Case Report

Ocular Prosthesis Fabrication with Visible Light-Cured Resin Custom Tray: A Case Report

Upasana Panda[1], Mirna Garhnayak[2], Abhilash Mohapatra[3], Bodhisatta Mukherjee[4], Saroj Nehra[5], Gaurav Pal Singh[6]

[1]Postgraduate Student, [2]Professor, [3]Professor, [4]Postgraduate student, Department of Prosthodontics and Crown & Bridge, Institute of Dental Sciences, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India, [5]Senior Lecturer, Department of Pedodontics and Preventive Dentistry, Daswani Dental College & Hospital, Kota, Rajasthan, India, [6]Associate Professor, Department of Prosthodontics and Crown & Bridge, Mahatma Gandhi Dental College & Hospital, Jaipur Rajasthan, India

Abstract

A well fitting custom ocular prosthesis warrants an accurate impression of the anopthalmic socket. Problem arises when neither the stock ocular tray nor conformer is available or ill fitting in nature. This case report elaborates the fabrication of an ocular prosthesis with emphasis on chair side method of custom ocular tray fabrication. Visible light cured resin denture base material has been used for preparation of ocular tray. This method is simple, quick and precise.

Keywords*: Ocular Prosthesis, Ocular tray, Visible light cured resin denture base material*

Introduction

Loss of eye is an unfortunate incident and often allied with trauma, glaucoma or cancer. [1] Early rehabilitation of the anopthalmic socket is essential for psychosocial well-being of patient. [2] A well-adapted custom ocular prosthesis (COP) not only improves aesthetic but also the ease of eye movement. [3] This warrants an accurate ocular impression. Routinely ocular impression is made with stock ocular tray. [4] A custom ocular tray is preferred in absentia of stock tray and in highly irregular anopthalmic socket. [5] This case report enumerates the fabrication of COP with an emphasis on chair side method of custom ocular tray preparation.

Corresponding Author:
Dr. Mirna Garhnayak,
Professor, Department of Prosthodontics, Institute of Dental Sciences (IDS), Siksha 'O' Anusandhan (Deemed to be University), K-8, Kalinga Nagar, Ghatikia PO: Bhubaneswar, Odisha, 751003, India
Email: mirnagarhnayak@gmail.com;
Telephone: +91 8457011217

Case Report

A five-year-old boy was referred to the department of prosthodontics, for rehabilitation of the lost eye. History of the patient suggested, enucleation of right eye one year back due to trauma. A shrunken right eye with healthy intraocular tissue bed was revealed upon clinical examination (Fig. 1A, B). Depth of fornices was adequate for retention of ocular prosthesis. So, a COP was planned for the patient and consent taken for the same.

The procedure was initiated, with fabrication of custom ocular tray, using visible light cured resin denture base material (VLCRDBM) (Dental Avenue DMG supertech: India). [6] Outline (indelible colour pencil) of the tray was made on right eyelids, followed by adaptation of a sheet of VLCRDBM over it (Fig. 2A). The marked portion of the adopted sheet was cut and a sectioned needle cap (2ml dispovan syringe) was attached to its centre for passage of impression material (Fig. 2C). The whole unit was readapted over the right eye and then polymerized with a handheld UV light source for initial stabilization. A protective eye glass

(3M: India) was used for left eye during the procedure. Definitive polymerization of the ocular tray was done in a light polymerization unit (sibari Sr 620; Sirio Dental S.R.L: Italy) as per manufacturer's instructions (Fig. 2D). The polymerized tray was perforated and verified for fit, after necessary corrections (Fig. 3A).

Ocular impression was made with this custom tray and light bodied poly vinyl siloxane elastomeric impression material (Aquasil; Dentsply Caulk:USA), when the ocular muscles were at neutral gauze. [7] The impression material was slowly injected through the stalk of ocular tray to avoid air entrapment. A functional ocular impression was made by asking the patient to move his eyes in all direction (Fig. 3B). The obtained ocular impression was analysed for any defect and then invested with irreversible hydrocolloid impression material to create the mould of defected right eye. Wax pattern (Inlay wax, Maarc; Shiva Products) of the ocular prosthesis was prepared from this mould.

Try in of ocular wax pattern was done for verification of contour, comfort and ease of eye movement (Fig. 4A). [8] Shade and position of the right iris was synchronized with that of normal left eye (Fig. 4B). The selected shade of iris button was then cut from the stock ocular prosthesis and secured in desired position of the ocular wax pattern, with the help of a disposable needle cap.

Processing of the ocular wax pattern was done, with heat polymerized acrylic resin (DPI; India). Characterization of the polymerized blank sclera was done with red fibres obtained from high strength heat polymerize acrylic material (Lucitone; Dentsply: USA), to simulate the blood vessels of eye. The characterized prosthesis was covered with a layer of heat polymerize clear acrylic resin (Acralyn-H; Asian Acrylates: India) again, to avoid irritation of eye.

The definitive ocular prosthesis was delivered to the patient, with proper education for its insertion, removal, and maintenance (Fig. 4C). No ophthalmic lubricant was advised for this patient, as the lacrimal flow was adequate. He was further educated about the change of prosthesis with age.

FIGURES

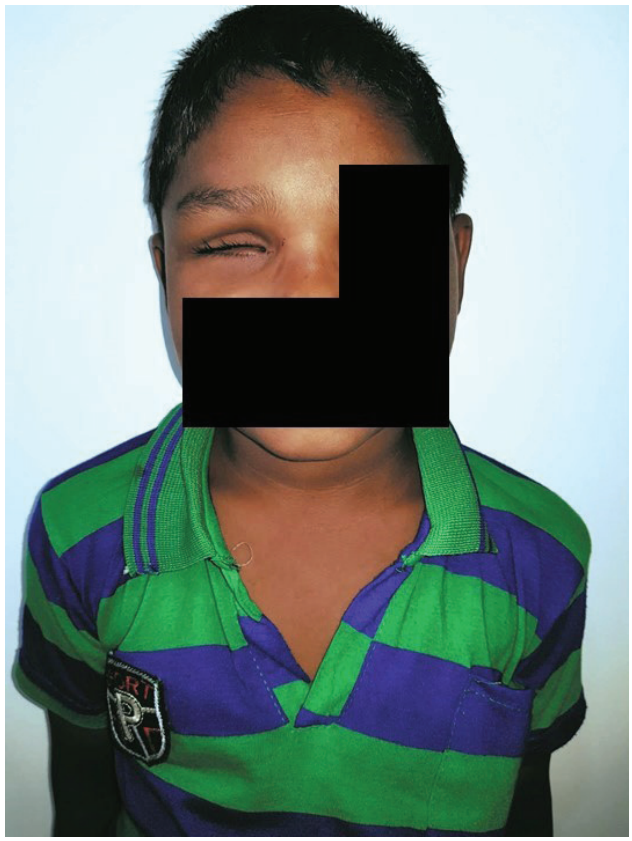

Fig. 1A. Preoperative extra ocular view

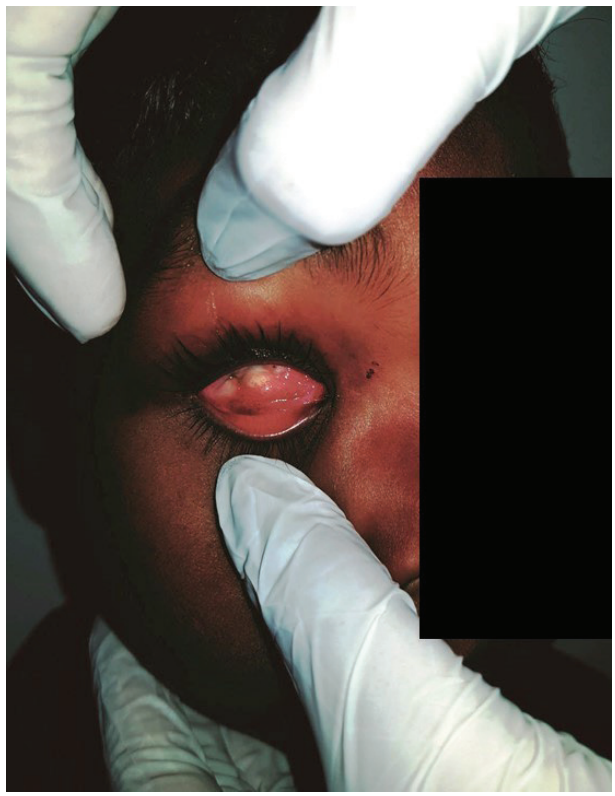

Fig. 1B. Preoperative intra ocular view

Fig. 2A. Out lined upper and lower eye lids

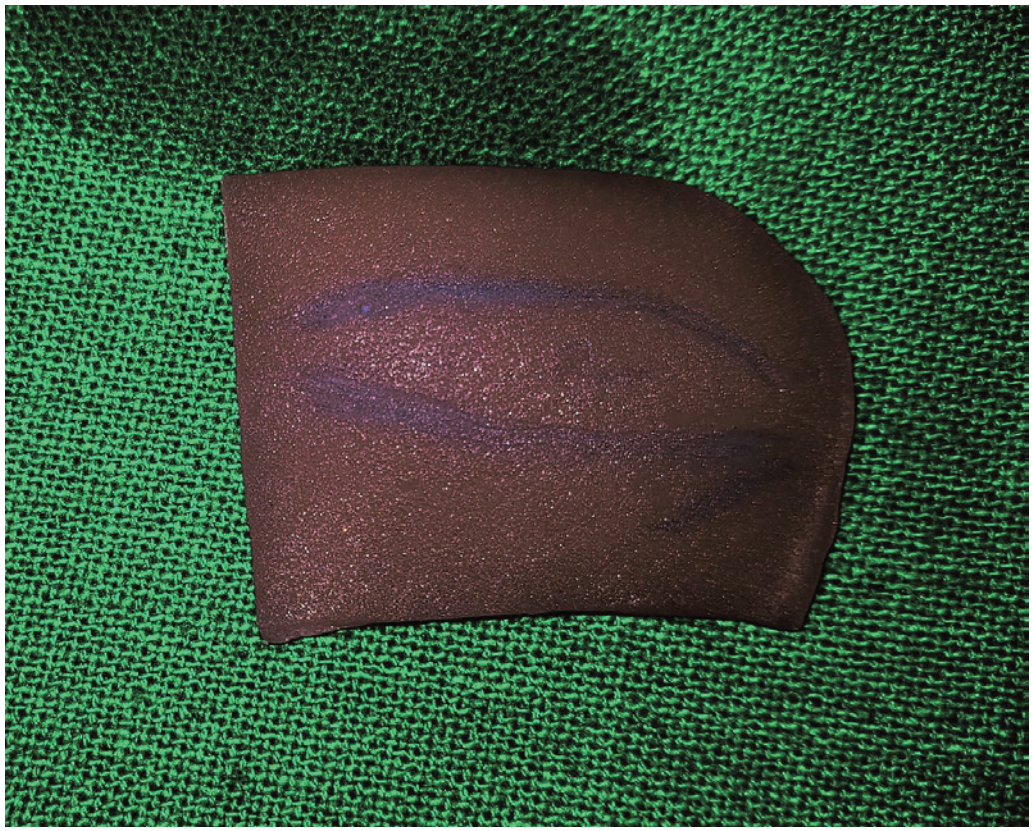

Fig. 2B. Transfer of markings of out lined upper and lower eye lids to sheet of VLCR denture base material

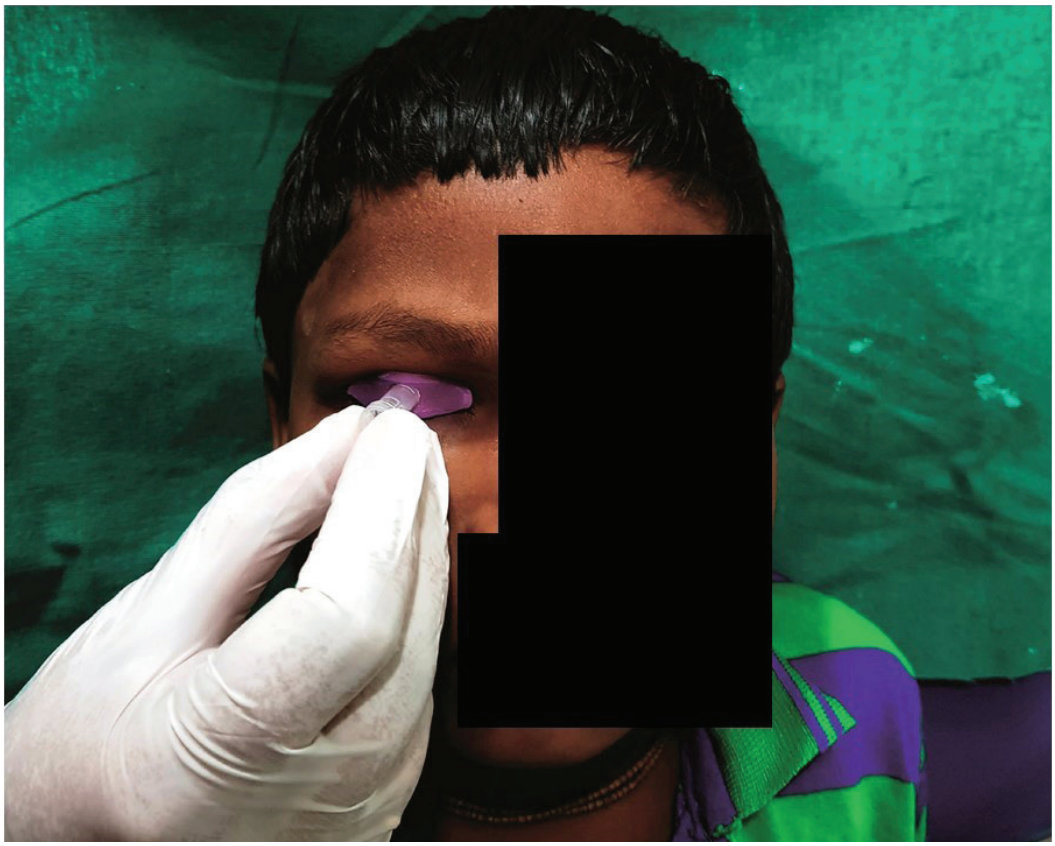

Fig. 2C. Adopted sheet of VLCR denture base material with attached needle cap

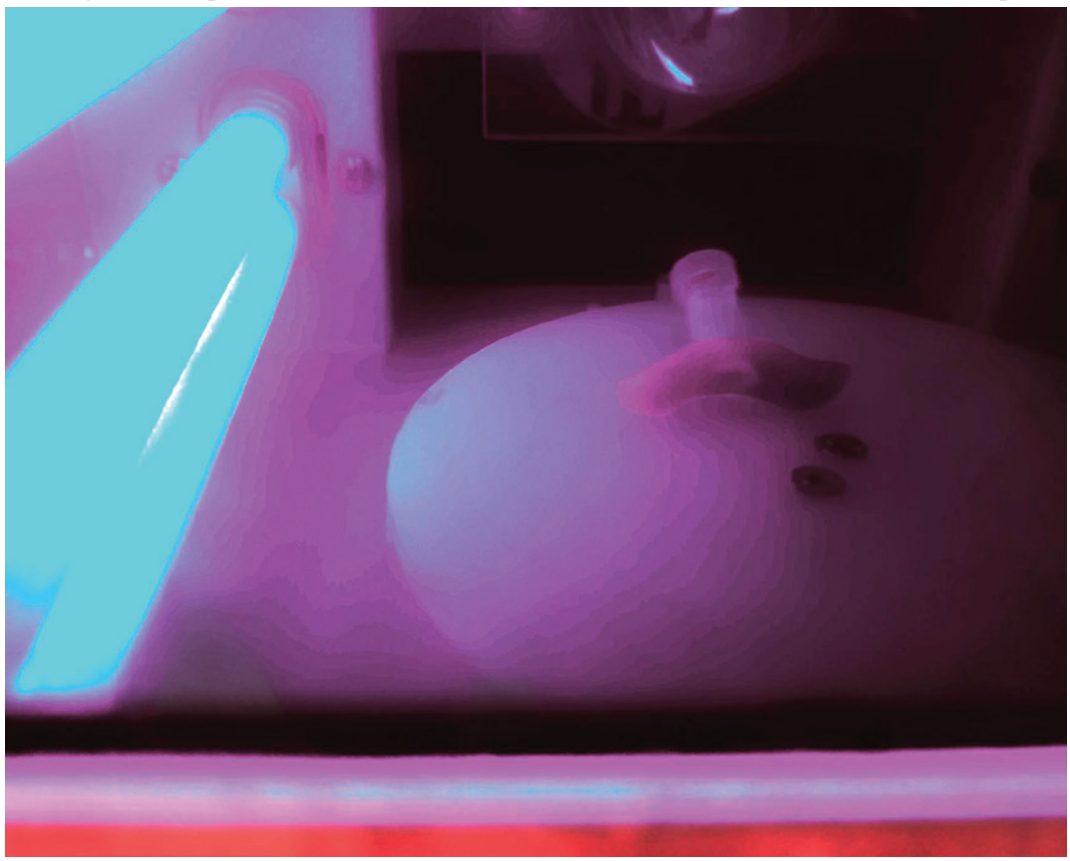

Fig. 2D. Light polymerizing machine polymerizing the adopted ocular tray

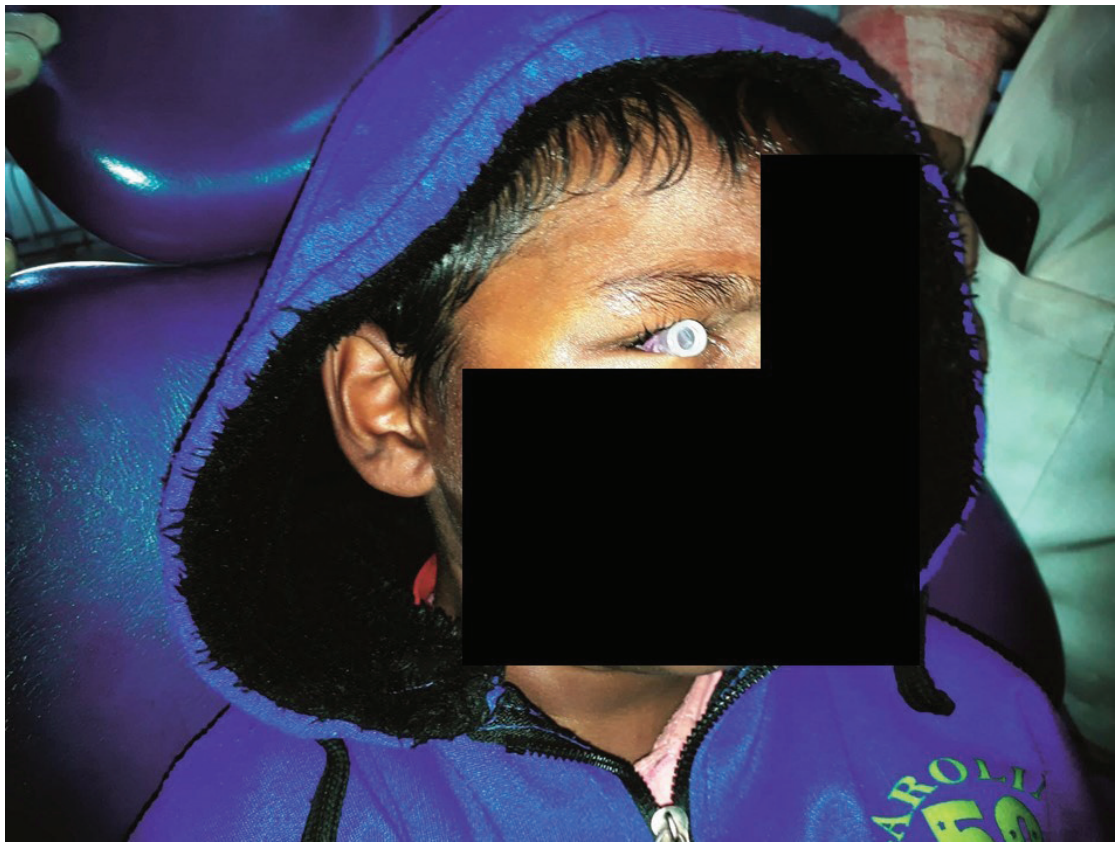

Fig. 3A. Verification of ocular tray

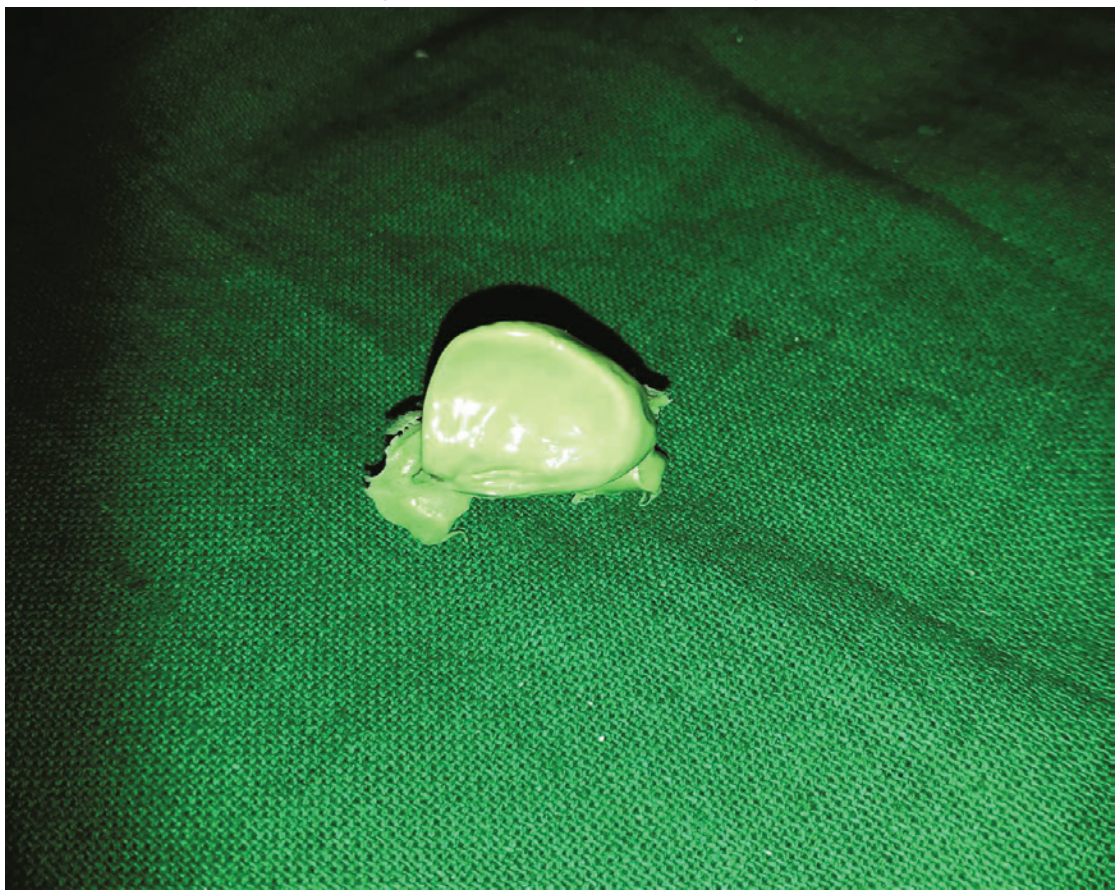

Fig. 3B. Ocular impression

Fig. 4A. Ocular wax pattern try-in

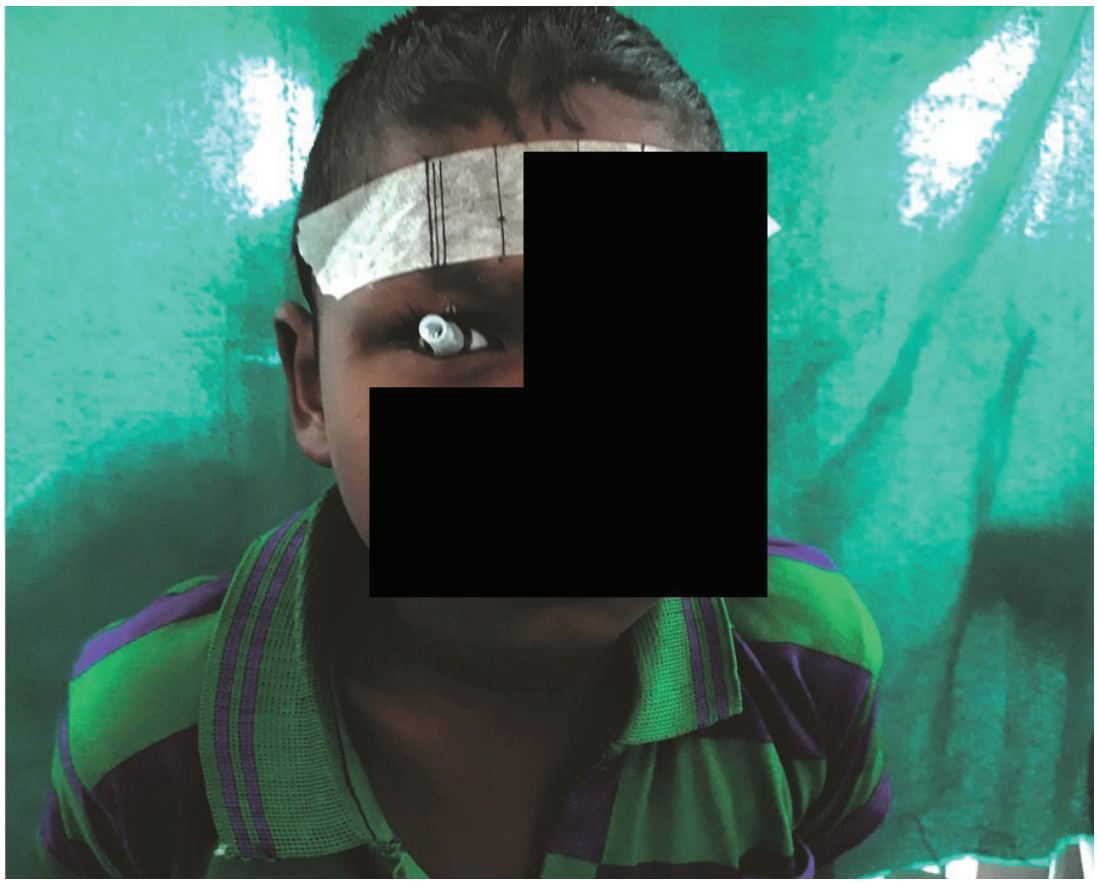

Fig. 4B: Positioning of iris in the ocular wax pattern

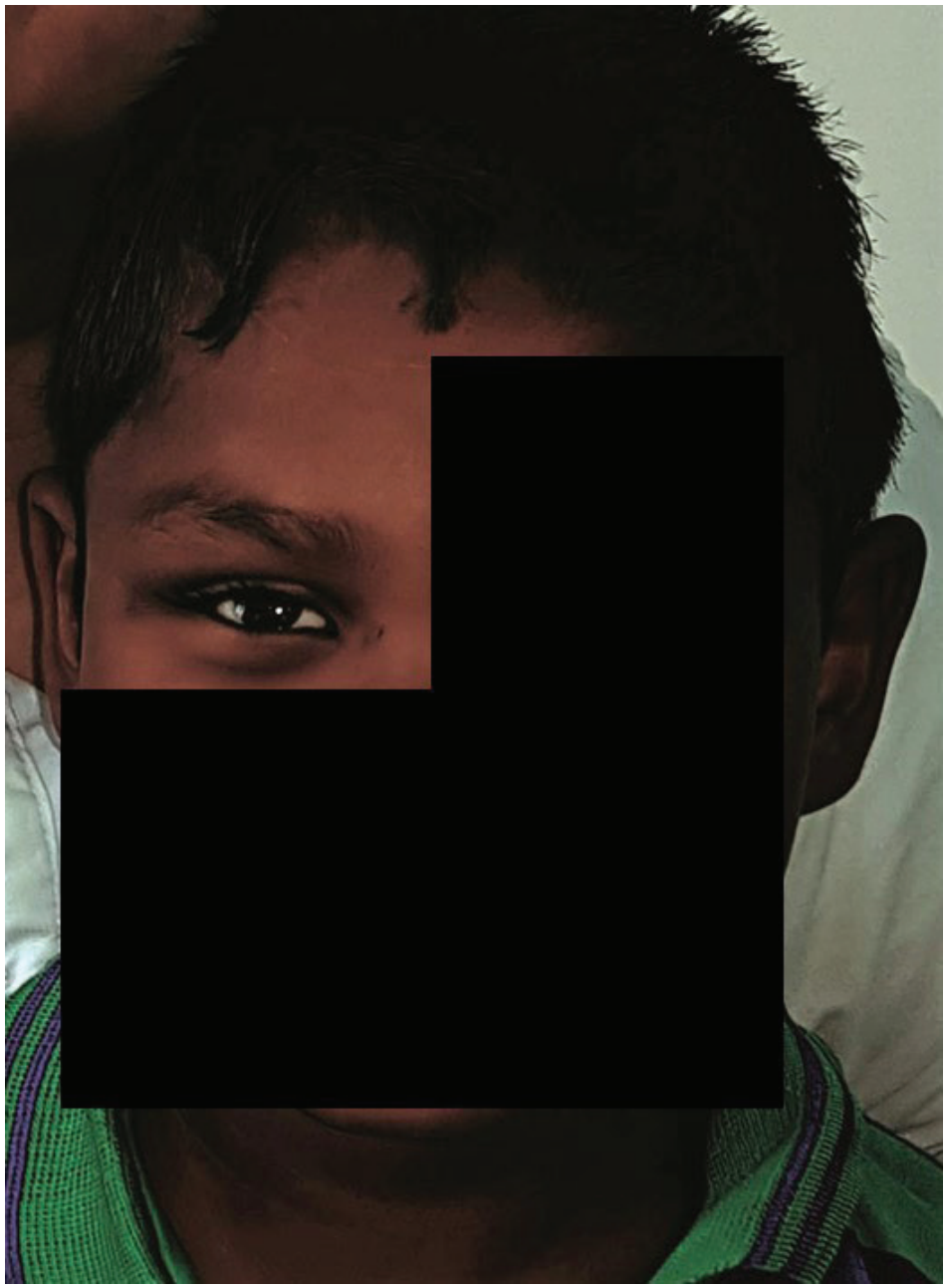

Fig. 4C: Post-operative view of patient with definitive ocular prosthesis

Discussion

A well-adapted COP to ocular bed not only improves mobility but also eliminates voids, pooling of stale tears and ulceration. [3] It is achieved by an accurate functional impression of the anophthalmic socket. Literature suggests, direct use of stock ocular prosthesis as an ocular tray in favourable situation. [9] But this technique requires many stock ocular prostheses, for size and shade matching.[9]

Custom ocular tray has been fabricated in the past, with an array of methods like, duplication of old ocular prosthesis of patient, conformer or wax shell. [5, 10] However, most of them are time consuming and not so accurate.

In this clinical report, custom ocular tray has been prepared chair side with VLCR denture base material. This material is routinely used for fabrication of denture base and custom tray by chair side.[6] Being malleable in nature, it gets closely adopted to the master cast.

The malleable property of VLCR denture base material has been used in a similar manner, to closely adapt to the contour of affected eye lid of the patient. Custom ocular tray prepared by this method requires fewer adjustments, as its shape is in harmony with shape of affected eye. The only disadvantage of this technique is that, a light polymerization unit is mandatory for this procedure. A chair side fabrication of ocular tray with VLCR denture base material is precise and swift. It makes an accurate impression in the absence of stock ocular tray or conformer.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Ethical Permission: Approved

Conflicts of interests: None

Funding: None

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