CASE REPORT

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Fabrication of Custom Made Ocular Prosthesis for Congenital Defect: A Case Report

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ABSTRACT

Eyes are generally the first feature of the face to be noticed. An eye is an important feature of the facial expression, a vital organ and a symbol of beauty. Ocular prosthesis can be classified as stock shell eye, stock shell eye modified and custom-made prosthesis. A custom ocular prosthesis is a good treatment alternative when reconstruction of the defect by plastic surgery or the use of osseointegrated implants is not feasible or unaffordable. This case report highlights the same.

KEYWORDS: Enucleation, Occular prosthesis, Acrylic eye

INTRODUCTION

Eyes are generally the first feature of the face to be noticed. An eye is an important feature of the facial expression, a vital organ and a symbol of beauty. The loss of an eye has a crippling effect on the individual's psyche not just because of the functional disability but also due to impaired facial esthetics.[1] Rehabilitating an ocular defect is an arduous task because of the variable anatomy of every socket. In order to restore full physiologic function and to provide maximum comfort and esthetics; an individually designed prosthesis is mandatory.[2]

In sixteenth century, Ambroise Pare was the first person to use porcelain eyes in an eye socket. Ludwig Muller (1830's) popularised the use of glass eyes.[2] During and after the World War II, the naval dental school tested the use of acrylic eyes in fabricating ocular prosthesis. In comparison to glass eyes, resin eyes were easier to fabricate and adjust, unbreakable, inert and esthetically pleasing.[3]

Ocular prosthesis can be classified as stock shell eye, stock shell eye modified and custom-made prosthesis.[4-6] Stock eyes are generally used when time is limited and/ or economic constraints are present. Custom-made ocular prosthesis improves tissue health, pressure is distributed more equally and the incidence of conjunctival abrasion is decreased. In this case report, a simplified technique was used to fabricate an acrylic custom ocular prosthesis for an enucleated ocular socket.[4-6]

CASE REPORT

A 19-year old boy was referred to the Department of Prosthdontics, PGIDS, Rohtak for fabrication of ocular prosthesis.

The history of the patient dates back to 17 years (at the age of 2 years) when he was diagnosed with retinoblastoma of the right eye and enucleation was done for the same. On examination, it was observed that the whole eye ball was surgically excised, but the muscles at the base of the socket were intact (Figure 1).

A direct impression was recorded using a thin mix of alginate. A hollow plastic cap of a 2 disposable needle was attached to it (Figure 2). During the impression, the patient was asked to move his eyes up and down to facilitate flow of the impression material. This was followed by a fixed gaze at a point 6 feet away to allow flow of material in neutral position. The impression was boxed, poured in dental stone and sectioned cast was fabricated. The self-cure acrylic resin trays were made and used for making definitive impression. The definitive impression was made with light body addition silicone(Figure 3). The impression

thus obtained was poured using split-cast (three piece) procedure (Figure 4).

A scleral wax pattern was fabricated and tried in for pressure points and contour. Iris positioning is an extremely vital step as it has a great effect on the facial esthetics. To mark the position of the iris, facial midline and a line passing through the center of the iris of the healthy eye were marked. The distance between two lines was measured using a vernier calliper(Figure 5), and the measurement was transferred to the affected side. The patient's healthy eye was matched with the stock shell eye and the iris was cut off from it. The iris hence obtained was placed on the pre-determined position in the wax pattern and try in was done. The movements of the wax pattern was checked in different gazes (frontal, left and right lateral).

The wax pattern was invested in a crown flask. The selected scleral shade was matched with the tooth coloured heat cure acrylic resin. Initially, a thin layer of heat-cure clear acrylic resin was placed around the iris and on the scleral region to get a natural glossy appearance. Red coloured silk threads were added to the resin to mimic the blood vessels. The finally acrylized prosthesis was trimmed, finished, polished and was inserted (Figure 6). Post- insertion instructions were given and regular follow-ups were maintained.

DISCUSSION

The prognosis of the prosthetic rehabilitation using custom ocular prosthesis depends on the condition of the enucleated eye bed to a great extent. The following observations should be made during examination to achieve best possible results:

1. Relation of the palpebral fissures in both open and closed positions.
2. Evaluation of the muscular control of the eyelids.
3. Anatomy of the eye socket in resting position and during excursive movements.
4. Mobility of the posterior wall of the defect during the excursive movements of the normal eye.

A custom ocular prosthesis is a good treatment alternative when reconstruction of the defect by plastic surgery or the use of osseointegrated implants is not feasible or unaffordable.

The use of a stock ocular prosthesis is usually considered when time is less, and treatment cost is a consideration. Fabrication of a custom ocular prosthesis allows several variations during construction. The closer the adaptation to tissue bed better are the movements of the prosthesis. Custom prosthesis reduces or minimizes the collection of mucus and debris. Hence, the chances of irritation of the mucosa and development of infection are reduced. Optimum cosmetic and functional results increase the patient's chances of leading a normal life.

Custom ocular prosthesis have certain advantages like improved comfort, fit and adaptation, better mobility, even distribution of pressure thereby reducing chances of ulceration.[4-6]

One of the most important steps in making accurate impressions is the close adaptation of the mucosal surface of the ocular prosthesis to the posterior wall of the eye socket.

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Figure 1. Pre-operative view

Figure 2. Primary impression

Figure 3. Secondary impression

Figure 4. Sectional model fabricated

Figure 5. Measurements for Iris placement

Figure 6. Post-operative views