CLINICAL REPORT

Fabrication of a Custom Eyelid Implant Prosthesis: A Clinical Report

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Patients with lagophthalmos are often treated with a stock gold weight that has been implanted in the upper eyelid. This relatively simple surgical technique does not, however, always produce the desired result. This article describes a technique for the fabrication of a custom eyelid implant prosthesis for patients who present with a non-functioning and unaesthetic eyelid implant.

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LAGOPHTHALMOS is the inability to close the eyelid.[1] It may be the result of the residual effect of seventh cranial nerve damage secondary from Bell's palsy, tumors, cancer removal, temporomandibular arthrotomy, congenital dysphasias, infections, or degenerative diseases.[2-7] Failure to provide protection to the eye may lead to exposure keratitis, corneal abrasion, or blindness. The treatment of lagophthalmos includes ointments, eye drops, taping, tarsorrhaphy, or an eyelid implant.[8-12] The eyelid-implant method of treatment has proven to be very successful, easily accomplished, and one that may involve the dental profession.[1,11]

In this procedure, a gold weight is inserted in the upper eyelid to allow for closure by the force of gravity. The weight of gold required can be determined by taping known weights of gold to the affected eye to determine the weight required for lid closure. It has been reported that this weight is typically between 0.75 and 1 g but can range from 0.6 to 1.6 g.[5,9,12] Gold is the preferred material due to its color, specific gravity, and tissue compatibility.[1] Commercially prefabricated weights are usually used but may create a "brick-like" appearance within the eyelid. Custom-made weights that produce a much more esthetic result can be fabricated by the dental profession.

Clinical Report

The patient presented to the dental clinic with a chief complaint of an unesthetic result following gold weight insertion for lagophthalmos secondary to cranial nerve damage during tumor removal. The goal of the treatment was to create a more esthetic result by placing a custom-fabricated gold weight in a more favorable position.

The following technique is recommended when a patient presents with lagophthalmos and a pre-existing unesthetic and/or non-functional existing gold weight eyelid implant (Fig 1–3). Manipulation of the existing eyelid and the embedded implant downward and anteriorly over the ocular bulb revealed that the weight was adequate to close the eyelid, once it reached a certain point. However, the patient could not reach this point without physically guiding the eyelid implant. In other words, the patient could not create lid closure by simply trying to blink. It was surmised that the weight was correct but positioned too far superiorly.

Since taping of known weights to ascertain the proper amount of gold was not feasible due to the presence of the existing eyelid implant, measurements of the existing implanted gold weight were made with the following dimensions being recorded: 15 × 5 × 1 mm. The calculated volume from the measurements and the density of the gold

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Figure 1. Frontal view of existing prefabricated eyelid implant.

Figure 3. Patient demonstrates inability to close the eye with the prefabricated eyelid implant.

weight were used to determine the weight of the gold implant. The following formula was used to determine the weight of the wax pattern to be cast in order to produce the required weight of the new eyelid implant.[11]

$$\text{Weight of wax pattern} = \frac{\text{Weight of gold}}{\text{Density of gold}} \times \text{Density of wax}$$

An irreversible hydrocolloid impression (moulage) of the unaffected eye was made. The unaffected eye was used to create the shape of the implant wax-up that would more closely follow the natural contours. The cast of the affected eye, if used, would have required the arbitrary reduction of the "brick-like" appearance of the eyelid prior to creating the wax pattern and may have resulted in an ill-fitting and unesthetic prosthesis. The cast was lubricated and a pattern in the desired shape of the eyelid implant was waxed (Fig 4). The wax pattern was tried on the patient's unaffected eye prior to investing for accuracy of fit. Utilizing the lost-wax technique, the pattern was cast in type III gold.[1] The holes were placed in the most medial and lateral positions of the prosthesis for suturing of the eyelid implant in place. The gold weight was weighed, finished, polished, reweighed, and delivered to the surgeon for sterilization and insertion (Fig 5–7).

Discussion

The use of gold weight eyelid implants is certainly a desirable option of treatment of patients suffering from lagophthalmos, but it is not

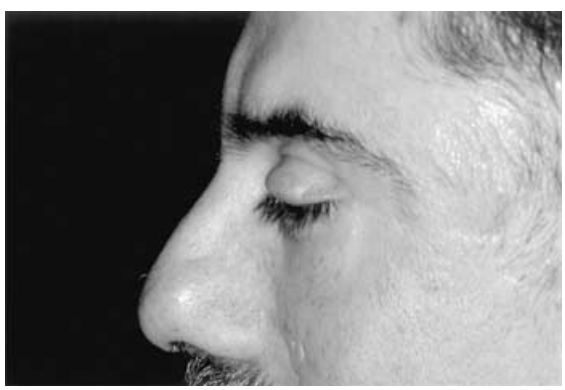

Figure 2. Sagittal view of existing prefabricated eyelid implant.

Figure 4. Cast of custom-waxed eyelid implant.

Figure 5. Frontal view of custom-fabricated eyelid implant on the unaffected eye.

always successful or esthetic due to the thickness of the prefabricated implants and the anatomical structures of the eye. The technique presented emphasizes the importance of proper positioning and contour of the eyelid implant and details a method of correcting an undesired result.

Summary

The fabrication of a custom prosthesis is presented for a patient who had an existing unesthetic and non-functional eyelid implant. Simple prosthodontic principles were utilized; they markedly improved the patient's quality of life.

Figure 6. Frontal view of inserted custom-fabricated eyelid implant.

Figure 7. Sagittal view of inserted custom-fabricated eyelid implant.

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