



Case Report

Management of lagophthalmus with gold implant: A case report

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ABSTRACT

Blinking covers the eye with a thin layer of tear fluid, thereby promoting a moist environment necessary for the cells of the exterior part of the eye. The tears also flush out foreign bodies and wash them away. This is crucial to maintain lubrication and proper health of the eye. In lagophthalmus, there is inability to close the eyelid and loss of blinking mechanism, thereby resulting in corneal dryness, ulceration, abrasion and infection. It may occur due to facial nerve damage secondary to trauma, iatrogenic due to surgery, tumour or Bell's palsy. Initial symptomatic management is directed towards ocular surface lubrication. Viscous artificial tears are used or thin polyethylene film may be applied over the eyes to reduce evaporative drying. Temporary or permanent tarsorrhaphy may be required in some cases. Changing the position of either the top or bottom eyelid can help relieve the symptoms of lagophthalmus. A prosthetic procedure involves implanting gold weights into the upper eyelid, which allows the eyes to close by gravity. A case report of management of Lagophthalmus is presented here.

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1. Introduction

As the facial nerve carries sensory, motor and parasympathetic fibres involved in facial muscle innervation, facial palsy results in functional and cosmetic impairment. Facial palsy can result from a wide variety of causes, Bell's palsy (idiopathic) being the most common (70%),¹ but it can also result from infectious processes, trauma, neoplasms, autoimmune diseases, and it can be of iatrogenic origin.² The prognosis of the paralysis has been proven to depend on the cause of nerve damage: traumatic and iatrogenic lesions have less chances of functional recovery, while most patients with Bell's palsy show complete recovery without intervention within 3–4 months.¹ The paralytic orbicularis oculi muscle is unable to promote eyelid closure with the counter-force offered by the normal functioning levator muscle and the effect of laxity and gravity in the lower eyelid, the corneal protection is compromised. The increased corneal exposure and the

disruption of the tear film puts the eye at risk of keratitis, corneal ulceration and potentially vision loss.

There are several methods to address paralytic lagophthalmos. They can be temporary or permanent. The decision is based on the clinical examination and on the exposure risk of the cornea. Temporary and non-surgical measures aim to protect the ocular surface while recovery is awaited. They traditionally include the frequent use of artificial tears, ophthalmic ointments, soft contact lenses, protective taping, occlusive moisture chambers, scleral shells and external eyelid weights.^{2–4} but new options are constantly being reported. The most popular and widely used static procedure in facial nerve palsy is the upper eyelid gold weight implant. Gold eyelid implants are designed for the gravity assisted treatment of the functional defect of lagophthalmos resulting from facial paralysis.⁵ We report a case of a patient with facial paralysis who underwent gold weight implantation in the upper eyelid for correction of paralytic lagophthalmos.

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2. Case Report

A 35-year-old male reported with complaint of inability of complete closure of the right eye [Figure 1a and Figure 1b]. He gave a history of maxillofacial trauma two years back which was operated twice in a span of six months which resulted in facial nerve injury thereby, resulting in paralytic lagophthalmos. Following the injury, he was advised ophthalmic drops, ointments and protective taping to provide comfort and protection to the cornea from trauma and drying. After 1 year of conservative treatment which did not provide desired result, he was taken up for correction of paralytic lagophthalmos through static measures.



Fig. 1: (a-b): Pre-Operative Presentation of Lagophthalmos

An Irreversible hydrocolloid impression (Dentsply Zelgan Plus Alginate, Gurgoan, Haryana, India) was used to make the impression and a plaster model was prepared. The plaster was trimmed arbitrarily (Figure 2) and was used to design the implant.

For correction of paralytic lagophthalmos through static measures, commercially available 2.0-g, square-shaped, 22-carat pure gold was used. This was wrought by a rolling machine and then trimmed to a desired shape. The exposure of eye after maximum effort for closure by the patient was carefully noted (2 mm) and the dimensions of the tarsus (23 mm) were measured using a caliper and carefully reproduced on a paper model. Gold weights starting at 0.8 g with 0.2-g increments were placed serially over the pretarsal eyelid skin using paper tape with dual adhesive surface. The ideal weight was predefined as the one that achieved closure of palpebral fissure (Figure 3).

The prosthesis was made by using the required weight of pure 22-carat gold and subtracting 1.0 mm from the paper model. This helps one to confine the gold weight to the dimensions of the tarsus. The curvature was initially obtained by making an imprint of the outer surface of the eyelids using irreversible hydrocolloid dental impression material. Weight of 1.6 g was found to be adequate for the desired result

After evaluation by the general physician and anaesthetist, the patient was taken up for surgery under

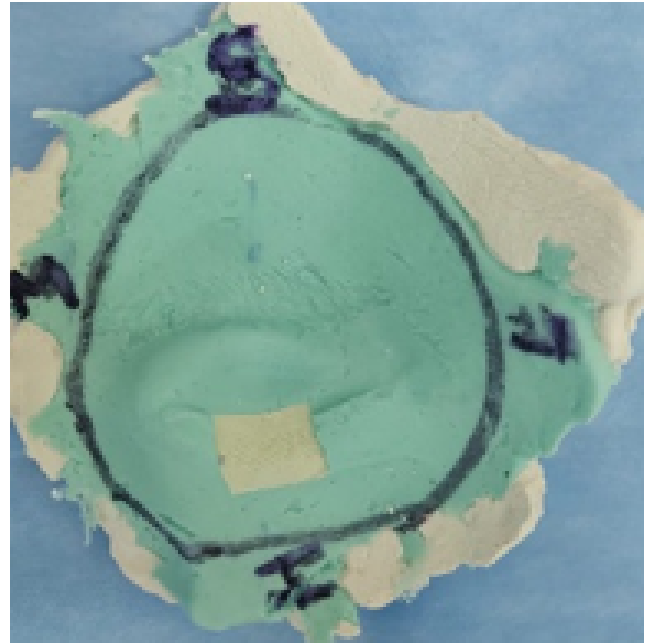


Fig. 2: Prepared Plaster cast from impression of the face



Fig. 3: Determination of the ideal weight of prosthesis

general anaesthesia (GA). Marking was made in upper eyelid for incision. A 1 cm incision was made in the supratarsal and continued through the orbicularis oculi muscle to the tarsal plate. The dissection was carefully carried out and a pocket was made over the tarsal plate approximately of the size of the gold weight staying at least 2 mm superior to the lid margin. Pre-weighed gold weight of 1.6 g was placed in the pocket medial to the mid-pupillary line [Figure 4] and was sutured to the tarsal plate with two partial thickness sutures of 5-0 prolene. The orbicularis oculi muscle was closed over the implant with resorbable sutures and the skin re-approximated with a running suture of 6-0 nylon. The post-operative sequelae were uneventful and the sutures were removed on the 7th day with tight eye lid closure (Figure 5).



Fig. 4: Surgical exposure of the Tarsal Plates and placement of Gold Implant

3. Discussion

Gold weight implantation is the most commonly used static procedure for surgical correction of paralytic lagophthalmos.^{2,6} In the present case, a gold weight was inserted in the upper eyelid to allow closure by the force of gravity after accurate measurement of the weight required for complete closure. Though various surgical options like tarsorrhaphies, canthoplasties, lid magnets, palpebral springs, muscle and fascia transfers and slings and nerve anastomosis exist for rehabilitation of paralyzed eyelid, the outcome and complexity of these procedures varies and the experience of the surgeon and case selection is critical in ensuring a favourable result.

The mainstay of treatment in paralytic lagophthalmos is upper eyelid loading, as there is usually a rapid and effective improvement in ocular symptoms. Loading the upper eyelid can help gravitational forces “pull” the upper eyelid down, essentially producing a mechanical ptosis.^{6,7} Patients can be “sized” preoperatively, so that the most appropriate weight



Fig. 5: Post Operative review shows complete closure of the Eye lids under gravity

can be selected. During implantation, eyelid dissection should avoid transection of the attachments of the levator aponeurosis and Muller’s muscles to the tarsal plate. Some surgeons suture the implant in the pretarsal plane to the levator aponeurosis or even superior to the tarsus. While gold has traditionally been the most common material used for weights, it is associated with a higher incidence of complications (implant migration, extrusion, infection, astigmatism, and poor cosmetics). Platinum is preferred secondary to its increased density, lower profile, and lower rates of capsule formation and extrusion.⁶ Platinum chains confer even greater advantages, as their versatile shape offers superior contour match to the eyelid tarsus. In the event of facial nerve function recovery, the weights may be removed easily under local anesthesia.

Gold weight implantation has been shown by multiple authors to be a safe, reliable, reproducible and effective means of permanently rehabilitating paralyzed eyelids. It has gained widespread acceptance because of its low rate of complications and the relative simplicity of the surgical procedures. Though other materials have been used to load the upper eyelid, gold is considered the material of choice because of its inertness, high density, malleability, non-allergic properties, relatively low cost (when compared to platinum) and also it provides good colour camouflage.

4. Conclusion

Gold weight lid loading is a technique for the treatment of paralytic lagophthalmos and has become the standard in the management of paralytic lagophthalmos. The safety and efficacy of gold weight implants has been reported in several case series studies. Although the evidence is limited, implantation of gold lid weights (i.e., lid loading) has become an accepted and a widely used treatment for patients with paralytic lagophthalmos. The use of gold eyelid weights is a simple, reliable and successful means of permanently rehabilitating paralyzed eyelids. Individual implants appear to decrease the postoperative complication risk and are effective in the management of paralytic lagophthalmos.

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6. Conflict of Interest

The authors declare they have no conflict of interest.

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