

Relining of an Existing Ocular Prosthesis to Improve Socket Adaptation and Retention: A Case Report

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Abstract:

An ocular prosthesis restores symmetry and aesthetics of the face after loss of an eye, however changes in the anophthalmic socket with time may result in poor adaption and retention. A 9-year-old female patient with surgical excision of the left eye at 5 years of age for retinoblastoma presented with mobility and poor retention of the existing ocular prosthesis. The patient was delighted with its aesthetic appearance and decided to keep it. On clinical examination, a well-healed socket was found with poor prosthesis adaption and retention. Hence, the old prosthesis was relined to increase its fit. The prosthesis displayed an enhanced adaptability, retention, stability and comfort. Relining an aesthetically acceptable ocular prosthesis is a simple and conservative alternative to manufacturing of a new prosthesis.

Keywords: Ocular prosthesis, Relining, Anophthalmic socket

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I. INTRODUCTION

Loss of an eye can produce significant aesthetic, functional, and psychological consequences. The cause for loss of an eye could be a fatal tumour, trauma, or congenital defects ^[1-2]. An ocular prosthesis is used to restore the appearance of the missing eye, provide support to the eyelids, and improve facial symmetry. Although it cannot restore vision, a well-adapted ocular prosthesis can contribute substantially to the patient's psychosocial rehabilitation³. An ocular defect may affect a patient psychologically, and the use of an ocular prosthesis helps in improving the patient's confidence and social acceptance⁴. An ocular prosthesis may be available readymade (stock ocular prosthesis) or can be custom-made ⁵.

An ocular prosthesis may require replacement or modification when changes occur in the anophthalmic socket. Progressive changes in the orbital tissues, alterations in the conjunctival surface, or changes in socket volume may result in loss of adaptation and retention of a previously satisfactory prosthesis.

Fabrication of a new ocular prosthesis is not always necessary. If an existing prosthesis has satisfactory aesthetics, including acceptable iris position, colour, scleral characterization, and overall appearance, relining may be considered. Relining modifies the tissue-contacting surface of the existing prosthesis to improve its adaptation to the present anatomy of the socket while preserving the external aesthetic characteristics⁶.

This case report describes the clinical management of an aesthetically satisfactory but poorly adapted ocular prosthesis using a relining procedure.

II. CASE REPORT

A 9-year-old female patient reported to the Department of Paediatric and Preventive Dentistry with the chief complaint of mobility and poor retention of an existing ocular prosthesis. The patient had undergone surgical removal of the right eye at 5 years of age due to retinoblastoma. The patient had been using the existing ocular prosthesis for approximately 2 years.

The patient was highly satisfied with the aesthetic appearance of the existing prosthesis, including the iris colour, characterization, pupil size, scleral appearance, and overall facial symmetry. However, the patient reported that the prosthesis had gradually become loose and demonstrated reduced retention and mobility during functional movements.

As the existing prosthesis was aesthetically satisfactory and the patient's primary concern was poor adaptation and loss of retention, fabrication of a new prosthesis was not considered. Relining of the existing ocular prosthesis was therefore planned to improve its adaptation and retention while preserving its existing aesthetic characteristics.

Extraoral examination revealed an acceptable aesthetic appearance of the existing ocular prosthesis. The prosthesis closely resembled the contralateral natural eye in terms of iris colour, pupil size, scleral appearance, and overall orientation.

Clinical examination revealed poor adaptation of the existing ocular prosthesis to the anophthalmic socket, with reduced retention and increased mobility during functional movements. An observable gap was present between the prosthesis and the socket tissues, along with reduced eyelid support and limited movement of the prosthesis. The socket tissues appeared healthy and well healed, with no signs of inflammation or other pathological changes. The existing ocular prosthesis was carefully removed and examined. Its external surface and aesthetic characterization were found to be satisfactory, with no significant deterioration in the iris or scleral characterization. Since the primary problems were related to loss of adaptation, retention, eyelid support, and stability rather than aesthetic deficiency, fabrication of a new ocular prosthesis was considered unnecessary. Therefore, relining of the existing ocular prosthesis was planned to improve its tissue adaptation and functional performance while preserving its original aesthetic appearance.

Evaluation of the existing prosthesis

The existing ocular prosthesis was carefully evaluated for external surface integrity, iris position and characterization, scleral colour, pupil size, overall shape, eyelid support, socket adaptation, retention, and movement. The external aesthetic characteristics of the prosthesis were found to be satisfactory. The patient was informed that the primary concern was related to the tissue-contacting surface and its adaptation to the socket rather than the external appearance of the prosthesis. Therefore, a relining procedure was selected to improve adaptation and retention while maintaining the existing aesthetic characterization (Figure 1a).

Preparation of the existing prosthesis

The prosthesis was thoroughly cleaned and disinfected before the procedure. The tissue-contacting surface was examined carefully to identify areas of inadequate adaptation. The internal surface was selectively relieved to provide adequate space for the relining material while maintaining the original external contour and aesthetic characterization. Particular care was taken not to alter the external surface, iris position, pupil size, or scleral characterization.

Impression of the anophthalmic socket

An impression of the anophthalmic socket was obtained using the existing ocular prosthesis as the impression carrier. An additional silicon impression material was applied to the prepared tissue-contacting surface of the prosthesis, which was then carefully positioned within the socket. The patient was instructed to perform gentle ocular and eyelid movements to facilitate functional recording of the socket anatomy. After adequate setting of the impression material, the prosthesis was carefully removed from the socket, and the impression was examined to ensure an accurate and complete recording of the relevant socket tissues (Figure 1b).

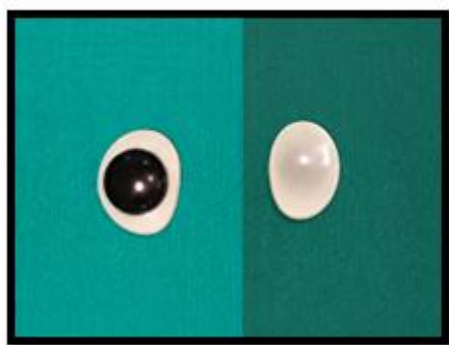


Figure 1. a) Ocular Prosthesis Before Relining



b) Impression taking

Processing of the impression

The impression was appropriately boxed and poured with die stone to obtain a working cast representing the current anatomy of the anophthalmic socket (Figure 2a). The cast was carefully inspected for any defects or voids and was subsequently used for processing the relining procedure.

Relining of the existing ocular prosthesis

The impression material was carefully removed from the tissue-contacting surface of the existing ocular prosthesis. The internal surface was cleaned and prepared according to the manufacturer's instructions for the selected relining material. Heat-cure acrylic resin was adapted to the prepared tissue surface, and the prosthesis

was positioned accurately on the working cast to ensure close adaptation of the relining material to the recorded socket anatomy. The relining material was subsequently polymerized and processed according to the recommended laboratory protocol. (Figure 2b).



Figure 2. a) Cast photograph

b) After relining

Finishing and polishing

After polymerization, the relined prosthesis was carefully removed from the cast. Excess acrylic resin was trimmed, and the borders were smoothened to eliminate any irregularities. The tissue-contacting surface was appropriately finished and polished to obtain a smooth, non-irritating surface suitable for insertion into the socket. Care was taken to preserve the original external contour, iris position, scleral characterization, and overall aesthetic appearance of the prosthesis.

Insertion and clinical evaluation

Before the placement of the improved prosthesis, it underwent disinfection in a solution consisting of 0.5% chlorhexidine and 70% isopropyl alcohol for a duration of 5 minutes. Subsequent to disinfection, the prosthesis was thoroughly cleansed in a sterile saline solution to prevent chemical irritation, and ultimately, the ocular prosthesis was provided⁷. The relined ocular prosthesis was inserted into the anophthalmic socket and evaluated clinically for retention, adaptation, stability, eyelid support, comfort, mobility, facial symmetry, iris position, and overall aesthetics. Following relining, the prosthesis demonstrated improved adaptation to the socket and increased retention compared with the pre-relining condition. The external appearance of the prosthesis remained unchanged, which was particularly important because the patient was highly satisfied with its original aesthetic appearance. No significant alteration in iris position, scleral appearance, or overall facial symmetry was observed.

Following completion of the relining, finishing, and polishing procedures, the ocular prosthesis was reinserted into the anophthalmic socket. The patient reported improved retention, stability, and comfort compared with the pre-relining condition (Figure 3). Relining successfully corrected the functional deficiencies associated with poor socket adaptation while preserving the satisfactory aesthetic characteristics of the existing prosthesis. Retaining the original prosthesis was particularly advantageous because the patient was satisfied with its iris colour, scleral characterization, pupil size, and overall appearance, thereby eliminating the need for fabrication of a new prosthesis.



Figure 3. Profile photograph of patient before and after insertion of prosthesis

The patient was instructed regarding proper insertion and removal, cleaning, hygiene, storage, and maintenance of the prosthesis. The prosthesis may be retained in the socket as long as it remains comfortable and non-irritating; however, the duration of continuous wear should be individualized according to socket condition and clinical recommendations. When removed, the prosthesis should be kept water or contact lens soaking solution such as O-3 Solution (Milton Roy Co., Milroy Laboratories Div., Sarasota, Fla.) or Collyrium (Wyeth Laboratories, Inc., Philadelphia, Pa.) and should not be allowed to dry or be wrapped in tissue or paper towels. The patient was advised to maintain good socket and eyelid hygiene and to avoid abrasive or chemically harsh cleaning agents. Protective spectacles were recommended to protect the remaining natural eye from accidental trauma and to improve overall facial symmetry⁸. Periodic follow-up was advised to assess the retention, adaptation, stability, and condition of the prosthesis, as well as the health of the anophthalmic socket.

III. DISCUSSION

Replacement of the lost eye as soon as possible is necessary to promote physical and psychological healing of the patient. An ocular prosthesis is designed not only to reproduce the appearance of the natural eye but also to provide adequate eyelid support and maintain facial symmetry. Successful rehabilitation therefore depends on both aesthetic quality and proper adaptation to the anophthalmic socket.

With prolonged use, changes in the socket tissues may occur. These changes can result in alteration of the relationship between the prosthesis and the socket, leading to decreased retention, increased mobility, discomfort, or inadequate eyelid support.

In the present case, the existing ocular prosthesis had satisfactory external aesthetics. The patient was particularly pleased with the iris characterization, scleral appearance, and overall resemblance to the natural eye. However, the prosthesis had become poorly adapted to the socket and demonstrated reduced retention.

Fabrication of a new ocular prosthesis could have addressed the retention problem, but it would also have required reproduction of the patient's existing satisfactory aesthetic characteristics. There was therefore no aesthetic indication for replacing the prosthesis.

Relining of an ocular prosthesis is indicated when tissue changes in the socket result in an ill-fitting prosthesis due to atrophic degeneration of surrounding tissues⁶. The procedure allowed modification of the tissue-contacting surface while preserving the external surface of the existing prosthesis. Thus, the patient's preferred aesthetic appearance could be maintained while improving adaptation to the current socket anatomy.

An important advantage of relining is that it can reduce the need for complete fabrication of a new prosthesis in selected cases⁹. It can be particularly useful when the external portion of an existing prosthesis remains satisfactory but the internal surface no longer conforms adequately to the socket.

However, relining should not be considered appropriate in every situation. A new prosthesis may be indicated when there is significant deterioration of the acrylic resin, alteration of iris characterization, incorrect iris position, severe dimensional discrepancy, extensive damage, or substantial changes in the socket that cannot be adequately managed by relining.

In the present case, careful evaluation confirmed that the primary deficiency was inadequate tissue adaptation and loss of retention. Therefore, relining was selected as a conservative treatment option.

The successful outcome highlights the importance of individualized treatment planning. Rather than routinely replacing an existing prosthesis, clinicians should determine whether the patient's primary problem is aesthetic, functional, or related to socket adaptation.

IV. CONCLUSION

Relining of an existing ocular prosthesis is a conservative treatment option when the aesthetic appearance is satisfactory but retention and adaptation are compromised. In the present case, the existing prosthesis was retained, and its internal surface was relined to improve adaptation to the anophthalmic socket. This resulted in improved retention, stability, and comfort while preserving the patient's preferred aesthetics. Thus, relining can be a simple, effective, and patient-centered alternative to fabricating a new prosthesis when aesthetics is acceptable and poor adaptation is the primary concern.

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