Management of a patient of phthisis bulbi: a case report

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Abstract

Maxillofacial prostheses which restore and replace stomatognathic and associated facial structures with artificial substitutes aim to improve the patient aesthetics, restore and maintain health of the remaining structures and consequently provide physical and mental wellbeing. The objective of this article is to reveal the rehabilitation of uniocular phthisis bulbi, a clinical case treated with a scleral cover shell in a male patient whose cause of defect was trauma. Also digital reproduction of the iris is made, instead of painting the iris using acrylic or oil painting.

Key Words: Orbital prostheses, Ocular prostheses, Phthisis bulbi, Scleral cover shell

Introduction

An eye for an eye is what the old saying goes. Eyes are generally the first features of the face to be noted.[1] The disfigurement associated with the loss of an eye can cause significant physical, psychological and emotional problems.[2] Most patients experience significant stress, primarily due to adjusting to the functional disability caused by the loss and to societal reactions to the facial impairment.[3] Replacement of the lost eye as soon as possible is necessary to promote physical and psychological healing for the patient and to improve social acceptance[4]. A fundamental objective when restoring an anophthalmic socket with an ocular prosthesis is to enable the patient to cope better with the difficult process of rehabilitation. A multi-disciplinary management and team approach are essential in providing accurate and effective rehabilitation and follow-up care for the patient.[5] Therefore, the combined efforts of the ophthalmologist, the plastic surgeon and the maxillofacial prosthodontist are essential to provide a satisfactory ocular prosthesis.[6] The role of the maxillofacial prosthodontist in fabricating an ocular prosthesis with acceptable esthetics, to restore facial symmetry and normal appearance for the anophthalmic patient becomes essential.[7] A case report of a patient with uniocular phthisis bulbi, rehabilitated by a custom made scleral cover shell prosthesis is presented.

Clinical Report

A 25-year-old male presented with the chief complaint of blindness associated with the decreased size of the left eye [Table/ Fig. 1]. On clinical examination, it was found that the cause of the defect was trauma (needle prick) occurred at the age of 9 years. Due to the poor socio-economic status and illiteracy, no proper care was taken, thus leading to the present clinical situation. On palpation it was found that, there was no associated pain, discomfort or residual edema. Thorough ophthalmic evaluation was done and it was diagnosed as Phthisis bulbi [Table/ Fig. 2]. The appropriate treatment was planned and was decided to fabricate a custom made scleral cover shell. The whole procedure regarding the fabrication of the prosthesis including its maintenance and limitations were explained to the patient. Impression of the external surface of the defective eye was made.[Table/ Fig. 3] A 5ml disposable syringe without a needle was used to record the defect using irreversible hydrocolloid impression material[Table/ Fig. 3]. The most important criteria for recording an acceptable ocular impression is that there should be accuracy in recording the posterior wall. During impression making the position of the palpebral in relation to the posterior wall is to be maintained. Impression should also record the greatest extent of the superior and inferior fornics. The impression was invested with dental plaster to obtain the cast. Spacer was adapted and custom tray fabricated using self-cure clear acrylic resin. To attach a syringe for injecting impression material, a 2-3 mm diameter perforation was made around approximately at pupil location. Multiple perforations of 1-2 mm were made over the remainder of the surface, which sufficed for the retention of the impression material. The custom tray was trimmed, polished and disinfected. It was tried in the patient to check for extension and proper orientation. The tray was placed in the socket and the syringe was loaded with low viscosity polyvinyl siloxane. The impression material was injected into the tray and patient was instructed to perform all the movements of the eye, so that the functional impression was recorded [Table/Fig. 4]. After removal from the socket, the impression was checked for acceptability. After beading and boxing, the impression was invested with die stone (type IV). Wax pattern conformer was then carved and contoured to give it the simulation of the lost eye. Try-in was done with the wax conformer to assess the fit, contour, comfort, size, support from the tissues, and the simulation of eye movement in

comparison with natural eye[Table/ Fig. 5]. Using lost wax technique[Table/ Fig. 6]. The scleral cover shell was fabricated using heat cured tooth colored acrylic resin; the shade was selected using shade guide in comparison with adjacent natural eye sclera. Try-in of the scleral shell was done to check proper fit and contour. With the help of anatomical landmarks and that of the adjacent natural eye the position of the iris was determined. On a custom-made iris disc, the color of the patient's iris was replicated by digital photo image. Later, a custom made corneal button was glued over the digital photo image iris disc. After polymerization, the prosthesis was finished and polished. Disinfection of prosthesis was done with 0.5% chlorhexidine and 70% isopropyl alcohol for 5 mins, later the prosthesis was rinsed in sterile saline solution and inserted [Table/ Fig. 7, 8]. Instructions were given to the patient regarding proper care and hygiene maintenance. Also instructions of the use of ancillary products (e.g., lubricants, lubricant delivery systems, cleansers.) and procedures were given in order to help the patient adapt to the prosthesis.

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 6

Fig. 7

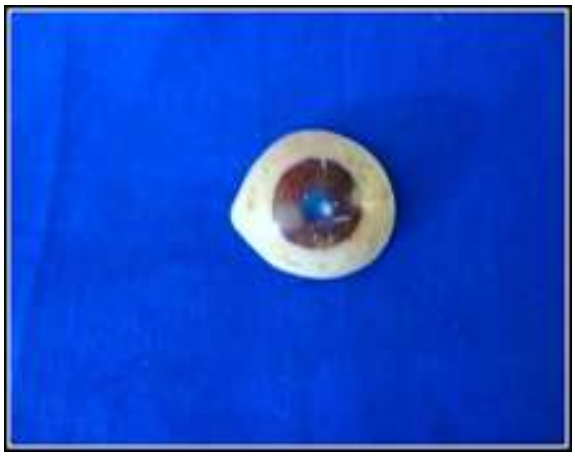

Fig. 8

Fig. 9

Discussion

Man has known the art of making artificial eyes from the days of the early Egyptians and the Peruvian Indians, but not until World War II, and the development of refined plastics has been the option for a satisfactory aesthetic ocular prosthesis. Replacement of any anatomic structure by artificial means remains a challenge, especially in the facial region. The replacement must be one, which blends with the adjacent tissues as well as replaces the missing structures. Careful planning and meticulous attention in detail fabrication of prosthesis can enable the maxillofacial prosthodontist to make a major contribution in the rehabilitation of the patient with an orbital defect.[8] Empirically fitting a stock eye, modifying a stock eye by taking an impression of the ocular defect and the custom eye technique are the most commonly used techniques.[9] However many optical companies developed the mass-produced stock acrylic resin prosthesis. Though the fabricating procedure is rapid, but the results are not entirely satisfactory. They even have a limited choice of sizes and iris color matching. Custom made, hand painted, and individually constructed acrylic resin artificial eye have been proved to be the most satisfactory ocular replacement.[10] The fabrication of a custom made acrylic resin eye provides a more precise and satisfactory aesthetic as an impression outlines the defect contents, with the iris and the sclera being fabricated and painted individually with ocular defect. Advantages include improved adaptation to underlying tissues, increased mobility of the prosthesis, improved facial contours, and enhanced esthetics gained from control over the size of the iris and pupil and color of the iris and sclera. The ocular prostheses are either ready-made or custom-made and are produced from either glass or methyl methacrylate resin.[11] Criteria for an acceptable impression included accurately recording the posterior wall, the position of the palpebrae in relation to the posterior wall, and the greatest extent of the superior and inferior fornices of the palpebrae.

Conclusion

An alternative approach to fabrication of ocular prosthesis is presented in this case report. Direct impression with an elastomeric impression material has been tried here with satisfactory results. Digital iris has been incorporated in the ocular prosthesis instead of the hand painted method. Both the techniques require further study to assess their efficacy and stability.

References

1. Doshi PJ, Aruna B. Prosthetic Management of patient with ocular defect. J Ind Prosthodont Soc 2005;5:37–38.
2. Raflo GT. Enucleation and evisceration. In: Tasmun W, Jaeger E eds. Duane's Clinical Ophthalmology, Revised edn, Vol. 5. Philadelphia: Lippincott-Raven, 1995:1–25. [Table/Fig. 6]: Final prosthesis in situ.
3. Lubkin V, Sloan S. Enucleation and psychic trauma Adv Ophthalmic Plast Reconstr Surg 1990;8:259–62.
4. Artopoulou II, Montogomery PC, Wesley PJ, Lemon JC. Digital imaging in the fabrication of ocular prostheses. J Prosthet Dent 2006;95:327–30.
5. Ow RKK, Amrith S. Ocular prosthetics: use of a tissue conditioner material to modify a stock ocular prosthesis. J Prosthet Dent 1997;78:218–22.
6. Bartlett SO, Moore DJ. Ocular prosthesis: a physiologic system. J Prosthet Dent 1973;29:450–59.

7. Erpf SF. Comparative features of plastic and/or glass in artificial-eye construction. Arch Ophthalmol 1953;50:737.
8. Welden RB, Niiranen JV. Ocular prosthesis. J Prosthet Dent 1956;6:272–78.
9. Guerra LR, Finger IM, Echeverri J, Shipman B. Impression making, sculpting, and coloring of orbital prostheses. Adv Ophthalmic Plast Reconstr Surg. 1992;9:287-96.
10. Mark F. Mathews, DDS, MS, 1 Rick M. Smith, DDS, MS, 2 Alan J. Sutton, et al. The Ocular Impression: A Review of the Literature and Presentation of an Alternate Technique. J Prosthodont 2000;9:210-16.
11. Erpf SF. Comparative features of plastic and/or glass in artificial-eye construction. Arch Ophthalmol 1953;50:737.
12. Cain JR. Custom ocular prosthetics. J Prosthet Dent 1982;48:690–94.
13. Beumer J III, Curtis TA, Firtell DN eds. Maxillofacial Rehabilitation: Prosthodontic and Surgical Considerations. St Louis: CV Mosby,1979:352–62.