

Case Report

Fabrication of silicone finger prosthesis: A clinical report

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Maxillofacial prosthodontics is an art and science which provides life-like appearance to the missing structures of an individual. Planning the prosthesis, making the impression, sculpting the model and choosing the material - all contribute to a successful prosthesis. A case report has been presented where a custom made finger prosthesis; comfortable in use and esthetically acceptable to the patient was fabricated; using silicone material.

Key words: Maxillofacial, silicone

INTRODUCTION

The fabrication of a digital prosthesis is as much an art as it is a science. Prosthetic form, coloration and texture must be as indiscernible as possible from the surrounding tissues. The ideally constructed prosthesis must duplicate the missing feature so precisely that the casual observer notices nothing that would draw attention toward the prosthetic reconstruction. Rehabilitation efforts can only be successful when patients can appear in public without fear of attracting unwanted attention. To create such a prosthesis, which has a realistic skin surface and seamless visual integration with the surrounding tissues requires both artistic and technical expertise.^[1]

Surgical procedure is more likely to meet the requirements of absolute function, but the patient's involvement and willingness to undergo extensive surgical procedure and implant placement may preclude these alternatives.

This paper presents an alternative method of prosthetic rehabilitation of an amputated finger with heat cure silicone material.

CASE REPORT

A 22-year-old boy reported to the Department of Maxillofacial Prosthetics, K.L.E.S's Institute of Dental Sciences, Belgaum for the reconstruction of the missing ring finger of the right hand.

On examination - a solitary healed wound [scar] was seen on the dorsal aspect of the hand at the base of the amputated ring finger, measuring 1×1 cm with round regular margins; brown to pink in color with some crusting was seen. The surrounding area appeared to

be normal with no signs of any infection over the wound. The histopathological report of the patient was suggestive of giant cell tumor, for which the patient had undergone a surgical amputation of the affected part.

After radiographic and clinical evaluation of the defect it was concluded that the surgical lesion was acceptable for prosthetic rehabilitation. An informed consent was taken from the patient before starting the treatment to ensure his willingness and co-operation.

Technique

1. The patient's hand was lubricated with a thin layer of petroleum jelly. This prevents the hydrocolloid impression material from adhering to the surgical site and the tissue surface. Following this, the area around the hand was boxed, the material impression 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 [Figure 1].
2. The impression was then poured in artificial stone, using vibrator to avoid voids.
3. The positive replica of the hand was retrieved and prosthesis of the missing finger was sculpted in modeling wax [Figure 2].
4. The wax pattern of the finger was placed in the correct position on the hand, so that markings could be made on the cast for the fabrication of rings. These rings serve the purpose of retention and are evaluated on the patient's hand [Figure 3]. During the try in stage, the fit, stability and seating of the wax pattern were evaluated along with as the shape and size of the pattern.
5. The pattern was then flaked in the lower half of the



Figure 1: Pre-treatment



Figure 3: Wax pattern with rings for retention



Figure 2: Hand model with wax pattern carved



Figure 4: Post-treatment

- flask, making sure that the rings were embedded in plaster to avoid undercuts for the counter flasking. The pattern was flaked 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 is applied between the two pours. After dewaxing, the mould is allowed to cool.
6. The shade matching was done using natural daylight. The best time for this procedure was between 11:00 AM and 1:00 PM. Intrinsic colors were mixed to achieve the appropriate characterization for the palmar and dorsal surfaces. It is critical to carry out this procedure in the presence of the patient so as to gain his approval.
 7. The mould created by the elimination of the wax was packed with silicone rubber. It was kept in mind that the higher surface tension of the silicone causes easy entrapment of air within the material and every precaution must be taken to avoid this.

8. The material was allowed to bench cure overnight and for the final polymerization it was placed in hot water for one hour at 45 degrees Celsius.
9. Once the final prosthesis was retrieved, the flash was trimmed using a sharp blade and the final finishing was accomplished using fine sand paper.
10. To complete the prosthesis an appropriate sized artificial nail was adapted into place and to achieve an enhanced realistic appearance, the nail was shaped according to the nail of the natural fingers. In addition, a few sparse hairs were incorporated into the prosthesis.
11. The final and most gratifying step was to place the prosthesis on the patient's hand *in lieu* of the missing finger. Patient was instructed and demonstrated about the use and maintenance of the prosthesis. The gratitude and satisfaction in the patient's eyes made the tedious and time-consuming procedures well worth their while [Figure 4].

SUMMARY

Prosthetic rehabilitation is advantageous in that it is relatively quick, reversible, medically uncomplicated and allows the surgical site to be closely monitored. Silicone elastomers are probably the most widely used material for prosthetic rehabilitation. A clear to translucent silicone rubber is compatible with all the intrinsic and extrinsic coloring systems available.^[2]

The custom-made finger prosthesis is esthetically acceptable and comfortable for use in patients with amputated fingers, resulting in psychological improvement and personality.

However, disadvantages associated with early prosthetic rehabilitation are the initial instability of the surgical site and the inevitable tissue bed contraction,

which occur after healing tends to change the retentive alternative for the prosthesis. Keeping these disadvantages in mind, the use of silicone adhesives was avoided at the wound site, for this case.

REFERENCES

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Announcement

9th National Post-graduate Convention Indian Prosthodontic Society

22nd, 23rd, & 24th June 2007

Sharad Pawar Dental College & Hospital

Sawangi (Meghe), Dist. Wardha,

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Tel.: 07152243542, Fax: 07152 241711

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