

Rangsit University study shows simple bypass protocol improves outcomes in chronic cerebral occlusion

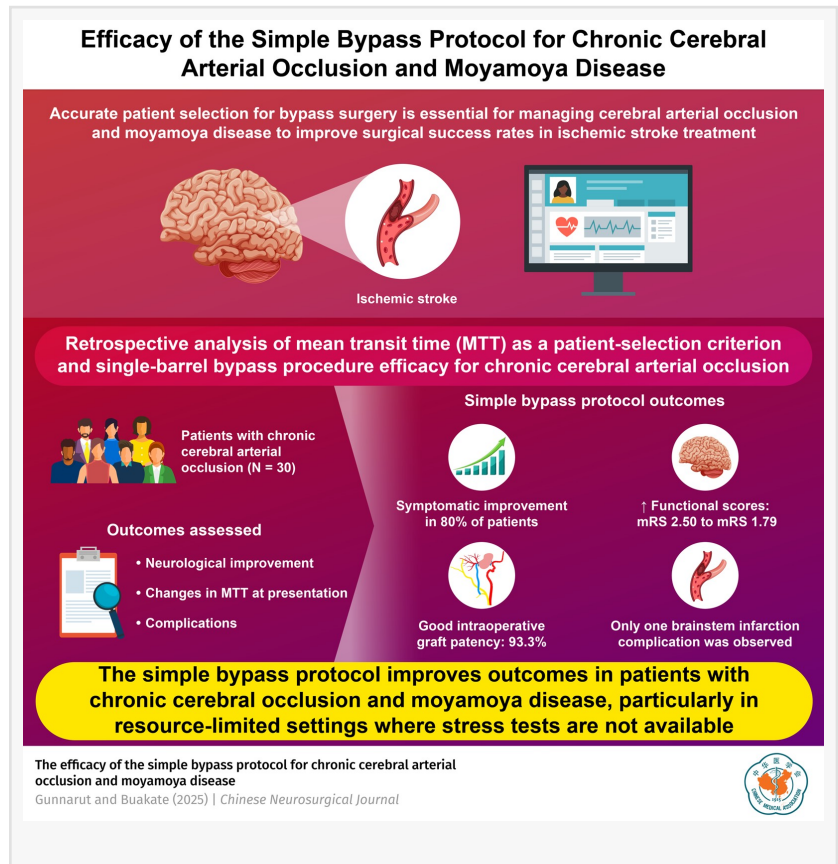
Single-barrel bypass guided by mean transit time improved symptoms in 80% of patients with chronic cerebral occlusion or moyamoya disease

BEIJING, BEIJING, CHINA, December 12, 2025 /EINPresswire.com/ -- Single-barrel bypass guided by mean transit time improved symptoms in 80% of patients with chronic cerebral occlusion or moyamoya disease

Chronic cerebral arterial occlusion and moyamoya disease are significant causes of stroke, particularly in regions where advanced diagnostic tools are limited. This study from Rajavithi Hospital assessed a simple bypass protocol that uses mean transit time to identify candidates for single-barrel bypass surgery. Thirty patients were evaluated, and 80 percent showed postoperative improvement with high graft patency and minimal complications. The findings support mean transit time as an effective non-stress method for guiding surgical decision-making.

Ischemic strokes represent a major health burden and are the leading cause of death in Thailand, with more than 250,000 new cases each year. Chronic cerebral arterial occlusion and moyamoya disease are important contributors to this problem and often require careful evaluation of cerebral blood flow. In many regions, advanced stress tests for cerebrovascular reserve assessment are unavailable, which makes simple and reliable alternatives important for patient care.

A study from Rajavithi Hospital, College of Medicine, Rangsit University, led by Dr. Ittipon Gunnarut and Dr. Kritsada Buakate, evaluated whether a simple bypass protocol guided by



mean transit time (MTT)—the average time taken by blood to travel through a specific part of the body—could reliably improve outcomes in patients with chronic cerebral arterial occlusion or moyamoya disease. The research, made available online on October 27, 2025 in Volume 11, Issue 27 of the [Chinese Neurosurgical Journal](#).

The research reviewed patients who underwent single-barrel bypass surgery between 2010 and 2024 and had complete preoperative perfusion imaging and postoperative follow-up records. MTT prolongation of more than six seconds was used as the indicator of hemodynamic compromise. A total of thirty patients were included in the study. Before surgery, 23.3 percent had MTT delay on both sides, and the average Modified Rankin Scale—a measure of the degree of disability after a stroke—score was 2.50.

“Our results show that prolonged mean transit time is a practical indicator for selecting patients who can benefit from bypass surgery, especially in regions where stress tests are not available,” says Dr. Gunnarut.

80% of patients experienced symptom improvement with over 90% intraoperative graft patency (the ability of a blood vessel graft to remain open and allow unobstructed blood flow). Only one complication occurred—a brainstem infarction unrelated to the bypass site. The mean postoperative Modified Rankin Scale score improved to 2.0, indicating better functional outcomes.

They presented two clinical examples. In the first case, a man with transient ischemic attacks and right eye blindness had right internal carotid artery occlusion with bilateral MTT prolongation. After a single-barrel superficial temporal artery to middle cerebral artery bypass, his symptoms improved, and postoperative imaging showed better perfusion. In the second case, a woman with left-side weakness experienced complete recovery of motor strength after surgery, and imaging also improved.

The study highlights limitations of stress tests, such as acetazolamide or carbon dioxide challenges, which may provoke ischemic events and are unavailable in many countries. Non-stress MTT testing avoids these risks, making it suitable for resource-limited settings. These findings align with previous studies showing that MTT correlates with cerebrovascular reserve and can predict postoperative improvement.

Dr. Buakate noted, “The simple bypass protocol provided good clinical outcomes with a very low complication rate and can be used in hospitals that do not have access to more complex testing.”

These results support the usefulness of MTT in identifying candidates who may benefit from revascularization.

The study acknowledges several limitations, including its retrospective design, potential missing postoperative imaging data, and the influence of comorbidities and variations in perioperative

management. Despite these factors, the results demonstrate that the simple bypass protocol is effective for patients with chronic cerebral occlusion or moyamoya disease. It provides a practical yet cost-effective method for evaluating cerebrovascular reserve in settings where stress-based testing cannot be performed.

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