

BBC News HEALTH
“Paralysed man walks again after cell transplant”
21st October 2014

Introduction

30 years of research to improve spinal cord function after an injury came to fruition for Professor Geoffrey Raisman with the recent surgery to implant Mr Darek Fidyka with his own olfactory ensheathing cells. In the weeks and months after surgery the patient experienced neurological recovery that enabled him to walk increasingly longer distances with aids.

Though only one patient, it has raised hopes that further research will confirm the value of the technique and lead to it becoming available for other people with spinal cord injury.

Background

It is known that the nerves that detect smell (olfactory nerves) multiply to replace those damaged by inhaled chemicals. The cells that surround the nerves and facilitate regeneration are called olfactory ensheathing cells (OECs). Animal experiments have provided strong evidence that OECs can stimulate regeneration in the damaged spinal cord. Professor Geoffrey Raisman, Chair of Neural Regeneration at University College London's Institute of Neurology has pioneered this work in animals and was ready to take it to clinical trials.

The patient Mr Darek Fidyka became a mid thoracic (T9) paraplegic when stabbed in 2010. The knife sliced through the cord leaving an 8mm gap. This narrow, clean cut was considered ideal for the trial.

Treatment before Surgery

Mr Fidyka's injury was clinically complete and stable. Despite intensive physiotherapy pre-surgery there was no improvement in muscle power or sensation.

The Procedure

The olfactory bulb on one side was originally removed in the first operation and the cells were grown in culture.

Two weeks later the OECs were planted into the spinal cord. After removal of scar tissue about 500,000 cells were injected by means of 100 micro-injections above and below the damaged area. Four thin strips of tissue taken from the nerve of the ankle were placed across the gap to provide a bridge for nerve fibres.

Physiotherapy was continued after the operation at 5 hours per day five days a week. After three months he noticed that his left thigh was bigger and over the following months, leg strength improved, particularly on the left side and he started to walk with aids in parallel bars with aids and help from his physiotherapist. He can now walk

outside using a walking frame. He has also noted some return of bowel and bladder sensation and sexual function.

Is this another hyped up media report?

In contrast to most media reports of improvement in neurology and promises of cure, this particular case has been independently monitored since before the surgery.

Professor Wagih el Masri has worked in the field of spinal cord injuries for 40 years. While the Head of the Spinal Service at the Robert Jones and Agnes Hunt Orthopaedic Hospital in Oswestry he treated thousands of patients for spinal cord injury.

BBC's Panorama program and the team of researchers invited him to assess the patient independently. He writes, "I was invited by the BBC and the team of researchers to assess the patient independently. I was flown to Wroclaw by the BBC where I was given full access to the patient, the pre op assessment and the post intervention assessments. There is definitely some modest clinical neurological improvement and also neurophysiological signs of connectivity after the intervention both of which were absent before the intervention. I confirmed what is written in the manuscript with the only difference being the power grade in the quadriceps and hip flexors and their ability to move the joints. This development is unlikely to be coincidental or due to chance. The findings are significant and compelling for the pursuit of this line of research without raising the expectations of patients at this stage. The intervention was 21 months following injury and the patient is now over three years from injury.

My conclusion is that Cautious optimism, longer period of follow up and evaluating the outcomes of this intervention in a few more patients is what is required at this point in time and what I would recommend."

The researchers hope to treat another 10 patients in Poland and Britain to see if the results can be replicated and whether those with the more usual crushed and torn spinal cord with ragged gaps of 20-30 mm may respond in a similar way.

What does this mean the person with spinal cord damage?

The independent verification of the neurologic change following this procedure gives cause for hope, despite the fact that three previous surgeries are reported not to have shown any improvements. With hopes raised high by this reported success, people with spinal cord injury need to take stock of their situation. It will be a tragedy if spinal cord function can be improved, but bowels and bladder have been destroyed beyond repair, muscles destroyed by pressure sores and joints with limited movement because of contracture meaning that functional recovery will be greatly limited.

Therefore, the Australian and New Zealand Spinal Cord Society strongly recommends that people with SCI focus on ensuring that their bodies are in tip top condition so that when treatments to improve spinal cord function become available they will be in the

best position to obtain maximum benefit. They should optimise their range of movement, muscle care, bowel and bladder function and cardiac fitness in order to make the most of any recovery that becomes available.