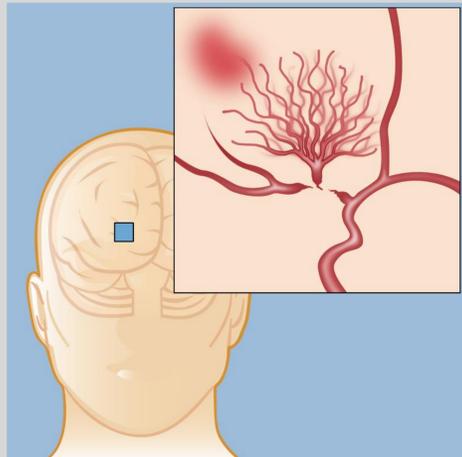


Introduction

“Moyamoya” in the Japanese language translates to “puff of smoke”. The collateral vessels at the base of the brain appear like a puff of smoke on angiography.¹ “It is an idiopathic cerebrovascular disorder that is characterized by progressive stenosis or occlusion of the distal internal carotid arteries (ICA) and their proximal branches.”²



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Digital subtraction angiography (DSA) is thought to be the golden standard for imaging Moyamoya disease (MD), but other imaging can provide a reliable diagnosis.^{1, 4} Physicians who diagnose MD uses more than one imaging modality to treat and diagnose patients accurately.

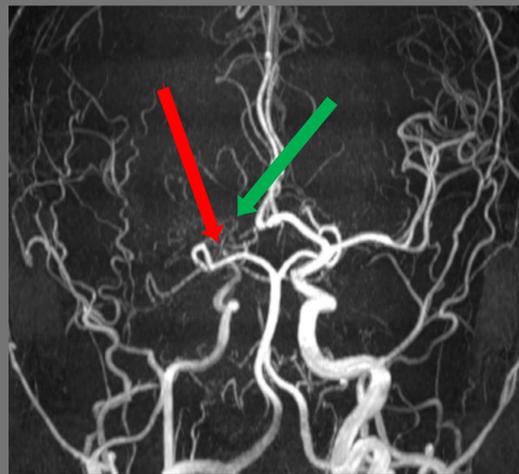
Digital Subtraction Angiography (DSA)



DSA showing stenosis of the right ICA (white arrow) with collateralization (red arrow).⁵

The advantage of DSA is the live acquired image series, which shows the status of collateralization.⁶ DSA doesn't allow a definitive diagnosis and HRMRI can augment DSA for obtaining a more complete diagnosis.⁴

High-resolution Magnetic Resonance (HRMRI)



MRA shows complete stenosis of the right ICA (red arrow). The right middle cerebral artery is not visualized but multiple small collateral vessels are seen (green arrow).⁵

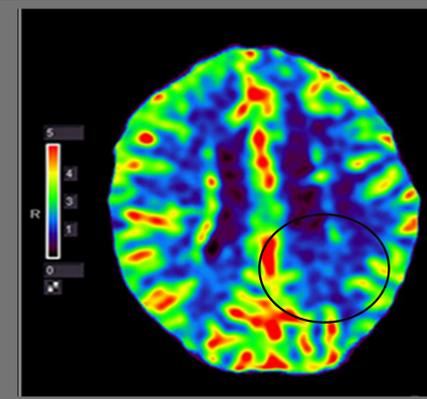
“HRMRI visualizes the vessel wall and the lumen, evaluating both for pathology.”² To diagnose MD, other diseases that involve the same anatomy must be excluded.⁶ Conventional arterial imaging techniques just focus on the lumen of the vessel itself.^{2, 6} Therefore, HRMRI may provide a more comprehensive diagnosis of MD.⁶

Computed Tomography Perfusion (CTP)



CTA shows occlusion of bilateral ICA's and development of collateralization at the base of the brain.⁷

CTP assesses the cerebral hemodynamics of MD, blood flow in the brain tissue.⁷ Computed tomography angiography (CTA) could easily be performed in the same session with a CTP due to the reconstruction of data collected.⁸



Large abnormal perfusion areas before surgery which were supplied by the middle arteries of the left hemisphere are shown.⁸

Conclusion

DSA is currently one of the top imaging choices for physicians who diagnose and treat MD. While this golden standard has been around for a long time, HRMRI, CTP and CTA scans show a promise in the diagnosis and treatment of patients. DSA in conjunction with different modalities can give a more detailed diagnosis and treatment plan for patients with MD.

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