

**Changes in speech production and facial movement pre and post facial transplant
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Abstract

Facial transplant involves partial or total reconstruction of neuromuscular and skeletal structures of the face, head and neck and is among the most extensive facial reconstructive procedures. While the surgical outcomes of many cases have been described, far fewer published studies have investigated the procedure's impact on speech production. In addition, little is known about the relationship between an individual's pre and post-transplant speech motor performance. To address these knowledge gaps, the present worked studied facial movement and speech production in one participant over a 13-month-period pre and post total facial transplant. Acoustic and kinematic data were collected at five time points: once pre-transplant and four times post-transplant (4-months, 7-months, 10-months, 13-months), during speech and non-speech tasks. Findings revealed significant increases in lip and jaw movement, as well as fluctuations in movement stability over time. Vowel space significantly increased, with the most notable changes observed in formant frequencies for /i/ and /u/. Findings document the recovery of articulator movement and contributions to improved speech production following facial transplant. Changes reflect the adaptability of the speech motor system and are discussed in relation to pre-transplant speech motor control patterns.