

Health



Future of regenerative medicine

By MAJORIE CHIEW

PENANG-born Dr Saw Khay Yong is becoming well known for his stem cell work in regenerating and repairing cartilage in damaged joints. "With stem cells, we are regenerating back the original cartilage. Stem cell is the future of medicine and Malaysia needs to be at the forefront. Once we're ahead, we need to stay ahead," says Dr Saw.

The articular or joint cartilage is the surface lining that covers the ends of the bones and provides a smooth, pain-free gliding motion. Damage to the articular cartilage exposes the underlying bone, which causes pain when the two ends of the bone grind together during movement. This leads to recurrent swelling and pain, and eventually osteoarthritis.

Dr Saw, 51, specialises in arthroscopic surgery of the knee and shoulder and is a consultant orthopaedic surgeon at the Kuala Lumpur Sports Medicine Centre (KLSMC), where he is a founder and one of six partners.

Since March 2007, he has operated on more than 300 patients aged between 14 and 72, both locals and from overseas, using stem cells. While he might not be the first to use stem cells, he has been very successful in regenerating and repairing the articular (joint) cartilage with his technique.

Dr Saw obtained his medical degree and masters degree in orthopaedic surgery from the Liverpool University Medical School in Liverpool, England.

He won the Norah Walker prize for post-graduate orthopaedic radiology in 1993 for his thesis on *Early mobilisation following operative repair of ruptured Achilles tendon*. His work has been recognised in the North West region of England as a newer and better treatment and has now been adopted as a standard method of care.

After spending 15 years abroad, Dr Saw returned to Malaysia in 1994 and was appointed an orthopaedic lecturer at the University Hospital Kuala Lumpur. In 1997, he went into private practice at the Gleneagles Intan Medical Centre, Kuala Lumpur.

Research studies

Dissatisfied with the options for treating patients with articular cartilage injuries, Dr Saw first began his research in animal studies in 2005 by collaborating with Universiti Putra Malaysia (UPM) to regenerate articular cartilage of the knee joint in goats.

In 2007, he began clinical trials in humans and the results were published in *Arthroscopy: The Journal of Arthroscopic and Related Surgery* (April 2011).

In January last year, he conducted a clinical trial involving 50 patients aged between 18 and 50. This 18-month study focused on the effects of stem cell therapy on damaged knee cartilage.

The patients were randomly divided into two groups. After surgery, one group received stem cells and the other group didn't.

"We're now doing biopsies of the repaired cartilage from the clinical trial patients to find out whether stem cells can regenerate better articular cartilage. In the next six to 12 months, we will know," says Dr Saw.

This randomised clinical trial was partially funded with just over RM2mil by the Ministry of Science, Technology and Innovation (MOSTI).

As the government funding is insufficient, Dr Saw says, KLSMC, a one-stop private hospital for sports injuries, came up with additional funds to complete the research project. KLSMC has also just installed a high field (1.5T) Extremity MRI scanner to enable better visualisation of the repaired cartilage.

Sharing his expertise

"We're collaborating with doctors overseas so that they can replicate what we're doing," says Dr Saw.

In recent years, doctors from the United States, United Kingdom, Austria, India, Australia and Indonesia have come to learn from him.

One of them was Dr David McGuire from Anchorage, Alaska, who came in October, 2009.

A local orthopaedic surgeon has put Malaysia on the world map for his pioneering work in using a patient's stem cells to regenerate the knee cartilage.

In Dr Saw's earlier years of practice, he learnt a lot about knee surgery from Dr McGuire. "We shared knowledge and last June, Dr McGuire started his first case (with stem cells) in Alaska," Dr Saw says.

He points out that the results of this new method of regenerating articular cartilage must be able to be reproduced by other surgeons in the world for the clinical trial to be successful.

"Medicine is to share knowledge so that doctors can help patients," he opines.

Globally, the number of patients with articular cartilage injury is "huge". Says Dr Saw: "This is the future - what we are doing (with stem cells). It's a method that has been shown to work very well with the regeneration of good articular cartilage and seems to be much cheaper and more effective than what is currently available."

Good for the pros

As for professional athletes, this is another option to treat their knee cartilage injury. If one can regenerate good cartilage, this will be more resilient to wear and tear as compared to the traditional methods of repair.

Brian Smoluch, 39, portfolio (stocks) manager from Portland, Oregon, US, found Dr Saw on the Internet and was in Kuala Lumpur for six weeks for the repair of his left knee.

He says: "I've been researching on cartilage regeneration all over the world and concluded that the best solution is this method with stem cells."

Doctor Saw stem cells as the cure

Smoluch injured his left knee while playing American football 25 years ago. And, for the last 12 years, he has been seeking treatments for his bad knee.

Tay Yong Sing, 44, a Singaporean businessman, broke his knee more than 20 years ago while in the army. He had his first knee surgery to reconnect his torn ligaments after the accident.

Two years ago, another surgery had to be done on the bad knee "to correct some ligament problems".

"My doctor says that my knee is in very bad shape and in unstable condition. I felt a lot of pain due to the loss of ligaments and cartilage.

"I'm hopeful that I'll get better results with stem cells."

Dr Saw's technique to regenerate good articular cartilage is "revolutionary", says Dr William D. Murrell, 43, an orthopaedic surgeon from the United States. He was here twice this year - in March and July - to learn about treating cartilage injuries.

For young patients with cartilage injury, the treatment options are very expensive and available only in the US, Europe and Japan. However, the costs are astronomical and the results aren't great, he contends.

"Dr Saw's method appears to regenerate joint cartilage and can be done very inexpensively and with very little risk to patients. It's very easy and well tolerated."

Striking a balance

Dr Saw travels a lot and is a busy man. But he admits that in life, one must "strike a balance between work and family".

When he is not performing surgery, he spends a lot of time working on his research or writing.

He also travels a lot for work. This year, he has presented papers in Rio de Janeiro (Brazil) and Singapore. Later this year, he will be giving talks in Padova (Italy), Strasbourg (France) and Beijing (China).



Dr Saw examining Smoluch's knee after surgery. Looking on is Dr Murrell.



A patient having her knee scanned by a High Field Extremity MRI

"I try to incorporate work with travelling. My wife and children sometimes accompany me," says Dr Saw, who has two sons aged nine and 11, and a daughter aged seven.

His typical day starts at 8am and he returns home late. Dinner is usually at 9pm.

On Sundays, he is back to work for a brief round. The physiotherapy unit is open seven days a week.

There is also paperwork involved like looking over the accounts or managing the centre, which can't run on its own!

But he sets priorities, depending on what's more urgent, like if the kids are sick.

"My wife and kids understand," says Dr Saw, who goes alpine skiing in Japan or Europe with his family yearly.

Then, there is a time to play.

"A few weeks ago, we were in Pangkor Laut, and, in two weeks' time, we're going to Phuket," he says of his holiday plans. On holidays, he sometimes still has to work.



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— DR SAW KHAY YONG

"My family may be fishing and I may be working. Or they may go swimming and I'll be in the room, working on research projects or a book chapter. It's a compromise."

Technology has allowed him to keep an eye on things at his centre, either texting on his mobile phone or via e-mails.

Research funding for the private sector is rather limited, but for evidence-based medicine, this is essential. It's difficult to do research in the private sector, but it's possible if one perseveres, he muses.

Dr Saw intends to set up KLSMC's own research institute to look at other applications of stem cells for other problems, such as the diabetic foot, bone regeneration, persistent tennis and golfer's elbow, nerve and tendon repair and aesthetic medicine.

His philosophy as an orthopaedic surgeon?

"Do good, honest work. It's always better to under-promise your patients and over-deliver than the other way round.

"I tell my staff and children that it's not that difficult to know how to treat someone else so long as you put yourself in the other person's shoes to know what it feels like," he says.