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Management of upper eyelid defect with silicone prosthesis: A non-invasive aesthetic approach

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Abstract

An enucleated ophthalmic socket's prosthetic rehabilitation is of paramount significance since an eye defect undermines self-esteem and results in aesthetic and psychological issues. In many cases the orbital fat redistributes downwards along with the deepening of the upper eyelid sulcus (DUES) which has an adverse cosmetic result. An ocular prosthesis alone creates a staring appearance hence not providing the intended aesthetic outcome. This case report presents a novel technique of combing a silicone eyelid prosthesis with a customized ocular prosthesis of appropriate contour, size and colour to create life like appearance.

Keywords: Upper eyelid defect, periorbital fat loss, sunken appearance, silicone eyelid prosthesis, ocular prosthesis

Introduction

The art of replacing a missing eye with a prosthesis is in practice for many years ^[1]. Congenital, traumatic, or pathological factors can all lead to ocular globe loss. It impacts facial asymmetry, and has various aesthetic and psychological issues ^[2].

The ocular prosthesis should be of the appropriate size, color, and shape to increase social acceptability while helping the patient's recovery, both physically and mentally ^[1]. Ocular prosthesis is crucial for treatment of anophthalmic patients. They aid in concealing the deformity so that the general public is unaware of it, boosts morale and improves an individual's reintegration in community. They are functional in occupying the ocular volume, avoiding potential side effects like eyelid sagging, mucoid discharge and/or conjunctival inflammation ^[3]. Post-enucleation socket syndrome, also known as enophthalmos, ptosis, ectropion, and lower lid laxity, can develop after enucleation surgery as a result of the reduction of volume and rotation of intraorbital contents ^[4].

Deepening of the upper eyelid sulcus (DUES) also referred to as "sunken eye" is difficult to evaluate and address clinically. The eye take on a sunken or cadaveric aspect thus compromising the esthetics ^[5].

Most patients with an upper eyelid that is depressed after enucleation receive prosthetic rehabilitation. Over time if the upper lid takes on a more sunken aspect surgery might be necessary to address this ^[5]. Hence, to address the aesthetic demands of such compromised cases without any invasive methods a combined eyelid and ocular prosthesis was fabricated.

Case report

A 46-year-old male patient was diagnosed with retinoblastoma of the right eye 2 years back. He underwent surgery for the same and enucleation along with removal of the periorbital fat was done. Patient underwent ocular prosthesis fabrication but was not satisfied with the aesthetics. As per examination right eye socket revealed sunken eyes. The volume gap in the socket was significant. The upper and lower lids had inadequate closure and the superior fornix was shallow. (Figure 1) Since surgery using mucus or dermis fat grafts may fail due to poor vascularity of the socket a decision was made to fabricate a custom ocular prosthesis followed by silicone eyelid prosthesis

Steps

The ocular prosthesis fabrication was done using conventional technique. For the fabrication of the silicone eyelid prosthesis a putty index (Zhermack Zetaplus putty, Zhermack SpA, Italy) of the contralateral eyelid was made (Figure 2a). It was invested using type III dental stone (Kalstone, Kalabhai, Mumbai, Maharashtra, India) and a cast was fabricated. Using this cast a wax pattern (Maarc, shiva product, Mumbai, Maharashtra, India) of the eyelid was fabricated which was then evaluated in the patient's affected eyelid with the ocular prosthesis in place. (Figure 2b) The wax pattern was invested in a dental crown flask and dewaxing was done. Shade matching was done using a Spectrophotometer (E-Skin Spectrophotometer, Spectromatch Ltd., UK) by measuring the skin colour closest to the defect. (Fig 3) Medical grade silicone (M 511 Standard Addition {Platinum} Silicone Rubber, Technovent Ltd, South Wales, UK) was weighed out according to the measurements given by the software & packing was done. After processing and finishing external characterization was done chairside using extrinsic pigments (Spectromatch Extrinsic system, Technovent Ltd, South Wales, UK). Hair was sewn using donor hair matching the colour and texture of the patient's eyelid. First only the ocular prosthesis was inserted (Figure 4a) and then ocular prosthesis along with eyelid prosthesis was inserted (Figure 4b) to compare the change in aesthetics. A medical grade silicone skin adhesive (water based) (G609 Probond adhesive, Technovent Ltd, South Wales, UK) was employed for further retention. Post insertion care was explained to the patients. A 6 month recall showed satisfactory aesthetics.

Discussion

Fabrication of an ocular prosthesis with optimized esthetics is extremely important. Any type of facial deformity has a profoundly negative impact on a person's psychology. In a study by Rutgers *et al.* measuring quality of care and life in patients with an ocular prosthesis, patients frequently indicated satisfaction with the artificial eye's outward appearance and reported normal psychosocial functioning [6]. The volume of the orbit and the support provided by the contents of the orbit decrease when there is an imbalance between the volume of the bony orbit and the volume of the orbital content due to redistribution of periorbital fat or over resection. A staring appearance or cadaveric look is often observed [5].

The treatment of dry contracted sockets is never easy. Surgical management include dermal fat abdominal graft [5], coronal frontoplasty [7], or even autologous fat grafts injected or surgically placed to correct eyelid depressions [8]. Factors like graft absorption and dislocation, ptosis and donor side morbidity should also be given due concern. [5] Grafts given via injections may require multiple injections [8]. Grafts and operations may also fail as a result of low vascularity. Since prosthetics don't require surgery, they are always favored modality of treatment [9]. The eyelid prosthesis adopts a conservative approach and delivers a favorable cosmetic result. Alternative methods include attaching an upper eyelid to the ocular prosthesis or painting a lid beneath the veneer to reduce the visible size of the palpebral aperture.

It is simple to employ spectrophotometric assessment of skin colour for prosthetic applications. To match the patient's skin tone, it includes about 22000 skin tones. Each entry in the electronic library has a corresponding colorant recipe. The tool is portable, light, and simple to use. Its sophisticated picture capture technology raises the bar for precision in a

compact hand-held device [10].

The current article outlines a simple and non-invasive method for addressing the aesthetic concerns of patients with upper eyelid defects. This approach yields predictable and satisfactory results without causing additional trauma to the patient. However, it does have some drawbacks, including the inconvenience of using an adhesive-retained prosthesis, which can be sticky, dirty, messy, and short-lived.



Fig 1: Preoperative image



Fig 2: Putty index of contralateral healthy eyelid & Wax pattern trial of eyelid prosthesis with ocular prosthesis in place

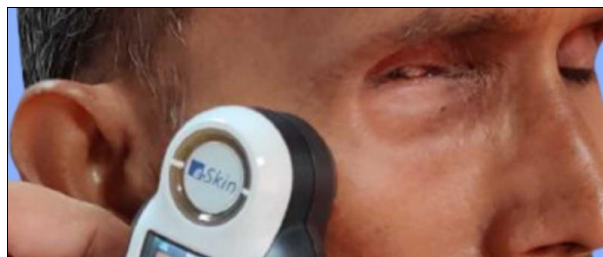


Fig 3: Shade matching done using a Spectrophotometer



Fig 4: Ocular prosthesis without eyelid prosthesis & Ocular prosthesis with eyelid prosthesis

Conclusion

This article describes an innovative prosthetic approach for fabrication of upper eyelid prosthesis which can provide a non-surgical option and more comfort to the patient. By using the upper eyelid prosthesis along with the ocular prosthesis the psychological state of the patient was improved. But at the same time it requires proper care and maintenance.

Conflict of Interest

Not available.

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Not available.

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