

Rehabilitation of A Patient With Prosthetic Thumb : A Case Report

Abstract

Maxillofacial Prosthodontics is an art and science which provides life-like appearance to the missing structures of an individual. Planning the prosthesis, making an impression, sculpting the model and choosing the material all contribute to a successful prosthesis. Thumb, finger and partial finger amputation are commonly due to traumatic injuries; digit loss may also be attributed to congenital malformations. Thumb is one of the vital parts of the hand. Thumb prosthesis is difficult to fabricate as they demand both aesthetic and function. Its partial or complete loss leads to psychological disturbances to an individual. This clinical report describes a technological process of designing and manufacturing a silicone rubber prosthesis for a patient who lost his thumb caused due to trauma. Restoring the natural appearance with the prosthesis eliminated the trauma generated by the dysfunction and represented an efficient psychological therapy.

Keywords: Thumb Prosthesis, Silicone thumb prosthesis, Maxillofacial prosthesis.

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Introduction:

The fabrication of a digital prosthesis is as much an art as it is science. Here there are no limitations to your imaginations and one cannot apply the inferences drawn from one patient to another. But we try to follow the doctrine "Every human has the divine right to look human".

Even if the disfigurement is slight, the psychological wound is so great that the disfigured person himself avoids social contacts. So the Prosthodontics should not only make the person functional physically but also socially. The ideally constructed prosthesis must duplicate the missing feature so precisely that the casual observer notices nothing that would draw attention towards the prosthetic reconstruction¹. To create such prosthesis, which has a realistic skin surface and seamless visual integration with the surrounding tissue one requires a technical qualification along with artistic ability. Rehabilitation of amputated thumb is of utmost importance as restoration of the natural appearance eliminates the trauma generated by the dysfunction. When surgical reconstruction is contraindicated, unsuccessful, unavailable or unaffordable, then a high quality esthetic prosthesis with passive function can be helpful².

In this clinical report, a silicone rubber thumb prosthesis fabricated for a patient who lost his thumb caused due to trauma.

Case Report

A 36-yr old male reported in Seema Dental College & Hospital, Rishikesh in Department of Prosthodontics having a chief complaint of unaesthetic look due to amputated thumb of right hand which happened during cutting of grass in machine. (Fig1) As patient was not ready to go through surgical

procedure so a prosthodontics rehabilitation was planned.

Procedure:

The patient hand was lubricated with petroleum jelly. Then an impression was taken of the defect side with hydrocolloid impression material. Impression material was first placed on palmer side and then on the dorsal side. (Fig. 2)

The impression was then poured with stone and the positive replica was retrieved. (Fig. 3)

Then impression of the normal thumb on the other hand was taken in hydrocolloid impression material (Fig4) and wax pattern was fabricated from this⁴.

Then try in was done and fit, stability and seating of the wax pattern were evaluated along with the shape and size of the pattern. (Fig.5)

Next thing was to make a nail for the missing thumb for that small amount of base and catalyst of rubber base impression material was taken, then mix the material and place it on the nails of the normal thumb and wait for till it set and finally got nail index. After forming a nail index a thin shell layer of self cure acrylic with small amount of colour is added for the colour matching of the nail⁵. (Fig.6)

After preparation a nail index we will place it on wax pattern. (Fig.7)

The room temperature vulcanizing silicon material was color matched in dorsal and ventral side separately with intrinsic color and packed in the prepared mould.

The prosthesis was allowed to cure overnight and the prosthesis was then retrieved and the flashes were trimmed using a sharp blade and finished with

silicone finishing burs⁷. (Fig.8)

The final and most gratifying step was to place the prosthesis on the patient hand in lieu of the missing thumb in which final prosthesis was inserted on the residual stump. (Fig.9)

Basic retention of the prosthesis was achieved by engaging the undercut and the vacuum formed.

Patient was advised to clean the prosthesis with a dilute soap solution, such as shampoo, rinse well and pat dry with tissue.

On 3 months recall appointment; no complication were observed. The prosthesis was in good shape and required no further intervention. The prosthetic thumb lacks the sensation of normal or reconstructed thumb, although it does not require the multiple procedures of surgical reconstruction.

Discussion

The essential characteristics of the finger prosthesis were described by Jean Pillet⁸ as the prosthesis must be of high quality, both technically and aesthetically. It must be very similar to the digit of the opposite hand. The skin must correspond to the normal skin in all details and match the color as precisely as possible. The material of the prosthesis must be strong and repairable if torn. It must not stiffen at low temperatures within the normal climatic range and must also be heat resistant. It must not be stained by ordinary materials such as newsprint and, if soiled, must be easily cleaned by washing in water with a mild soap. It must not irritate the skin. All the above said requirements are fulfilled by the silicone material and Buckner H et al, stated that the acceptance rate of individually

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sculpted custom made silicone prosthesis has been much higher⁹.

Retention in finger prosthesis is generally achieved by a vacuum effect on the stump, use medical grade adhesives, and placement of finger ring. Recently osseointegrated implants are used to retain the finger prostheses. In the suction-fitted prosthesis, the elastic and nonporous silicone rubber allows an airtight “cupping” of the residuum such that an incipient slippage of the prosthesis is immediately followed by an internal vacuum effect that checks further

displacement¹⁰.

Conclusion

Prosthetic rehabilitation is advantageous in that it is relatively quick, reversible, & medically uncomplicated. The custom made thumb prosthesis is esthetically acceptable & comfortable for use in patients with amputated thumb, resulting in psychological improvement and personality. Such type of prostheses are widely accepted and also boost the morale of the patient.

References:

References are available on request at

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Legends:

- Fig 1 patient with a missing thumb (pre treatment)
- Fig 2 impression of the defect with alginate
- Fig 3 Stone cast poured
- Fig 4 impression of the contralateral finger
- Fig 5 wax pattern trail
- Fig 6 fabrication of the nail index
- Fig 7 wax pattern with the nail attached
- Fig 8 prosthesis after flasking
- Fig 9 final prosthesis ventral side

