Olgu Sunumu

Duplication of the Middle Cerebral Artery: A Case Report

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Abstract

It is essential to identify the anatomic variations of neurovascular structures in terms of preventing complications which may develop during neurosurgery and interventional neuroradiological procedures. It is necessary to be aware of the middle cerebral artery (MCA) outlet anomaly to understand collateral blood flow in events of cerebral ischemia related to duplicated or accessory MCA in cerebral aneurysm surgery. Intracranial vascular anomalies involving the MCA are relatively rare. Duplicated MCA has been reported at rates of 0.2%-2.9% in literature. In this paper, the imaging findings of a 71-year old male with duplicated middle cerebral artery are presented in whom the complaints of mildly ataxic step and cloudy consciousness were present.

Key words: Duplication, middle cerebral artery, magnetic resonance angiography

Introduction

It is advantageous to demonstrate the middle cerebral artery (MCA) outlet anomalies to understand the collateral blood flow patterns in events of cerebral ischemia related to duplicated or accessory MCA in cerebral aneurysm surgery (1). In 1973, Teal et al (2) used the term accessory MCA for abnormal vascular outlet originating from the anterior cerebral artery (ACA) and duplicated MCA for the 2nd arteries originating from the distal end of the internal carotid artery. Both accessory and duplicated MCA are vascular anomalies which are not widely seen. A duplicated MCA originates from the terminal bifurcation of the internal carotid artery (ICA) and from between the distal ICA and the anterior choroidal artery (3). In this report, we present the magnetic resonance imaging (MRI) and MR angiography findings of a patient with a duplicated MCA that developed from the ICA.

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Case Report

A 71-year old male patient presented at our neurology clinic with complaints of unconsciousness for half an hour which occurred 3-4 days ago. There was nothing remarkable in the patient's history or in his family history. In the physical examination, deep tendon reflexes on the right side were mildly live, Babinski was mildly positive and he had slight ataxic step. Electroencephalography findings were normal. There were no abnormalities in the blood count and biochemical parameters. Cardiac test results were normal. In the magnetic resonance imaging examination, areas of periventricular chronic ischemic gliosis were determined in the brain. At the level of the left MCA bifurcation, an image was observed which was thought to be an aneurysm or an MCA anomaly. In the MR angiography, a duplicated MCA variation originating from the left ICA was determined (Figure 1ab). There was no aneurysm at this level. The duplicated MCA in the medial and anterior of the temporal lobe was causing congestion in the inferior part of the deep temporal lobe and basal ganglia. After improvement in the acute neurology clinic, the consciousness status of the patient completely recovered in the follow-up period. The patient was discharged with recommendations.

Discussion

Intracranial vascular anomalies involving the MCA are relatively rare. Duplicated MCA has

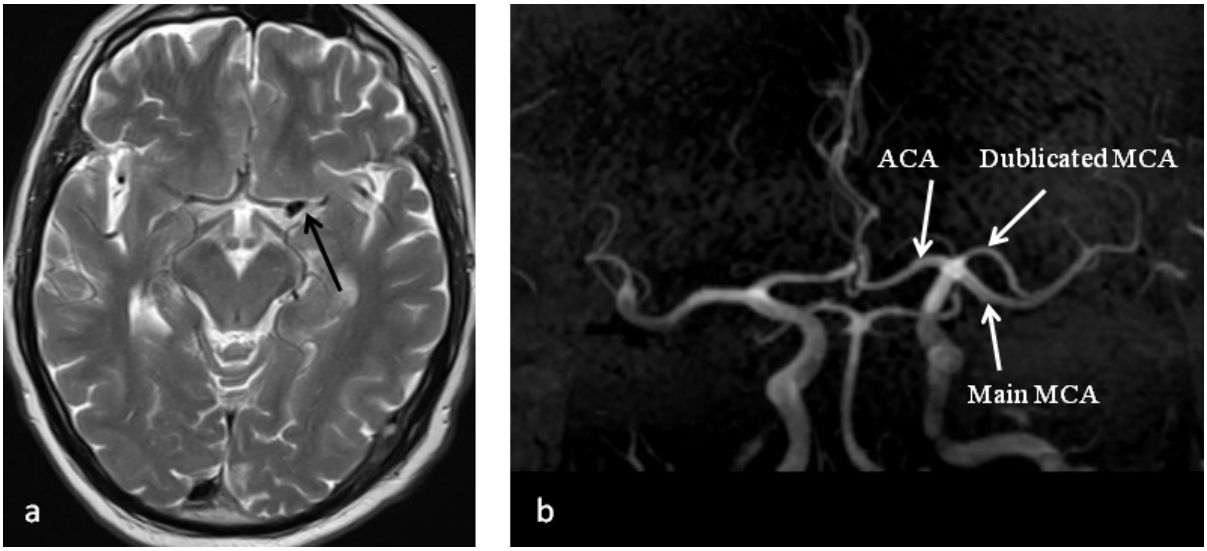

Fig. 1. In the axial T2-weighted MRI, extensive vascular segment suggesting an aneurism at the level of left MCA outlet was revealed (a). On the MR angiography, an image of duplicated MCA originating from the distal segment of the left ICA was observed. No aneurism was determined at this level (b).

been reported at rates of 0.2%-2.9% in literature (4). MCA anomalies are defined as accessory MCA, duplicated MCA and fenestrated MCA (4). However, in the generally accepted Teal classification, the area of origin of accessory MCA is from the same side ACA close to the anterior communicating artery and the area of origin of duplicated MCA is from the terminal bifurcation of the ICA and from between the distal ICA and the anterior choroid artery (2). In the case presented that was demonstrated in this report, as both MCAs originated from the ICA as two separate roots, it was defined as duplicated MCA.

The combination of increased cerebral aneurysm together with duplicated MCA or accessory MCA has been well-documented in some series. However, it is not fully understood which mechanisms create this relationship (4). In practice, no difficulties are encountered in treating these aneurysms. Preoperative determination of these anomalies has a vital importance to prevent the possible related complications which may develop. In an ischemic attack, while the accessory MCA can provide a collateral blood flow to the anterior frontal lobe, the main MCA cannot provide enough blood to the area (5). However, in a study by Karazincir et al, (6) no relationship was determined between aneurysm and vascular anomalies. In the case presented here, no aneurysm or other pathology was determined apart from the duplicated MCA.

Phylogenetically; the MCA develops later from the anterior communicating artery. Therefore, the MCA can be considered as a branch of the ACA. Just as duplicated MCA can be considered as an abnormal early branching of the MCA from the internal carotid artery, accessory MCA should be considered as abnormal MCA originating from the ACA (4).

In conclusion, MCA variations are rarely seen in the general population. However, regarding the operative aneurysm treatment procedures and ischemic events, determination and characterization of MCA anomalies is important to elaborate the relationship between the blood flow and relevant watershed areas.

Orta Serebral Arter Dublikasyonu: Olgu Sunumu

Özet

Nörocerrahi ve girişimsel nöroradyolojik işlemler öncesi, nörovasküler yapıların anatomik varyasyonlarının iyi tanımlanması gelişebilecek komplikasyonları önleme açısından önemlidir. Orta serebral arterin (OSA) çıkış anomalisinin bilinmesi, serebral anevrizma cerrahisinde ve dublike ya da aksesuar OSA ile ilişkili serebral iskemi olaylarında kollateral kan akımı anlamak için gereklidir. OSA'yı içeren intrakranial vasküler anomaliler nispeten nadirdir. Literatürde dublike OSA %0.2–2.9 arasında rapor edilmiştir. Biz bu yazıda, hafif ataksik yürüyüş ve bilinç bulanıklığı şikayeti ile kliniğimize başvuran dublike orta serebral arterli 71 yaşındaki erkek bir olgunun görüntüleme bulgularını sunuyoruz.

Anahtar kelimeler: Dublikasyon, orta serebral arter, manyetik rezonans görüntüleme

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