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REVIEW

Reanimation of the brow and eye in facial paralysis: Review of the literature and personal algorithmic approach

J.I. Leckenby*, S. Ghali, D.P. Butler, A.O. Grobbelaar

Department of Plastic and Reconstructive Surgery, The Royal Free London NHS Foundation Trust, Pond Street, Hampstead, London NW3 2QG, UK

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Summary Facial palsy patients suffer an array of problems ranging from functional to psychological issues. With regard to the eye, lacrimation, lagophthalmos and the inability to spontaneously blink are the main symptoms and if left untreated can compromise the cornea and vision. There are a multitude of treatment modalities available and the surgeon has the challenging prospect of choosing the correct intervention to yield the best outcome for a patient. The accurate assessment of the eye in facial paralysis is described and by approaching the brow and the eye separately the treatment options and indications are discussed having been broken down into static and dynamic modalities. Based on our unit's experience of more than 35 years and 1000 cases of facial palsy, we have developed a detailed approach to help manage these patients optimally. The aim of this article is to provide the reader with a systematic algorithm that can be used when consulting a patient with eye problems associated with facial palsy.

Introduction

Failure to protect the globe in facial paralysis can lead to considerable patient morbidity. Lacrimation, lagophthalmos, recurrent eye infections, asymmetry and the inability to spontaneously blink are the main symptoms, which if left untreated can compromise the cornea and vision.[1—3] The inability to express emotion, combined with the facial asymmetry, can affect social interaction raising psychological issues.[4,5]

Numerous procedures and treatment algorithms have been described to address the eye in facial paralysis.[1,6—14] In the acute phase, simple taping[15] and lubrication may be adequate but once the condition is deemed permanent, surgical intervention may be required.

* Corresponding author.

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We propose a step-by-step detailed approach to achieve this goal based on our experience of in excess of a thousand cases of facial paralysis.[16–19] Many of the symptoms are age related and a child with facial palsy may not require any intervention at an early stage as they can compensate adequately with an intact protective Bell's phenomenon. In contrast, an adult with ageing skin may require more immediate intervention.[20]

Assessment of the eye in facial paralysis

A thorough examination of the patient, including their past medical history, the cause of the facial palsy, the main symptoms and a full physical assessment of the upper face is required. The severity of the functional and social symptoms should be ascertained and the severity of exposure keratopathy must be examined grossly and with the use of a slit lamp. When assessing asymmetry, measurements should be standardised and the patient must have their static and dynamic position observed. Measurements are made relative to the mid-pupillary level and the vertical distance between the mid-point of the eyebrow and the anterior hairline.[21] Video assessment is an invaluable tool as it provides dynamic representation pre and post operatively allowing the patient to see a comparison. The position of the brow at rest and whilst the patient raises their eyebrows will make the degree of brow ptosis clearly evident. Great care must be exercised when assessing the impact of brow function on upper lid closure as excessive surgical elevation may improve appearance but worsen eye closure.

The degree of inferior scleral show, the amount of lagophthalmos and the ability to achieve complete eye closure should be documented. In patients with ineffective eye closure, the degree of scleral show plays an important part in the correct management. If there is no evidence of inferior scleral show only the upper lid needs to be addressed, if there is significant inferior scleral show both the upper and lower lids need to be treated; the exception to this is in the patient who has developed an effective Bell's phenomenon allowing the pupil to be covered by the upper lid as the globe turns upwards and therefore only treatment of the lower lid is required.

Timing of surgery

An idiopathic Bell's palsy represents the majority of referrals and patient education is crucial to their care. Whilst most Bell's palsy patients fully recover, the time taken is unpredictable.[22] When a patient first presents, conservative management should be advocated in the primary care setting. In extreme cases, a Frost stitch may be required,[23] for example in situations where there is severe peri-orbital swelling post cranio-facial surgery or trauma.[24] Surgical measures should be delayed until no further nerve recovery is expected and may be up to two years in the case of Bell's palsy patients,[25] however, failure of conservative measures even in the acute phase may force surgical intervention in order to protect the globe.

Non-operative management

In cases where a spontaneous recovery is expected this represents the mainstay of treatment. In permanent partial or complete facial paralysis, this is a key adjunct to the operative management. In patients complaining of difficulty in eye closure at night, particularly in the absence of Bell's phenomenon, simple taping of the eyelids closed may be all that is required.[15] It is crucial to keep the eye hydrated and this may be achieved by using topical eyedrops. Other conservative methods include the use of lubricating ointment, a moisture chamber and protective glasses.

Botulinum type A (Botox®, Allergan) provides a reversible method of denervation and may be used for two different patient groups; firstly in patients complaining of asymmetry[26,27] and secondly, those complaining of synkinesis.[28–31] For brow asymmetry, Botox® is often the first step in a patient's management and it is important to recognise that the dose is variable between patients and it should be administered to the unaffected side. Pseudoptosis of the upper lid as a result of aberrant regeneration of the facial nerve can also be effectively managed with Botox®.[32] Typically patients achieve a maximum response at two weeks and the dose should be repeated every three months and titrated as necessary. Fasciculations associated with synkinesis are an important symptom of the recovering nerve and can be troublesome in the short-term; these can be successfully treated with smaller doses of Botox®. Alternatively, Focused Cold Therapy™ (Iovera°, Myoscience)[33] may be used to provide reversible paralysis and is useful in cases where Botox® treatment is contra-indicated or by patient choice. Physiotherapy and Mime Therapy[34–36] can be adjuncts in certain patient groups, especially to improve synkinesis. Electrophysiological stimulation of the nerve is difficult to scientifically quantify and we have not found it a useful tool in our experience.[37–39]

Operative management

It can be difficult to choose the best option and a systematic approach is required to ensure the best possible outcome. Treatments can be separated into conservative and non-conservative measures; the surgical interventions can be further divided into static and dynamic. The goal of a static procedure is to protect the cornea and improve symmetry at rest. In comparison, a dynamic procedure, whilst protecting the cornea can also achieve the ability to close the eye and restore a spontaneous blink.[40,41] In cases where non-operative management is unsuccessful or not indicated, surgical intervention may be considered. The options available will be considered by separating the brow from the eye.

Static surgical techniques for restoring brow symmetry

Two key issues should be addressed in the restoration of brow symmetry 1) furrowing and 2) the height of