ISSN No:-2456-2165

Innovative Rehabilitation Approach: Spectacle-retained Orbital Prosthesis for Post-mucormycosis Orbital Defect

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Abstract:- This case report presents a 56-year-old male patient who underwent enucleation of the right eye following a mucormycosis infection. After successful treatment and healing, the patient soughtthe assistance of the Department of Prosthodontics at Sri Aurobindo Dental College for the fabrication of an orbital prosthesis. Due to the absence of intraoral findings and the presence of a deep defect without any undercut areas, a spectacle-retained orbital prosthesis was chosen as the optimal treatment approach. This case report highlights the challenges encountered and the successful outcome achieved through the utilization of this innovative technique, underscoring the importance of interdisciplinary collaboration in complex post-mucormycosisrehabilitation cases.

Keywords**:** *Mucormycosis, Orbital Prosthesis, Enucleation, Spectacle Retention, Case Report.*

I. INTRODUCTION

Mucormycosis, a severe and potentially life-threatening fungal infection, can lead to devastating consequences, including orbital involvement. In cases where the infection reaches an advanced stage, enucleation of the affected eye becomes a necessary intervention to ensure patient survival. Subsequently, the rehabilitation of these patients with an orbital prosthesis becomes crucial to restore both their physical appearance and psychological well-being [(1,2).]

This article presents a case study of a 56-year-old male patient who underwent enucleation of the right eye following a bout of mucormycosis two years prior. After receiving successful treatment and allowing for adequate healing time, the patient to Department of Prosthodontics at Sri Aurobindo Dental College in Indore, India, for the fabrication of a suitable orbital prosthesis.

The choice of a retention mechanism for an orbital prosthesis depends on various factors, including the extent of the defect, anatomical considerations, and patient preference. In this particular case, the patient presented with a deep defect devoid of any undercut areas for conventional retention techniques, necessitating the exploration of alternative options.

Through this article, we intend to provide valuable insights into the management of post- mucormycosis orbital defects and emphasize the importance of interdisciplinary collaboration between prosthodontists and other healthcare professionals involved in the treatment of such complex cases. The successful outcome achieved in this case may serve as a reference and guide for future clinical decisions in similar challenging scenarios. [(3,4,5)]

Furthermore, we aim to contribute to the existing body of literature by expanding the knowledge on orbital prosthetic rehabilitation in the context of post-mucormycosis enucleation, addressing the specific challenges faced, and offering potential solutions for the benefit of both clinicians and patients alike.

Overall, this article emphasizes the significance of providing comprehensive care to patients who have undergone enucleation following mucormycosis infection. By exploring innovative techniques, such as spectacle-retained orbital prostheses, we strive to enhance the quality of life and restore the confidence of individuals dealing with the aftermath of this debilitating infection. [(6)]

II. CASE REPORT

A 56-year-old male patient, previously diagnosed with mucormycosis two years ago, presented to the Department of Prosthodontics at Sri Aurobindo Dental College, Indore, for rehabilitation after enucleation of the right eye(fig 1). The patient had undergone successful treatmentfor mucormycosis and had completely healed from the infection. Upon clinical examination, no intraoral findings suggestive of residual disease or complications were observed.

The defect resulting from enucleation was deep but lacked any undercut areas for conventional retention techniques. In consultation with the patient, various treatment options were discussed, including adhesive retention,

implant-retained prostheses, and spectacle-retained prostheses. Considering the anatomical limitations and patient preference, a spectacle-retained orbital prosthesis was chosen as the most suitable option.

The fabrication process involved taking an impression of the orbital area and creating a custom- made spectacle frame with specially designed attachments to retain the prosthesis. The orbitalprosthesis was meticulously fabricated to closely match the patient's remaining eye in terms ofcolor, shape, and texture, providing optimal esthetics.

Fig 1 Extra-Oral Photographs and Radiograph of the Defect

III. METHOD

➢ *Impression Making:*

An impression of the orbital area was obtained using addition silicon putty consistency and light body material. Care was taken to capture the contours and borders of the defect accurately (fig.2)

Fig 2 Impression of Orbital Defect

➢ *Transferring of Marking*

Micropore tape was used to transfer the markings from the patient'sremaining eye onto the impression(fig 3). This step aided in achieving symmetry and matching the position of the prosthesis with the contralateral eye.

Fig 3 Transferring of Marking

➢ *Making of Wax Pattern*

Using the impression as a guide, a wax pattern was fabricated on a working cast. The wax was carefully contoured to mimic the shape and form of the contralateral eye, ensuring a natural appearance of the prosthesis (fig 4 b).

➢ *Try-in of Wax Pattern*

The wax pattern was tried in the patient's orbital area to assess its fit, esthetics, and overall comfort. Any necessary adjustments were made to achieve iris positioning correctly and a satisfactory appearance (fig 4 a).

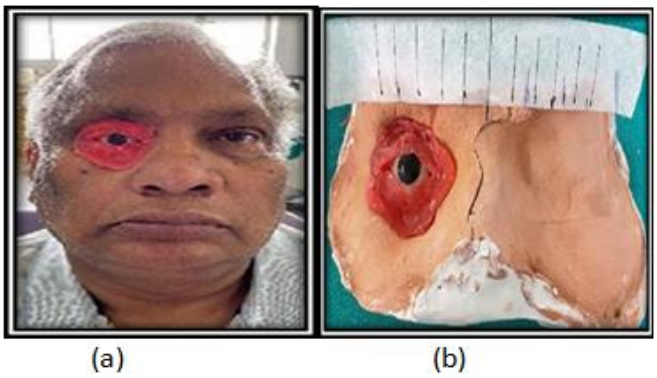

Fig 4 Try-in for Wax Pattern

➢ *Making of Acrylic Strap*

To ensure proper retention and stability of the prosthesis, an acrylic strap was fabricated (fig 5a). It was adjusted to fit securely in the patient's defect area for further attachment to the patient's existing spectacle frame for added support.

- *Relining of Wax Pattern with Light Body*

To improve the accuracy and comfort of the prosthesis, the wax pattern was relined with a light body silicone material(). This step enhancedthe intimate adaptation of the wax pattern and acrylic strap to the patient's orbital contours.

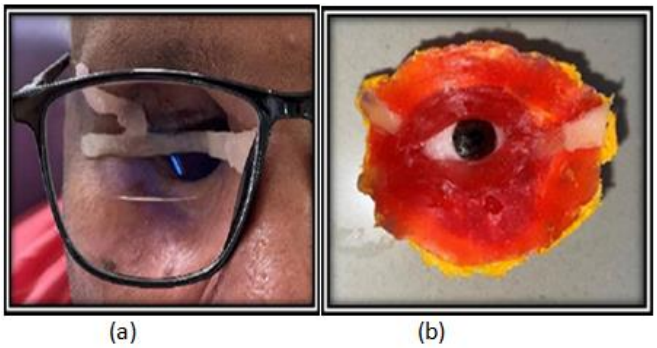

Fig 5 Relining of the Prosthesis

- *Flasking*

An iris button using cold cure acrylic was made and attached to the iris of the prosthesis. Flasking was then.

- *Dewaxing*

The flask was subjected to a dewaxing process to remove the wax, leaving behind iris button in counter flask and acrylic strap (fig 6b).

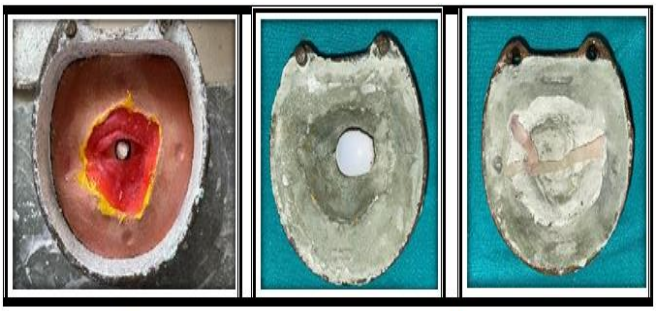

Fig 6 Flasking & Dewaxing of the Prosthesis

➢ *Shade Matching*

The patient was recalled for a shade matching session, during which the color and characteristics of the remaining eye were analyzed to achieve an accurate color match for the prosthesis using intrinsic staining(fig 7).

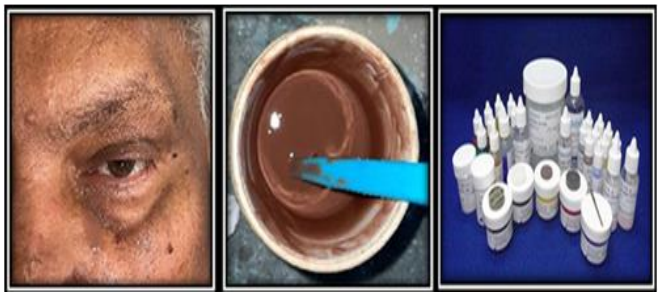
Fig 7 Shade Matching

➢ *Packing and Delivery*

RTV medical grade silicon was mixed with the catalyst according to the manufactures instructions, packed into the flask, and After 24 hours polymerized under controlled conditions. Once the prosthesis was cured, it was carefully retrieved and inspected for any irregularities and excess flesh was cut. Commercially available eye lashes were attached to the prosthesis, providing a realistic appearance. The acrylic strap of the prosthesis was then securely attached to the patient's existing spectacle frame for stability and retention (fig 8).


Fig 8 Delivery of the Orbital Prosthesis

➢ *Post Insertion Instructions for Patient*

- *Cleaning and Hygiene*

✓ Clean the prosthesis daily using a mild soap or non-alcoholic cleanser.
✓ Gently brush the prosthesis surface using a soft-bristled toothbrush or a designatedprosthesis brush.
✓ Rinse thoroughly with clean water to remove any residue.
✓ Avoid using abrasive materials or harsh chemicals that may damage the prosthesis.

- *Maintenance and Care*

✓ Handle the prosthesis with clean hands and avoid excessive pressure or bending.
✓ Remove the prosthesis before engaging in activities that may put it at risk of damage, such as contact sports swimming.
✓ Store the prosthesis in a designated case when not in use to protect it from dust, sunlight,and accidental damage.
✓ Avoid exposing the prosthesis to high temperatures, as it may warp or discolor.

- *Spectacle Retention*

✓ Ensure that the acrylic strap attached to the prosthesis is securely fastened to theexisting spectacle frame.
✓ Regularly check the fit and stability of the prosthesis and the strap. If any discomfort orlooseningisexperienced,contact your prosthodontist for adjustments.
✓ Be cautious when removing or adjusting your spectacles to prevent accidental dislodgement of the prosthesis.

- *Regular Check-ups*

✓ Schedule regular follow-up appointments with your prosthodontist to monitor the fit, condition, and overall satisfaction with the prosthesis.
✓ Any discomfort, changes in fit, or concerns should be promptly addressed during thesevisits.

- *Psychological Support*

✓ Adjusting to wearing an orbital prosthesis can be emotionally challenging. Seek supportfrom the healthcare team, support groups, or counseling services to address any psychological concerns or feelings of self-consciousness.

IV. DISCUSSION

The presented case highlights the successful rehabilitation of a patient who underwent enucleation following mucormycosis infection, utilizing a spectacle-retained orbital prosthesis. The chosen treatment approach was based on the absence of intraoral findings and the deep defect without any undercut areas, posing challenges in conventional retention techniques.The fabrication process involved multiple steps, starting with accurate impression making to capture the orbital area's contours and borders. Transferring the markings from the patient's remaining eye onto the impression using micropore tape aided in achieving symmetry and aligning the prosthesis with the contralateral eye.[7]

The wax pattern was meticulously crafted, replicating the shape and form of the contralateral eye. During the try-in stage, the fit, esthetics, and comfort of the wax pattern were assessed. Adjustments were made as necessary to ensure optimal fit and a satisfactory appearance.

To enhance retention and stability, an acrylic strap was fabricated and attached to the patient's existing spectacle frame. This innovative technique provided additional support for the prosthesis, compensating for the absence of undercut areas in the defect.

The fabrication process also involved the iris positioning, matching the color and texture of the patient's natural iris.

After flasking Shade matching was performed to achieve a seamless integration of the prosthesis with the patient's remaining eye after which packing was done with medical grade silicone. Eye lashes were attached to the prosthesis, further enhancing its natural appearance.

The successful delivery of the prosthesis, with the acrylic strap attached to the patient's spectacle frame, ensured optimal retention, functionality, and patient satisfaction.

The utilization of a spectacle-retained orbital prosthesis in this case offers several advantages. Firstly, it eliminates the need for invasive surgical procedures or implant placement, which may not have been feasible due to the absence of undercut areas in the defect. Secondly, it provides stability and retention through the secure attachment of the acrylic strap to the existing spectacle frame. Additionally, this approach allows for easy adjustment, replacement, or removal of the prosthesis as needed.[8,9]

Interdisciplinary collaboration played a crucial role in the success of this case. Close coordination between prosthodontists, ophthalmologists, and other healthcare professionals involved in the patient's care ensured a comprehensive and patient-centered approach.

While the presented case demonstrates a favorable outcome, it is important to note that each patient's condition and anatomical considerations may vary. Therefore, careful evaluation and personalized treatment planning are essential for successful orbital prosthesis rehabilitation.

V. CONCLUSION

The successful fabrication and delivery of a spectacle-retained orbital prosthesis for a patient following enucleation due to mucormycosis infection demonstrate the effectiveness of this innovative treatment approach. The absence of intraoral findings and the deep defect without undercut areas presented challenges in conventional retention techniques. However, the utilization of a spectacle-retained prosthesis provided optimal retention, stability, and functionality, addressing the unique anatomical limitations of the patient [10].

The interdisciplinary collaboration between prosthodontists, ophthalmologists, and other healthcare professionals involved in the patient's care played a crucial role in achieving a successful outcome. The step-by-step fabrication process outlined in this case report serves as a valuable reference for clinicians faced with similar challenges, emphasizing the importance of meticulous impression making, wax pattern creation, and shade matching.

The rehabilitation of patients with post-mucormycosis orbital defects requires a comprehensive and patient-centered approach. The utilization of innovative techniques, such as spectacle- retained prostheses, offers several advantages, including non-invasiveness, adjustability, and easy maintenance. Additionally, the attachment of the acrylic strap to the patient's spectacle frame contribute to a natural appearance and enhanced patient satisfaction.[11,12]

While this case report highlights a successful outcome, it is important to consider the individual variations in each patient's condition and anatomical considerations. Personalized treatment planning and ongoing interdisciplinary collaboration remain essential in achieving optimal results in orbital prosthesis rehabilitation.

Continued research and studies in the field of post-mucormycosis orbital prosthetics are warranted to further refine and expand treatment options. By sharing experiences and knowledge, clinicians can enhance the quality of life and restore the confidence of patients affected by these challenging conditions.

In conclusion, the fabrication of a spectacle-retained orbital prosthesis for a patient following enucleation due to mucormycosis infection exemplifies the importance of interdisciplinary collaboration, innovative techniques, and patient-centered care. The successful outcome achieved in this case serves as a testament to the advancements in prosthetic rehabilitation and offers valuable insights for clinicians involved in the management of post-mucormycosis orbital defects.

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