

## Rebasing as a Problem-Solving in Complete Dentures

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### Abstract

According to Sangiuolo, there are two main methods of replacing the denture base: the first is called relining and the second is called rebasing. Indeed, the term rebasing is defined as, "A process of refitting a denture by the replacement of the denture base material by preserving the same prosthetic teeth". The main purpose is to re-establish adequate adaptation of the denture base to the bearing area and to preserve the original jaw relations. This technique is mainly indicated in the case of an immediate or late static prosthetic instability induced by physiological or pathological resorption. The approach is the same as the final impression with the obligation to have a well-balanced occlusion with a correct occlusal plane, a valid centric relation with the right vertical dimension. This manuscript attempts to cover most of the common complete denture rebasing indications along with a simple description of clinical and laboratory steps that can any practitioner follow to succeed the prostheses base replacement.

**Keywords:** complete denture, rebasing technique, prosthetic instability, general complaints, resorbed ridge, functional impression, porous prosthesis.

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## INTRODUCTION

Edentulous patients with new complete dentures are generally satisfied but up to 30% of the patients have complaints [1]. They still experience ongoing difficulties in adaptation such as unsatisfactory appearance, wrenching pain or discomfort due to the lack of retention and stability, altered speech, accumulation of food under the denture, difficulty in chewing [2, 3].

These kind of complaints may compromise the quality of life and can bring him to re consult again to solve them [4, 5]. As a solution to these problems, a particular clinical procedure which is rebasing is indicated in some particular cases [6].

According to Sangiuolo, the total repair consists of completely redoing the base of the prosthesis using a heat-polymerized acrylic resin using either a direct or an indirect method needing the intervention of

the laboratory [7]. In fact, this technique is used to refit an old denture without making a new one by replacing the entire denture base material on an existing prosthesis without changing the occlusal relations of the teeth in order to restore stability and retention and to reestablish the correct relation of the denture to basal tissue.

This article aims to present through a series of illustrations, the different clinical situations leading us to re-use the prosthetic base for total rebasing and to high its added value in the practitioner daily practice. It also illustrates the different clinical and laboratory stages of this therapeutic.

## INDICATIONS

The rebasing of prosthetic bases find its indication in the re-adapting of a used prosthesis, (recent or old) to the support surfaces in order to promote better prosthetic integration and to improve

aesthetic and function of the oral system. However, the prosthesis must not contain any particular error, both aesthetically (teeth setting) and functionally in the intermaxillary and occlusal relation.

The different indications will be illustrated through some clinical situations. The main added value

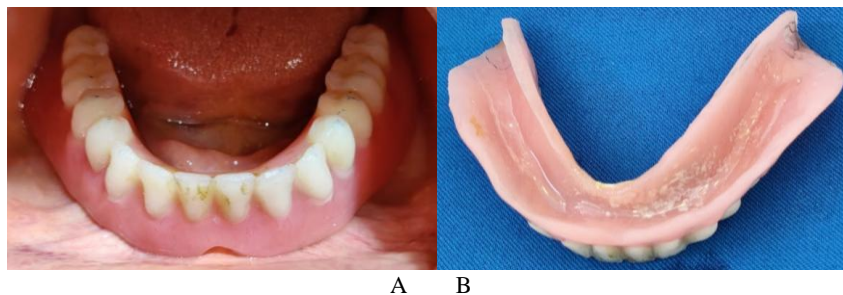
of this procedure is to compensate prosthesis instability and/or to correct the registration errors of the bearing surface due to improper impressions or abusive modifications done by the practitioner following the complaints described by the patient in control sessions [8](Figure 1 A-B).



**Fig-1: Illustration of a clinical case showing a lack in the left mylohyoidian line. A: Intraoral examination; B: Prosthesis examination**

Refection impression is also indicated to compensate the effects of pathological or physiological alteration of bearing surfaces by recording the physiologically exploitable support for better distribution of forces over the ridge and reduce the inflammation of the fibro mucosa, such as in the case of

diabetic patients with accelerated bone resorption as well as in the case of the immediate prosthesis to compensate the changes following bone and mucous healing for a better adaptation to bearing surface [9] (Figure 2 A-B).



**Fig-2: Illustration of a clinical case showing a non-adaptation of the prosthesis following a change in the bearing surfaces by resorption. A: Intra oral examination; B: Prosthesis examination**

Polymerization defects such as dimensional variations and porosities can lead the praticien to remake the prosthesis base in order to stop the deterioration of the material's surface and limit microbial colonization [10] (Figure 3).

associated with unstable non retentive discomfort able bases. Using a neutral zone arrangement of teeth enhances also the balance of the prostheses system (Figure 4).



**Fig-3: Deterioration of the material's surface prosthesis**



**Fig-4: View of the mandible showed a bone resorption**

Rebasing is considerate as a conservative clinical approach (instead of using implants) for the treatment of severely advanced resorbed ridges

**Clinical procedure**

Tissue and denture preparations are both needed and included in clinical steps in order to

establish the stabilization of the existing prostheses. The occlusion is balanced in centric relation. The vertical dimension (VD) and the centric relation (CR) must be

verified and the occlusion ratios must be harmonious to avoid the shift or tilt of the denture while taking the impression in occlusion [11] (Figure 5 A-B).



**Fig-5: Balanced occlusion control. A: Control of the vertical occlusion dimension; B: Control of the centric relation**

We start by cleaning, roughening and slightly reducing the fitting surface of the denture. Then, to avoid the effect of overextension, we must shorten or trim the flanges. The borders are reduced 2mm approximately to keep away from the interference of the reflected tissue about the periphery of denture.

When undercuts are removed so the denture may be moved easily from the cast then the extensions are corrected. The entire fitting surface of the base is slightly relieved 1.5 mm in all areas except the post dam when it's about the upper prosthesis, to allow room for the impression material (Figure 6).



**Fig-6: Reduction the edges of the prosthesis**

Each impression, wither maxillary or mandibular, must be taken separately and in the same way [12]. We start by an extra oral examination to make sure that the surface is already cleaned and correctly reduced then a denture flanges intraoral check

is also made to assess the need for peripheral reduction or extension to attempt the right thickness and length. Border molding with softened thermoplastic compound is accomplished manually and functionally and the obtained retention is controlled (Figure 7).



**Fig-7: Border molding with the thermoplastic paste zone by zone**

To make a functional impression in centric occlusion, the material is mixed and a thin layer of placed inside the denture covering the whole impression surface and the borders. The denture is inserted in the

patient's mouth and the mandible is guided into a gentle returned stabilizing position (in centric occlusion) and the patient is demanded to make functional movements while the material is setting (Figure 8 A-B-C-D).



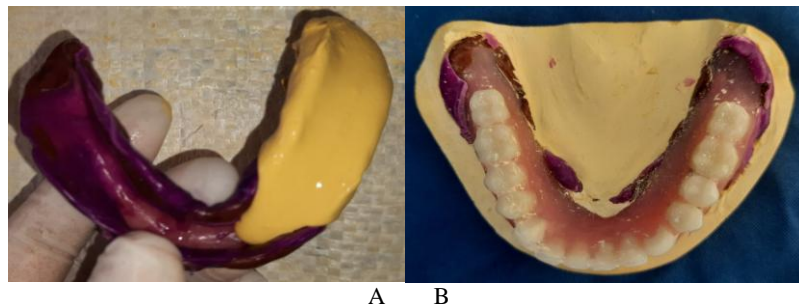
**Fig-8: Steps of taking the impression.**

**A: Impression materials; B: Materials mixing; C: Mandibular impression under occlusal pressure; D: Mandibular impression**

After about 5mn kept in situ, the denture is removed and examined carefully. With no imperfections found the impression is deemed acceptable to be boxed and a cast is poured.

**The laboratory steps are the following**

We start by boxing then pouring the impression with stone material (Figure 9 A-B).



**Fig-9: The casting steps of the impression. A: Casting of the impression; B: The cast resulting from the impression's reflection**

Without separating the denture from its cast, the prostheses is flaked in the classic manner without forgetting to remove the excess on the teeth and surfaces of the base (Figure 9).

A heavy silicone key is made to control the positioning of the teeth and retaining means are applied on the latter (Figure 11).



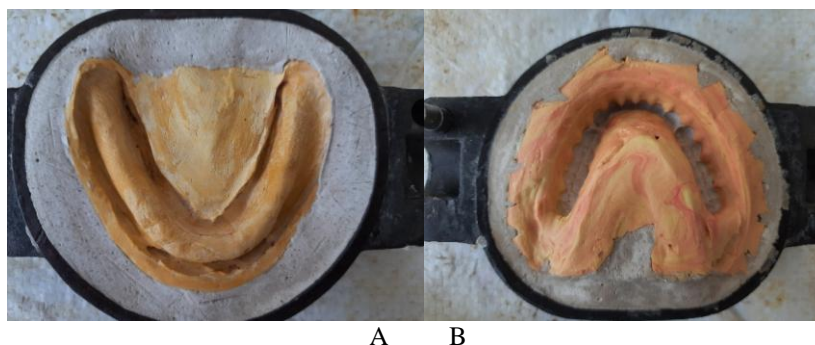
**Fig-10: Flasking dental cast**



**Fig-11: Realizing a key with heavy silicone**

The heating flask is putted in hot water for 5 mn and then its two parts are separated and all the

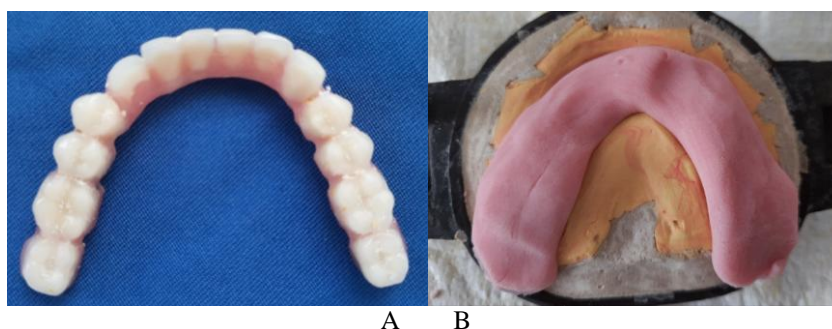
material impression is cleaned from the cast and the denture base is cut and removed (Figure12 A-B).



**Fig-12: Opening of the flask (two parts party and counter party). A: The cast in the party of the flask; B: Silicone key with the denture impression in the counter party of the flask**

The cast is painted by a separating medium. The original teeth are putted in their previous positions in the cast and died with a monomer moistened cotton

pellet. The heat curing resin is mixed, placed in the flask and cured after processing the denture (Figure 13 A-B).



**Fig-13: Polymerization step. A: Reposition of the original denture; B: The placement of the resin**

We finish by deflasking, removing the denture from the cast then finishing and polishing. The

prostheses is ready to be inserted in mouth (Figure 14 A-B).



**Fig-14: Insertion of the prosthesis. A: Prosthesis after polishing; B: Prosthesis inserted**

## DISCUSSION

Rebasing might give a great economic option in some cases of Porous, discolored or contaminated denture base, also for Chronically ill patients such as non-equilibrated diabetes with continued resorption of the residual alveolar ridges, geriatrics, mentally compromised individuals who cannot afford the cost or the long and several appointments required for the construction of a new denture. This procedure increases the comfort (better ability to speak, to masticate and a better overall attitude) and helps to improve the prostheses stability and to preserve the residual bone

[13, 14, 15, 16]. But what is the real efficiency of this denture impression procedure [17, 18].When the modified denture undergoes after all, a routine polymethylmethacrylate polymerized denture which undergoes the same margin of error (denture base thickness, interocclusal rest space affecting the DV and occlusal variation) due to polymerization shrinkage that are the reason of consulting in the beginning [11].

Both an accurate functional impression together with other correctly performed clinical and laboratory procedures ensure improvement of the

retention and stability [19]. Indeed, for many authors, rebasing with a functional ordinary final impression using the zinc oxide-eugenol paste for the intrados surfacing and the Kerr paste to with recorder the peripheral limits of Kerr paste and intrados, remains the solution of choice [20].

For others, the use of certain elastomers for the border molding alone or in addition to Kerr paste, has been advocated by some authors in recent years [21, 22]. This approach has the main advantage of recording the highest and widest possible prosthetic edges while respecting the physiological free play of paraprosthodontic organs. Other authors recommend a surfacing using material of different viscosities in order to remedy the different anatomical shapes of the support surfaces as well as the recording of the muscle power of the patient [23].

In fact, by the accurate impression technique, rebasing can offer in these cases a maximal of base extension and a greater area of intimate contact between mucosa membrane and the denture base improving remarkably the support of the basal seat and the stability of the denture. In addition to a good knowledge and a perfect control of the clinical steps, a tissue preparation before making the impression is primordial in the success of this procedure and may need several sessions especially in some cases when the tissue is severely affected. So a treatment with tissue conditioner is established and it's renewed every week in order to achieve a clinical healthy soft tissue state before making the impression [24, 25]. It's also required to help tissue recovery to adjust the transmission of masticatory forces to the supporting mucosa by eliminating isolated pressure spots in the case of ill-fitting denture. (Pink zone =pressure areas should be relieved). Overextended borders are also reduced in the case of traumatic vestibular mucosa lesions or epulis fissuratum.

A surgical management of the excessive hypertrophic tissue, is also needed before rebasing and the denture can be used as a surgical splint [26].

Some recommendations are given to boost the tissue recovery for example to insure the tissue rest the patient should leave the old denture out of the mouth as much as he can and mostly at night and specially before taking the final impression.

A massage of the soft tissue is also recommended to stimulate the blood supply and recovery; to recap, rebasing is a trade-off decided with the patient; avoiding renewal of dentures which is more expensive demanding more appointments also; and the patient may adapt the rebased dentures quicker thanks to the reproduction of familiar features and facial appearance [27]. Nevertheless, some dentists recommend making new dentures when the residual ridges have resorbed extensively with great loss of

vertical height or when proper occlusion is difficult to establish, others relines, and still others prefer to reprocess the old denture on a cast from a new impression [12].

Computer-aided design and manufacturing (CAD/CAM) technology has expanded removable prosthodontics including the fabrication of conventional complete dentures. Despite the fact that reports on computer-engineered complete dentures (CECDs) continue to increase. Yet still no description of the use of rebased complete denture fabrication in the literature [28, 29, 30, 31, 32].

## CONCLUSION

A regular annual visit of control or adjustment appointment is essential as one of the most clinical phases of denture fabrication to guarantee the patient's care and preserve oral health. So, Checkups are important to detect any variation of the different parameters or any problem that can be solved by making little adjustment if needed

Otherwise It's reasonable to consider some proper (individual) patients 'factor such as age, gender, medical, or psychological status in the hindering success of treatment and not only a real design fault or a tissue problem.

**Conflicts of Interest:** No conflicts of interest.

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