CASE REPORT

Total Rehabilitation Of Poor Edentulous Arches With Metal Denture Bases And Finger Prosthesis.

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Abstract

In routine dental practice, cases are encountered with a compromised ridge. Metal dentures have been used successfully these days and their popularity has gained heights because of their ability to decrease the amount of bone resorption, enhanced stability and retention provided with close adaptation to the underlying tissues. Hand deformities severely affect esthetics, function & psychology of a person. In the following case report, an old denture wearer patient aged 72yrs with an amputed ring and little finger of right hand is rehabilitated with a full upper and lower metal denture framework and finger prosthesis in routine clinical setup.

Keywords: Metal denture bases, silicone, finger prosthesis

Introduction:

The use of metal bases for complete dentures has the advantages being-excellent strength to volume ratio, good adaptation to the supporting tissues, enhanced control of denture plaque, high thermal conductivity, high biocompatibility, no dimensional changes in time through fluids absorption, and no interferences with phonation. The fabrication of digital prosthesis is as much an art as it is a science. Prosthetic form, texture & coloration 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 towards the prosthetic reconstruction.

This paper presents rehabilitation of resorbed edentulous ridges with metal denture bases and prosthetic rehabilitation of amputed fingers with heat cure silicone material.

Case report:

A 72 yr old male patient reported to the Department of Prosthodontics for replacement of missing upper & lower teeth. The patient was a previous single upper denture wearer since 20 yrs. He lost his teeth in an accident, alongwith a ring and little finger of right hand.

On extra oral examination, patient had a square-tapering facial form with a normal profile, cosmetic index being medium. (Fig: 1). Shrinked distal phalange of the ring finger & completely amputed little finger with a 1/4th remaining stump and no signs of infection (fig: 2). Intra oral examination revealed that maxillary ridge was low well rounded & mandibular being
flat. OPG showed highly resorbed ridges (Fig: 3). Healthy class I mucosa, arch sizes were medium with a U-shaped palatal vault. Ridge relation was Normognathic & the Inter Arch Space was adequate.

After radiographic and clinical evaluation, metal denture bases were planned. Also, his amputated fingers were acceptable for prosthetic rehabilitation. An informed consent was taken from the patient.

**Technique for oral rehabilitation:**

Upper & lower primary compound impressions made with a lower wash impression followed by border molding and final impressions (impression compound, green stick compound, zinc oxide eugenol impression paste, Y-dent, DPI). The master cast was duplicated in reversible hydrocolloid impression material (Agar) which was eventually hardened. A wax pattern was fabricated on both the edentulous casts. Finally investing was followed by casting using 8 capsules of Co-Cr alloy (DENTSPLY). The framework was then sandblasted, finished & polished (fig: 4). Occlusal rims were fabricated over the metal bases, jaw relationships made and monoplane teeth of appropriate shade were selected (Primadent teeth).
Technique for finger prosthesis:

Patient’s left hand was lubricated with a thin layer of petroleum jelly, preventing the hydrocolloid impression material from adhering to the tissue surface. The area around the hand was boxed, the material impression was placed over the palmer side first & then the dorsal side. The patient was instructed to keep the hand in normal resting position. Another impression of the affected right hand was made in the same manner. The impressions poured in dental stone (fig: 6).

The positive replicas of both the hands were retrieved and prosthesis of the missing finger was sculpted in modeling wax on the stone replica of left hand, so as to exactly copy the left side fingers to replace the missing ones on the right hand. Currently, the methods for prosthesis retention to the remaining part of the finger include ring, double ring, adhesives and osseo-integrated implants. Retention is the primary determinant factor for the success of prosthetic restoration in any part of the body. It is important for aesthetics, function, and comfort, thereby improving the patient’s quality of life. The stump of the amputated finger should be minimally 1.5 cm in length to fit the standard finger prosthesis. Two silver rings with centrally split design were attached to the wax pattern with the help of self-cure resin for enhancing retention.

During try-in stage, the fit, stability & seating of the wax pattern was evaluated along with the shape & size of the pattern (figure: 7). The pattern was then flasked in the lower half of the flask, making sure that the rings were embedded in plaster to avoid undercuts for the counter flasking.

The pattern was flased to enhance the accuracy at the time of shade matching, such that the dorsal & ventral side of the fingers was separable. Separating medium was applied between the two pours. After dewaxing, the mould was allowed to cool (fig: 8).

Shade matching was done in natural daylight. Packing was done with silicone rubber (MP Sai, Mumbai), also some intrinsic pigments were employed to induce shade onto the palmer & dorsal surfaces respectively. The material was allowed to bench cure overnight. Once the final
prosthesis was retrieved, the flash was trimmed & the final finishing was accomplished. The cured silicone fingers color matched with the color of the skin and were painted using extrinsic oil paints (Camlin-brown, red & yellow ochre).

(Figure: 9 Final finger prosthesis in place)

To complete the prosthesis, appropriate sized artificial nails were adapted into place & the nails were shaped according to the nails of the natural fingers. The most gratifying step was to place the prosthesis on the patient's hand in lieu of the missing fingers. Patient was instructed & demonstrated about the use & maintenance of the prosthesis. (Fig: 9).

Summary & conclusion:
Numerous investigators have recognized that metal base dentures are more “tissue tolerant” and resistant to deformation than plastic base dentures. The few disadvantages are far outweighed by the many advantages. The possibility of allergy to the metal, although a valid concern, varies with the composition and electrochemical properties of the alloy and the susceptibility of the patient. With metal bases for dentures, the patient benefits by having a more comfortable, better fitting, and stronger prosthesis.

Currently, many injuries and traumatic amputations of fingers can be rescued by micro-surgery through re-implantation. However, in some cases, reconstruction is either not advisable or partially successful. The acrylic resin and silicone are the most common materials used for rehabilitation. Although resin can be easily characterized and presents great durability, it is a very hard material and uncomfortable for the patient. On the other hand, silicone has texture and flexibility similar to the skin, provides a more comfortable prosthesis and presents better capacity for skin-prosthesis linkage. A custom fitted silicone prosthesis replaces a portion of or all of an absent finger. If the patient has movement in the remaining portion of the finger, the prosthesis will restore the function of the finger. Both psychological and functional effects of the prosthesis enhance rehabilitation by restoring finger loss and normal professional and social life.

References:


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