CASE REPORT

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A simple technique for orientation of iris disc in custom made ocular prosthesis using a transparent graph grid- A case report

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ABSTRACT

An ocular prosthesis restores the confidence and self-esteem of the patient. Various techniques have been in use to fabricate such prostheses. A custom made ocular prosthesis provides with better adaptation and esthetics over stock eye prosthesis. To improve upon the custom made ocular prosthesis, the position of the iris in the natural contralateral eye can be traced to guide in positioning the iris disc in the ocular prosthesis. In this case, report a simple and cost-effective method is described to position the iris in a custom ocular prosthesis.

Keywords: Ocular prosthesis, artificial eye, Iris positioning, custom eye prosthesis, Sclera

1. INTRODUCTION

The eyes unveil the outer world to our consciousness. Loss of an eye, therefore, has been regarded as the greatest misfortune (Danz, 1990). Man has tried to alleviate the psychological suffering caused by the loss of an eye by providing an array of materials and methods with the eye prosthesis. As the techniques, materials, and manufacturing methods for ocular prostheses continue to evolve, the need to improve the aesthetics and functionality of the protheses will also increase (Goiato et al., 2014; Chamaria et al., 2017; Priyanka et al. 2020). Proper orientation of the iris disk with its counterpart, greatly contributes to improving esthetics. This article reports the fabrication of custom ocular prosthesis by adopting a simplified and cost-effective technique of positioning the iris disk using a transparent graph grid.

2. CASE PRESENTATION

A 28 year old male patient reported with chief complaint of a missing left eye to the Department of Prosthodontics. Patient gave history of trauma to left eyea year ago.Careful examination revealed that the intraocular tissue bed was in good condition and had sufficient depth between the upper and lower fornices (Fig.1).

Figure 1 Preoperative frontal profile

3. MATERIALS AND TECHNIQUE

A custom perforated tray was fabricated using clear auto polymerizing acrylic resin. For recording the anophthalmic socket irreversible hydrocolloid impression material was used. Alginate impression material was introduced using a 5 ml disposable syringe (Fig.2). The impression thus obtained was disinfected and the cast was poured in two sections using dental stone (Fig.3). Baseplate wax was melted and poured into the dental stone mold to fabricate a scleral wax pattern. Wax pattern was polished and the precision of fit was tested and accustomed till acceptable contours of the eyelids were attained.

Figure 2 Impression of the anopthamic cavity using Irreversible hydrocolloid impression material.

Figure 3 Cast poured in two sections using dental stone.

Iris disk placement

Figure 4 Use of transparent graph grid to trace and transfer the iris position onto the scleral wax pattern

A transparent graph grid was used to locate the position of iris disc (Fig.4). All through the trial of the scleral wax pattern, few guidelines were marked on the patient's face with an indelible pencil. A midline was marked running in vertical direction crossing the forehead crease, glabella, nose tip and chin. The distance from the medial canthus of the right eye to the midline and medial canthus of the left eye to the midline was measured. This distance standardized the midline marking and was used to position the grid template each time during the try-in visit.

The patient was instructed to look straight. The operator then marked the vertical lines coinciding with the medial and distal borders of the iris of the existing natural eye. Similarly, the horizontal lines indicating the midpoint, inferior and superior confines of the iris were striked. Markings were also made on the transparent grid template, on the X-axis from A to H starting from the midline, and on the left side A1 to H1; similarly, on the Y-axis from 1 to 7 and 11 to 71. The length in between every marking was 1 cm on X and Y axes both. These markings were made to correspond to the markings done on the patient's face. The markings on face were relocated to the grid template by engaging it on the face of patient. These markings were transposed onto the side of the defect. The markings were shifted onto the molded scleral wax pattern. A stock iris disk was selected, approximately one millimeter smaller than the actual measurement, permitting for magnification of the iris by the clear acrylic which harvests three-dimensional effects.

The stock iris was attached to the scleral wax pattern with the help of the grid template. This confirmed the position of the iris disk in the wax pattern in comparison to the iris of the contralateral eye. The soft tissue contours and the location of the iris were satisfactory (Fig.5). The wax pattern was acrylized, and the prosthesis was finished and polished. Further characterization was done by attaching red silk threads as artificial veins to simulate that of the natural eye. External staining was also done. The prosthesis was sheltered with a thin film of wax and acrylized further (Fig.6). The prosthesis was obtained from the flask, finished, polished, and placed in the eye socket (Fig.7). The patient was guided for insertion, removal, and hygiene of the prosthesis.

Figure 5 Iris disc positioned using the markings transferred from the graph grid.

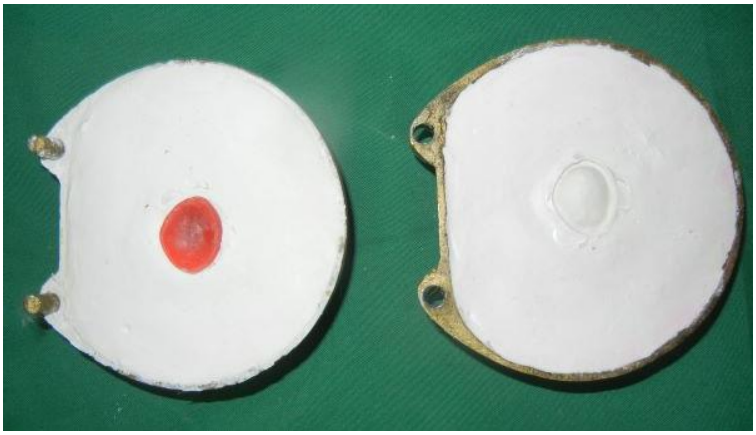

Figure 6 Flasking and curing of the scleral wax pattern along with the iris disc.

Figure 7 Final insertion of the custom made ocular prosthesis

4. DISCUSSION

Accurate positioning of the iris in symmetry with the contralateral eye improves the aesthetics and acceptability by manifolds. Literature provides us with many techniques. Lokendra Gupta et al used a customized scale fabricated with heat-polymerizing resin for positioning of the iris disc (Gupta et al., 2014). Optical vernier IPD ruler (Chihargo and Syafrinani, 2018) a graph grid attached to spring bow (Chamaria et al., 2017) or spectacle frames (Meena et al., 2017) have also been used to transfer the iris position from the existing natural eye to the prosthesis (Dasgupta et al., 2019). The procedure foriris positioning requires more contemplation because it is a sensitive technique.

The method adopted in this article involves a simple procedure for positioning the iris in a custom made prosthetic eye. A transparent graph grid was used for the purpose which is readily available and cost-effective when compared to the other techniques mentioned above.

5. CONCLUSION

The case reported here is a simple procedure consuming less time and not technique sensitive. A transparent graph grid was used to position the iris disc in the custom made ocular prosthesis. The technique has provided good results in regard to patient esthetics, acceptance, and satisfaction.

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Authors' contribution

Vinutha Kumari: Research conceptualization and manuscript revision.
Sami Alduwayhi: Case Study design and data analysis.
Saquib Ahmed Sheik: Case Study design and Manuscript writing and revision.
Meena kumara Chikkanna: Case Study design Manuscript writing and revision.
Narendranath Kumar Ajay: Case Study design and Manuscript writing
Lavanya Thota: Case Study design and Manuscript writing and revision.

Conflict of Interest

The authors declare that they have no conflict of interest.

Informed Consent

Appropriate oral and signed consent was taken from the patient before writing this case report.

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Data and materials availability

All data associated with this study are present in the paper.

Peer-review

External peer-review was done through double-blind method.

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