Facial Reanimation:

putting a smile back in patients with facial nerve disorders

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Overview

Disorders of the facial nerve are socially and functionally debilitating. The facial nerve powers the muscles that are responsible for essential emotional expressions such as smiling as well as basic functions such as eating, speech and eye closure. Facial nerve injuries can therefore be devastating, leading to significant disfigurement and impaired function.

In particular, the inability to smile – a basic function for non-verbal communication and social interaction - can have an appalling effect on quality of life. Many patients subsequently experience a reluctance to appear in public, and refrain from simple pleasures such as dining out. In addition, the streaming eyes, nasal airway blockage and oral incontinence that afflict patients with facial nerve disorders only contribute to the constant menace.

Who gets it?

There are many causes of facial nerve injury and patients need to be assessed on an individual basis to determine likely prognosis and best course of action. It can affect patients of all ages.

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Bell's palsy

A rapid onset of facial paralysis without apparent cause that is the most common diagnosis, affecting up to 25,000 people in the UK every year. It's name derives from Sir Charles Bell, a 19th Century Scottish anatomist who deciphered the function of the seventh cranial nerve. Bell's palsy is often characterised by a prodrome consisting of ear/ facial pain and a viral illness. Early (within 72 hours) steroid treatment and antiviral medication (acyclovir) can modify the course of illness. The majority of patients (80%) recover completely, whereas, a minority experience a delayed and incomplete recovery.

Congenital

Some patients are born with facial weakness at birth, which can be developmental or secondary to trauma at birth. The pattern of weakness varies from simple lip asymmetry to complete paralysis. Treatment is usually considered after the patient is 4 years of age.

Infection

A variety of infections are associated with facial nerve disorders. These include acute and chronic ear disorders (otitis media); Varicella Zoster infection, characterised by vesicles on the ear (Ramsay Hunt Syndrome); or Lyme disease (Borrelia Burgdorferi) transmitted by a deer tick vector.

Tumour

Tumours may arise from the facial nerve itself (facial nerve schwannoma) or in the vicinity of the nerve causing pressure damage – parotid tumours, acoustic neuromas.

Trauma

Facial nerve injury can result from direct head trauma, particularly from fractures of the temporal bone, through which the nerve travels. Iatrogenic causes are also common, as the nerve is susceptible to injury during parotid and skull base surgery.

When to refer?

Children with congenital facial weakness can be reviewed as early as 4 years. At this age, formal assessment is easier and treatment may be considered.

Adults with acute onset facial weakness should be reviewed urgently in Accident and Emergency for the immediate prescription of steroid and antiviral medication, if necessary.

Patients with an established facial weakness or those following initial treatment for Bell's palsy should be reviewed by a facial palsy specialist. At the initial consultation, the patient will be asked to complete a medical questionnaire and undergo a formal head and neck examination. The facial nerve function will be scored and photographed, and a short video clip taken to document facial function. If appropriate, investigations (MRI facial nerve, Blood tests) will be organised and a treatment plan made.

What does treatment involve?

Historically, outcomes have been poor. However, this is an area of active clinical research and there are now a variety of contemporary techniques and innovative approaches that can help restore function and appearance as well as improve general well-being. The common management modalities include physiotherapy, botulinum toxin injection and surgical intervention. Whether an isolated injury (eyebrow, eyelid, smile or lip) or a global nerve dysfunction, the treatment goals remain the same – to improve symmetry at rest, restore function and deliver a spontaneous and symmetric smile.

Nonsurgical

Chemodenervation

As patients recover from their facial nerve injury, they are often afflicted by inappropriate movements (synkinesis) and excessive tightening of the muscles (hypertonicity). Botulinum toxin may be injected into the affected side of the face to relax any facial muscles that have become tight, or to target synkinesis. It can also be used on the unaffected side of the face to improve the overall symmetry and appearance. The injections may need to be repeated at four monthly intervals.

Facial physiotherapy

Facial physiotherapy is an essential part of most treatments, designed to help improve the balance of the face and optimise outcome.

Surgical

Static procedures

a series of interventions that can improve position of the affected side of the face as well as function (eye protection, oral control of solids and fluids).

Brow lift

Facial nerve injuries may result in a droopy eyebrow appearance. A browlift is a relatively simple procedure that can elevate the position of the brow to match the unaffected side.

Eyelid protection

Patients with facial paralysis may be unable to close their eyes due to paralysis of the orbicularis oculi muscles. The resulting corneal irritation and tearing of the eyes can be very bothersome, and can lead to corneal ulcers. Insertion of a goldweight in to the eyelid and tightening of the lower eyelid is a simple local anaesthetic procedure that can greatly improve the situation.

Static sling to the cheek

A simple procedure that can improve the position of the face at rest by using a piece of fibrous sheet to tighten and lift the cheek.

Face-lift

A face-lift can be used in conjunction with other techniques to improve facial symmetry at rest.

Dynamic procedures can be used to restore movement to the affected side of the face by powering the normal facial muscles or by harvesting the power of other muscles to do a similar job.

Free muscle transfer (gracilis)

The gold standard reconstruction in patients with a long-standing facial paralysis. When powered by a nerve graft connected to the other ('intact') side of the face, it gives the best chance of a spontaneous and symmetric smile.

Temporalis Sliding Myoplasty

An increasingly popular technique for restoring the ability to smile by using the temporalis muscle. Requires intense physiotherapy afterwards to 'learn' to smile again. May be suitable for elderly patients with long-standing facial paralysis looking for a simpler operation.

Nerve transfer or graft

May be appropriate in patients who have had a recent onset of facial paralysis. Often performed in conjunction with other procedures such as tumour removal.

Although this article mostly dwells on the surgical treatments available, patients with facial palsy can also benefit from a holistic approach through a combination of surgical treatments, physiotherapy and psychological support to optimise recovery and rehabilitation.

Figure 1 - Branches of the facial nerve

Problem	Solution
Synkinesis, herypetonicity, asymmetry	Botulinum toxin
Brow droop	Brow lift or botulinum toxin to contralateral side
Eye irritation	Goldweight, canthopexy, blepharoplasty
Nasal airway blockage	Static sling to nose, rhinoplasty
Loss of smile	Free functional muscle transfer, nerve transfer, static sling
Lip asymmetry	Botulinum toxin

Table 1. Table illustrating the common functional problems associated with injury to different branches of the facial nerve and treatment options.