One-Visit Relining Procedure in Patient with Loss of Vertical Dimension: Case Report

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ABSTRACT

Background: Dentists often encounter patients with worn dentures that still feel comfortable even though the patients have lost the supporting tissue heights due to physiological and pathological resorption. Loss of denture retention, stability, and occlusal vertical dimension are most often caused by alveolar bone resorption. Dentures that are loose because of poor adaption to the supporting tissues should be relined. Chair-side procedures provide immediate resolution, avoiding the edentulous period of time accompanying laboratory relines. Case Report: A 70-year-old male edentulous patient came to the Prosthodontic Clinic, Faculty of Dentistry, Trisakti University, Jakarta, Indonesia. The patient had been wearing the upper and lower dentures for approximately eight years. The patient had alveolar ridge resorption, which causes loss of retention, stability and vertical dimension. After the problems were thoroughly diagnosed and corrected, a chair-side denture relining with an open-mouth technique was used. Conclusion: Direct relining in a single visit helped the complete denture to regain its retentiveness, allowing for prolonged the use of the worn denture. It also adjusted occlusal vertical dimension to improve the occlusal support and esthetics.

Keywords: complete denture, direct relining, retention, support

Background

The main objectives of complete denture prosthesis are to improve esthetics, mastication, and phonetic functions and to protect supporting tissue under the denture.¹ Dentists often encounter patients that are still comfortable wearing their dentures, even though the patient has lost the vertical dimension heights due to physiological and pathological resorption. These conditions can be affected by systemic factors or due to poor complete denture making process.² Alveolar bone resorption causes loss of denture retention and stability, occlusal vertical dimension reduction, facial support, horizontal tooth movement, and occlusal disharmony.³
The most common complaints by patients are loose complete dentures and pain. A common treatment for fixing loose dentures is relining. However, it is necessary to first diagnose the cause of a loose denture before relining the denture. Using proper diagnostic techniques for a patient’s complaints prior to the relining procedure is very important. Relining is the act of adding new material to the denture’s surface during a readjustment of the supporting tissue and opposing denture to restore the denture's adhesion. Various methods of relining include those without changes in vertical dimension and those with changes in vertical dimension. Relining the prosthesis with the vertical dimension that has changed begins with placing three small squares of impression compound in the right and left first premolar and in the anterior alveolar bone area.

The techniques commonly used in relining are direct and indirect. In a patient with a loose denture and loss of vertical dimension, the indirect relining technique is done in several steps and laboratory work is needed; experiencing an edentulous phase can cause the patient feel uncomfortable. This case report discusses a simple procedure to raise the patient’s vertical dimension through a direct relining method with an open-mouth technique in one visit.

**Case Report**

A 70 year-old-patient working as a driver came to the Prosthodontic Clinic at Faculty of Dentistry, Trisakti University with a concern about his uncomfortable upper denture. He had been using the denture for approximately eight years, but at that time the denture seemed to be loose and unstable when chewing food. The patient felt that his face looked older. He had a history of controlled diabetes mellitus. The patient was provided with a written informed consent to participate in the case report. The informed consent included a statement that the case report will be published in a journal.

The loss of vertical dimension, the esthetic problem, the horizontal movement, and the occlusal disharmony needed some adjustments before the relining or rebasing procedure. The preliminary actions included tissue preparation and complete denture preparation. Tissue preparation included: (1) the oral mucosa needed to be free from irritation; (2) using the denture at night was prohibited; and (3) the denture needed to be removed at least 24 hours before the impression procedure. Complete denture preparation included: (1) making the base and occlusal surfaces of the denture free from debris and stain (Fig. 1); (2) examination of the borderline exactness and impression surface of the denture with pressure indicator paste (Fig. 2); (3) examination of the incisal and occlusal plane; (4) examination of the occlusal vertical dimension; and (5) examination of the centric occlusal.

The result of pressure indicator paste (PIP) before the relining procedure showed that the edge of the denture was too long because the PIP material was removed from the entire edge of the denture. The PIP material still had the brush pattern on the impression surface, which indicated uneven pressure because it did not contact the patient’s mucosa (Fig. 2).

*Figure 1. Denture cleaning process.*

*Figure 2. Pressure indicator paste.*
In this case, there was a vertical occlusion dimension reduction, due to the alveolar bone resorption. Following the preliminary actions, three square vertical stops (green colored) were constructed on the palatal of the maxillary denture impression surface (intaglio surface) (Fig. 3), followed by a chairside relining procedure on the maxilla.\textsuperscript{12,13} The relining materials were mixed and placed on the denture-bearing surface of the maxillary denture. The technique used was a direct relining procedure performed in the patient’s mouth. The relining procedure on the maxilla was performed with the open-mouth impression technique that aimed to produce edge closure directly by trimming and functional movement before the relining material set.

After the material set, the finishing and polishing procedure for the maxillary denture was performed, followed by re-examination of the denture inside the mouth (Fig. 4).

![Figure 3. Vertical stopper construction.](image)

**Figure 3.** Vertical stopper construction.

![Figure 4. Before (left) and after relining (right).](image)

**Figure 4.** Before (left) and after relining (right).

**Discussion**

The loss of physiological factors, such as retention and stability, and loss of the vertical dimension can make the denture unable to function properly, which is esthetically diminishing. Careful attention to denture care will minimize adverse changes to the supporting tissues and surrounding facial structures. Dentures can be improved in accordance with the alteration of supporting tissue and denture-supporting tissue damage can be reduced by performing regular controls.\textsuperscript{14}

Over time, complete denture users will come with complaints that their dentures are not adhesive anymore, that they have mucosal pain, difficulty in mastication, and changes in appearance that affect esthetics.\textsuperscript{13} To extend a denture's usefulness, relining or rebasing should be
performed. However, not all complete dentures with reduced adaptability to supporting tissue should be relined or rebased. If the cause is imbalance occlusion, relining measures will not solve the problem. In such a case, by doing only selective grinding, the denture can be used again comfortably. For a proper diagnosis, the cause of denture looseness should be established and complaints from patients should be listened to.\textsuperscript{5,12}

Diabetes mellitus patients who use complete dentures often have complaints about complete denture incompatibility. The main cause of this problem is a change in the supporting tissue due to alveolar bone resorption. This pathological resorption is caused by reduced production of insulin which result an increase uptake of amino acids and collagen synthesis in bone cells.\textsuperscript{15} In this case report, there was a vertical occlusal dimension reduction, due to the resorption of the maxillary alveolar bone, causing the edge of the denture to suppress the fornx. The reduction of the maxillary incisal and occlusal plane caused the patient’s esthetic to be a bit unfavorable, and when the patient was in a resting position, the maxillary incisal could not be seen (Fig. 4).

Relining techniques can be performed directly or indirectly. In the case above, a direct relining technique (chairside relining) was performed with an open-mouth impression technique.\textsuperscript{5} Before the relining process is carried out, it is important for the supporting tissue under the complete denture to be in good condition or the complete denture must be removed for at least 24h, so that the mucosa tissue is not depressed. This technique requires only one visit and the patient does not need to release the denture for more than 24h. The patient can come in with an old denture, which is not adhesive anymore, and return home feeling better with the denture fixed. This will save the patient money as he does not have to spend extra for a new complete denture. This relining technique has several disadvantages, including the use of a self-curing acrylic material that can cause heat and also easily experience porosity, which makes the denture base change colors and causes unpleasant odors.\textsuperscript{11,16}

In the open-mouth technique, the operator has an important role in placing the worn denture which now was used as an impression tray. The operator must take the impression in the correct position with the correct pressure. Preparation of a vertical stopper from compound material keeps the impression position in accordance with the vertical dimension of occlusion that has been determined. Later, the compound material is replaced with a material that is colored with acrylic. In a study conducted by Schneider, making the impression using the open-mouth technique resulted in good fixation for the denture because of a proper peripheral seal, appropriate denture border length and following muscle movements when closing and opening the mouth, tongue movements during lower jaw impression, and lateral movements.\textsuperscript{2,10}

**Conclusion**

Denture looseness can result from problems with denture occlusion, tooth position, and denture contours. If these problems are not properly diagnosed and corrected, relining will not improve retention and stability of the denture. Direct relining helps the complete denture to regain its retentiveness in one visit and prolongs the use of the worn denture. It also adjusts the occlusal vertical dimension to improve the esthetics. A direct chair-side relining procedure may serve as an option for a practical and accurate method to obtain a vertically stable prosthesis with an improved esthetic.

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