Medical Xpress

In double transplant, left hand works first

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(AP) -- When patients had both hands transplanted, their brains re-established connections much more quickly with the left hand than the right, a team of researchers in France reports.

The sample was small, just two patients, but both had been right-handed before losing their hands, and both followed a pattern of reconnection with their brain that was quicker for the left hand.

The study, led by Angela Sirigu of the Center for Cognitive Neuroscience at the University of Lyon, France, is reported in Tuesday's edition of *Proceedings of the National Academy of Science*.

The research shows that even years after the loss of hands the brain can reorganize and rewire itself to recognize and connect to a replacement.

And it comes just days after French physicians, in a 30-hour operation, performed the world's first simultaneous partial-face and double-hand transplant. Paris' Public Hospital authority described the recipient as a 30-year-old burn victim who was injured in a 2004 accident.

Sirigu's team used magnetic imaging to study the brains of people who had lost both hands and to see how the motor region that controls movement responded after new hands were transplanted.

The first case involved LB, a 20-year-old man injured in 2000, who received the transplants in 2003 after having used artificial hand devices in the meantime.

He was checked periodically and the researchers found his brain had re-established nerve connections to control the left hand by 10 months, while it took 26 months to complete the rewiring needed for the right hand.

"Interestingly, despite that LB was right-handed, and that after his amputation he used his prosthetic device mostly with his right hand, hand preference shifted from right to left after he had the graft," the researchers reported.

The second patient studied, CD, was a 46-year-old man who lost both hands in 1996 and received a dual hand transplant in 2000. He was tested by the researchers in 2004, 51 months after the transplants. Strong connections in the brain were observed for the left hand, but not yet the right.

The researchers said more study is needed to determine why the brain reconnected more efficiently to the left hand in these patients. Possibilities include a basically better connection to the left hand, factors in the way that the brain reorganizes itself during the process of the loss of a hand and its later replacement, or perhaps some pre-existing difference in brain organization.

In general, experiments have shown that the right side of the brain controls the left side of the body and many researchers believe it also dominates in such areas as spatial abilities, face recognition, visual imagery and music. The left side of the brain controls the right side of the body and is thought to dominate in language, math and logic. However, many traits are shared by both sides, and if one side is damaged the other can take over many of its functions.

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On the Net:

Proceedings of the National Academy of Science: http://www.pnas.org