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CASE REPORT

CUSTOMISED OCULAR PROSTHESIS – A CASE REPORT

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ABSTRACT

Eyes are the windows to soul and they are noticed first. Loss of an eye affects a patient psychologically and also socially. It makes an individual feel crippled. Hence its very challenging for a maxillofacial prosthodontist in fabricating an ocular prosthesis with acceptable aesthetics to restore facial symmetry and normal appearance for the patient. This article presents a case report of a patient with an acquired ocular defect due to trauma, treated with an ocular prosthesis using conventional technique which is much easier and with a good aesthetic results.

Key words:

Stock Eye Prosthetics,
Acrylic Eye Prosthesis,
Sclera,
Orbital Defect

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INTRODUCTION

The human eye has been one of the most precious of gift of god. It unveils the entire outer world to our consciousness; gives life, expression, and dignity to the face. The disfigurement associated with loss of an eye can cause significant physical and emotional problems and requires an early replacement so that the patient may return to a normal life. Loss of the eye can occur due to trauma, infection or congenital reasons (Chiramana *et al.*, 2013; Bhat, 2010). Rehabilitating an orbital socket include many techniques such as, stock eye prosthesis and custom made ocular prosthesis (Rahn and Boucher 1970; Welden and Niiranen, 1956; Cain, 1982). The stock prosthesis are available in standard sizes, shapes, and colour can satisfy the need for an artificial eye for such patient. This type prosthesis does not require any special skills or materials for fabrication. These prostheses are economical and are often given quickly. But the choice is custom ocular prosthesis (Cain, 1982; Smith, 1995; Sykes, 1996). Custom ocular prosthesis have advantages like improved adaptation to underlying tissues, the prosthesis have

more mobility compared to stock eye prosthesis, better aesthetics as the size of the iris and pupil and colour of the iris and sclera can be controlled and manipulated These also have improved facial contours (Bartlett and Moore, 1973; Taicher *et al.*, 1985; Jayaprakash and Misra, 2014). This case report describes rehabilitation of a ocular defect using conventional technique.

Case Report

A 18-year-old male patient was reported to the department for replacement of his right ocular prosthesis. He had been repeated changing his stock ocular prosthesis which had been placed following a surgical excision of the ocular content. According to the history he lost his right eye due to trauma from a cat scratch when he was a kid. The stock prosthesis was placed by an ophthalmologist and changed several times as the prosthesis had poor retention and aesthetics. At the time of examination it was observed that the whole eyeball was surgically excised, but the muscles at the base of the socket were intact (Figure 1). It was decided to fabricate a custom acrylic ocular scleral prosthesis to solve the problems associated with the present prosthesis. After a thorough examination of the ocular defect, the treatment was initiated. Primary impression of the defect was recorded using alginate impression with plaster reinforcement (Figure 2). An intraocular custom tray was made with self cure acrylic resin.

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Figure 1. Preoperative



Figure 2. Plaster reinforced alginate impression of eye



Figure 3. Secondary impression of eye made with elastomeric impression material

Perforations were made on the tray for mechanical interlock and also for excess material to flow out. The custom tray was tried in the patient's socket and adjusted for a passive fit. Rubber base light body impression material was loaded in syringe and injected into the socket through a syringe and then simultaneously medium body impression material was loaded on to the special tray and placed on to the socket. Hence a final impression was recorded (Figure 3). While making the impression the patient should sit straight with a 45-degree angle head tilt. To allow the material to flow into all aspects of the socket the patient was asked to move his eyes both up and down. Then patient was instructed to look directly at a fixed point 6 feet away at the level of the eye. This helps in recording the impression of the site with the muscles in a neutral gaze position (Allen and Webster, 1969). A two-piece split cast was poured with the final impression (Brown, 1970).



Figure 4. Split master cast

After the stone set, the two parts of the split cast were separated and the impression material along with the tray was removed (Figure 4). The wax pattern for the scleral prosthesis was fabricated using inlay wax. The inner surface of the cast was coated with separating medium. And then the inlay wax was heated and molten wax was poured into the mould. Additional wax was poured to compensate for the wax shrinkage. Then mould was opened to retrieve the wax pattern. Wax patterns were returned into a smooth hemispheroid removing the sharp edges. Later they were highly polished and free from dust and debris before placing it in the socket. During the try-in of the wax pattern following things (Bhat, 2010; Benson, 1977) should be checked (Table 1). Using the normal eye as a guide the size and colour of the iris was determined.

Table 1. Points to be noted during wax try-in of the eye

• Relieve the pressure points or areas of discomfort.
• Check eye contour The eye contour and lid configuration from different angles.
• Manual palpation with the eyes closed ;
• Height of convexity over the pupil should be centred, usually slightly medial to the midline between the inner and outer canthi;
• Eyelids that should close completely over the wax pattern;
• Contours and palpebral fissure that should resemble the adjacent natural eye



Figure 5. Wax Try in of eye

A preformed iris was obtained matching the opposite eye. It was then placed on the pre-determined position in the wax pattern such that the margins of cornea were made to flush with the wax pattern and the wax pattern was tried in (Figure 5). While investing the waxed up prosthesis in an ocular flask its important to stabilize the corneal button into plaster. So a small holder of autopolymerising acrylic was attached to it, which prevented its displacement during dew axing. Processing was similar normal denture processing with heat cure tooth coloured resin, and for curing long curing cycle was followed. The acryl zed prosthesis was then retrieved from the flask and trimmed to remove the acrylic handle and all irregular and sharp surfaces.



Figure 6. Final eye prosthesis

But at this stage the prosthesis lacks a natural life like appearance and so the prosthesis was customized according to the opposite eye. An artistic hand of the dentist or technician plays a vital role in mimicking the other eye. A layer of acrylic resin about 1 mm around the corneal button of the prosthesis with an acrylic trimmer (Benson P1977; Fir tell, 1975). A combination of yellow, red and orange oil paint was applied on the trimmed surface to simulate the colour of the natural eye using picture of the normal eye as a guide. The colours were selected and mixed using monomer as the thinning agent. To simulate blood vessels, red satin strands were placed (Firtell, 1975; Firtell *et al.*, 1975). The painted prosthesis was placed onto the flaked mould back, over the painted surface self-cure clear acrylic resin was mixed and placed to regain the original contour of the surface. The acrylized prosthesis was then trimmed, polished and finished. The factors observed during try in were checked again (Figure 6). Patient was instructed to do regular removal and cleaning of the prosthesis with a

ophthalmic irrigation solution (Parr *et al.*, 1983), this case aesthetic rehabilitation of the was successfully done and the showed good eye movement with the prosthesis.

DISCUSSION AND CONCLUSION

The loss of an eye has always been regarded as the greatest misfortune and requires early replacement so that the patient may return to a normal life. The art and science of ocular prosthesis has been refined over many decades to provide aoptimum cosmetic and functional replacement. Ocular prosthesis has a long history of successful use and many innovative techniques and materials have been introduced throughout the years (Allen and Webster, 1969; Bartlett and Moore, 1973). But the most important part is artistic and very innovative approach to treat such patients, along with the available materials and techniques. Even a thorough knowledge of the regional anatomy and recent trends in the treatment modality is equally important .Therefore a properly fabricated custom-made prosthesis enhances the patient's comfort and confidence by increased adaptiveness and natural appearance.

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