fang SK, Hou S, Wang X, Meng HM. Suspected brain metastasis from lung cancer mimicking intracerebral hemorrhage: A case report. Medicine (Baltimore) 2018;97:2-4.
10. Tsuda K, Ishikawa E, Zaboronok A, Nakai K, Yamamoto T, Sakamoto N, *et al*. Navigation-guided endoscopic biopsy for intraparenchymal brain tumor. Neurol Med Chir (Tokyo) 2011;51:694-700.
11. Warrick JI. Clinical significance of histologic variants of bladder cancer. J Natl Compr Canc Netw 2017;15:1268-74.
12. Yoo H, Jung E, Gwak HS, Shin SH, Lee SH. Surgical outcomes of hemorrhagic metastatic brain tumors. Cancer Res Treat 2011;43:102-7.
13. Zhao X, Flynn EA. Small cell carcinoma of the urinary bladder a rare, aggressive neuroendocrine malignancy. Arch Pathol Lab Med 2012;136:1451-9.

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