Rehabilitation of single finger amputation with customized silicone prosthesis

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ABSTRACT

Finger amputations are common in accidents at home, work, and play. Apart from trauma, congenital disease and deformity also leads to finger amputation. This results in loss of function, loss of sensation as well as loss of body image. Finger prosthesis offers psychological support and social acceptance in such cases. This clinical report describes a method to fabricate ring retained silicone finger prosthesis in a patient with partial finger loss.

Key words: Finger amputation, finger prosthesis, mechanical retention, silicone finger prosthesis

INTRODUCTION

Hands are capable of performing a huge range of activities from gentle and precise actions to industrial strength. Human hands normally have five digits or phalanges on each hand. Trauma, congenital abnormality or disease can lead to partial or complete loss of fingers. Traumatic finger amputation results in dramatic impairment in hand function. It leads to loss of strength, grasp, and marked psychological trauma.[1] When surgical reconstruction is not feasible due to rehabilitative or financial constraints, fabrication of artificial prosthesis is considered.

Silicone is the material of choice in fabricating finger prosthesis due to acceptable strength and durability.[2] To aid in retention of the prosthesis, adhesives, or mechanical methods can be incorporated. Certain ornaments such as ring and bracelet provide mechanical retention. This article presents a case of a patient, rehabilitated with finger prosthesis for amputated finger of the left hand.

CASE REPORT

A 21-year old female patient reported to Department of Prosthodontics for rehabilitation of amputated finger on her left hand [Figures 1 and 2]. History revealed that patient lost her finger 11 years back in a traumatic injury by mechanical lathe. The wound was healed without any sign of infection or inflammation. The patient had no history of the previous prosthesis. Due to required available residual digit length, it was planned to use ring as a mode of retention.

Treatment procedure

After lubricating the finger with thin layer of petroleum jelly (Vaseline, Hindustan Unilever Ltd., Mumbai, India), remaining digit was duplicated with irreversible hydrocolloid impression material (Zelgan 2002, Dentsply Pvt. Ltd., Gurgaon, Haryana, India). Vaseline facilitates easy removal of impression without tearing. Impression...
was poured with dental stone (Type 3 Labstone, Kalabhai, Karson Pvt. Ltd., Mumbai, India) and cast was retrieved. Dorsal and ventral aspects were marked on cast to later provide an orientation of wax pattern. Area of remaining digit which was designated for contact with silicone prosthesis was scraped 1 mm uniformly on cast, for snug fit of prosthesis.

Donor hand was selected from the departmental outpatient department, with contours and dimensions similar to that of the patient. Selecting a donor hand prevents the laborious task of sculpting the wax pattern. The impression of donor finger was obtained in slightly flexed position and poured with modeling wax (Modeling wax no 2, Hindustan Dental Products, Delhi, India). Wax pattern was hollowed and adapted to scraped digit mold. The nail was fabricated with autopolymerizing clear and pink acrylic resin and trimmed to appropriate shape and size. After incorporating nail, wax pattern was tried on patient’s hand for evaluation of contour, fit, and dimensions [Figure 3].

Wax pattern was invested in a way to obtain dorsal and ventral halves in a separate flask. Visualizing the basic skin color, silicone was intrinsically colored in natural daylight and packed into the mold. After curing for 24 h at room temperature, prosthesis was finished and polished. Extrinsic staining was done, and prosthesis was delivered to the patient [Figures 4 and 5]. Instructions were given regarding use and maintenance of the prosthesis. Ring aids in retention as well as hide the junction of prosthesis and finger.

**Discussion**

Body deformity may cause physical, emotional, and psychological as well as social damage to the patient. Therefore, most of the patients with finger amputation are primarily concerned with cosmetic appearance rather than function. Microsurgical replantation is not possible in all the patients due to several causes such as lack of facility, severely crushed fingers, lack of awareness in patient, and treatment failure. In such cases, finger prosthesis can provide good quality of the cosmetic result, with newer materials, methods and clinician’s expertise.

Silicone is preferred over other materials in this case because of its durability, strength, texture, light weight, and life-like appearance. Silicone also improves immature hypertrophied scars by hydration.

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**Figure 1:** Prerehabilitation dorsal view  
**Figure 2:** Prerehabilitation ventral view  
**Figure 3:** Wax pattern try-in  
**Figure 4:** Postrehabilitation dorsal view
Fabrication of life-like finger prosthesis is no more a challenge due to the availability of newer materials and improved methods. A well fabricated, esthetically pleasing prosthesis helps in re-establishing the lost self-confident of the patient. It is the primary responsibility of the prosthodontist to restore the function, comfort, and esthetics with a well-fabricated prosthesis. Hence, a simple method to fabricate ring retained finger prosthesis was attempted and found successful.

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**Conflicts of interest**
There are no conflicts of interest.

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