



New hope for Parkinson's sufferers

A device implanted in the chest and which sends signals to the brain may help Parkinson's patients improve their motor skills and muscle function

A new development in the treatment of Parkinson's disease offers patients hope in better managing their condition.

A neurostimulator (below) implanted in the chest sends impulses to two electrodes in the brain to mimic the action of a chemical needed for muscular function.

Since 2002, about 50 Singaporeans have benefited from Activa Deep Brain Stimulation (DBS) therapy and recent improvements to battery life have made it even more feasible.

National Neuroscience Institute (NNI) senior consultant neurosurgeon Dr John Thomas has performed 35 DBS

surgeries and the improvements to the quality of life of patients have been impressive.

"I had one patient who, after having the surgery, went from being able to walk 1km to being able to run for five," he said.

Parkinson's disease (PD) is a progressive, life-altering condition which, according to the NNI, is the second most common neurodegenerative disorder after Alzheimer's disease.

PD has been estimated to affect more than four million people worldwide and its incidence in Singapore is as common as in the West, affecting one in every 100 Singaporeans over 70.

The illness is seen more frequently in men and as many as three people out of every 1,000 aged 50 and above will suffer from it.

While the condition is more commonly seen among people over the age of 65, statistics from the National Parkinson Foundation of America indicate that 15 per cent of PD sufferers are under the age of 50. One famous example is actor Michael

J. Fox who was diagnosed with Parkinson's in 1991 at age 30.

Parkinson's primarily affects a patient's motor functions. Common symptoms are tremors, stiffness in the muscles, slowness of movement and poor gait and balance. Eventually, as the disease progresses, a patient will require round-the-clock care.

According to Dr Elena Moro, neurologist and director of surgical treatment of movement disorder at Toronto Western Hospital, up to 40 per cent of Parkinson's patients also suffer from depression, concentration problems, sleep disorders and eventual cognitive decline at the advanced stage of the disease.

PD results from the degeneration of the region of the brain that produces dopamine cells, a neurotransmitter which primarily mediates movement and muscle functions. This process of degeneration occurs years before the patient

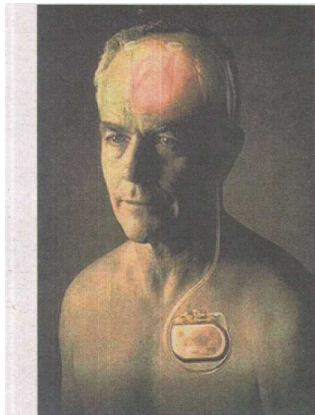


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The Activa DBS kinetra implant is a small, sealed device implanted in the left side of the chest. It emits electrical pulses that travel up to the two electrodes implanted in the brain to effectively control Parkinson's symptoms.

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Tremors forced his hand

Mr John Lee (not his real name, left) appears an unlikely candidate for Parkinson's. The amiable and talkative 68-year-old has a strong handshake and a steady stride which do not betray the condition he has lived with for the past 15 years.

Once the general manager of a group of engineering companies, Mr Lee began experiencing depression and weakness in his hands in 1993. He was diagnosed with Parkinson's disease the following year, when he was 53.

Although he had heard of the illness prior to the diagnosis, he was not fully aware of the repercussions it would have on his life.

He began to fully grasp the gravity of his condition when he no longer responded well to medication and the tremors worsened over a decade. His condition deteriorated to the point where he would uncontrollably slap his hand against his thigh all day.

He could not read the newspapers or sign documents due to the severity of his tremors. The disease also forced him into early retirement at the age of 56.

Despite two aborted attempts due to malfunctioning technology and a suspected viral infection, Mr Lee decided to undergo Activa Deep Brain Stimulation therapy in May last year.

His wife and two children, now aged 36 and 38, were immensely supportive, particularly in the lead up to the surgery.

Religion also helped. "I was fortunate to have some religious beliefs and that helped me tremendously," he said.

It took only one week to recover from the DBS surgery and Mr Lee has since regained his motor movements. He now needs only one quarter of the medicine he used to take. He also no longer needs physiotherapy and he cycles or walks for an hour every day to remain active.

Though Mr Lee is in much better shape now, he is unable to drive anymore so he relies on his wife to chauffeur him. He has also hired a maid who accompanies him everywhere. This is a preventative measure, in case he falls.

He said: "The worst thing that can happen is for me to fall and hit my head because it can cause a stroke."

His quality of life has improved significantly since the surgery and he recommends the surgery for those eligible.

"Now I can spend much more time reading the papers and doing the things I like", he said.

begins to notice it.

Doctors still do not know the exact underlying causes of the disease but it is believed to be a combination of environmental and genetic factors.

"About 10 per cent of cases are hereditary and 90 per cent are sporadic," says Dr Moro.

There is presently no cure for Parkinson's and no treatment has been shown to slow or stop the progression of the disease. However, there are several types of treatment currently available which allow the patient to effectively manage his or her symptoms. (See story on next page.)

Recently, improvements made to Activa DBS therapy have given patients more flexibility in their treatment. The therapy requires invasive surgery to implant its three components: two electrodes in the brain, a neurostimulator in the chest and an insulated lead running up the back of the neck, under the skin, to connect the neurostimulator to the electrodes.

The neurostimulator emits electrical pulses that travel up the lead and stimulate the electrodes in the brain. This mimics the benefit of dopamine replacement therapies and improves motor skills and muscle function.

According to Dr Moro, Activa DBS therapy is the best surgical treatment available at the moment. It is also reversible and is safer than other surgical options as it does not make lesions within the brain which can cause permanent damage.

The procedure can decrease the need for medication by up to 50 per cent. It helps suppress tremors and improve rigidity. Some younger patients who have had the treatment have been able to go drug-free.

The main surgical risks include potential bleeding in the brain, stroke and infection of the wound. Of the 35 patients Dr Thomas has operated on, only two or three have had wound infection due to negligible post-operative care. Complications that may result from the treatment include speech impairment and weight gain.

The degree of success also depends on the progression of the illness. Dr Thomas says that ideally, patients should undergo DBS treatment when they become less responsive to medication and are on the brink of dependency on carers. That's when they will get maximum benefit from the procedure.

However, the treatment is considered only for selective patients, who are usually referred by their neurologist.

Presently, the neurostimulator device, known as the Activa kinetra, is non-rechargeable and has a battery life of three to five years.

However, two new versions - the Activa primary cell (PC) and rechargeable cell (RC) - were launched in Europe last year and were recently made available in Singapore.

The Activa PC is very similar to its predecessor, resembling an old-fashioned pager, but **slimmer and lighter** with the same battery life.

The Activa RC is the smallest of the three and has a battery life of up to nine years but patients need to be diligent about recharging the battery. They can recharge it every day for approximately 15 minutes or every 10 to 14 days for four to eight hours using a charging pack that emits electromagnetic waves to penetrate the skin and recharge the device.

Activa DBS surgery costs about \$50,000 to \$55,000, including hospital stay and surgical costs.