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Case Report

Efficacy of selective transarterial chemoembolization for recurred liver metastases from intracranial meningioma: A case report [☆]^{☆☆}

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ABSTRACT

Extracranial metastases from intracranial meningioma involve multiple organs with repeatedly recurrence. Due to the rarity of these metastases, management remains to be established, especially in cases that are not amenable to surgery, such as postsurgical relapse and multiple metastases. We present the case of a right tentorial meningioma with multiple extracranial metastases, including postsurgical recurrent liver metastases. The intracranial meningioma was surgically resected when the patient was 53 years of age. The patient was 66 years of age when the hepatic lesion was first revealed, for which an extended right posterior sectionectomy was performed. Histopathology demonstrated a metastatic meningioma. Twelve months after liver resection, multiple local recurrences in the right hepatic lobe were revealed. Because additional surgical resection would put the patient at risk of declining residual liver function, we performed selective transarterial chemoembolization, resulting in a reduction in size and good control without relapse. Selective transarterial chemoembolization for incurable liver metastatic meningiomas could be valuable in palliating patients unsuitable for surgery.

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Introduction

Intracranial meningioma is the most common benign intracranial neoplasm. Extracranial metastases have been described in the medical literature but are rare, accounting for less than 0.1%-0.2% of cases [1]. The lungs (37.2%), bones (16.5%), intraspinal region (15.2%), and liver (9.2%) are the most common sites of extracranial metastasis [2]. Due to its rarity, management remains challenging and problematic, especially in cases of postsurgical relapse and multiple metastases. Herein, we describe the case of a patient with an intracranial meningioma that led to recurrent liver metastasis, which was treated with selective arterial chemoembolization.

Case presentation

A 69-year-old man was diagnosed with a right tentorial meningioma at 53 years of age when he presented with dizziness (Figs. 1A and B). He underwent surgical resection at that time, resulting in subtotal removal. Histopathological examination revealed an atypical meningioma. Local recurrence occurred repeatedly, and gamma knife radiosurgery was performed 3 times 2, 6, and 10 years after the initial surgery (Figs. 1C and D).

Thirteen years after the initial surgery, he presented to our hospital with right lower back pain. Computed tomography (CT) revealed mass lesions in the right ilium and body of the thoracic vertebra, as well as a hypervascular lesion in the right hepatic lobe (Figs. 2A and B). A small nodule was also observed in the right upper lobe of the lung and the left kidney. Needle biopsy of the right iliac lesion was performed, revealing metastasis of the meningioma. Radiotherapy was administered for the right iliac and thoracic lesions.

For the hepatic lesion, which increased in size, extended right posterior sectionectomy was performed. Histopathology revealed the proliferation of spindle-shaped cells with fascicles or whorl-like structures, confirming a metastatic meningioma (Fig. 2C). The patient had no postoperative complication; subsequently, the lung lesion was surgically resected. The kidney lesion was also treated with radiotherapy.

Twelve months after liver resection, follow-up CT revealed multiple local recurrences in the right hepatic lobe, which gradually increased in size (Fig. 2D). We considered that additional surgical resection was likely to cause a decline in residual liver function, and endovascular treatment, such as selective arterial chemoembolization, was considered a better palliative treatment for the multiple and hypervascular metastatic lesions.

The treatment strategy was similar to that used in hepatocellular carcinoma [3]. The procedure was performed via the transfemoral route under local anesthesia. Digital sub-

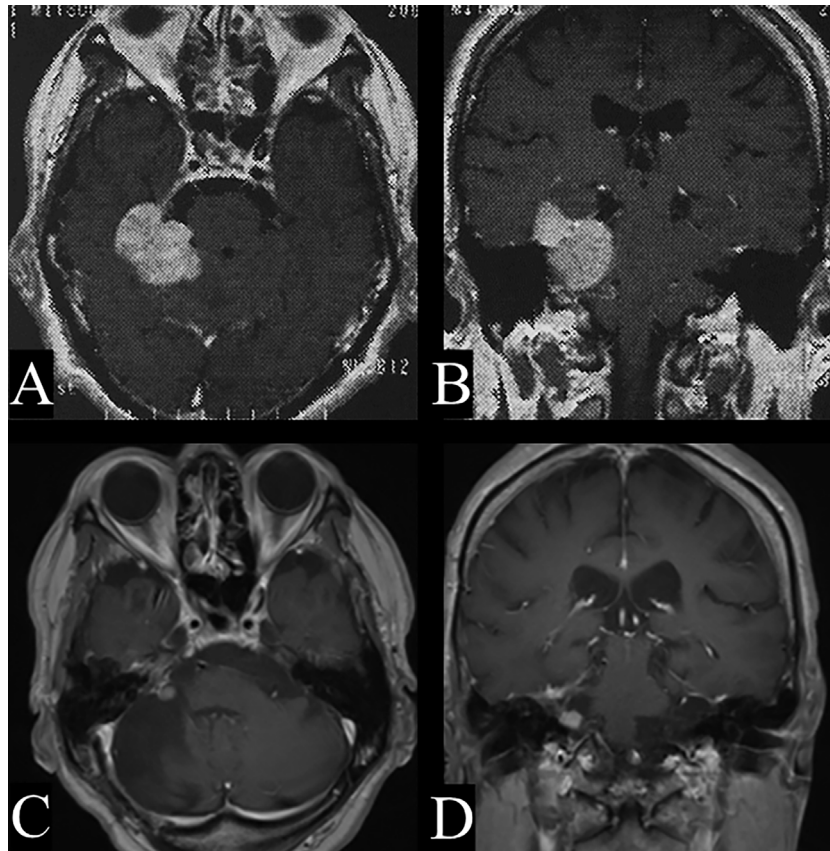


Fig. 1 – (A, B) Initial magnetic resonance imaging (MRI) showing right tentorial meningioma. (C, D) MRI 16 years after the initial surgery showing residual tumor in the posterior fossa.

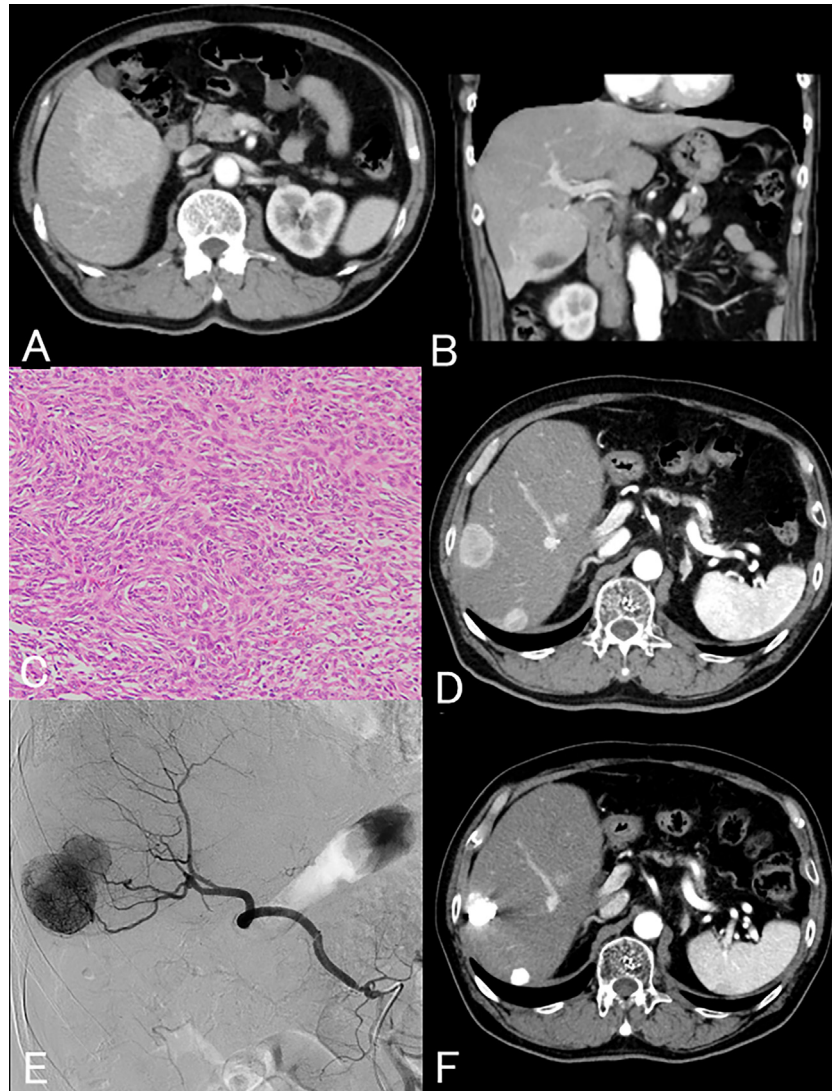


Fig. 2 – (A, B) Contrast-enhanced computed tomography (CT) at the arterial phase showing a hypervascular lesion in the right hepatic lobe. (C) Histological analysis shows proliferation of spindle cells arranged in intersecting short fascicles or small whorl-like structures, confirming the meningioma (hematoxylin and eosin staining, original magnification $\times 100$). (D) Twelve months after liver resection, follow-up CT showing local recurrences in the residual hepatic lobe. (E) The right hepatic artery angiography showing tumor staining. (F) Six months after transarterial chemoembolization, CT scan showing the reduction in tumor size of without any local recurrence.

traction angiography showed tumor staining predominantly at the right hepatic artery but not the portal vein (Fig. 2E). After a 4-Fr catheter (CX Catheter; Gadelius, Tokyo, Japan) was introduced into the right hepatic artery, a 1.9-Fr microcatheter (Asahi Tellus; Asahi Intecc, Nagoya, Aichi, Japan) was navigated to its anterior branch. Miriplatin (70 mg) mixed with Lipiodol (iodine combined with ethyl esters of fatty acids of poppyseed oil) was injected, followed by gelatin sponge particle injection. Postprocedural angiography showed reduced tumor staining and intratumoral retention of Lipiodol, and the procedure was terminated. The patient had a favorable postoperative course. A follow-up CT scan revealed a definite and continuing reduction in the size of

the tumor mass without local recurrence for 6 months (Fig. 2F).

Discussion

The treatment for metastatic meningiomas remains to be established. Surgical resection has been performed as an initial treatment in most previous studies; however, some patients are not amenable to further surgery because of their general condition and tumor progression. Alternative therapies for patients precluding surgical resection are poorly documented.

To the best of our knowledge, only 3 cases of inoperable hepatic metastasis from intracranial meningeal tumors were treated palliatively via transarterial chemoembolization [4–6]. Of these cases, 2 had recurrence after resection, and one had multiple intrahepatic metastases. Generally, the endovascular treatment for hepatic tumor is characteristic of chemotherapeutic and hypoxic effects on tumors and is mainly performed for inoperable hepatocellular carcinomas as it is safer and less invasive [7]. Metastatic tumors with hypervascularity, such as neuroendocrine tumors and renal cell carcinomas, have also been treated using transarterial chemoembolization, resulted in good tumor control [8,9]. In addition, in cases with local recurrences, endovascular treatment can be performed repeatedly without a further decline in liver function [2]. Liver metastases from intracranial meningioma have been proposed to be disseminated through hematogenous routes, and many have multiple lesions and local recurrences, as in our case [2]. The present case involved multiple hypervascular metastases with recurrence, which were unsuitable for surgery, and were thus treated with selective arterial chemoembolization, resulting in reduced size and good control without relapse. In this regard, selective transarterial treatment could be valuable in palliating patients with recurred liver metastatic meningiomas that are not amenable to surgery.

The present treatment included the chemotherapeutic drug miriplatin, which contains platinum complex agents. Platinum agents have been widely used against many epithelial malignancies. Indeed, preliminary in vitro studies demonstrated that the meningioma cell line was sensitive to cisplatin [10]. Because systemic medical therapy is limited in meningiomas, the findings of the present case, which indicate that transarterial chemotherapy with miriplatin might potentially respond to metastatic meningioma without any complications, will help advance the investigation of chemotherapy for meningiomas.

Conclusion

Selective transarterial chemoembolization for incurable liver metastatic meningiomas could be valuable in palliating patients unsuitable for surgery.

Patient consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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