life & times **health**

Internal repair

Harvesting adult stem cells to repair the heart muscle is showing good potential. **ANEETA SUNDARARAJ** finds out what the procedure entails

WHEN certain parts of your body break down, there are treatment options. For example, if you break a leg, your bones can be repaired and hopefully, you'll recover the full use of your leg.

But what happens when the heart is damaged? Can it be repaired? With adult stem cell therapy, it's a resounding "yes".

So, what exactly does it entail?

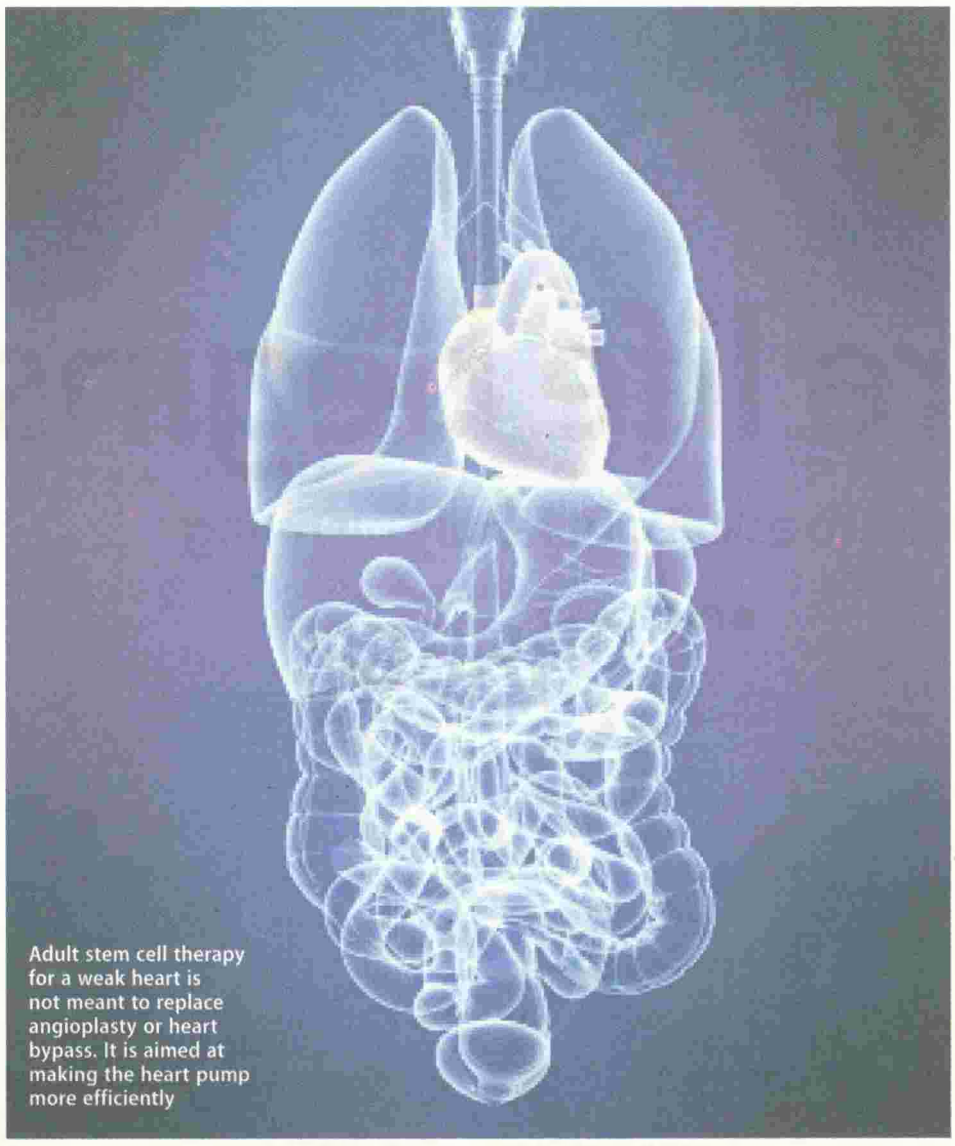
Datuk Dr Devan Pillay, consultant interventional cardiologist at Prince Court Medical Centre, explains it this way: Think of stem cells as the body's internal repair system. As long as a person is alive, stem cells can divide and replenish other cells. The beauty of this process is that when a stem cell divides, each new cell can become another stem cell or a cell with a more specialised function such as a muscle. That's what led to the idea of stem cell harvesting to create specific organs or tissues.

Stem cells can be harvested from embryos that have been fertilised in vitro, with consent from the donors. But this method has been met with ethical issues.

That's why there is a conscious effort to harvest stem cells from adults. The biggest potential of this method is that a patient can use his stem cells and so cut the possibility of these cells rejected by his immune system.

But for a patient with heart disease, Dr Devan is not in favour of using the patient's stem cells as "it makes no sense to harvest stem cells from an unhealthy body".

Instead, he suggests using stem cells harvested from the healthy bone marrow (mesenchymal stem cells) of adults aged between 18 and 25 which are stored in stem cell banks. This method, he claims, has been widely tested in the West with positive results. Besides, adult stem cells from the bone marrow have the greatest capacity to regenerate, he says.



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Dr Devan points out that when a patient suffers a heart attack, part of the heart muscles dies and becomes scar tissue.

"When the patient's ejection fraction (the method of measuring the amount of blood pumped by the heart per minute) is less than 35 per cent, his heart muscle no longer pumps blood efficiently. He's suffering from a condition known as ischaemic cardiomyopathy or dilated cardiomyopathy. With adult stem cell therapy, stem cells are infused into the heart to repair the heart muscle so it can pump blood more efficiently."

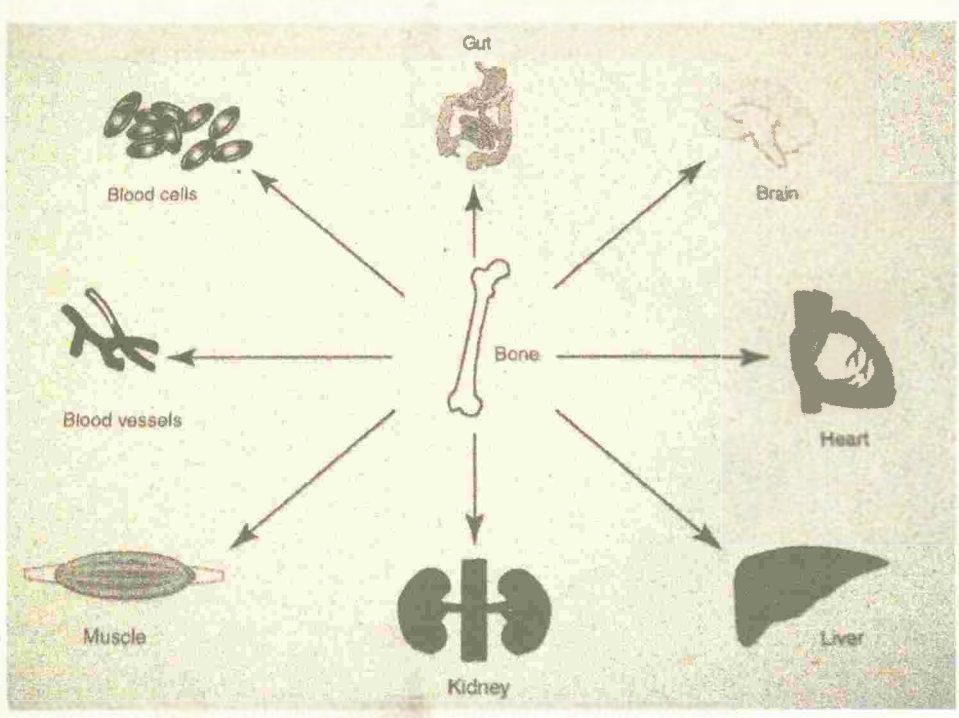
The procedure for adult stem cell therapy for a weak heart is similar to minimally invasive angiogram and angioplasty. When a patient has a heart attack, the immediate concern is to stabilise him. Once he's no longer in a critical condition and is deemed suitable for adult stem cell therapy, the cardiologist, guided by an echocardiogram or cardiac MRI, will insert a catheter into his blood vessel and carefully guide the catheter until it reaches the coronary artery. At that point, he's infused with two million cells per kg of body weight.

Like how a balloon is placed inside a stent during an angioplasty, a balloon is also inflated when the stem cells are infused into the heart muscle. This is to ensure that the stem cells flow directly into the heart muscle, not in the opposite direction. Once the cells are in place, the balloon is deflated and removed.

Dr Devan points out that adult stem cell therapy for a weak heart is not meant to replace angioplasty or heart bypass. It is aimed at making the heart pump more efficiently, whereas the other two procedures are aimed at optimising blood flow to the heart. This means adult stem cell therapy complements other kinds of cardiac therapy.

At present, there are no known side effects for this therapy apart from nausea and headache. The biggest drawback remains its cost: A dosage of 100 million stem cells can cost about RM15,000.

Nevertheless, Dr Devan is optimistic about this therapy's prospects. "Patients who have undergone this therapy have seen 5-8 per cent improvement in the function of their heart muscle. While that may not seem much, for a patient with an ejection fraction of less than 35 per cent, there's symptomatic relief, and this is good."



A healthy bone marrow can help various conditions