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Total face transplant in patient with severe burns—team outlines surgical approach

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Last year, the most extensive clinical face transplant to date was successfully carried out at NYU Langone Medical Center. A complete report on this procedure—including the extensive organizational and training program created to prepare for it—is published in the July issue of *Plastic and Reconstructive Surgery*, the official medical journal of the American Society of Plastic Surgeons (ASPS).

"To improve upon the current state of face transplantation in facial burn patients, our team implemented a stepwise research plan to clinically execute a total face, eyelids, ears, scalp, and skeletal subunit transplant," according to the report by ASPS Member Surgeon Eduardo D. Rodriguez, MD, DDS, Chair of the Hansjörg Wyss Department of Plastic Surgery at NYU Langone, and colleagues.

Dr. Rodriguez and colleagues report on the assembly and development of a face transplant program designed to meet the unique challenges of reconstruction in patients with extensive facial and scalp burns.

The face transplant team included plastic surgeons with expertise in craniofacial and reconstructive microsurgery, along with professionals from a wide range of other disciplines. Surgeons prepared by carrying out a series of cadaver simulations, followed by a "live facial procurement" in a brain-dead donor.

After institutional approval, an "optimal recipient" was selected who was fully informed and consented to the procedure: a firefighter who

sustained full face and total scalp burns in the line of duty in 2001. Despite multiple reconstructive surgeries, the patient still experienced severe facial deformity and loss of function, including constricted motion of the neck and mouth and loss of the eyelids and ears.

In August 2015, a potential donor who suffered brain death after a traumatic brain injury was identified, and soon after was found to be a suitable match for the recipient.

Dr. Rodriguez and coauthors outline the steps in the 26-hour facial transplant procedure, which involved 100 physicians, nurses, and technical and support staff.

Among the many advances in the procedure was the preparation and transplantation of "skeletal subunits" needed to support reconstruction of the recipient's nose, jaw, and cheekbones. The unprecedented reconstruction also included transplantation of the eyelids, the ears and ear canals, and the scalp skin.

In the months since surgery, the recipient has shown progressive improvement of facial movement and sensation. He has regained oral function, including speech, chewing, and swallowing; along with reflexive and voluntary blinking function. With ongoing speech and physical therapy, the patient reports better quality of life and satisfaction with the outcomes of the procedure.

"Utilizing lessons learned from prior face transplants and extracting the principles of aesthetic, craniofacial, and microsurgery facilitated a stimulus to devise solutions to previous obstacles and shortcomings of face transplantation encountered in the burn patient," Dr. Rodriguez and coauthors conclude. They hope their ongoing experience will help to improve the current and future outcomes of facial transplantation—particularly in the "incredibly challenging" population

of patients with extensive facial burns.

More information: Michael Sosin et al. Total Face, Eyelids, Ears, Scalp, and Skeletal Subunit Transplant, *Plastic and Reconstructive Surgery* (2016). DOI: 10.1097/PRS.0000000000002322

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