Arterial Graft to Treat Ruptured Distal Middle Cerebral Artery Aneurysms in a Patient With Mucosa-Associated Lymphoid Tissue Lymphoma
—Case Report—

Yu HASEGAWA,1 Motohiro MORIOKA,1 Keishi MAKINO,1 Yutaka KAI,1 Jun-ichiro HAMADA,2 and Jun-ichi KURATSU1

1Department of Neurosurgery, Kumamoto University School of Medicine, Kumamoto, Kumamoto; 2Department of Neurosurgery, Kanazawa University School of Medicine, Kanazawa, Ishikawa

Abstract
A 60-year-old man was admitted to our hospital with sudden onset of motor aphasia, Gerstmann syndrome, and incomplete right hemiparesis one week after administration of chemotherapy for mucosa-associated lymphoid tissue (MALT) lymphoma. Computed tomography showed an intracerebral hematoma in the left subcortical area. Cerebral angiography revealed 2 aneurysms on the distal middle cerebral artery (MCA) that increased in size in the course of 2 weeks. The aneurysms were excised and a bypass placed using a superficial temporal artery (STA) graft. Histological study showed no bacteria, infiltration of inflammatory cells, or lymphoma cells in the aneurysm wall. The chemotherapy against MALT lymphoma was highly effective, so we presumed that the lymphoma cells had disappeared. The source of the distal MCA aneurysms was thought to be oncotic. Distal MCA aneurysms caused by MALT lymphoma are extremely rare. Surgical reconstruction using the STA may be effective in patients with ruptured distal MCA aneurysms if the wall is intact.

Key words: distal middle cerebral artery aneurysm, reconstruction, intracerebral hematoma, superficial temporal artery, mucosa-associated lymphoid tissue lymphoma

Introduction
Distal cerebral aneurysms tend to arise in the anterior circulation and the etiology includes mitotic, oncotic, and traumatic causes. Consequently, the natural history and treatment of these aneurysms differ. The incidence of central nervous system lymphoma is relatively low, and the reported rate of secondary brain lymphoma is 6.1%.1 The most common neuropathological findings in patients with metastasis are infiltration of the leptomeninges, nerve roots, perivascular space, or brain parenchyma, which can result in both focal and generalized symptoms.6,10

We report an extremely rare case of ruptured aneurysms on the distal middle cerebral artery (MCA) that may be attributable to mucosa-associated lymphoid tissue (MALT) lymphoma. The patient was successfully treated with vasoconstructive surgery using a superficial temporal artery (STA) graft.

Case Report
A 60-year-old man had been diagnosed with MALT lymphoma (stage IV) of the lung 6 years previously. Chemotherapy resulted in complete remission. Three months before visiting our internal medicine department, he noticed weight loss and fever. He again received chemotherapy under a diagnosis of recurrent MALT lymphoma of the lung. One week later, he suffered sudden onset of motor aphasia, Gerstmann syndrome, and incomplete right hemiparesis, and was referred to our department.

Computed tomography showed a subcortical hematoma in the left parieto-temporal region (Fig. 1A). Magnetic resonance (MR) imaging demonstrated the hematoma and 2 thrombosed aneurysms adjacent to the hematoma (Fig. 1B). Left internal carotid angiography revealed 2 distal saccular aneurysms of the posterior parietal artery and angular artery (Fig. 2A, B). As the patient had myelosuppression due to chemotherapy, we placed him under observation. Two weeks later he had recovered from myelosuppression, and angiography at this time showed that the aneurysm on the left posterior parietal artery had disappeared, but the aneurysm on the angular artery had tripled in size (Fig. 2C, D).

He underwent aneurysmectomy and vessel reconstruction using an STA graft on the next day. After incision of the dura, the arachnoid was found to be thick and whitish, and the cortex adjacent to the aneurysm on the angular ar-
Fig. 1  A: Computed tomography scan demonstrating a subcortical hematoma in the left parieto-temporal lobe.  B: T1-weighted magnetic resonance image with gadolinium showing the hematoma and 2 adjacent thrombosed aneurysms (arrows).

Fig. 2  A, B: Initial left cerebral angiograms, lateral view (A) and the higher magnification (B), revealing 2 saccular aneurysms in the posterior parietal artery (solid arrows) and angular artery (dotted arrows).  C, D: Repeat left cerebral angiograms obtained 2 weeks after the first, lateral view (C) and the higher magnification (D), showing the aneurysm on the angular artery 3 times larger than at the first angiographic study (dotted arrows). The aneurysm on the posterior parietal artery was thrombosed (solid arrows).

tery was reddish (Fig. 3A). The proximal and 2 distal parent arteries of the aneurysm were identified (Fig. 3B). After establishing an end-to-end bypass from the proximal to larger distal parent artery (1-mm diameter) using an STA graft, the aneurysm was excised and a side-to-end bypass placed from the angular artery to its smaller (0.5-mm diameter) distal parent artery using an STA graft. Blood flow Doppler study confirmed good flow through the end-to-end graft (Fig. 3C).

Postoperative clinical course was uneventful and his neurological deficit improved. Postoperative angiography revealed excellent patency of the larger distal parent artery graft, but no blood flow through the smaller graft was recognized (Fig. 4). He was moved to the internal medicine department in our hospital where he underwent 4 courses of chemotherapy for MALT lymphoma of the lung. Histological examination of the thin arachnoid showed collections of necrotic and denatured tumor cell-like scars (Fig. 5A), with structural retention of the parent artery, but the aneurysm wall was not infiltrated by inflammatory cells (Fig. 5B). The adventitia and thin intima of the artery contained local collections of lymphocytes (Fig. 5B), but immunohistochemistry revealed no expression of CD79a or CD20, both of which are B-cell markers. Various stains excluded the presence of bacteria.

Discussion

Distal aneurysms secondary to oncotic embolization invading and destroying the arterial wall are rare, and most notably involve choriocarcinoma. In our case, the
Reconstruction of Distal MCA Aneurysm

cause of the expansion is not clear but MR imaging should be helpful to distinguish between the increase in aneurysm diameter and the expansion of the lumen in the aneurysm resulting from thrombus reduction.

In conclusion, a distal MCA aneurysm that developed after the delivery of chemotherapy in a patient with MALT lymphoma was successfully treated by vasoconstructive surgery using the STA. The treatment of intracranial distal MCA aneurysms that may be attributable to disseminated malignant tumor must consider both aneurysm excision and retention of the blood flow in the parent artery to preserve its normal structure and to ensure patency of the graft. Moreover, such aneurysms should be treated as soon as possible, because distal aneurysms of oncotic origin may enlarge in the course of weeks even if the chemotherapy for the tumor is effective.

Conflicts of Interest

None.

References


Address reprint requests to: Yu Hasegawa, MD, PhD, Department of Neurosurgery, Kumamoto University School of Medicine, 1–1–1 Honjo, Chuo-ku, Kumamoto-shi, Kumamoto-ken 860–8550, Japan.

Neurol Med Chir (Tokyo) 52, June, 2012