Breakthrough in stroke therapy

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NO one wants to live like a wilted vegetable. Imagine how frustrating it would be if you are unable to move your limbs, talk, recognize family members, or feed and clean yourself.

These are some of the devastating effects of stroke, the number one cause of adult disability.

Statistics from the World Health Organization reveal that ischaemic heart disease and stroke are the world’s biggest killers, accounting for a combined 15.2 million deaths in 2016.

Compared to other life-threatening problems, stroke is mostly preventable, yet 52,000 Malaysians suffer from stroke annually, with six cases occurring every hour.

Sadly, 70% of stroke patients stop taking part in social activities. 90% need assistance in copulating with dully life and 15% die within a month. And patients with a history of stroke are at a higher risk of a recurrent stroke.

It’s a bleak scenario.

Stroke occurs because of bad lifestyle, smoking, high blood pressure, high cholesterol, diabetes, obesity, lack of exercise or heart issues. There are two types of stroke – ischaemic, and haemorrhagic or bleeding.

Ischaemic stroke makes up the majority of cases, where blood supply to part of the brain is reduced significantly or cut off due to a clot.

As a result, the brain cells can’t get the oxygen and nutrients it needs. Within minutes, the brain cells start to die. The brain damage caused by a stroke can lead to a variety of disabilities, including problems with speech and language.

In haemorrhagic stroke, one of the weakened blood vessels in the brain ruptures and bleeds into the surrounding area.

Dr Jeyalekshmy, a consultant interventional radiologist at Gleneagles Medical Centre, shared that 70% of stroke patients are ischaemic, which is an emergency like the heart attack.

“There is a blood clot in the arteries of the brain so blood cannot flow through, just like a clogged pipe. When blood cannot flow to a certain crucial artery called the middle cerebral artery – then the rest of the blood vessels don’t get supply. Hence, the tissues don’t get supply and for an interim period, the tissue can survive but there comes a critical point where it can’t hold on anymore and it strokes out.

“But tissues don’t die overnight. Like vegetables, when you take them out of the refrigerator, they may be wilted but when you put them in water, they freshen up. So what we are doing is removing the clot to re-establish circulation and recover the supply to the affected artery. That is the process.”

Minimally-invasive procedure

Called mechanical thrombectomy, this interventional procedure involves removing a blood clot (thrombus) from a blood vessel.

The breakthrough treatment, which is the current gold standard of care, is applicable to ischaemic stroke patients, came about from the 2014 DAWN Trial and offers hope of full recovery.

The previous standard treatment for ischaemic stroke was an injection of recombinant tissue plasminogen activator (t-PA), which is useful only up to three hours after the onset of symptoms. t-PA works by dissolving the clot and improving blood flow to the part of the brain being deprived of blood flow.

In the DAWN trial, nine out of 10 patients became disabled or died when only t-PA was used while in the mechanical thrombectomy group, only two in 10 patients became disabled, a breakthrough in stroke treatment.

In mechanical thrombectomy, a catheter is threaded into an artery in the groin and up through the neck, until it reaches the blood clot causing the stroke. "We put in a steel-like device into the catheter to engorge the clot, pull it and slowly remove it via the groin to re-establish circulation. In the same sitting, if we get it whole, we go in and remove the clot again. We can repeat this up to three times," explains Dr Jeyalekshmy who spent two years in France studying interventional procedures.

However, the points out that there are other factors involved in making a full recovery. "There is something called the collateral circulation i.e. the neighbouring blood vessels in that area can help pushing the time before the situation becomes critical. Alternatively the collateral circulation can take care of the peripheral part of the stroke, reducing the impact. If patients come early and remove the clot before the tissue dies, they can gain almost 100% recovery.

"If they couldn’t speak before, they could start talking; if they recognize people, that is an improvement. Full recovery can take up to six months but the degree varies as it depends on how many neighbours are helping, how fast they came to the hospital and how soon the procedure was done. Since 80% of stroke cases come to us in the ischaemic phase, 30%–50% can recover to become independent again," she says.

Example window period

In the past, we were told to get to the hospital within six hours of getting a stroke to improve the chances of recovery but the Dawn Trial found the window period can go up to 24 hours. Still, the earlier you head to the hospital, the better.

The trial has made the diagnosis and treatment options skryokre.

Removing blood clots from the brain leads to better outcomes for stroke patients, including greater independence and mobility. Previous endovascular interventional devices were unable to remove clots quickly and safely enough. When used in conjunction with tPA and medical treatments, this method significantly reduces stroke-related disability and mortality.

Dr Jeyalekshmy says, "Let’s say patients come late or the family is not aware of treatment options, think it’s too late already so there is no need to do anything, and don’t come to hospitals. Why should one think like that?"

"When you open the pathway, you give the patient a chance to recover, if not reduce the impact because the artery is open and blood supply is restored.

Furthermore some may recover blood supply from the neighbouring arteries. If it is a haemorrhagic stroke, then we cannot do anything but here in ischaemic stroke, there is an option."

The limits the procedure is expensive (RM450,000 to RM550,000) due to the cost of the imported materials.

"If you don’t treat and the patient becomes a complete vegetable, he may love for another 20 years, especially if patients are getting younger. Think of the bedpans, pumps, feeding tube, medication, prepared formula, family support... family units break down if the patient is the sole breadwinner, can you imagine what will happen?"

"There are initial expenses but if you can be independent, why not? You’re saving money in the long term, plus more and a sense of value of living," says Dr Jeyalekshmy.

"Patients don’t stay in hospital long because mechanical thrombectomy is a minimally invasive procedure. Typically in successful mechanical thrombectomy, the hospitalisation period is about four or five days.

When a stroke patient is present at the hospital, the standard procedure is to have a computed tomography (CT) scan done to check for the type of stroke. If there is no bleed, the patient is subjected to a CT angiography (CTA) scan. A type of radiological test that combines a CT and injection of a special dye, given intravenously, to produce pictures of blood vessels and tissues in one part of the body. The doctor does a few more tests to look for perforation and collaterals circulation, before deciding what to do.

She says, "People are always concerned about the kidneys when we give the contrast (dye) but there is a saying ‘nerves over the kidneys’. We can solve your renal issues later."

Locally, mechanical thrombectomy is performed by radiologists sub-specialised in interventional radiology.

The size of the wire is small so it takes a lot of skill to learn to navigate the arteries. We cannot be experimenting at this time, so tactile sense is important. "Usually within 45 minutes from the time of CTA, we would have established circulation. It takes longer in older people as the arteries are more crooked so it’s a bit of a struggle to place the catheter or younger people have straighter arteries," she says.

The procedure is available at several public, teaching and private hospitals by Dr Jeyalekshmy’s advice: “Take the initiative to find out where the nearest hospital providing this mechanical thrombectomy is for the sake of your health.”