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Simplified technique of iris fabrication and custom made ocular prosthesis for patient with evisceration: A case report

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Abstract
The disorders leading to surgical removal of ocular contents result in ocular defects. The amount of tissue removal and time interval between the surgical procedures and prosthesis fabrication are the important factor for prognosis of ocular prosthesis. Fabrication of a custom made prosthesis gives better tissue adaptation thus the movement of prosthesis is enhanced and also provides esthetics. This case report describes the fabrication of custom made ocular prosthesis where the digital camera was used to fabricate the iris portion of a prosthesis which allowed proper color matching and exact size of the iris. Comfort, movement and retention of a prosthesis, appropriate color and size matching of the iris portion improved the esthetics and patient's self-confidence.

Keywords: Evisceration, ocular prosthesis, ocular defect

Introduction
The eye is considered to be the jewel of the body. Trauma, congenital malformation or surgical removal of various pathologies results in loss of eye causing psychological and physical damage to the patient. The mutilated face can be a stigma for the patient and relatives. This may affect the individual's self-esteem due to difficulty in establishing emotional ties, new life style, insecurity and rejection [1].
Rehabilitation of the ocular defects can be done by ocular prosthesis following an enucleation, evisceration, orbital exenteration, or the phthisis bulbi or a discolored blind eye of near-normal size to improve the cosmetic appearance [2]. Generally used surgical procedures are evisceration which is the removal of the contents of the globe, leaving the sclera and on occasions the cornea in place, and enucleation where the eyeball is completely removed [3].
Ocular prosthesis is commercially available as prosthetic eye shell which is made up of acrylic or glass or it can also be custom made. Custom made ocular prosthesis is always advisable because of its good tissue adaptation, proper fit and it also allows for color and shade matching. Fabrication of iris and sclera portion with proper match of color and size in terms with patient's normal eye is always a big challenge.
This case report describes rehabilitation of the patient with eviscerated eye using custom made ocular prosthesis and simplified technique of iris fabrication using digital camera.

Case report
A 36 Year old female patient reported to Department of Prosthodontics, Sri Hasanamba Dental College and Hospital, Hassan, Karnataka, with the chief complaint of missing left eye causing impaired esthetics. Patient gave history of surgical removal (Evisceration) of the left eye one and half month back due to pain and swelling. Prosthetic stalk eye shell was given to the patient after the surgical procedure by the ophthalmologist. But it was ill fitting causing discomfort to the patient upon wearing. On examination convexity was noted in defect eye as minimal tissues was removed during surgical procedure and loss of folding on upper eyelid was seen due to tissue shrinkage after the surgery (Fig. 1). The remaining ocular tissues were healthy with movement of the tissue bed.

Treatment plan included fabrication of custom made ocular prosthesis which provides comfort, facial esthetics, movement and tissue adaptation. Also to get better color and size matching of the iris digital camera was used; without following the conventional method of iris button painting or using a stalk eye which are cumbersome and technique sensitive.

Procedure

- **Primary impression:** Patient was informed about the treatment procedure. Petroleum jelly was applied to the defect eye and on eyebrows to ensure easy removal of impression material once it sets. Preliminary impression of a defect eye was made using light body poly vinyl siloxane impression material (Flexceed, GC, Japan). Patient was in supine position during impression making, as this will prevent the material to flow against the forces of gravity. Upper and lower eyelids were stretched to ensure flow of the material in to the sulcus and then the eyelids were released to normal unstrained position because in this case very minimal tissues were removed so proper extension of the material was required to provide retention of the prosthesis. Impression was then removed and examined (Fig. 2).
- **Iris Fabrication:** Photographs of the normal eye was taken using the digital camera (Canon EOS 200D) for fabrication of iris portion and for color matching of the sclera during fabrication of the prosthesis. Diameter of the iris of the normal eye was measured, which was 12 mm. Picture of iris was printed on photo paper keeping the same diameter. On the other hand a round wax pattern which has convex surface at one side and flat surface on other side which was about 1.5 mm thick in the centre and 0.5 mm at the periphery was made and processed using clear heat cure polymethyl methacrylate (DPI, India) (Fig. 3). Printed iris photo paper was attached to this at its flat surface using white self-cure resin (Fig. 4).
- **Wax pattern fabrication:** Impression was poured in dental stone. Wax (Golden dental products, India) was melt and poured into the dental stone (Gem Stone, India) mould. The facial surface of a wax pattern was made convex. This wax pattern was used for the trial of the prosthesis.
- **Iris positioning:** Transparent graph grid method was used to position the iris on the wax pattern. 2 lines (1 horizontal and 1 vertical) were marked on the grid template. Then grid template was positioned in such way that vertical line coincides with facial midline and horizontal line passing through centre of the iris. The distance between midpoint of iris and the intersection point made by horizontal and vertical lines were measured which was 3 cm. Similarly, one more point were marked on the horizontal line which was 3 cm from the intersection point of horizontal and vertical lines and this point represented the centre of the fabricated iris. Wax was removed from the facial surface of the wax pattern and then iris was positioned (Fig. 5).
- **Try in procedure:** During trial procedure the wax pattern was inserted into the defect eye and checked for its extension, retention and facial contour. Facial contour was adjusted by modifying the facial surface of the wax pattern in accordance with the normal eye of the patient (Fig. 6).
- **Reline impression:** Once the iris was positioned wax pattern was checked for its movement, esthetics and extensions into the sulcus. A small stick was attached on iris using sticky wax for easy placement and removal of trial prosthesis. Tray adhesive was applied to the tissue surface of the wax pattern. Then the thin layer of light body elastomeric material (Coltene, Switzerland.) was applied over it and placed into the defect. Patient was instructed to give movements on right, left, up and down. Trial prosthesis along with reline impression was removed once the material was set (Fig. 7). Shade selection for the sclera was done.
- **Flasking and processing:** Flasking was done using dental stone. Small acrylic stem was attached on to the iris; this prevents the displacement of iris during dewaxing procedure (Fig. 8). Staining of the sclera is done using acrylic intrinsic stains and the prosthesis was processed with the heat cured acrylic resin using conventional long curing cycle. After curing and bench cooling retrieved ocular prosthesis was finished and polished.
- **Insertion of prosthesis:** Prosthesis was inserted and evaluated for its fit, comfort and esthetics (Fig. 10, 11, 12.). Patient was trained for the placement and removal of the prosthesis. Instruction was given regarding the maintenance of the prosthesis and follow up was done after 1 day, 1 week and every 6 months.

Patient showed positive response and was happy with the comfort and aesthetics of the prosthesis.

Discussion

Ocular prosthesis is a maxillofacial prosthesis that artificially replaces an eye missing as a result of trauma, surgery, or congenital absence [4]. Evisceration involves the surgical removal of the contents within the globe, while preserving the sclera, extra ocular muscles and optic nerve. Indications for evisceration typically include blind, painful eyes found in such cases as chronic uveitis or neovascular glaucoma, corneal perforation and endophthalmitis requiring anophthalmic surgery [5].

The most common complications for patients with ocular prostheses include recession of the upper lid sulcus, absence of the superior lid folds, and progressive enophthalmos. These complications are attributed to the degeneration of inactive extra ocular muscles, orbital fat atrophy, and a tendency for enophthalmos associated with aging [6]. As this was a case of post evisceration, more amount of tissue were preserved. Thus the thickness of the prosthesis was kept minimal to avoid difficulty in closing the eye and aesthetic complications.

Various techniques of impression has been described in the literature, such as impression with or without using stalk tray, two step or single step impression and impression using alginate and elastomeric impression materials [3, 7-10]. Here impression was made using light body by directly injecting into the socket. Using light body as an impression material is advantageous because it flows easily and records the details of the eye socket in a functional form in turn aids in the proper adaptation and ease of functional movements of the ocular prosthesis [7].

Conventionally iris or the sclera portion of the prosthesis is colored manually or stalk prosthesis is selected to match the patient's contra lateral iris and sclera. Manual coloring requires aesthetic skills and experience, stalk eye color can vary or sometimes it is difficult to get appropriate match with the sclera's color and size. Currently few literature mentions the fabrication of the iris and sclera portion using digital

photography [11-13]. The technique described here for fabrication of the iris using a digital photography allowed accurate matching of the color and size of the iris to the contra lateral eye enhanced the aesthetic. Also the above mentioned technique is simple and cost effective.

Positioning of the iris is a crucial step. Technique such as facial markings, visual judgment, graphic grid technique and iris positioning devices can be used to position the iris.[11, 14.] Here transparent graphic grid technique was used for positioning the iris and later assessed by visual judgment. Graphic grid is a simple procedure and requires less time. Minor flaws after positioning were corrected using visual judgment.

Figures

Fig 1: Eviscerated left eye

Fig 2: Impression of defect

Fig 3: Shell made with clear acrylic resin

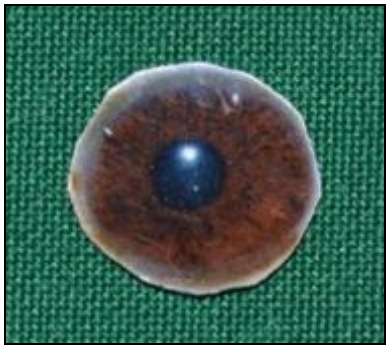

Fig 4: Acrylic shell attached to printed photo paper

Fig 5: Iris positioning

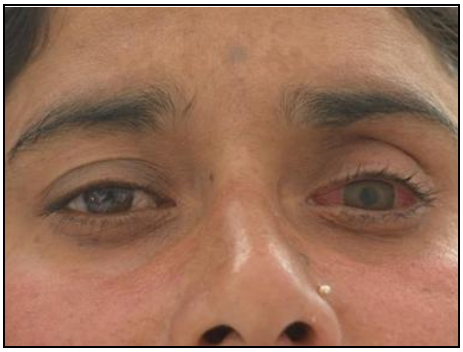

Fig 6: Wax pattern trial

Fig 7: Reline impression

Fig 8: Flasking

Fig 9: Pre-operative

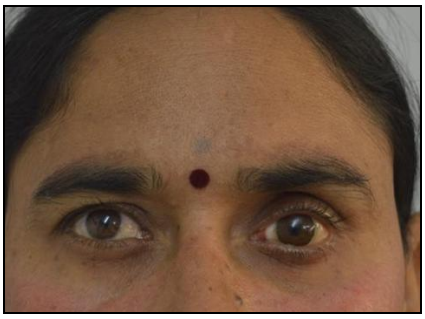

Fig 10: Insertion of ocular prosthesis

Fig 11: Right ocular movement

Fig 12: Left ocular movement

Conclusion

Fabrication of custom made ocular prosthesis always gives promising results as the fit, extension, adaptation to the tissue and esthetics of the prosthesis is improvised. In this case report patient underwent the surgical procedure of evisceration, thus intact intraocular muscles showed mobility which here to improve the movement of prosthesis without affecting its retention. Early fabrication of the prosthesis help in avoiding tissue shrinkage and improve patients self-confidence. Digital photographic method for fabrication of iris improved esthetics and allowed proper color and size matching of iris. If the prosthesis is made early, follow up for every 6 months and relining of the prosthesis is required till tissues heal completely.

Conflicts of interest: The authors declare no conflicts of interest.

References

1. Goiato MC, Dos Santos DM, Bannwart LC, Moreno A, Pesqueira AA, Haddad MF, Dos Santos EG. Psychosocial impact on anophthalmic patients wearing ocular prosthesis. Int J Oral Maxillofac Surg 2013; 42:113-119.
2. Avisar I, Norris JH, Quinn S, Allan D, McCalla M, Dugdale D *et al*. Temporary cosmetic painted prostheses in anopthalmic surgery: An alternative to early post operative clear conformers. Eye. 2011; 25:1418-1422.
3. Siddhesh Kumar C, Chandra Shekhar S. Prosthetic management of an ocular defect. Contemporary clinical dentistry. 2010; 1(3):201-203.
4. The glossary of prosthodontic terms. J Prosthet Dent 2017; 117(5):49.
5. Malinda C, Cathy M, Heather JD. Ocular Prosthesis: Indications to Management. Can J of Optometry 2015; 77(2):24-32.
6. Pokpong A, Dinesh, Binit S, Theerathavaj S. Prosthetic rehabilitation of an ocular defect with post-enucleation socket syndrome: A case report. Saudi Dent J 2014; 26:29-32.
7. Ilango T, Rathika R, Prabhu R, Varun AD, Arun KS. Rehabilitation of artially eviscerated eye with custom made ocular prosthesis. J Clinic Diagnost Res 2014; 8(1):285-287.
8. Bali N, Dhall RS, Singh N. Various Steps Involved in Fabrication of an Ocular Prosthesis: A Case Report. Int J Dent Med Res 2015; 1(5):93-96.
9. Gupta RK, Padmanabhan TV. Prosthetic Rehabilitation of a Post Evisceration Patient with Custom Made Ocular Prosthesis: A Case Report. J Ind Prosthod Soc 2012; 12(2):108-112.
10. Raizada K, Rani D. Ocular Prosthesis. Contact Lens & Anterior Eye. 2007; 30:152-162.
11. Shah RM, Countinho I, Chitre V, Aras MA. The Ocular Prosthesis: A Novel Technique Using Digital Photography. J Indian Prosthodont Soc. 2014; 14(1):248-254.
12. Jain S, Makkar S, Gupta S *et al*. Prosthetic rehabilitation of ocular defect using digital photography: a case report. J Indian Prosthodont Soc. 2010; 10:190-193.
13. Artopoulou LI, Montgomery CP, Wesley JP. Digital imaging in the fabrication of ocular prostheses. J Prosthet Dent. 2006; 95:327-330.
14. Shetty PP, Chowdhary R, Yadav RK, Gangaiah M. An iris positioning device and centering approach: A technique. Prosthet Dent. 2018; 119:175-177.