Talking Head (Transplants)

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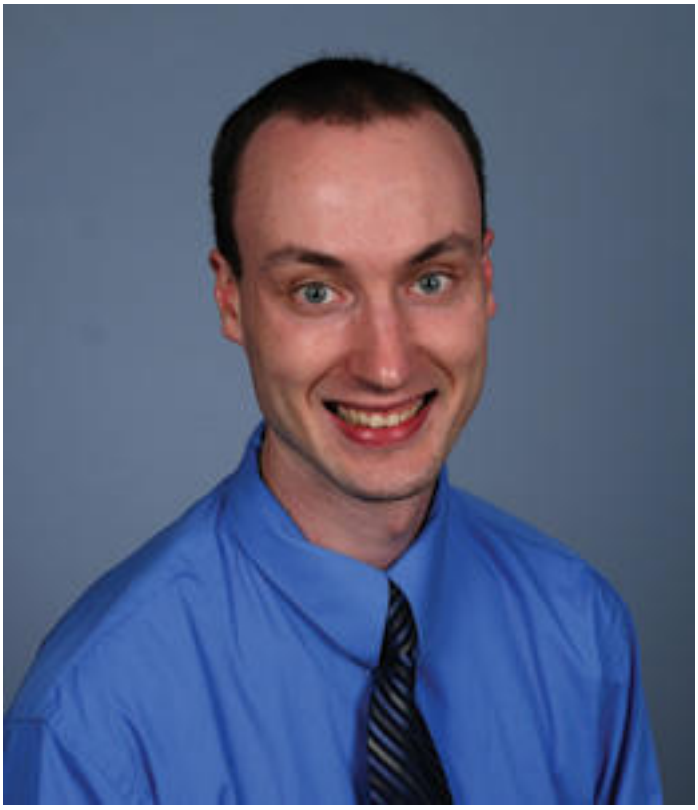
Whether or not we see actually see a human head transplant performed in the relatively near future seems to be more of an ethical question than a medical or scientific one.

Or so says Italian scientist Dr. Sergio Canavero.



Canavero, who works at Turin Advanced Neuromodulation Group in Italy, recently tackled the topic of head transplants by writing about how such a procedure could work in a recent article [1] that appeared in the journal *Surgical Neurology International*. Early on in the article he acknowledged that greatest technical hurdle to such a procedure is the reconnection of the donor's and recipient's spinal cords. However, he laid out a hypothetical situation and proposed an intriguing solution to combat such a complication.

The scenario involved a donor who is brain dead, but his or her brain is still intact. However, he noted that two surgeries would have to take place in the same operating room at the same time. Both the donor's spinal cord and recipient's spinal cord would be severed simultaneously. Furthermore, hypothermia would be induced, and the spinal cord would be cut with an "ultra-sharp blade" so it could be fused with the donor's spinal cord. The donor body's spinal cord would be "chemofused" to the recipient head's spinal cord using a substance

called polyethylene glycol

There's no doubt a ton of preparation would be necessary to pull off such a procedure. According to Canavero, the surgical teams would have to refine the approach details on cadaveric specimens and the surgery would have to be reenacted several times in order to coordinate the surgical and anesthesiological teams. In short, the process would be extremely complicated and risky.

Human head transplants are without precedent, but the general idea is not. In 1970, a group of scientists transplanted the head of one rhesus monkey on to the body of another – without complications. Well, other than the fact that the recipient lived for only eight more days.

Nevertheless, what fascinates me about this proposed procedure is the ethical dilemma, which Canavero touches on in his article. He cites Thomas Mann's *The Transposed Heads* [2] to explain his thoughts. In the story, two friends behead themselves. Through the power of magic, their heads are restored – but they are switched. This story leaves the reader asking following question: Is a human defined by his or her mind or body?

If human head transplants actually took place, imagine the sort of life a recipient would have with a familiar body but an unfamiliar mind. Scratch that, it is probably more accurate to say the mind would be familiar. Either way, the best words to describe the whole idea of a human head transplant are "unnatural" and "fascinating."

Thankfully, Hollywood has given us a gem of a movie about two men – a dangerous and mentally unhinged criminal and the FBI agent obsessed with bringing him to justice – who undergo a surgical procedure that results in their faces being switched. The cheesy (but extremely entertaining) flick, entitled Face/Off *[3]*, plays off the identity crises of the characters played by John Travolta and Nicolas Cage. As expected, complications arise.

Ethics and complications aside, Canavero should be applauded for tackling the technical aspects of a human head transplant. Right now it is nothing more than an imaginative procedure that's better suited as the basis for a Hollywood blockbuster than a surgery to be taking seriously by medical professionals. Will this always be the case? Time will tell…

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