

Silicon Finger Prosthesis for A Partial Finger Amputation: A Case Report

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ABSTRACT

As we know all that the hand function is very important for our daily life. Finger and partial finger amputations are some of the most frequently encountered forms of partial hand loss which causes significant mental and economic damage to an individual. An silicone glove finger esthetic prosthesis can offer psychological, functional, and rehabilitative advantages. This clinical report demonstrates a method to fabricate silicone rubber prosthesis for a patient who has a partial finger loss.

Keywords: Amputation, Glove type finger prosthesis, Silicone.

INTRODUCTION

Alteration in the anatomy of hand results in diverse physical and emotional responses from the patient. The reason for the responses are varied, but cosmetic changes, loss of function and discomfort are usually the major sources of concern.¹ Loss of fingers can occur because of trauma, congenital disorder such as amniotic band syndrome and excision for neoplastic disorder.² Creating a finger prosthesis that appears to have a realistic skin surface while achieving seamless visual integration with the surrounding tissue requires both artistic

and technical expertise.³ This report presents a case of rehabilitation of a finger defect with a glove type silicon prosthesis.

CASE REPORT

A 62 year old male patient reported to Department of Prosthodontics, with a chief complaint of a partially missing index finger on his left hand. [Figure 1] History reveals that the patient had lost his finger in a traumatic injury 3 years back. On examination of the hand, partial amputation

was there in the index finger in proximal phalanx part. The skin of the amputated finger was completely healed. Because of trauma his thumb, middle finger, ring finger and little finger were affected and patient was not able to straighten them. A Glove type finger prosthesis was planned with slightly bent finger to make harmony with other fingers.

Technique

1. The subject's hand was lubricated with a thin layer of petroleum jelly prior to making impression with irreversible hydrocolloid to prevent it from adhering to the skin and hairs.
2. The area around the hand was boxed and the Irreversible Hydrocolloid was placed over the palmer side first and then the dorsal side. The patient was instructed to keep the hand in normal resting position, without stretching. Dental plaster was poured in a thick consistency over the irreversible hydrocolloid to give additional strength to impression. [Figure 2]
3. The impression was then poured in Dental Stone, using a vibrator to avoid any voids and the positive replica of the hand was retrieved. [Figure 3]
4. An impression of index finger of right hand was made using polyvinyl siloxane impression material and modelling wax was poured into it to duplicate the lost finger. [Figure 4]
5. This wax pattern was modified to adapt on the stump of the missing finger, an undercut was created beneath the cuticle margin to retain the prefabricated artificial nail within the wax pattern.
6. Wax trial was done on the patient [Figure 5] and another impression of stump was made with polyvinyl siloxane and poured with die stone for flasking purpose.
7. Flasking was done to enhance the accuracy at the stage of shade matching, such that the dorsal and the ventral aspects of the finger were separable. Separating medium was applied between the two pours. After dewaxing, the mould was allowed to cool.
8. Shade matching was done in the presence of patient. Intrinsic colours were mixed in the silicon to achieve the appropriate characterization for the palmer and dorsal surfaces. [Figure 6]
9. The material was packed in the flask for dorsal and palmer surface and a piece of orthodontic wire of appropriate size was placed into it. [Figure 7]
10. The material was allowed to bench cure overnight and for the final polymerization.
11. Once the final prosthesis was retrieved, the excess material was cut using a scissor and the final finishing was accomplished using fine sand paper. [Figure 8]

DISCUSSION

The loss of any finger of hand affects esthetics and functionality, greatly impacting dexterous individuals. Currently many traumatically amputated digits can be saved by microsurgical replantation or osseointegrated digital prosthesis. In some cases, where reconstruction is contraindicated or patient economic conditions preclude such treatment options. Prosthetic replacement of fingers can be satisfactory in patients who have at least 1.5 cm of residual stump.⁴

Most cases involving proximal phalangeal amputations can be restored to near normal functionality using appropriate prostheses.⁵ Customized silicone prostheses have a wider rate of acceptance, owing to their comfort, durability, and stain resistance, which are far superior to any other available maxillofacial materials for

finger prosthesis. Almost all stains can be removed easily with water and soap.^{6,7} The silicone gel also improves the hydration of the stratum corneum of immature hypertrophic scars.⁸

To maintain its natural appearance, the wrinkles are carved in to the dorsal surface in the prosthesis. Orthodontic wire was inserted into the silicone to allow a change in curvature for his daily needs like typing, writing etc. Factor II Brand Medical Grade Silicone was used for the fabrication of the prosthesis. It is an easy to pour, clear-to-translucent material with high strength and high elongation, along with good physical and electrical stability. It cures at room temperature and does not shrink on curing.

Various methods of retention are available to retain the prosthesis in place like using rings over the margins of the finger prosthesis, implants, attachments, medical grade adhesive etc. The longer the residual finger, the more secure the resulting grip of the prosthesis is seen. In this case we used mechanical retention with adjustable ring over the margin of prosthesis which gives a pleasant look and less noticeable prosthesis.

CONCLUSION

It is of utmost importance to rehabilitate the patient with amputated finger to restore the form and esthetics to eliminate the trauma generated by the dysfunction and to provide an efficient psychological therapy. This custom made finger prosthesis was esthetically acceptable and comfortable for use in patients with amputated fingers, resulting in psychological improvement and personality. An esthetic and retentive

prosthesis are the primary determinant factors in the successful prosthetic restoration of a finger.

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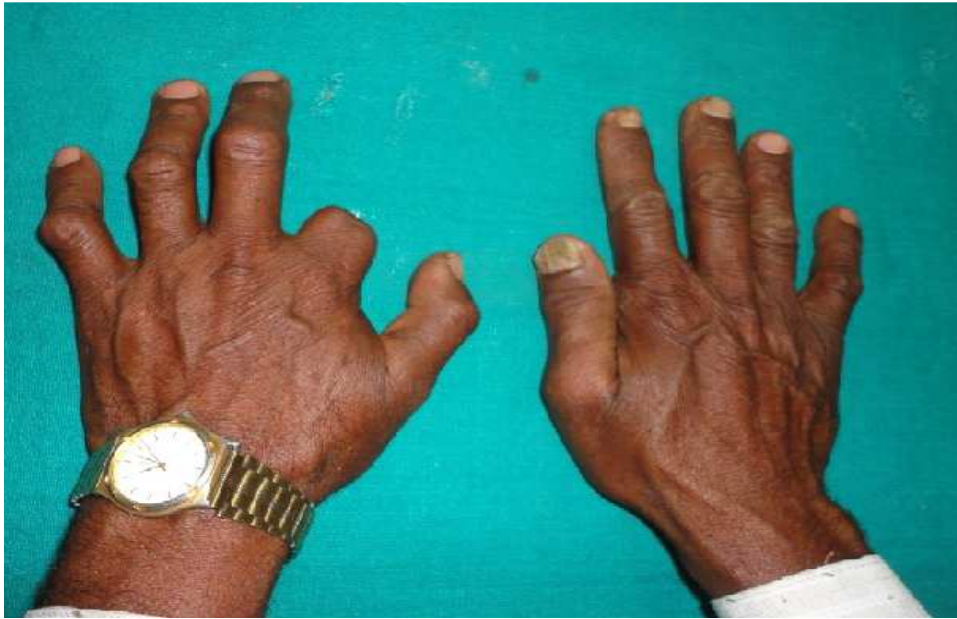


Figure No. 1: Preoperative photograph.



Figure No. 2: Impression of defected finger.



Figure No. 3: Master cast.



Figure No. 4: Wax pattern



Figure No. 5: Try in.



Figure No. 6: Shade matching.

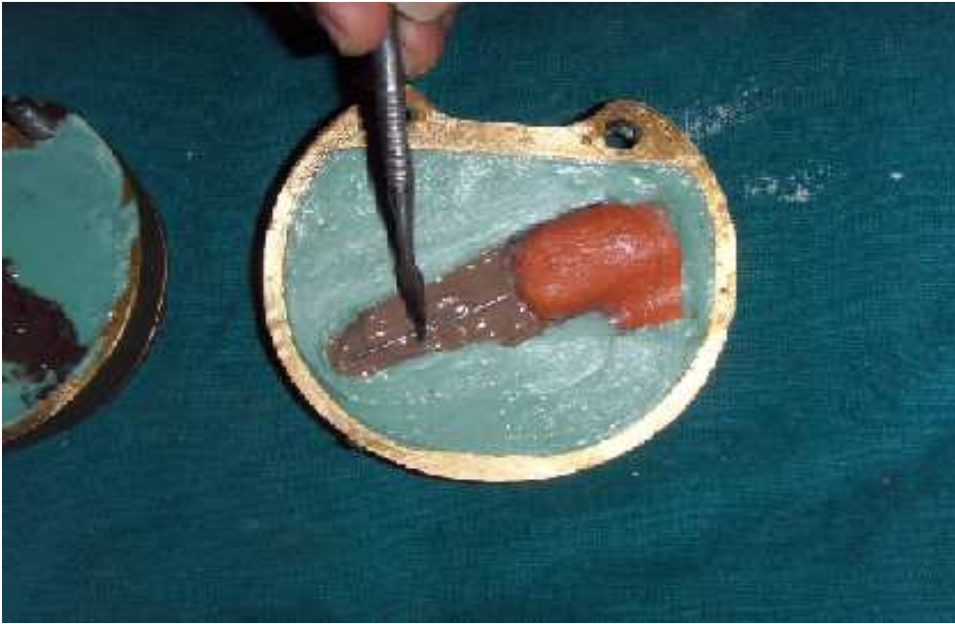


Figure No. 7: Silicone packing.



Figure No. 8: Post operative photograph