

CLINICAL NOTE

External Lid Loading for the Temporary Treatment of Paresis of the M. Orbicularis Oculi: A Case Report

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ABSTRACT. Hesse S, Werner C, Melzer I, Waldner A, Bardeleben A. External lid loading for the temporary treatment of paresis of the M. orbicularis oculi: a case report. Arch Phys Med Rehabil 2011;92:1333-5.

This clinical note re-introduces external lid loading with the help of a lead weight for the temporary treatment of lagophthalmos. Although simple and effective, the technique is rarely used. Instead of wearing a monocular, the patient uses an individually tailored lead weight (0.8-mm thickness, 1.0–2.0g) stuck on the lid to enable its closure. Spontaneous ptosis indicates a too-heavy weight. With the musculus (M.) levator palpebrae intact, lid lifting is possible. The effect is gravity dependent; therefore, the patient has to wear the monocular at night. To minimize the risk for lead intoxication, the surface of the weight is varnished. In the case of persistent M. orbicularis oculi paresis, internal lid loading can follow. Since 1997, a total of 152 lagophthalmos cases have been treated. All patients could close the lid immediately. Almost half the patients had to readjust the weight several times per day because of hooded eyelids. Compliance was high, and partial or complete restoration of M. orbicularis oculi function occurred in 60% of cases. In some subjects, restoration of the M. orbicularis oculi was faster than for the M. orbicularis orbis. External lid loading for the temporary treatment of lagophthalmos is simple and effective. Compared with a monocular, vision is unimpaired and the aesthetic is more appropriate for most patients. Faster restoration of the M. orbicularis oculi hints at a potentially facilitatory effect of the weight.

Key Words: Bell palsy; Case report; Cerebrovascular accident; Parotis tumor; Rehabilitation.

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SEVERE PERIPHERAL PARESIS of the musculus (M.) Orbicularis oculi is a common problem in rehabilitation medicine, for example, after surgery on an acoustic neurinoma or a pontine stroke. A major risk is keratopathy caused by the lagophthalmos. A monocular and eye ointment commonly are applied, but are not well appreciated by patients because of the impaired vision, skin reddening, and cosmetic aspects.

A new, old technique (ie, a technique that has been published before but rarely used) is external lid loading with the help of an individually tailored lead weight stuck on the lid to enable



Fig 1. Lead weight set.

its closure due to gravity. In the German literature, the ophthalmologists Müller-Jensen and Müller-Jensen¹ published the technique in 1993. Although simple and effective, external lid loading rarely is applied. The internal lid loading and muscle transfer operations are more common in the case of persistent lagophthalmos. Accordingly, the present article intended to reintroduce the technique of external lid loading for early and temporary treatment of lagophthalmos in subacute patients and report on our experience in 152 cases treated since 1997.

Lead has a high specific weight (11.3kg/dm³), is flexible and bendable, and thus can be fitted to the curvature of the lid. The lead weight is scissored in kidney form out of an 0.8-mm thick lead plate, available in angling shops (fig 1). Weight ranges from 1.0 to 2.0g. Double-sided adhesive tape helps stick the weight to the lid after cleaning, degreasing, and stretching the lid skin. The cilia are not be touched. In the case of a hooded eyelid, fixing can be difficult. The patient may have to repeat the procedure several times daily. The position and weight of the lead weight are optimal when the patient can close the lid; spontaneous ptosis indicates a too-heavy weight. Lid opening

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List of Abbreviations

| | |
|-----|----------------|
| EMG | electromyogram |
| M. | musculus |
| N. | nervus |



Fig 2. A patient with lagophthalmos 8 days after parotis tumor resection (A) without a lead weight and (B) with the lead weight enabling immediate lid closure. (C) After 2 weeks of wearing the lead weight all day long, she could partially close the right lid by herself, and (D) 2 months later, she had continued wearing the lead weight during the day and was able to close the lid completely.

as a function of the nervus (N.) oculomotorius–innervated M. levator palpebrae is intact. The gravity-related effect of the weight does not work while the patient is sleeping because the head must be tilted at least 30°. To prevent an unlikely lead intoxication, the weight can be varnished with colorless nail polish. A more expensive gold weight of similar shape and weight is another alternative. With the M. orbicularis oculi paresis receding, the size of the weight can be decreased accordingly.

CASE REPORT

A 56-year-old woman was admitted to the rehabilitation department as an outpatient after surgery for a benign tumor of the right glandula parotis 8 days before. After the operation, she presented with severe paresis of the right N. facialis–innervated muscles. The surgeon had provided a monocular, which she felt was uncomfortable, and she was totally unhappy with her appearance. An initial concentric needle EMG of the Mm. orbicularis oculi et oris obtained 18 days after disease onset showed spontaneous, but no volitional, electromyographic activity in both muscles. **Figure 2A** shows the typical clinical picture 15 days after admission; the patient was unable to close the lid on request. **Figure 2B** shows the same patient on the same day with external lid loading. She then was able to close both lids, and opening was unimpaired. The patient quickly learned to fix the weight herself every morning, and it kept the whole day. At night, she used a monocular and eye ointment. During the day, she dripped artificial tear liquid and repetitively stimulated the lower part of the M. orbicularis by pushing it up and down with 2 fingers. Mimic exercises in front of a mirror and facilitation techniques (ice, sensory stimulation, kinesiotape) additionally were applied. An ophthalmologist confirmed an intact cornea and age-matched vision on both sides. After 2 weeks, she was able to voluntarily partly close the right lid, covering the cornea. Paresis of the M. orbicularis oris was unchanged (**fig 2C**). The concentric needle EMG of the M. orbicularis oculi correspondingly showed recurrence of volitional activity of single motor units; spontaneous activity had decreased. The electromyographic result of the M. orbicularis oris had not changed. The patient decided to continue

external lid loading. She asked a goldsmith to prepare a gold weight similar in shape and size. Two months later, she was able to close the lid completely because spontaneous blinking had recurred (**fig 2D**).

DISCUSSION

Overall, we have treated 152 subacute patients with lagophthalmos from various causes, with brain stem infarction in half the cases, since 1997 (**table 1**). In all cases (**table 2**), external lid loading, which started a mean of 9.3 days after disease onset, resulted in immediate complete lid closure: 45% of patients had to fix the weight several times per day, and 5% did not continue lid loading and instead preferred the monocular. Side effects, with the exception of skin reddening, did not occur. After mean \pm SD 25 \pm 7.1 days of treatment, more than half the patients (56%) were able to close the lid, at least partly covering the cornea, and spontaneous blinking recurred in two-thirds of patients (68%). All were instructed in mimic exercises in front of a mirror and received sensory facilitation of the paretic facial muscles for at least 30 minutes per day each, as part of a comprehensive rehabilitation program. Its content and intensity depended on individual impairments. Concentric needle electromyography of the facial muscles was optional. In 8% of responders, the mentioned faster M. orbicularis oculi function restoration compared with that of the oris also was observed.

In the remaining patients who had not responded within 5 to 6 weeks, external lid loading was continued for at least 2 to 4 more weeks, and the success rate in those patients was less than 5%. In persisting nonresponders (approximately one third), we then obtained a concentric needle EMG of the M. orbicularis oculi, which mostly showed no signs of volitional electromyographic activity and ongoing spontaneous activity. The option of internal lid loading then was discussed with the patients. The recommended interval before surgery was at least 6 months.

Table 2: Results of Patients With Lagophthalmos Treated Using a Lead Weight

| Results | No. of Cases (N=152) | % |
|---|----------------------|----------|
| Complete lid closure directly after lead weight application | 152 | 100 |
| Acceptance | 137 | 90 |
| Adjustment (1/2–3/>3 times/d) | 84/50/18 | 55/33/12 |
| Skin irritation | 16 | 11 |
| Independent lid closure, covering at least the cornea* | 88 | 58 |
| Spontaneous blinking* | 98 | 64 |

*After a mean of 25 days of external lid loading.

Table 1: Diagnoses of All Patients With Lagophthalmos Treated

| Diagnosis | No. of Cases (N=152) | % |
|------------------------------|----------------------|----|
| Brain stem infarction | 81 | 53 |
| Acousticus neurinoma | 40 | 26 |
| Parotis tumor | 28 | 18 |
| Cerebellopontine angle tumor | 1 | 1 |
| Petrous bone meningioma | 1 | 1 |
| Meningitis | 1 | 1 |

CONCLUSIONS

In line with the work of Müller-Jensen and Müller-Jensen¹ presented in 1993, the technique of external lid loading for temporary lagophthalmos treatment is simple and effective. In comparison to a commonly applied monocolus, the patient can close the lid because of gravity, vision is unimpaired, and the aesthetic is more appropriate. Additionally, patients can wear glasses, and in case of keratopathy, local treatment can be applied. At night, patients have to wear a monocolus. Skin reddening and the 45% of surveyed cases that had to attach the weight several times daily because of hooded eyelids have to be taken into consideration. Müller-Jensen and Müller-Jensen¹ drew blood samples in selected patients and did not detect increased lead concentrations, which was not to be expected because lead ingestion or inhalation normally results in intoxication. Nevertheless, we recommend varnishing the weight with clear nail polish or having a golden weight custom-made. In case M. orbicularis oculi paresis persists for several months and the concentric needle EMG fails to show voluntary muscle activity, internal lid loading or a muscle transfer operation is recommended.^{2,3} The observation that restoration of the M.

orbicularis oculi was faster than for the oris in some patients may hint at a facilitatory effect of external lid loading. Sensory stimulation and better muscle fiber prestretch may be possible explanations, analogous to the techniques of proprioceptive neuromuscular facilitation or kinesiotape.^{4,5}

In conclusion, these positive clinical experiences recommend external lid loading for temporary lagophthalmos treatment in a daily routine.

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