

Bloomberg News

Paralyzed Man Walks After Cells for Smelling Placed in Spine

By David Wainer October 21, 2014



Bulgarian patient Darek Fidyka walks with the assistance of leg braces and a walking frame at the Akron Neuro-Rehabilitation Center in Wroclaw, Poland. British and Polish scientists helped the paraplegic man with a severed spinal cord to walk again. The surgery on the former fireman was performed in the Polish city of Wroclaw in 2012. Photographer: BBC via EPA

A man paralyzed from the chest down in a knife attack is walking again after undergoing surgery using cells responsible for the sense of smell, marking an advance in the search for treatments for spinal injuries.

Darek Fidyka, 38, received the cells after failing to recover from a stabbing in the back in 2010, according to University College London, whose doctors developed the procedure. The technique involves using olfactory ensheathing cells and placing them in the spinal cord.

The study gives hope to the thousands of people each year who suffer a severe spinal cord injury and must live the rest of their lives with permanently damaged body functions. Such injuries typically occur during sports or automobile crashes and there is no approved treatment to repair them.

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“We have now opened the door to a treatment of spinal cord injury that will get patients out of wheelchairs,” said Geoff Raisman, chairman of neural regeneration at the UCL Institute of Neurology and leader of the U.K. research team. “Our goal now is to develop this first procedure to a point where it can be rolled out as a worldwide general approach.”

The cells used were discovered by Raisman in 1985 and were shown to work in treating spinal injuries in rats in 1997. They allow nerve cells that give people their sense of smell to grow back when they are damaged. The procedure on Fidyka was performed by surgeons at Wroclaw University Hospital in Poland.

Surgical Procedure

For the treatment, Fidyka underwent brain surgery to remove an olfactory bulb, a structure responsible for the sense of smell. The bulb was placed in a cell culture for two weeks to produce olfactory cells, which were injected into the spinal cord along with four strips of nerve tissue taken from the ankle. The strips formed bridges for the spinal nerve fibers to grow across, with the aid of the cells.

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Three months after the surgery, Fidyka's left thigh muscle began to grow and after six months he was starting to walk within the rehabilitation center with the help of a physiotherapist and leg braces, according to UCL. His bladder sensation and sexual function have also improved.

"This technology has been confined to labs, so it's promising to see that it may have helped someone recover from a clean cut through the spinal cord," said Jeremy Fairbank, a professor of spine surgery at the University of Oxford who wasn't involved in the research.

Further Developments

"The next question is what sort of clinical experiments must be done to prove that this works," Fairbank said. "I suspect it will take years until there is a practical way of doing this."

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The research, funded by the UK Stem Cell Foundation and the Nicholls Spinal Injury Foundation, was published in the Cell Transplantation journal. Further studies in patients are planned by UCL and Wroclaw University Hospital, according to Michael Hanna, director of the UCL Institute of Neurology.

"It's as if you were born again," the patient, who can now walk using a walker, said in a statement from University College London.

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