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Case Report

CASE REPORT

The role of external eyelid weights in acute facial palsy: functional and aesthetic considerations

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Abstract

Purpose: Patients with acute paralytic lagophthalmos are at high risk for ocular surface breakdown due to exposure. External eyelid weights are a temporary solution for paralytic lagophthalmos that aim to reduce exposure and optimize blink excursion. Despite easy application and high efficacy, this product is under-utilized in clinical practice with few physicians employing this treatment adjunct.

Results: Ocular surface health was maintained in all patients, and overall aesthetic satisfaction was high.

Conclusion: External eyelid weights are a valuable adjunct in the treatment of facial palsy but are under-utilized in clinical practice. This article highlights the benefits of external eyelid weights as an accessible adjunct to restore eyelid function and maintain cosmesis. The device can be implemented without specialist involvement and adds a dimension of independence for general practitioners to manage ocular complications of facial palsy.

INTRODUCTION

Lagophthalmos is the incomplete or defective closure of the eyelids. Eyelid closure and the blink reflex are essential for a healthy corneal surface, maintaining ocular surface lubrication and also as protection from a foreign body in the event of an insult. Continued corneal exposure accelerates evaporation of the protective tear film and consequently patients complain of dry irritated eyes [1, 2].

The primary aetiology of lagophthalmos is facial nerve paralysis (paralytic lagophthalmos), however it can be resultant of surgical error, trauma (cicatricial lagophthalmos) or during sleep (nocturnal lagophthalmos).

Acute onset paralytic lagophthalmos due to facial nerve palsy is commonly seen in the primary care setting, ophthalmology practice and emergency department. With diminished ability to blink and close the eyelids, patients if not managed, are at high risk for exposure keratopathy, corneal surface breakdown, ulceration and ultimately permanent vision loss.

The cornea is a multifunctional tissue; it contributes a large proportion of the refractive power of the eye, meaning it must serve as a barrier to keep pathogens from reaching the rest of the eye, whilst maintaining transparency. The eye elects to limit local immune and inflammatory responses to avoid scarring and preserve vision, this peculiarity is known as immune privilege, a

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phenomenon demonstrated by the cornea. This mechanism is usually effective however the drying of the tear film can lead to small abrasions and allow external pathogens to infiltrate this privileged site, leading to a downward cascade of erosion and ulceration that can, if not managed, result in blindness.

Diagnosing lagophthalmos in the primary care setting can be difficult as one must consider and eliminate the more sinister aetiologies of this condition. The most prevalent diagnosis is that of Bell's palsy, however, as a clinical diagnosis of exclusion, physicians in the primary care setting with limited immediate access to diagnostic resources may feel uncomfortable making this judgement without further investigation [3, 4]. Referral to specialist tertiary services should always be considered however many practical steps can be taken to prevent damage to the cornea during this vulnerable time.

Initial management consists of intensive lubrication and ophthalmology referral. National Institute for Health and Care Excellence, Clinical Knowledge Summary (NICE CKS) management guidelines detail an evidence based approach to prescription of antiviral agents and steroids, but recommendations for eye care and secondary referral are based on expert opinion [5].

Subspecialist care for the patient with acute onset paralytic lagophthalmos aims to optimize ocular surface lubrication and guarantee corneal protection. This can be achieved by frequent instillation of artificial tears, eyelid taping at night and external eyelid weights [6]. Patients can benefit from the induction of protective ptosis by an injection of botulinum toxin type A into the levator palpebrae superioris muscle [7, 8], an approach usually reserved for patients with limited functional capacity or who are poor surgical candidates. In cases where facial nerve recovery is limited, surgical interventions are adopted as follows: tarsorrhaphy, lower eyelid tightening and/or implantation of gold or platinum weights within the upper eyelid [9]. The implementation of facial physiotherapy to optimize neuro-muscular recovery is of paramount importance and should not be discounted.

The psychosocial impact should also be considered as the face and eyes convey emotion and patients have to immediately adjust to this dysmorphic condition, despite most cases recovering without permanent sequel [10].

EXTERNAL EYELID WEIGHTS

External eyelid weights are a temporary solution for paralytic lagophthalmos that aim to restore functionality to the eyelid during the transitional rehabilitation period. The weights can be adhered to the pretarsal skin adjacent to the sulcus and will hide behind the superior palpebral fold [2].

The weights are to be attached to the upper eyelid with double sided adhesive tape provided with the kit. It is recommended that the adhesive strips are changed daily however for patients with reduced dexterity or those who will struggle to fit the weight correctly, a tissue adhesive can be used as an alternative with mean wear time described as 10.7 days [2].

The weight should be administered to the upper eyelid with the concave surface attached to the skin. The company recommends placing the weight while the patient is sitting upright ~3 mm above the lash line. It should be centred at the junction of the medial and central third of the eyelid (Fig. 1), as this is the point of maximal levator function. Weights should be sized with optimal position inducing a ptosis of roughly 1 mm when the patient is looking straight ahead. The product is manufactured in various skin tones and weights [11–13].

The weights protect the cornea and improve dynamic lid functionality and aesthetics, which are equally important in the younger cohort of patients. Stuart Seiff at UCSF was the first to share his experience with this treatment in 1995, however, lid loading has been subsequently investigated [12, 14, 15]. Despite the easy administration and efficacy, this intervention is under-utilized in the UK with few physicians employing this treatment adjunct.

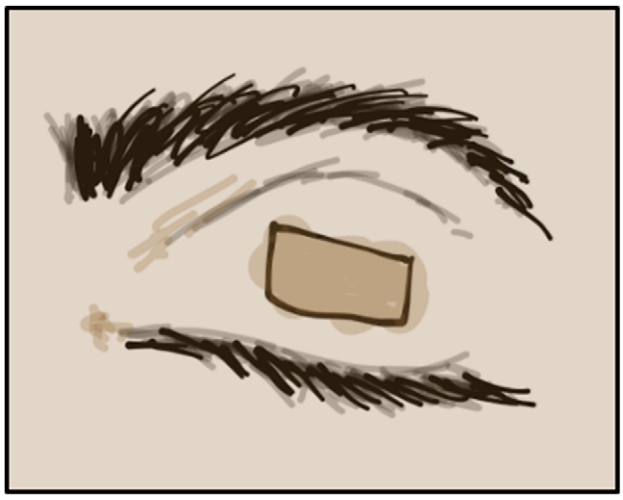

Figure 1: Ideal positioning of Blinkeze external eyelid weight.

In this article, we report a series of patients who were successfully managed with external eyelid weights and hope that this will popularize their use in the future management of this condition, by a wider circle of physicians from general practitioners to oculoplastic surgeons.

CASE REPORT 1

A 42-year-old male presented to the emergency room with acute onset left facial droop, paraesthesia, otalgia and an emergent vesicular rash on the left cheek and ear. He reported ocular irritation and epiphora. He was diagnosed with Ramsay Hunt syndrome, commenced on aAciclovir, and referred to the ophthalmology service for review (Fig. 2).

The patient was advised to use lubrication, and fitted with an external eyelid weight (1.4 g) to restore eyelid functionality and protect the ocular surface. Figures below depict the weight aiding with closure of the left upper eyelid. This would help to improve eyelid approximation by restoring the blink response improving cosmesis whilst preserving integrity of the cornea.

CASE REPORT 2

A 72-year-old male presented with a 2-day history of unilateral facial paralysis. He was referred for ocular review and management by his GP who diagnosed Bell's palsy and initiated him on an oral steroid regimen as per NICE guidelines [5] (Fig. 3).

Socially, however, our patient reported that he was a carer to his wife and would struggle with the high frequency of eye drop instillation and taping instructions at night. On examination there was left sided facial nerve palsy with a left paralytic ectropion of the orbicularis oculi muscle noted resulting in a 6 mm lagophthalmos. Bells phenomenon was present.

The patient reported that his duties as a caregiver for his wife would limit his ability to comply with frequent eye drops and eyelid taping at night. As such, he was prescribed an external eyelid weight in conjunction with a reduced lubrication regimen.

Figure 2: eyelids open and eyelids closed before and after the application of eternal eyelid weight

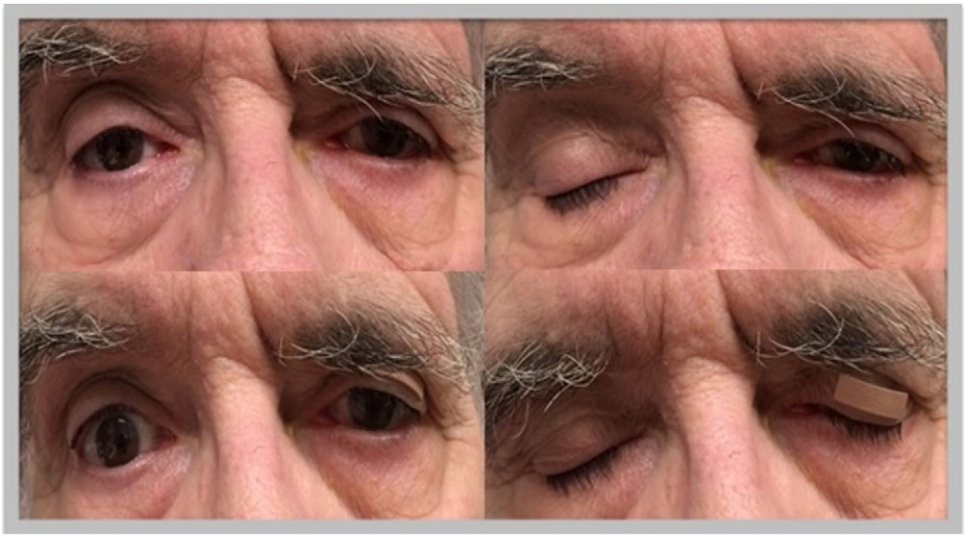

Figure 3: eyelids open and eyelids closed before and after the application of eternal eyelid weight

CASE REPORT 3

A 29-year-old female was referred with a known diagnosis of facial palsy since 2012. She was previously managed at a major University Hospital with lubrication and night time taping. She presented as a new patient for routine review due to relocation nearer to our centre. On examination, punctate epithelial erosions were observed on the lower third of the left cornea. External eyelid weights were sized and offered to this patient as an adjunct, who reported that she was previously unaware of this treatment option (Fig. 4).

On follow up all patients were still in possession of the device and had reported using it for the initial follow-up period.

DISCUSSION

The primary goal in patients with acute paralytic lagophthalmos is to prevent damage to the ocular surface and improve patient comfort by optimizing blink excursion and reducing exposure due to incomplete eyelid closure.

We believe that the use of external lid weights has been limited for multiple reasons. First, there is relative paucity of literature on the use of external eyelid weights. Second, due to the possible temporary nature of facial palsy and the highly specialized sight organ that it affects, many general practitioners may be hesitant to institute any form of therapy other than topical lubrication, opting to wait for specialist input. This is unfortunate because specialist appointments may not be accessible to the patient who is at risk for vision compromise. Third, it is certainly cheaper for patients to tape their eyelids closed. It is our experience, however, that patients suffer contact or irritative dermatitis from repeatedly taping the thin skin of the upper and lower eyelids. The paper adhesive tape affects a much larger area of the sensitive periocular skin, and patients have to change the tape daily to enable vision, further exacerbating the dermatitis. Additionally, patients are often instructed to instil

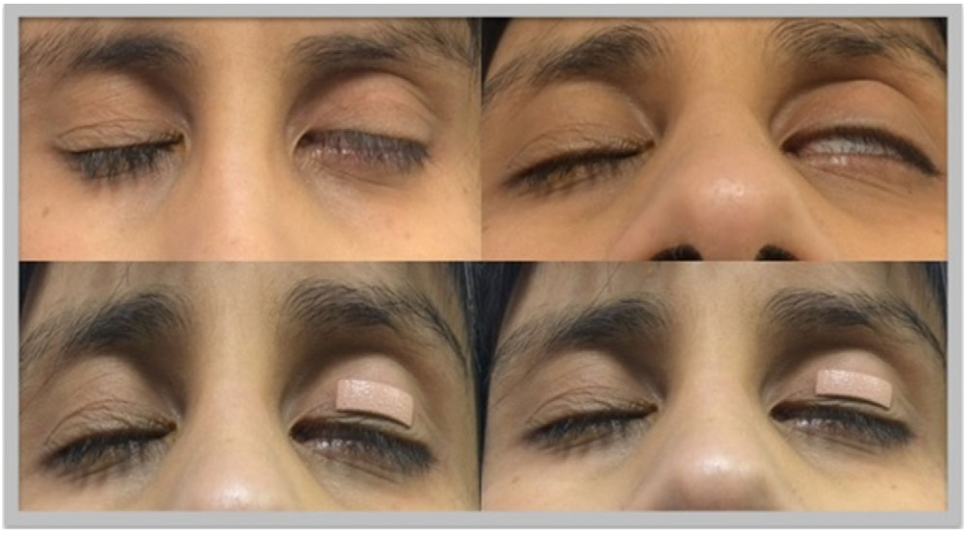

Figure 4: eyelids open and eyelids closed before and after the application of eternal eyelid weight

eye ointment prior placing the tape, but this causes the tape to lose its adherence and patients become frustrated reducing compliance. Finally, there is a common misconception that an eye patch will retain moisture in the eye. Eye patches are vaulted to avoid pressure/scratching of the eye and are not air-tight. Since evaporative tear loss is the main aetiology of exposure keratopathy in patients with lagophthalmos, eye patches do not help to prevent this mechanism of eye damage

External eyelid weights may play a role in the management of both temporary and permanent facial nerve palsies. NICE CKS guidelines indicate that secondary referral to ophthalmology should only be sought 'if the cornea remains open after attempting to close the eyelid' [5]. In the acute setting, external eyelid weights can be used as an adjunct to artificial tears and lubricating ointment. Early prescription of external eyelid weights may reduce secondary care referral to ophthalmology in temporary acute onset paralytic lagophthalmos.

Currently tarsorrhaphy is used in instances when comorbidities reduce a patient's ability to administer drops. Given the tendency for suture tarsorrhaphies to cheesewire and erode, in addition to being cosmetically objectionable, the use of external eyelid weights will allow patients to avoid this intervention. In patients with limited manual dexterity or functional capacity, botulinum toxin injection into the levator palpebrae superioris muscle can cause complete closure of the eyelid. This is often referred to as 'chemical tarsorrhaphy'. The limitations of this practice are: (i) Lack of predictability even in expert hands. Toxin injected into this thin muscle can diffuse into the adjacent superior rectus muscle, which then causes the downward gaze, aligning the cornea further into the area of exposure, worsening the risk of exposure keratopathy. (ii) Once the lid is successfully ptotic, the patient cannot wilfully elevate the eyelid except with a finger, which is impractical for daily function. A fully closed eye deprives patients of binocular vision and can increase risks for falls and accidents. In contrast, the eyelid weight is designed to permit use of the eye while simulating normal blink reflexes to protect the ocular surface. (iii) The effect of botulinum toxin lasts ~3 months. If facial nerve function recovers earlier than that, patients are still left with a closed eyelid. If facial nerve function does not recover within 3 months, repeat injections would be necessary, incurring further costs.

The majority of facial palsies except those resultant from surgical transection may recover function within a year from onset [16]. When facial palsy is deemed to be permanent, surgical implantation of an eyelid weight with or without lower eyelid tightening surgery is considered the gold standard treatment. However, studies report revision surgery in up to one in six patients (within 12 months) due to poor cosmesis and incomplete eyelid closure [17]. We believe that external eyelid weights are an effective option for patients awaiting nerve function recovery within the initial 12-month period. Even in patients who ultimately require surgical lid weight placement, delaying surgery for at least 12 months in order to ascertain any improvement may allow accurate lid weight sizing and therefore optimization of final aesthetic outcome reducing the need for revision surgery.

Limitations

The external eyelid weights are generally well tolerated and no complications were reported by our patients with their use. Contact dermatitis is a potential side effect of the adhesive tape, however, the area of contact is much smaller than when using tape. Both in our cohort and in the literature there is no evidence of this complication [12]. Dermatochalasis is a limitation to the efficacy of this product as the laxity of tarsal skin may reduce the desired action of the weight. In these patients the weight may be worn closer to the lid margin sacrificing cosmesis to preserve corneal safety. Patient dexterity is another concern for effective weight placement, however, in these instances, a long-term tissue adhesive may be considered to overcome this constraint [2].

Patient satisfaction

The frequency of artificial tear drop instillation required to lubricate an eye that does not blink is intense. It is widely reported that adherence to medication is sub optimal in the general population with rates inversely proportional to age. Reduced compliance with eye drop instillation is linked to memory and dexterity [18,19]. The external eyelid weights have been proven to reduce the reliance on artificial tear drops when used as adjunctive treatment [12].

Functionality and aesthetics

External eyelid weights are the only temporary treatment for facial palsy that reinstate the natural mechanism of eyelid closure. As shown in the images above, the weight restores the movement of the eyelid and is matched to skin colour, hiding within the tarsal crease to provide an acceptable cosmetic outcome. Restoration of cosmesis and functionality of the eyelid while protecting the cornea is achievable with this product reducing the social impact of this debilitating condition.

Cost

The current cost for this device is ~£150 for the weight and adhesive strips. As mentioned above, timely prescription in the primary care or emergency room setting may serve to reduce the referral burden to the oculoplastic service for temporary palsies and during the initial observation period, offsetting the initial cost burden.

CONCLUSION

In summary, external eyelid weights are a valuable adjunct in the treatment of facial palsies. The device restores eyelid function while maintaining cosmesis, thereby reducing the devastating psychosocial impact whilst protecting the cornea. Early prescription will bridge the gap in non-resolving palsy, delaying definitive surgery to allow for more accurate assessment of eyelid function and surgical planning.

This article aims to highlight the simplicity of use and application. The device can be implemented without specialist oculoplastic involvement and would add a dimension of independence to the management of facial palsy in the primary care setting.

CONFLICT OF INTEREST STATEMENT

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

CONSENT

All patients included in this case series consented for their data and images to be used for publication and/or presentation.

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