

Facial transplantation: Almost a decade out, surgeons prepare for burgeoning demand

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Plastic and reconstructive surgeons leading the first retrospective study of all known facial transplants worldwide conclude that the procedure is relatively safe, increasingly feasible, and a clear life-changer that can and should be offered to far more carefully selected patients.

Reporting in *The Lancet* online April 27, NYU Langone plastic and reconstructive surgeon and senior author Eduardo Rodriguez, MD, DDS, says results after nearly a decade of experience with what he calls the "Mount Everest" of medical-surgical treatments are "highly encouraging."

The review team noted that the transplants still pose lifelong risks and complications from infection and sometimes toxic immunosuppressive drugs, but also are highly effective at restoring people to fully functioning lives after physically disfiguring and socially debilitating facial injuries.

Surgeons base their claims on the experience of 28 people known to have had full or partial face transplants since 2005, when the first such procedure was performed on a woman in France.

Of the 22 men and six women whose surgeries were reported, including seven Americans, none have chronically rejected their new organs and tissues, says Dr. Rodriguez, chair of the Department of Plastic Surgery at NYU Langone Medical Center and director of its Institute of Reconstructive Plastic Surgery. All but three recipients are still living.

Four have returned to work or school.

Dr. Rodriguez, the Helen L. Kimmel Professor of Reconstructive Plastic Surgery at NYU Langone, in 2012 performed what is widely considered the most extensive facial transplant (when he practiced at the University of Maryland Medical Center in Baltimore). The patient was a Virginia man who had lost the lower half of his face in a gunshot accident 10 years earlier. Dr. Rodriguez is currently readying his new team at NYU Langone to perform its first facial transplantation, expected later this year.

In *The Lancet* article, Dr. Rodriguez and his colleagues point out that although all recipients to date have experienced some complications from infection, and mild to moderate signs of rejection, the few deaths among patients were due to infection and cancer not directly related to their transplants. Indeed, most patients, he says, especially those in the United States, are "thriving"—speaking, chewing, and leading social lives from which most had completely withdrawn because of their disfigurement.

"By far the overriding factor in the success of face transplantation has been in selecting patients most likely to benefit from and succeed through what can best be described as the most complex of medical-surgical procedures," says Dr. Rodriguez. "This is a life-changing treatment that can take years to prepare for and one that hopefully endures for the rest of the patient's life."

Dr. Rodriguez notes that only patients with the most severe facial disfigurement—not reparable by even the latest surgical techniques—are considered for the procedure. Patient histories range from victims of bear bites to multiple gunshot accidents and severe, electrical and house fire burn injuries. The extent of injuries may encompass any combination of the forehead, eyelids, nose, cheeks, lips, jaws, and chin.

"People who volunteer to undergo this procedure do so for very serious health and psychological reasons," says Dr. Rodriguez. "It goes far deeper than looks. People willing to undergo facial transplantation are highly motivated to do so. Without facial transplantation as an option, many of these people would be at serious risk for severe depression, even potential suicide," he says.

For those who do undergo facial transplantation, Dr. Rodriguez says success depends heavily on "total compliance" with their medication regimen and intense follow-up care. They must take immunosuppressive drugs as prescribed to ward off organ and tissue rejection, watch for early signs of infection, and keep up with their physical, occupational, and speech rehabilitation regimens. Having a strong family support system greatly helps.

Psychological improvements have been steep, the surgeons report in *The Lancet*, with most transplant recipients declaring a renewed sense of self and body image, showing fewer signs of depression, and experiencing fewer episodes of verbal outbursts than before their transplant. None had signs, as originally feared, of a "split" personality, in which they assumed their donor's identity. Indeed, donor family members say recipients do not even resemble their donors after the surgical transformation. Dr. Rodriguez attributes this to the rigorous psychological screening and counseling that preceded surgery.

Because facial transplantation is life-changing and not life-saving, Dr. Rodriguez points out that the procedure still raises grave concerns about the ethics of putting otherwise healthy, mostly young people on a lifetime regimen of toxic immunosuppressive drugs and at risk of potentially fatal infections and vital organ compromise.

"These moral considerations must be taken very seriously as the number of face transplants and medical centers equipped to perform them

grows," says Dr. Rodriguez. "We have the medical ability to restore these people's lives. With some victims from fire, police and military armed services, it can be argued that we have a moral imperative to restore them to society."

Despite accelerated psychological recovery in many cases, physical recovery can take years, the surgeons report. While recipients claim feeling sensations of cold and heat as early as a few months after surgery, sensing touch and pain on the skin often takes eight months or longer, as does recipients' ability to open and close their mouths and move their lips.

For some, speech, smelling, chewing, and swallowing abilities can resume within months and rapidly improve within a year. Relearning how to smile and drink fluids, though, takes as long as two years. Powerful drugs are used to accelerate nerve repair and growth.

Surgical revisions to properly align teeth and jaw bones are common among the transplant recipients, in addition to cosmetic procedures to smoothen facial contours and remove excess skin. Complications have been few, the report states.

In the article, Dr. Rodriguez and his colleagues also note the significant financial costs and the serious ethical debate around them. The procedures cost roughly \$300,000 each, not including fees associated with a lifetime of immunosuppressive therapy or need for additional surgery. These costs, they conclude, are only sustainable in the long term with committed public funding.

Dr. Rodriguez says his team at NYU Langone plans further research on developing better tools for screening patients best suited to the lifelong therapy and determining the relative value of full or partial face transplants. Additional efforts to forge a standardized surgical protocol

will focus on complex instructions about how best to position and fit the new face and underlying bone, as well as match and attach nerves and muscle. The NYU Langone team also plans studies on the long-term health effects of immunosuppressive therapies and whether dose reductions are possible to lessen drug toxicity without compromising risk of organ rejection. The team also plans to explore the feasibility of performing [face transplants](#) on severely disfigured children.

In placing the first decade of facial transplantation in historical context, Dr. Rodriguez compares it to the beginnings of liver transplantation in the 1960s, when few procedures were performed and few patients lived longer than a year. Today, he says, liver transplantation is performed at more than 100 medical centers in the U.S. alone, and the vast majority of patients, including children, survive beyond a year, with outcomes continuously improving despite [liver transplantation](#)'s frequent complications.

"We are still very much in the early days of facial transplantation," says Dr. Rodriguez. "So long as our patients need it—and they do—then, it is our medical duty to continue to advance science and medicine, and improve how we perform the procedure so that it is more widely available to future generations of people whose severe disfigurements go beyond the means of conventional surgery."

Provided by New York University School of Medicine

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