Brain repair goes au naturel

David Lam

A SUDDEN THUNDERCLAP headache should not be dismissed casually.

Headaches account for 2 percent of emergency room visits and up to 4 percent of visits to the primary care offices.

Often it is nothing, but it can also be a warning sign of a hemorrhagic stroke.

Among patients going to the emergency room with headaches, about 1 percent have a subarachnoid hemorrhage stroke.

According to estimates, one in every 50 people in the United States has an unruptured aneurysm. While the rupture occurs only in eight to 10 people out of 100,000, four out of seven people with ruptured aneurysm will have disabilities.

Hemorrhagic stroke occurs when a blood vessel in a part of the brain becomes weak, bursts open causing blood to leak into the brain.

High blood pressure is the primary risk factor, but people with weakened vessel walls in the intracranial blood vessels are particularly susceptible.

The weakened vessel wall or a thin spot in the cerebral blood vessel often balloons out and develops into a cerebral aneurysm.

Cerebral aneurysm can be treated.

The aneurysm in the brain can be prevented from bursting by clipping it in open surgery. This leaves a clip inside the patient's brain.

Bursting of the aneurysm can also be prevented by inserting metallic coils into the aneurysm.

The coils are delivered by inserting a catheter into a vascular opening in the thigh.

The catheter is then threaded to the brain and metal coils are inserted into the aneurysmal cavity to reduce blood flow and pressure at the aneurysm to prevent it from bursting.

Without open cranial surgery, the minimally invasive procedure reduces surgical complications significantly and allows the patient to carry on without the worry that the aneurysm would burst. However, neither clipping nor metallic coiling treatments can heal the aneurysm. The aneurysm remains dangling inside the brain.

Its movement during exercises and changes in shape or position can affect the surrounding brain cells. A better treatment would be one that allows our body to heal and eliminate the aneurysm naturally, and restore the intracranial blood vessel to its natural tubular state.

To do so, the coils cannot be metallic. A new intra-aneurysmal coil made from biodegradable organic material has been developed at HKUST.

Ex vivo tests showed the new intra-aneurysmal coils can reduce pressure inside the aneurysm within half an hour of insertion.

Since the coils are made from biodegradable organic material, the coils are naturally absorbed and do not obstruct the natural healing process of the aneurysm.

Tests with flow diverters showed that without obstruction, the aneurysm heals and disappears.

With support from Dr and Mrs Simon Kwok, the biodegradable coils are currently undergoing animal trials in HKUST. Once completed, the coils can be tested in clinical trials to help treat aneurysms and prevent strokes.

Unlike clipping and metallic coil treatments, which leave permanent fixtures inside the brain and obstruct healing, the new coil disappears and enables healing.

The new biodegradable coil treatment can help prevent stroke, and restore blood vessels to their natural healthy state without leaving metallic elements inside the brain.

Au naturel is preferred when it comes to our brain.

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