

Case Report

Embolism of chondroma in the vertebral artery resulting in cerebellar and cerebral infarction

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●Abstract●

Purpose: A case of multiple brain infarction caused by embolism of a chondroma in the left vertebral artery is reported.

Case presentation: A 38-year-old woman was admitted for cerebral infarction. On angiography, a round filling defect was observed in the V2 segment of the patent left vertebral artery, thought to be a floating embolus. The patient was successfully treated with embolectomy by means of endovascular procedures immediately after angiography. Histopathologic evaluation indicated the embolus to be a piece of chondroma.

Conclusion: Cerebral embolism from tumor, especially chondroma, is extraordinarily rare. The source of the embolism in this patient is thought to most likely be the heart.

●Key Words●

cerebral infarction, chondroma, embolic stroke, endovascular technique

(Received July 26, 2008 : Accepted September 16, 2008)

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Introduction

Ischemic stroke in the young is sometimes observed in various clinical settings. Causes include moyamoya disease, cerebral angitis, aortitis syndrome, arterial dissection, trauma, abnormal coagulability, and cardioembolism^{8,9)}. Neoplasms of the heart, such as myxoma and papillary fibroelastoma are rare, but known to sometimes cause cerebral embolism¹⁾. The embolic material is more likely to be fibrin or thrombus originating from the tumor surface^{13,16)}. In this report, embolus of chondroma observed in the left vertebral artery was successfully removed by an endovascular technique.

Case report

A 38-year-old woman was admitted to this clinic following the sudden onset of dysarthria, ataxic gait, and paralysis of the left upper extremity. She had noted some pain and stiffness in her left shoulder the day prior to admission. Blood pressure was normal and no arrhythmia was detected. Neurological examination indicated dysarthria, dysmetria of the left upper extremity, and slight paralysis of the left upper extremity. Hematological and blood chemistry examination

indicated no abnormalities. Anticardiolipin antibodies, lupus anticoagulant, antinuclear antibody, protein C, and protein S activity were measured to detect abnormal coagulability, but all were within normal limits. Computed tomography (CT) scan disclosed low-density areas bilaterally in the cerebellar hemispheres, and the right occipital lobe, suggesting multiple intracranial embolism. Diffusion-weighted magnetic resonance imaging (DWMRI) showed high-intensity lesions in the same areas as on CT scan. MR angiography showed occlusion of the right posterior cerebral artery (Fig. 1). Percutaneous and transesophageal echocardiography indicated no abnormal findings, including intraarterial or, intraatrial thrombus, and no shunts in the heart. No abnormalities were found on chest X-ray or lung CT scan.

The patient was treated conservatively with anticoagulant agents. Cerebral angiography was performed the following day. The left vertebral artery was patent but a round filling defect 5mm in diameter was found in the V2 segment, thought to be a floating embolus. A distal (P3) branch of the right posterior cerebral artery was occluded (Fig. 2). There were no abnormal findings in the right vertebral artery or in the carotid circulation bilaterally. An embolectomy by means of endovascular procedures was performed immediately after

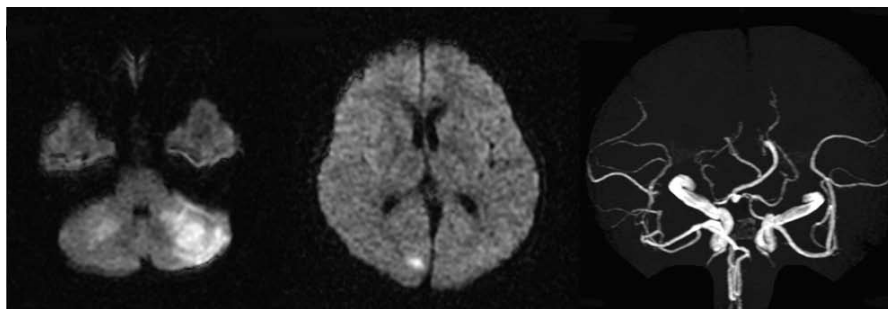


Fig. 1 Diffusion-weighted images show multiple high-intensity areas in the same regions as on CT scan (left, center). The right posterior cerebral artery is not visualized on magnetic resonance angiography (right).

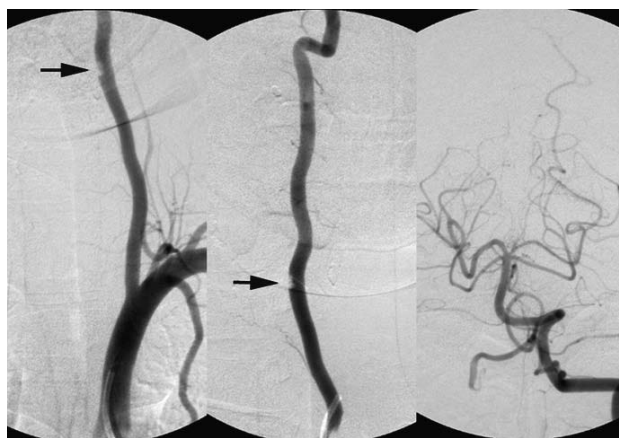


Fig. 2 A round filling defect 5mm in diameter (arrow) in the V2 segment is found on left vertebral angiography (left, center). The distal branch (parietooccipital artery) of the right posterior cerebral artery is occluded (right).



Fig. 3 A whitish elastic soft embolus is found in blood aspirated from the vertebral artery. The embolus resembles a piece of cartilage.

angiography.

Endovascular treatment : Under local anesthesia, a 6 French Shuttle Sheath (Cook Inc., Bloomington, IN, USA) was inserted into the origin of the left vertebral artery. A Guardwire Protection System (Medtronic AHA, MA, USA) was carefully navigated into the vertebral artery distal to the embolus, and the balloon was inflated for temporary occlusion of the distal vertebral artery. A 6 French Envoy catheter (Cordis Corporation, FL, USA) was navigated coaxially into the vertebral artery proximal to the embolus, and blood was then aspirated three times with a 10mL syringe through the 6 French catheter. A whitish elastic soft embolus 5mm in diameter was found in the first aspirated blood (Fig. 3). The embolus resembled a piece of cartilage. There were no other

clots in the aspirated blood. Contrast medium was injected to confirm lack of remaining filling defects in the temporarily occluded vertebral artery. The balloon was deflated, and neither filling defects in the V2 segment nor embolic occlusion in the distal circulation was found on control angiography. Neurological status of the patient was unchanged after treatment.

Postoperative course : Good physical and neurological recovery was observed after treatment, and the patient underwent rehabilitation. Whole-body scintigraphy with F-18 FDG performed to detect neoplasms was negative.

Histopathologic findings : The embolus consisted of mature hyaline cartilage. Cartilage cells were for the most part distributed sparsely and individually, though in some areas a

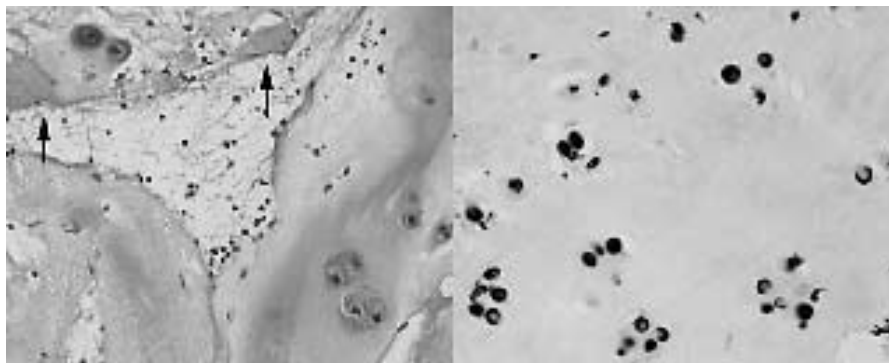


Fig. 4 Histopathological findings for the embolus: The specimen consists of mature hyaline cartilage with a superficial white thrombus (arrow). The chondrocytes exhibit slight nuclear atypia, and cellular density is low. Calcification and ossification are absent (left). Immunohistochemically, staining for vimentin is positive in chondrocytic cells (right).

few cartilage cells had formed cell islands. Cartilage cells exhibited slight nuclear atypia and were vimentin-positive (Fig. 4), with an MIB-1 index of approximately 2–5%. Neither ossification nor calcification was present, and there were no findings of myxoma. The interstitium was homogeneous, and hematoxylin- and alcian blue-positive. Surface of the cartilage was partially covered with thin layers of platelet thrombi containing a few erythrocytes and leukocytes. On pathologic examination, chondroma was strongly suspected because of the slight nuclear atypia, irregular but sparse distribution of cartilage cells, and 2–5% MIB-1 index, though it was impossible to clearly differentiate the tumor from chondrosarcoma given the small size of the specimen.

Discussion

The major causes of juvenile cerebral infarction usually include cardioembolism and dissecting aneurysm⁷⁻⁹. In young adults, ischemic stroke is considered relatively rare accounting for fewer than 5% of all cerebral infarctions⁹. Cardiogenic cerebral embolus is one of the most common causes of stroke in the young, accounting for up to one-third of cases.

In this case, a fragment of chondroma was found in the left vertebral artery and echocardiography indicated no shunts in the heart. Possible origins of this embolus therefore include the lung, heart, and aorta.

Primary cardiac tumors are rare, with an incidence between 0.0017 and 0.19% in unselected patients at autopsy¹⁵. Atrial myxomas and choriocarcinomas sometimes cause tumor embolism. Nearly half the benign cardiac tumors are myxomas, and the majority of the remainder are lipomas,

papillary fibroelastomas, and rhabdomyomas. Embolism occurs in 30 to 40% of patients with myxomas. In this case, myxoma was absent in the specimen of embolus, and cardiac tumor was not detected clinically. Incidence of central nervous system metastases of choriocarcinomas have been reported to range between 3 and 28%² and 95 to 99% of patients were with brain metastases¹⁸.

There have been no previous case reports of cerebral embolism by a chondroma. Only three cases of valvular or non-valvular chondroma in the heart have been reported^{5,17,20}, and all such patients presented with heart failure. There were no descriptions in these cases of embolism to distal organs. The most frequent sites of extraosseous soft-tissue chondromas are the hands and feet. Rarely, extraskeletal chondromas may develop in unusual sites including the floor of the mouth¹⁹, falx¹⁰, tongue³, neck^{6,11}, back¹⁴, and larynx¹². In the largest series, of more than 100 cases of chondroma of soft parts, no multiple recurrences or metastatic lesions were reported⁴. The patient in this report exhibited no signs or symptoms of heart failure. Although the primary site of chondroma could not be detected in this case, the most likely source was the heart, from which tumor probably detached resulting in embolism. Over two-year follow-up, no tumor lesions or other abnormalities have been observed.

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