

CRANIOFACIAL TRANSPLANTATION “An Enigma Turned Reality”:PART I

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FACE IS A CRITICAL COMPONENT OF AN INDIVIDUAL'S IDENTITY

Craniofacial transplantation represents a paradigm shift in maxillofacial reconstructive surgery. Face is the expression of mind and represents the most important part of the body. Maxillofacial reconstructive surgeons restore, rebuild and make those parts which nature has given but which have been taken away by the fortune. Face reconstruction is usually done for congenital, developmental, traumatic, neoplasms and post ablative surgical defects. At this time reconstructive efforts could only make use of those various body parts in the form of flaps and grafts. Though facial transplantation was once an enigma but it has become a reality from last decade and becoming a boom with latest advancements in Imaging and microvascular surgical techniques. The advent of facial transplantation eliminates donor site limitations and introduces the prospect of restoring injured anatomy by replacing it with an ideal part from a donor. We must consider the best existing imaging techniques and synthesize them into novel way of looking at patients.

The face is a nothing but a soft tissue envelope of the facial skeleton. Any change in the architecture will cause facial disharmony. Facial transplantation may or may not include skeletal elements being transferred; the craniofacial skeleton must be precisely understood for its contours and irregularities with appropriate imaging modality. 3D Computed Tomography(CT) Imaging offers a good modality of the choice. This can also offer a virtual view of a patient's skin by setting windows of soft tissue density display instead of bone density display. Accurate models can be obtained with commercially available hardware and software and most popular method is stereophotogrammetry and rapid prototyping. 3D CT angiography has been validated in accurately predicting the perforators and their location when there is a need in complex facial reconstruction. The nerves that provide sensory and motor supply to the facial tissues must also be accounted for in designing the optimal face transplant. Looking at these presently available Imaging modalities, it is clear that we can image the majority of the tissues essential for successful facial transplantation with a great degree of consistency and detail to restore the micro and macro esthetics of face. These Imaging requirements are essential to include include mock surgery with patient-specific anatomy instead of cadavers, prefabrication and planning of osteotomy, plates and bone graft templates, and simulation of ideal donor anatomy for a given recipient's defect simultaneously accounting for relationships between bone, vasculature, nerve and soft-tissue envelope.



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The human face is a complex organ tasked with supporting nutrition, respiration, sensation and communication. Facial transplantation is a tremendous exiting procedure with the potential to reverse once-irreparable/irreversible facial defect. It is incumbent upon the maxillofacial reconstructive surgeon to intimately know his patient's face from every perspective before he embarks upon its restoration. The methods described here may serve as a first step in this direction and the surgical technique will be discussed in the PART II of the article.



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