Fabrication of Custom Ocular Prosthesis : A Case Report

Dr. Neeraj Nagpal
Professor & H.O.D.

Dr. K.L. Gupta
Senior Lecturer

Dr. Suchi Agarwal
P.G. Student

Department of Prosthodontics, Institute of Dental Sciences, Bareilly (U.P.)

Abstract

Numerous ocular impression and fitting techniques have been described in the literature. Most can be placed into one of several broad categories: direct impression/external impression, impression with a stock ocular tray or modified stock ocular tray, impression with custom ocular tray, impression using a stock ocular prosthesis, ocular prosthesis modification, and the wax Scleral blank technique, Ocular chosen for a custom ocular prosthesis. An attempt is also made to mimick the shade and colour of the sclera in the wax pattern itself; using white paraffin wax. This gives an accurate registration of the position and alignment of iris disc assembly, giving a natural look.

Key Words: Impression Techniques, Ocular Prosthesis, Scleral Blank

Introduction

A congenital anomaly or pathology may necessitate an orbital evisceration or an orbital enucleation. The surgical procedure of evisceration is where the contents of the globe are removed, leaving the sclera intact. A more invasive procedure is enucleation where the entire eyeball is severed from the muscles and optic nerve. Exenteration, the most radical, involves removal of the contents of the orbit.

Methyl methacrylate prosthesis became popular since they offered superior strength and the shape and size could be modified. Recently flexible material such as silicone became advantageous when the defect extend beyond the orbital area and encounters movable tissue beds.

Case Report

A seventy-five year old man reported to the department of prosthodontics, Institute of Dental Sciences, Bareilly. He presented with evisceration performed four to five months prior on the right eye which was asymptomatic but blind. Keeping his paying capacity and other aesthetic requirement in mind he was elected for fabrication of a custom ocular prosthesis.

Evaluation of patient ocular defect

In a case of evisceration the extra ocular muscles are left intact and hence good mobility of the prosthesis is possible.

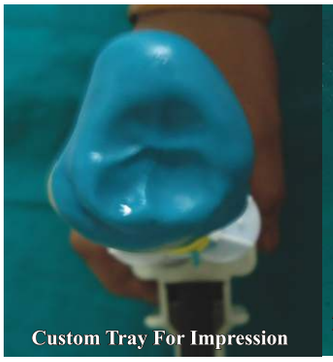
Preoperative

Examination Of Eye Socket

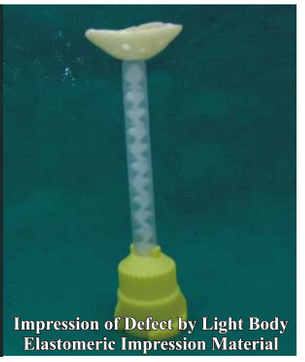
So it becomes mandatory to do the defect evaluations. According to standard procedure; the palpebral fissure was observed both in open and closed position to rule out any abnormality. Evaluation of the muscular control of the palpebrae and the internal anatomy of the socket in resting position and full excursive movement was performed. Mobility of the posterior wall of the defect was assessed. Condition of conjunctiva, depth of fornices, and presence of cul de sac was noted.

Materials and Techniques

Impression & wax pattern fabrication: The impression of the anophthalmic eye socket was sought by introducing an impression material into the eye socket using a disposable syringe and projecting it out between the lids.



Custom Tray For Impression



Impression of Defect by Light Body Elastomeric Impression Material

The elastomeric impression material used here was light body addition silicone. After the impression material was set, the impression was removed and invested in die-stone with slip-cast technique, in order to obtain a positive cast of the eye socket. Subsequently the cast was coated with a separating medium and modelling wax was then shaped in an empirical approximation of the anterior curves of the cast form.

Trying the scleral wax pattern

Wax was added or trimmed from the basic scleral pattern until satisfactory contours of the eyelids were achieved in open and closed positions.

Technique of Iris Disc Placement

1. Photograhs of patient's normal left iris were developed in average sizes.
2. Certain guidelines were marked on patients face for accurate placement of iris.
3. The facial markings were transferred to grid by

Wax Try In Of Ocular Prosthesis

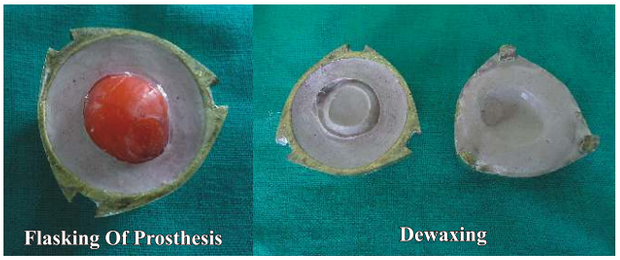
placing it on patients' face.

Guidelines on patients face

A vertical midline was marked passing through the forehead crease, glabella, tip of the nose and chin. The distance from the right eye medial canthus to the midline and left eye medial canthus to the midline was measured.

Investing, Dewaxing, Packing

The finished pattern was invested in a small two piece brass flask. A two part mold was constructed by the prototype ocular prosthesis by using dental gypsum in a two piece brass flask, the anterior portion of the mold was invested, a separating medium was applied and the posterior portion of the mold was then invested. The flask was then placed in a dewaxing bath for 20 min. The anterior and



posterior portions of the flask were separated. The color of the sclera was selected using tooth color acrylic shade guide.

Rayon thread fibril were used to simulate vasculature, by monomer polymer syrup method. The selected shade of the sclera was matched with the heat cure resin which was then packed in the two piece flask. The flask was kept for curing for a period of two hours and thirty minutes to avoid any residual monomer.

After processing the iris was placed by cutting it from

photograph in appropriate size. Finally, a layer of transparent cold cure acrylic was placed, finshed and polished.

Placement of ocular prosthesis

The patient was instructed on the aspects of insertion and easy removal of the prosthesis

Patient Follow up

The patient was asked to return on day 1, 2 and 7 for follow-ups after the prosthetic insertion. There after a 6 month follow-up was done for prosthesis evaluation and adjustment.

Advantages of a custom ocular prosthesis are:
1. Retains the shape of the socket.
2. Prevents collapse of the lids.
3. Provides proper muscular activity of the lids.
4. Prevents accumulation of fluid in the cavity.
5. Maintains palpebral opening similar to natural eye.

References

1. Taylor T. Clinical Maxillofacial Prosthetics; p. 233-76.
2. Beumer J, Curtis TA. Maxillofacial Rehabilitation. Prosthodontic and Surgical Considerations; p. 431-49.
3. Laney WR. Maxillofacial Prosthetics; p. 279-306.
4. Cain JR. Custom ocular prosthesis. J Prosthet Dent 1982;48:690-4.
5. Ponnanna A.A, Amit Porwal, Nikhi Verma. Impressions Techniques for Ocular Prosthesis- A Clinical Review . International Journal Of Dental Clinics 2009 ; 1(1) ; 29-33.
6. Dixit S, Shetty P, Bhat GS. Ocular prosthesis in children clinicalReport. Kathmandu University Medical Journal 2001; 3(1) ; 81-83.