Transarterial Embolization With Use of Lipiodol and Gelatin Sponge for Active Nasal Bleeding From Hepatocellular Carcinoma Metastasis in the Pituitary Gland

—Case Report—

Tomoji TAKIGAWA,1 Yuji MATSUMARU,1 Mikito HAYAKAWA,1 Kenji IKEDA,2 and Akira MATSUMURA3

Departments of 1Endovascular Neurosurgery and 2Hepatology, Toranomon Hospital, Tokyo; 3Department of Neurosurgery, Institute of Clinical Medicine, Graduate School of Comprehensive Human Sciences, University of Tsukuba, Tsukuba, Ibaraki

Abstract

A 58-year-old man presented with a very rare case of pituitary metastasis from hepatocellular carcinoma with active nasal bleeding which was treated by transarterial embolization using ethiodized oil (Lipiodol) and gelatin sponge. After treatment, nasal bleeding ceased and tumor size decreased. The prognosis for patients with pituitary metastases is very poor, so aggressive treatment is recommended to alleviate symptoms. This minimally invasive approach may be a reasonable therapeutic option for pituitary metastases.

Key words: pituitary metastasis, hepatocellular carcinoma, transarterial embolization, Lipiodol, gelatin sponge

Introduction

The pituitary gland is an uncommon site for metastasis of tumor. Pituitary metastases account for only about 1% of all pituitary lesions that have been detected and treated by surgery.5,6 Autopsy results indicate the incidence in cancer patients ranges from 0.14% to 28.1%.6,11,13 Most pituitary metastases derive from primary tumors in the breast or lung. Liver tumors rarely metastasize to the pituitary gland, and account for just 1% of all pituitary metastases.11,13 Only 8 cases have been described, three in surgical series6,11,13 and five case reports.1,7,8,12 Guidelines for treatment, including surgery, radiation, and chemotherapy, have not been clearly established. We report a case of pituitary metastasis from hepatocellular carcinoma (HCC) which was treated by transarterial embolization using ethiodized oil and gelatin sponge.

Case Report

A 58-year-old man was admitted to our hospital with diplopia caused by right abducens nerve palsy and blurred vision. Ten years previously he had undergone pituitary tumor removal via a transsphenoidal approach for pituitary apoplexy. Histopathology confirmed pituitary adenoma. After the first removal, tumor removal was subsequently twice performed due to tumor regrowth, and both histopathological diagnoses were pituitary adenoma. The patient had been suffering from hepatosplenomegaly and 2 months prior to the diplopia, abdominal ultrasonography and computer tomography had demonstrated extensive multiple solid hepatic masses. The diagnosis of HCC was confirmed by a fine-needle aspiration biopsy taken from one of the liver masses, and transarterial chemembolization using ethiodized oil (Lipiodol UltraFluid; Laboratoire Guerbet, Aulnay-sous-Bois, France) and cisplatin was performed. Radionuclide bone scintigraphy had revealed multiple bone metastases, and the prognosis was one-year survival.

On admission, physical examination determined that he had hepatosplenomegaly with no signs of ascites. Ophthalmological examination revealed right abducens nerve palsy, vision loss in the right eye, and significant visual defect in the left eye. Magnetic resonance (MR) imaging demonstrated a solid mass centrally compressing the optic chiasma, infiltrating the clivus, depressing the floor of the sella turcica, and extending into the bilateral sphenoid sinuses. Transnasal transsphenoidal decompres-
Fig. 1 Coronal (A) and sagittal (B) T1-weighted magnetic resonance images with gadolinium revealing a solid mass centrally compressing the optic chiasma, infiltrating the clivus, depressing the floor of the sella turcica, and extending into the bilateral sphenoid sinuses and nasal cavities.

Fig. 2 Anteroposterior angiograms of the right internal carotid artery in the early phase (A) and late phase (B) showing the tumor stain. Anteroposterior angiograms of the right external carotid artery in the early phase (C) and late phase (D) showing the tumor stain via the accessory meningeal artery and internal maxillary artery.

Fig. 3 Anteroposterior angiograms of the right accessory meningeal artery in the early phase (A) and late phase (B), and lateral view in the early phase (C) and late phase (D) showing the tumor stain without visualizing the right internal carotid artery.

dition with partial excision of the pituitary mass was performed. Intraoperatively, the tumor appeared hard in consistency and highly vascularized. The morphological and immunohistochemical findings were absolutely compatible with pituitary metastasis from HCC. Postoperatively, his left visual deficit improved but residual right abducens nerve palsy and right visual loss persisted. He was discharged one week after operation. Additional radiotherapy and chemotherapy were not performed.

The patient was readmitted to our hospital 3 months later complaining of massive nasal bleeding. MR imaging showed regrowth of the tumor extending into the bilateral sphenoid sinuses and nasal cavities, and to the palate (Fig. 1). The otolaryngologist could not stop nasal bleeding with any modality. The tumor had invaded the palate and oral intubation for general anesthesia was impossible, so transarterial embolization to stop the nasal bleeding was performed under local anesthesia.

The tumor was mainly fed by the right internal carotid artery (ICA), accessory meningeal artery (AMA), and internal maxillary artery (IMA) (Fig. 2). We planned to perform embolization from the AMA, and then additional embolization from the IMA if necessary, because tumor staining from the external carotid artery (ECA) was mainly via the AMA. We did not perform provocative test because the condition of the patient was very poor and he already had severe cranial nerve palsy. A 6 Fr guiding catheter was positioned in the right ECA. A hydrophilic Renegade microcatheter (Boston Scientific, Natick, Massachusetts,
AMA, the tumor staining from the IMA disappeared. Finally, right external carotid angiography revealed disappearance of the tumor stain and right common carotid angiography showed tumor staining only from the right ICA.

Immediately after embolization, the nasal bleeding stopped and no new neurological deficit developed. The patient was discharged one week after the operation. No adjuvant treatment such as radiation and/or chemotherapy was performed. MR imaging undertaken 2 months after embolization demonstrated decreasing size of the tumor and necrosis (Fig. 5). He died 5 months after the embolization of liver disease. No nasal bleeding events or new neurological deficits occurred during his life after embolization. An autopsy was not performed.

**Discussion**

Advanced HCC generally carries a poor prognosis, with a median post-diagnosis survival ranging from 6 to 20 months.5,15) The poor survival associated with HCC reflects the aggressive nature and propensity for hematogenous dissemination. Furthermore, the prognosis for patients with pituitary metastases is poor, not because of the location but because of the aggressiveness of the primary neoplasia. Mean survival length in clinical series is 6–7 months.11,17)

Treatment is basically palliative and the specific treatment depends on the symptoms and the extent of the systemic disease.11,13,14,16) Surgery reports indicate that pituitary metastasis lesions tend to be firm, diffuse, invasive, vascular, and hemorrhagic, so total resection is unlikely.14,16,17) In this setting, local radiation and/or chemotherapy are recommended as the initial course of action, especially in patients with widespread metastases, in combination with pituitary hormone substitution therapy.11,14,16,17) Surgical exploration and decompression, only or in combination with radiation, is essential if diagnostic clarification is likely to affect therapy or if suprasellar extension causes pain or progressive deterioration in vision.11,14,16) In the transsphenoidal approach, completeness of resection and aggressive treatment (surgery plus local radiation) are associated with better symptom relief but do not affect survival rates.13) Although the prognosis is poor due to uncontrolled systemic disease, resection may be indicated in a select group of patients to alleviate symptoms and improve quality of life. In our case, nasal bleeding caused a critical state in the patient and general anesthesia was impossible because of the tumor invasion to the palate. We selected endovascular transarterial embolization which is less invasive and can be performed under local anesthesia.

Since the development of transcatheter arterial embolization for HCC, intra-arterial treatments have been widely used for patients with unresectable HCC.2,19) Transcatheter arterial chemoembolization using anticancer drugs mixed with Lipiodol and gelatin sponges, which selectively remain in tumor tissue for extended periods of time, has become one of the most effective treatment modalities for patients with unresectable HCC.9,10,18) Lipiodol is an oily contrast medium which persists more selec-
tively in tumor nodules for a few weeks or months after injection into the hepatic artery, due to the arterial hypervascularization and absence of Kupffer cells inside the tumor tissue. Lipiodol does not cause arterial occlusion, so can be used as a vehicle to carry and localize chemotherapeutic agents into the tumor. To occlude the affected artery and tumor, microcoils, polyvinyl alcohol, gelatin sponges, or N-butyl-2-cyanoacrylate may be used. Each agent has advantages and disadvantages, and selection depends on the specific case and treatment purpose. In this case, we selected Lipiodol and gelatin sponge because these agents are widely used for transarterial embolization in HCC, and did not perform coil embolization from the IMA because the embolization was intended to stop the nasal bleeding for the expected remainder of his life within one year.

An important concept in endovascular management of tumor embolization is to deliver the embolic materials precisely to the target tumor and a short segment of the nearby affected artery, with preservation of adjacent branches to reduce the risk of face and neck ischemia and impairment of cranial nerve function. Furthermore, complications may occur due to the complex vascular structure and rich anastomoses. The most significant potential complications are intracranial backflow of embolic material or flow through dangerous anastomoses into the ICA or vertebral artery. Superselective technique using a microcatheter significantly reduces the risk of misplaced embolic materials.

The present case of successful transarterial embolization for pituitary metastasis from HCC using Lipiodol and gelatin sponge shows that endovascular therapy can be used to treat pituitary metastasis. This less invasive approach may be a therapeutic option for pituitary metastases.

References


Address reprint requests to: Tomoji Takigawa, MD, Department of Neurosurgery, University of Tsukuba, 1–1–1 Tennodai, Tsukuba, Ibaraki 305–8575, Japan.
e-mail: t-tomojiy@mx2.harmonix.ne.jp