

Replacing Lost Happiness

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ABSTRACT: Finger amputations are the most common type of amputation that occurs. It is generally due to trauma. It could be complete or partial; with or without the loss of a certain part of the hand. Irrespective of the etiology, the loss of a finger has a considerable functional and psychological impact on an individual. Prosthesis with adequate suspension, user-friendly design, and an aesthetic appearance can be effective in the rehabilitation of these patients. This clinical report portrays a method to fabricate silicone rubber prosthesis for a patient who has a partial finger loss caused due to trauma.

Keywords - Aesthetic Finger Prosthesis, Finger Prosthesis, Partial Finger Amputation, Prosthetic Finger, Silicone Finger

I. INTRODUCTION

A finger or phalange is an organ of manipulation and sensation found in humans and other primates^[1]. Amputation is the removal of part or all of a body part enclosed by skin. Finger amputation can be caused by trauma, congenital absence and malformation^[2]. However, trauma happens to be the most common cause for such amputation^[3]. Hand deformity or amputation can affect a patient's socioeconomic relationship because hand movement forms an important role in activities of daily living^[4].

The rehabilitation of such defects depends on amount of tissue lost, the level of amputation and the bone involvement if any. Prosthetic rehabilitation is one of the most common treatment options as it is cost effective and less technique sensitive when compare to microsurgical procedures^[5,6]. Also, it helps in the psychosocial aspect by providing increased grip strength and reducing hypersensitivity and pain^[4,7].

The design and fabrication of finger prosthesis, which is combination of art and science, is therefore an effective approach in the rehabilitation of the patient with finger and partial finger amputation^[2].

II. CASE REPORT

A 45-year-old female patient reported to the Department of Prosthodontics, School of Dentistry, D.Y. Patil University, Nerul, Navi Mumbai with a partially missing finger in the left hand (**Fig 1**). History revealed that she had lost the distal phalanx of her left-hand ring finger as an adolescent when working at a lathe. It was a traumatic amputation through the head of the middle phalanx. Clinical examination revealed that the skin over the residual finger stump was unremarkable with no sign of inflammation. A hard-callous type formation was present probably as a remnant of the head of the middle phalanx (**Fig 2**). A silicone finger prosthesis was planned for the patient.

III. CLINICAL PROCEDURE

The primary impression of the hand (**Fig 3**) and the stump was made (**Fig 4**) in alginate (Tropicalgin; Zhermack, Italy) by conventional method and the cast was poured using dental stone and the stone was trimmed, 1mm towards the tip and 0.5 mm towards the base (**Fig 5**). This was done to provide for a snug fit of the final prosthesis.

An alginate impression was made of the intact ring finger of the right hand of the patient. Patient was asked to keep her finger extended as the alginate set and not to bend the same. Molten wax was then poured into the impression. The trimmed stone cast of the stump was coated with a separating media (Vaseline) and oriented to the correct depth into the molten wax. Once the wax set, it was retrieved and carved. The nail bed was made deeper to accommodate an acrylic nail in the final prosthesis (**Fig 6**).

The wax try in is done and it shows a slit as the wax up is done on a trimmed finger and the wax does not possess elasticity like silicone (**Fig 7**). The wax pattern is then flaked in a three-piece mold to pack the silicone so that the ventral and dorsal aspects were separable (**Fig 8**). Dewaxing was done to completely eliminate the wax and the mold was cooled down to room temperature before packing silicone. Medical grade Platinum Vinyl Addition Silicone was used for packing. While packing the silicone, the intrinsic stains are added to match the skin and palmar shades to that of the patient (**Fig 9**). Curing was done according to manufacturer's instructions.

After the curing procedure, the flash is checked and the flask opened to retrieve the finger. The retrieved finger was then tried on the patient's hand to check the fit (**Fig 10**). Extrinsic stains are then applied and it is allowed to dry for 45 minutes to an hour. The acrylic nail is also placed in position using adhesives. The prosthesis is then finished and polished.

Once the prosthesis is placed on patient's stump, the shade match is appreciated and a ring is placed to mask the joint for a more natural emergence (**Fig 11**). The disadvantage is the absence of movement at the distal interphalangeal joint (**Fig 12**).

The patient was extremely satisfied with her prosthesis and we as prosthodontists could help instill the lost confidence back in a patient. (**Fig 13**)

IV. CONCLUSION

Prosthetic finger is indicated in cases where surgical reimplantation is contraindicated or unaffordable to the patient. Restoring the form of the digit, reinforced the confidence of the patient^[8]. Silicone prosthesis helps replicate every detail of the contralateral finger and also doesn't undergo any change when exposed to varying temperature or external stains with use^[9]. Although the fabrication of a life like prosthesis involves great skill and acumen, a rightly done prosthesis will restore the self-esteem of the patient. We, as prosthodontists, can lend a hand, to heal a hand.

V. FIGURES



Figure 1: Partially amputated finger



Figure 2: Callous Visible on the tip of the finger due to absence of surgical intervention at time of amputation



Figure 3: Poured impression of the full left hand



Figure 4: Impression of the finger being made in alginate



Figure 5: Trimmed down stone model of the amputated finger stump



Figure 6: Waxed up finger showing finger prints and surface details



Figure 7: Try in of the wax up showing the vertical split



Figure 8: Flasking of the waxed-up finger for the three piece mold



Figure 9: Packing of the flask using intrinsic staining for the body shade and excess staining for the dorsal surface



Figure 10: Trial of the deflasked prosthesis to check the final fit



Figure 11: The shade matching and the same colour of nail paint. Ring is used to conceal the Borders of the prosthesis



Figure 12: Prosthesis in function with limited distal phalangeal movement



Figure 13: Before and After of finishing and delivering the prosthesis

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