Endovascular treatment for multifocal systemic embolic infarctions related to a large intra-carotid thrombus: A case report

Running title: Treatment for embolic infarctions

Hyoun Ouk Kim, M.D., Nam Yeol Yim, M.D., Weong Yoong MD,
Yang Jun Kang, M.D., Jei Kye Kim, M.D.,
Department of Radiology, Chonnam National University Hospital. Gwangju. The Republic of Korea

Abstract

Multifocal systemic embolism is an important complication after the development of an intra-carotid thrombus, which could involve various organs and limbs. We encountered a patient with a large intra-carotid thrombus, who had experienced multifocal systemic embolic infarctions resulting in stroke and peripheral embolism. As an emergent treatment for this patient, various endovascular techniques were performed, and rapid systemic anticoagulation was expected. Endovascular treatment for multifocal systemic embolism originating from an intra-carotid thrombus is a feasible method to establish rapid recanalization and lower the rate of complications related to embolic occlusions.

Introduction

Although the true incidence of intra-carotid thrombus formation is unclear, it is an important problem as it can result in various complications. Especially, multifocal systemic embolism due to an intra-carotid thrombus is a severe complication that can lead to multiple target organs injury randomly through blockage of a dual blood flow perfusion. In a previous prospective study, systemic embolization related to left ventricular thrombosis occurred in 13−45% of cases. Recognizing the clinical importance of multifocal systemic embolic infarctions from intra-carotid thrombus, adequate management has not been established yet, owing to the diversity of the disease process. The present treatment has been systematic anticoagulation. However, to treat an embolic vascular occlusion rapidly, approaches for removal of the thrombus, such as surgical or endovascular thrombectomy, maybe appropriate, particularly in high-risk patients. Here, we present our experience of endovascular treatment for systemic embolization related to a large thrombus in the left atrial appendage, which caused stroke and peripheral embolism.

Case report

A 76-year-old man with hypertension and atrial fibrillation presented with uncontrolled dyspnea last for 3 days. A chest computed tomography (CT) scan revealed a large thrombus within the left atrial appendage as well as cardiomyopathy (Fig. 1). After 2 days of systemic intravenous heparinization, he developed sudden onset of coldness, numbness, pain, and pulslessness of both lower limbs. Emergency lower extremity CT angiography was performed and large embolic occlusions at the aortic bifurcation and left popliteal artery were detected (Fig. 2).

Angiography also confirmed embolic segmental occlusion from the distal popliteal artery to the tibial artery. To reopen the embolic segment, an additional arterial access was achieved at the left common femoral artery after hemostasis of the previous puncture site with a Seldinger guide wire. Then, embolus aspiration was performed using an 8-Fr, guiding catheter (Guider Softtip; Boston Scientific), which was introduced in the distal popliteal artery. After aspiration, a red embolus was retrieved. A completion angiogram confirmed complete recanalization of the embolic distal popliteal artery, as well as parallel collateral arteries and pedal arteries (Fig. 6). The total elapsed time to complete recanalization of the cerebral and lower extremity arteries, defined as the time from femoral access to achievement of recanalization, was 47 minutes. About 2 weeks later, the mase operation with removal of the left atrial appendage for arterial fibibration was performed. During the he operation, there was no remaining thrombus within the left atrium of the heart. At the time of discharge, the patient showed complete recovery, without any neurological complication or ischemic symptoms in both lower extremities.

Endovascular treatment was planned. However, during transport to our intervention suite, he experienced sudden right-sided motor weakness, global aphasia, and loss of consciousness. His National Institute of Health Stroke Scale (NIHSS) score was 17 at the time of symptom development. Instead of peripher CT angiography, emergent magnetic resonance (MR) imaging of the brain, with diffusion-weighted imaging, and AB angiography were performed, using a 1.5-T system (GE Medical Systems, Milwaukee, WI). Diffusion-weighted imaging showed acute cerebral infarction in the left precentral gyrus. Additionally, the brain MR angiography revealed loss of intracranial circulation to the left side (Fig. 3). Prior to recanalization of the lower extremities, we decided to perform cerebral angiography.

Angiography confirmed embolic segmental occlusion from the distal popliteal artery to the tibial artery. To reopen the embolic segment, an additional arterial access was achieved at the left common femoral artery after hemostasis of the previous puncture site with a Seldinger guide wire. Then, embolus aspiration was performed using an 8-Fr, guiding catheter (Guider Softtip; Boston Scientific), which was introduced in the distal popliteal artery. After aspiration, a red embolus was retrieved. A completion angiogram confirmed complete recanalization of the embolic distal popliteal artery, as well as parallel collateral arteries and pedal arteries (Fig. 6). The total elapsed time to complete recanalization of the cerebral and lower extremity arteries, defined as the time from femoral access to achievement of recanalization, was 47 minutes. About 2 weeks later, the mase operation with removal of the left atrial appendage for arterial fibibration was performed. During the he operation, there was no remaining thrombus within the left atrium of the heart. At the time of discharge, the patient showed complete recovery, without any neurological complication or ischemic symptoms in both lower extremities.

REFERENCES