



THE DIGIT IS BACK- A CASE REPORT

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ABSTRACT Hand deformities such as loss of finger not only affect aesthetics, but also impose a functional impairment and cause a deep psychological stigma to the patient. Finger prosthesis is more acceptable by the patient when it allows some of the movement in the prosthesis along with the restoration of the natural appearance to the lost structures of the patient. This article describes a custom fabricated, custom colored prosthesis made from silicone elastomers to make the prosthesis functional to imitate some of the movement.

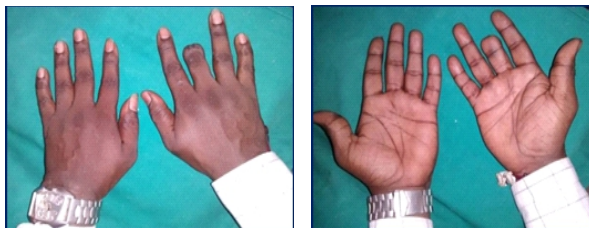
KEYWORDS : Finger prosthesis, Silicone elastomers.

INTRODUCTION

Hand is a major body part whose prime function is to grasp, hold, feel and manipulate items, it is also important for communication, body language and social contact¹. Fingers as organs of manipulation have an important role in function and esthetics². Congenital abnormalities or malformations, diseases and traumatic injuries result in the absence of hands or fingers³. Whatever the cause was, partial or complete loss of finger can cause psychosocial inability, functional loss, poor esthetics and economic damage to the patient., prosthetic rehabilitation is an alternative when micro-vascular reconstruction is contraindicated, unavailable or unsuccessful.⁴ A well fitted colour matched finger prosthesis improves not only esthetics and function but also eliminates constant feeling of disability and thus offers true psychological wellbeing. Creating a prosthesis having a life like appearance is challenging since it requires not only great artistic and technical skills but also better understanding of the patient's esthetic expectations⁵. The purpose of this case report is to describe a simple technique to fabricate a silicone finger prosthesis for a patient who had partial finger loss due to trauma 5 years back.

CASE REPORT

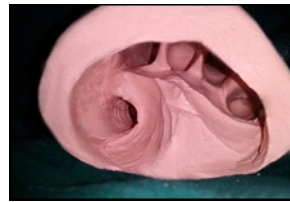
A 35 -year-old male patient reported to the Mamata dental college, Department of Prosthodontics, with a chief complaint of partially missing middle finger on his right hand. The patient had lost his finger due to traumatic injury 5 years ago. Clinical examination revealed that the mid-part of the middle phalanx of the right middle finger was missing (Fig1). The skin over the residual finger stump was completely healed with no signs of infection or inflammation. Silicone finger prosthesis was planned for the patient.



FIG(1) DORSAL AND VENTRAL VIEWS OF THE AFFECTED HAND

PROCEDURE

The patient's hand was lubricated with petroleum jelly. A suitably sized plastic box was used to confine the impression material. Alginate Impression material (Algitex) was loaded into the box and impression is taken (Fig 2). During the impression procedure, the patient was instructed to keep the hand in a relaxed position without stretching.



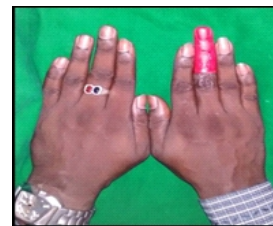
FIG(2) ALGINATE IMPRESSION



FIG(3) TYPE III DENTAL STONE

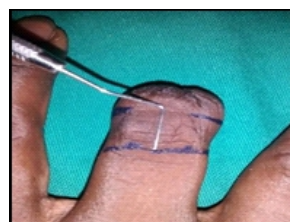
After the material had set, the impression was retrieved .The impression was poured in a type III dental stone(kalabhai) without any voids to obtain a positive replica of the affected hand (Fig 3). An impression of the left hand was also made using alginate impression material.

Molten wax was poured into this impression to obtain a working wax pattern, which was sculptured to fit the stump replica of the mutilated finger on the stone cast (Fig 4). A fingernail was fabricated using polymethylmethacrylate and pigmented to match the patient's natural nails . Wax try in of the prosthesis was done and necessary corrections were made.



FIG(4) WAX TRY

The stump was then sectioned from the stone cast with the wax pattern. In order to create a passive vacuum fit to the final silicone prosthesis, 5-7% of circumference reduction of the stump was done(Fig 5)



FIG(5) SCORING THE STUMP



The artificial nail was carefully removed from the wax pattern. Flasking of the wax pattern was done in such a manner that the ventral and dorsal aspects were separable. Dewaxing procedure was done and the wax residue was completely eliminated (Fig 6).



FIG(6) FLASKING AND DEWAXING

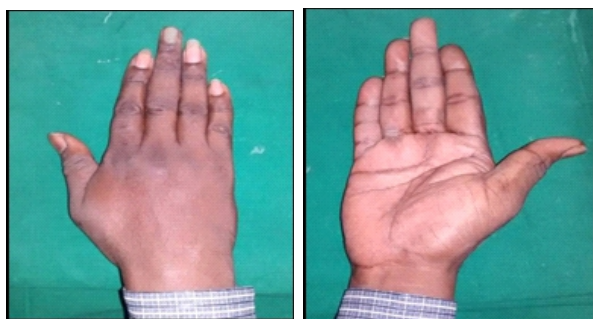
The mold was allowed to cool thoroughly prior to the shade matching and silicone packing procedure. Factor II medical-grade silicone MDX-4210 (RTV) was used for the fabrication of the prosthesis (Fig 7).



FIG(7) MEDICAL GRADE SILICONE

FIG(8) INTRINSIC STAINING

In the presence of the patient, shade matching was done by adding intrinsic colors to the silicone material (Fig 8). Characterization with shade variations was done on the dorsal and palmar surfaces during packing of the silicone material. Curing was done according to manufacturer's instructions. After complete polymerization, the prosthesis was retrieved and polished. Polymethylmethacrylate nail was reattached to the silicone prosthesis using cyanoacrylate adhesive.



FIG(9) DORSAL AND VENTRAL VIEWS OF THE PROSTHESIS

DISCUSSION

Loss of any finger affects esthetics and functionality, greatly impacting dexterous individuals. Most cases involving distal phalanx amputations can be restored to near normal functionality using appropriate prosthesis. Allen's classification is commonly used to describe the level of the amputation for finger tip amputations. Type 1 injuries are those involving the pulp only. Type 2 injuries consist of injury to the pulp and nail bed. Type 3 injuries include distal phalangeal fracture with associated pulp and nail loss.⁶

Prosthetic replacement can be considered in these situations to restore the finger with a functional prostheses with a matching color, form and texture to improve and enhance the patients confidence.⁷ Silicone prosthesis allows copying every detail of the natural hand and is not subject to ordinary thermal damages or stains.⁸ MDX-4210 is an RTV translucent silicone, which is compatible with almost all the intrinsic and extrinsic coloring systems. Advances in field of material science have led to evolution of silicone materials with improved biological characteristics and coloration methods.⁹ Although various modes of retention are available for retention of finger prostheses such as

implants, medical grade adhesives, vacuum retention was used as method of retention in this case. Leow et al,¹⁷ studied optimal circumference reduction of finger models for a good prosthetic fit and found out that 5-7% circumference reduction in the finger was shown to be best among 1-3% and 8-9% of reduction. In the present case 5-7% of circumference reduction of the stump is done to create the passive vacuum fit.

CONCLUSION

Loss of a digit will have a profound effect on the self-esteem and psychological status of the patient. When surgical reconstruction is contraindicated or unaffordable, a prosthetic finger will assist in the rehabilitation of the patient. Fabrication of highly esthetic finger prosthesis will require great technical and artistic expertise. This case report describes the prosthetic rehabilitation of a patient with an amputated finger using silicone finger prosthesis.

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