

Fabrication of Glove Type Silicone Finger Prosthesis: A Case Report

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Abstract: Finger and partial finger amputations can be the result of a congenital anomaly, trauma, tumour surgery or malformations. Surgical reconstruction may not be possible, owing to size or location of the defect. The patient's medical condition or personal desires may also preclude reconstructive surgery. In such cases, prosthetic rehabilitation is indicated. A case report has been presented where a custom made glove type prosthesis was fabricated using silicone elastomer.

Keywords: Glove prosthesis, Partial finger amputation.

I. Introduction

The replacement of missing parts such as a nose, eye or ear or the construction of a device to rebuild facial or cranial contour requires clinical skill and utilization of available materials. The improvements in esthetics and function are not only essential to the patient's physical well-being, but they also contribute to his mental attitude. The finger prosthesis are custom designed and hand made by a skilled artist using ones own techniques and experience in sculpting to imitate a living finger to achieve an optimum level of success. This report presents a case of rehabilitation of a finger defect with a silicone prosthesis.

II. Case Report

A 43-year old male patient reported to the department of prosthodontics for replacement of a missing tooth in the mandibular anterior region. During examination, the patient was found to have missing finger in his right hand (Fig 1). A detailed history revealed that the patient lost a part of his thumb 5-year-ago in a road accident and the index figure got disfigured. The amputation was partial involving a part of his thumb at metacarpopharyngeal joint. The amputated stump was well-healed and the surrounding skin showed no signs of inflammation and infection. The patient had no history of a previous prosthesis. The advantages and limitations of prosthesis were discussed with the patient and glove type prosthesis was decided to replace the amputated thumb and mask the disfigured index finger.

III. Procedure

A plastic container was reduced to a height, which could accommodate the hand upto the wrist level. A thin layer of petroleum jelly was applied to the patient's hand. Patient was instructed to keep the hand in normal resting position. An impression of the hand on side of amputated finger was made using irreversible hydrocolloid material (Fig 2) which was loaded into the prepared plastic container. After the material got set, patient was instructed to slowly remove the hand from the container in a jerking motion. Impression was then poured in dental stone using vibrator to prevent voids and thus a positive replica was obtained [Fig-3]. Impression of the contralateral thumb and index finger were similarly made to duplicate the size, shape and orientation of the fingers.

3.1 Selection of a donor and making wax patterns

A donor hand for making the wax patterns was essential to avoid the laborious task of sculpting. Using the cast of the normal hand as reference, a donor hand was selected for the patient from among the patients visiting our department. Impressions of the fingers of the donors were made using condensation silicone in putty consistency. Wax was molten and poured into the putty impressions. After the wax cooled down, it was retrieved from the impression and tried on the casts. Final carving and adjustments were made to blend the margins with the respective casts. Around 1 mm of nail bed was carved in the wax pattern to incorporate the nail later. The completed wax patterns were tried on the patient (Fig 4).

1.2 Color matching and incorporation of nail

The most critical step was to match the color of the prostheses to the patient's skin color. For maximal patient acceptance, careful coloration is important for successful rehabilitation when the patient can appear in

public without fear of attracting unwanted attention [1]. The basic skin color was observed and the colors were mixed with the silicone to obtain the base color for palmer and dorsal surfaces. The mould created by the elimination of the wax was packed with silicone rubber. The material was allowed to bench cure for 24 hours at room temperature. Once the final prosthesis was retrieved, the flash was trimmed using a sharp blade and the final finishing was accomplished using fine sand paper. The nails were made from cold cure clear acrylic resin. They were properly shaped and trimmed to the required size and were adapted into place. The silicone fabricated fingers were then attached to the regular glove of the patients size using an adhesive. This will aid in retention as well as mask the borders of the prosthesis. The final prosthesis was delivered and the fit and color of the final prosthesis was evaluated and was found to be satisfactory (Fig 5)



Fig 1: Preoperative



Fig 2: Diagnostic Impression of the fingers



Fig 3: Cast Poured



Fig 4: Wax Pattern try-in



Fig 5: Completed Prosthesis

IV. Conclusion

Maxillofacial prosthesis is a branch of medical and dental science which aims to protect and, directly or indirectly, restore structures that are injured or lost by congenital or acquired means beyond the limits of a usual prosthesis which restores the teeth and the alveolar ridges [2]. Patients with these deformities present various problems, both physical and psychological, and should be handled with the utmost care. Prosthetic replacement of the fingers can be satisfactory in patients who have at least 1.5 cm of residual stump [3]. An alternative technique for patients with short stump over which the standard digital prosthesis will not fit properly is an osseointegrated digital prosthesis. After amputation a painful hypersensitivity at the end of the finger remnants has been reported. The injured tip can be protected and desensitized by the gentle, constant pressure of a silicone elastomer prosthesis on the affected area. Function can be improved by a precisely fitting prosthesis by restoring normal length, protecting a sensitive stump, maintaining sensitivity through a thin lamina and transmitting pressure and position sense for activities such as writing or typing. The parameters which indicate successful thumb reconstruction are sensation, stability, length, mobility, position and pain-free function. In addition to this features like strength, esthetics and durability signify optimal management for a patient. Homecare instructions were given to the patient like the use of a soft tooth brush, soap and warm water irrigation to improve the life of the prosthesis. The patient was instructed not to expose the prosthesis to high temperatures and sunlight and not to smoke as it stains the prosthesis yellow [4,5]. The patient was advised to come back after 2 months for recall check-up.

References

- [1]. Taylor TD. Facial prosthesis fabrication- technical aspects clinical maxillofacial prosthesis. (Chicago): Quintessence Publishing; (2000) 233-44.
- [2]. Duni C, Miglani, Joe B. Drane. Maxillofacial Prosthesis and its Role as a Healing Art. JPD 1959; vol 9: 159-168.
- [3]. Heitmann C, Levin S. Alternatives to thumb replantation. Plast Reconstr Surg 2002; 110:1492-1503.
- [4]. PC Jacob, Kashinatha HM Shetty, Arun Garg, Bhupender Pal. Silicone Finger Prosthesis: A Clinical Report. Journal of Prosthodontics 2012; 21: 631-633
- [5]. Laxman Singh Kaira, Vishal Katna. Glove Type Silicone Finger Prosthesis- A Case Report. Indian Journal of Dental Sciences 2012; vol 4: 40-41.