

Dynamic Rehabilitation of Facial Nerve Injury: A Review of the Literature

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Abstract

Introduction Given the morbidity caused by facial nerve paralysis, there have been consistent approaches to treatment over the past 20 years in reanimation of the facial nerve. Treatment depends on accurate clinical examination, a good understanding of the anatomic course, and appropriate diagnostic tests. There are various options when it comes to dynamic facial nerve reanimation that range from nerve grafting, nerve anastomosis, crossover techniques and muscle transfer to microvascular muscle flaps, and—recently—potentially new concepts with microelectromechanical systems (MEMS) technology. The various dynamic facial nerve treatment modalities are discussed.

Methods and Results A comprehensive review of the literature was performed detailing various techniques used for dynamic rehabilitation following facial nerve injury and their known results and complications.

Conclusions Currently, techniques have been attempted to achieve adequate dynamic facial reanimation of the paralyzed facial nerve. Despite the advances that have occurred in the last few years, it has been classically very difficult to achieve a House-Brackmann grade better than grade III. Outcomes are improving. Ultimately, the approach depends on the surgeon's experience.

Keywords

- facial paralysis
- dynamic rehabilitation
- muscle transfer

The facial nerve (seventh [VII] cranial nerve) supplies the muscles of facial expression; the occipitofrontalis, orbicularis oculi, and orbicularis oris, in addition to the posterior belly of the digastric muscle just below the mandible, the platysma in the neck, the postauricular muscles, and the stapedius muscle in the middle ear. The most common cause of unilateral lower motor neuron lesion is idiopathic facial nerve palsy also known as Bell palsy. Closely following Bell palsy are infection and inflammation. Trauma, including surgical trauma, is the third most common cause of facial nerve paralysis in the general population but is ranked first among military personnel and young adults. Other important etiologies of facial nerve dysfunction include herpes zoster oticus and neoplasms of the parotid gland, brain, and the petrous part of the temporal bone.¹ Despite the morbidity caused by facial

nerve paralysis, there have been few advances in management over the past 20 years. Treatment depends on accurate clinical examination, a thorough understanding of facial nerve anatomy, and appropriate diagnostic tests.^{1,2} Medical therapies exist for the paralyzed eyelid via application of gels and ointments; however, these modalities result in blurring of vision and imperfect relief of symptoms. Static facial nerve reanimation techniques such as prosthetic gold implants and lower facial slings have been used and may yield satisfactory cosmetic appearance but have limited to no benefit in the restoration of facial tone, symmetry, and synchronous facial movements.¹ There are various current options when it comes to dynamic facial nerve reanimation: nerve grafting, nerve transfers, crossover techniques, and muscle transfers. Reconstruction depends on the severity of the injury, time

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