Complete denture treatment with closed mouth impression method for medically compromised elderly patients with flat ridge

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(Case Report)

Complete denture treatment with closed mouth impression method for medically compromised elderly patients with flat ridge

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Abstract

Geriatric patient with medically compromised condition needs proper and adequate nutrition. However, patient with edentulous ridge is unable to receive the optimum intake because the masticatory and chewing ability decrease. Therefore, a proper complete denture treatment is necessary to enhance the masticatory system. Female, 86 years old, came with medical records of chronic gastritis, diabetes mellitus, and atrial fibrillation wanted to improve her masticatory ability by making a complete denture. The treatment choice in this case is a complete denture with close mouth impression method since the patient has a posterior flat ridge. This treatment resulted in a retentive, stable, comfortable denture, and patient satisfaction.

Keyword: Geriatric; Complete Denture; Closed Mouth Impression Method; Medicine

1. Introduction

Geriatric patient with medically compromised condition needs a proper and adequate nutrition intake. However, a study revealed that about 29,8% of 80-year-old adult has an edentulous ridge in Indonesia [1]. Edentulism has been associated with poor health status, insufficient fruit and vegetable consumption, poor nutrition, and many chronic diseases [1]. Those conditions can worsen the medical condition of geriatric patients. Therefore, treatment of complete dentures for geriatric especially with medically compromised condition is strongly suggested to improve the nutrition intake. The success of a complete denture relies on its stability, comfort, and retention. However, some patients occur extreme resorption of the ridges, resulting in a flat ridge appearance, unstable and non-retentive dentures with associated pain and discomfort. The resorption of ridge is initiated by the loss of the tooth and periodontal membrane. In some cases, the ridge could be shortening and sharp and make the knife edge shape [2]. Then, if the resorption continues to occur, it could be resulting in the disappearance of basal bone and make the ridge flat [2].

The main problem of complete denture treatment on flat ridges that often arises is the unstable and non-retentive dentures [3]. An accurate impression is a very crucial step in denture making especially related to flat ridges. It is well known that the most recommended impression technique for flat ridge case is the closed mouth impression technique [2–4]. Closed mouth impression is a method to take an impression with patients closing the mouth and relying only to their movement. This method allows the impression taken by the functional movement of the patients, creating the negative pressure that seals the border of the denture [5]. Saliva under the denture bases is discharged at the biting moment generating the negative pressure by sealing the denture border all around [5].

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2. Case

An 86-year-old female came to Airlangga Dental and Oral Teaching Hospital and wanted to make a denture to improve the quality of her mastication. She was diagnosed of having atrial fibrillation, diabetes mellitus, and chronic gastritis by her internist and has been consuming warfarin, digoxin, and glimepiride daily in the last 18 years. The patient used to wear the denture made by unregistered self-claimed dental technician but was taken off 2 months ago due to the infection because the denture was glued permanently to the gingiva. Since then, the patient found it very hard to chew and lowered her appetite. The condition found in the oral cavity was edentulous ridge in both jaws, with flat ridge in the posterior of the mandible with only 2 mm height (figure 1). There was no torus mandible, torus palatine, exostosis. The treatment plan for this case was a complete denture with close mouth impression method.

3. Case Management

Preliminary impression was taken using Accudent edentulous stock tray (Ivoclar, USA) for the upper jaw and using free cut back tray (Morita, Japan) for the lower jaw. Then initial interocclusal record with a centric tray was performed to determine the interocclusal space. Facebow transfer was performed and Stratos 300 (Ivoclar, USA) semi-adjustable articulator was used in this case.

Custom tray was made from self-cure acrylic according to the denture outline drawn from the preliminary cast and combined with bite wax for the upper and lower jaw. Then, the bite wax was tried on the patient and rechecked the interocclusal record (figure 2). Using the custom tray – bite wax modification, the final impression was taken by the closed mouth impression technique. Tray adhesive was applied covering the custom tray surface as a thin layer and border molding using Silagum Monophase (DMG, Germany) was performed for each upper and lower jaw. Then, the final impression was taken using light body impression material for the upper jaw followed with the lower jaw in close mouth position. The patient was instructed to apply some functional muscle movement like, saying “woo” and “eee”, pushing the back of the upper tray with the tongue, and swallowing. This movement was repeated 3-4 times. The result of the close mouth impression can be seen in figure 3.

The next step is making the final cast from the impression and putting in the articulator. Teeth arrangement was done and set in the neutral zone for the mandible. The denture which was still wax was tried on the patient to see the relation of the teeth interocclusally, the color of the teeth, and the comfort. The patient was satisfied with denture wax, then gingiva contour would be done and followed by acrylic processing and polishing. After that, the acrylic denture was tried on the patient then continued by selective grinding, polishing, and insertion to the patient. The instruction given to the patient was “denture was allowed only for drinking and speaking, but not eating. The denture was recommended used at night and followed up the next day.” On the first day of follow-up control, the patient felt pain at the mylohyoid region of the lower jaw and posterior region of the upper jaw. The pain might be caused by excessive pressure of denture; therefore, grinding was done. Next, the patient was instructed to use the denture to eat something soft, to drink, and to speak. The denture should be removed at night and cleaned. The patient was instructed to have to follow up control three days later. The patient didn’t feel any pain or discomfort since then. The denture was retentive and stable. The patient felt comfortable using complete denture for speaking but still eating soft food. In the next month, the patient was followed up. She felt very satisfied and didn’t feel any pain (figure 4). The denture was retentive and stable and the patient found no problem speaking or chewing normal food with the denture. The patient was suggested to come for control periodically for six months.

4. Discussion

The nutrition intake is very important for geriatric patients with the systemic compromised condition to maintain their health. A complete denture can enhance the masticatory system and nutrition intake to the body. In this case, implant-supported complete denture was not chosen because of the systemic condition and the patient was against it. Therefore, the retention of this denture was solely relying on the oral mucous and residual ridge. In this patient, it is found the posterior ridge was flat so close mouth impression method was chosen. Closed mouth impression is a method to take an impression with patients closing the mouth and relying only on their movement. This method allows the impression taken by the functional movement of the patients, creating the negative pressure that seals the border of the denture. Saliva under the denture bases is discharged at the biting moment generating the negative pressure by sealing the denture border all around [5]. When the mouth opened. the retromolar pad is stretched posteriorly changing the shape thinner while the retromolar pad gets shortened and rounded when the mouth closed [5]. If the impression is taken at opened mouth condition, this would create space underneath the denture base once the mouth close and could break the border seal (figure 5). However, this method also has a disadvantage. The patient’s cooperation and understanding

are really needed to perform this method. After using of the denture for one month, patient felt very satisfied with this treatment. The denture was retentive, stable, and comfortable. The patient was being able to eat more than before using the denture.

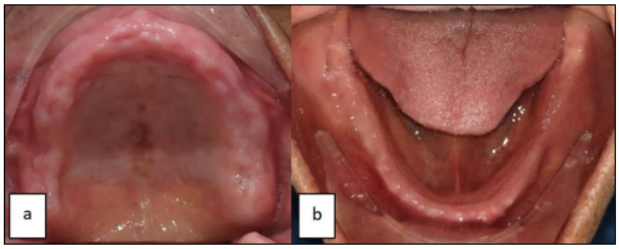

Figure 1 Intraoral examination of upper jaw (a) and lower jaw (b). Flat ridge condition was found at posterior of the mandible

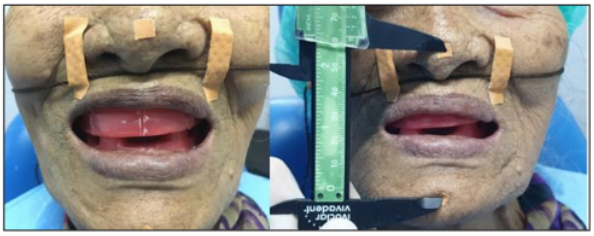

Figure 2 Rechecking the bite wax and remeasure the height of the interocclusal space.

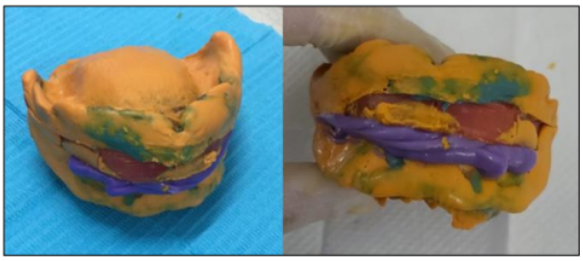

Figure 3 The result of close mouth impression method.

Figure 4 The Pre-Treatment Photo (a) and Post insertion of the denture (b)

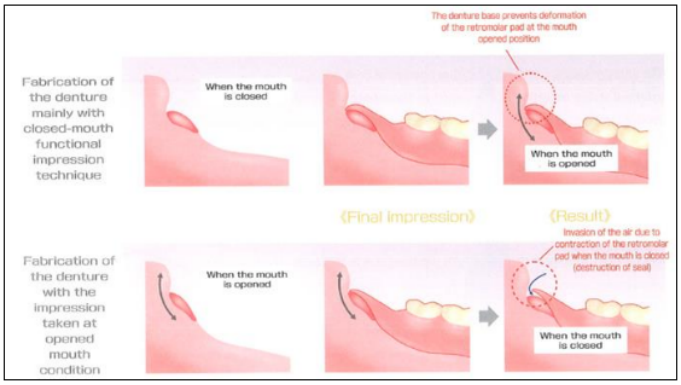

Figure 5 The ilustration of the deformities of retromolar pad if the open mouth impression method was perform. The contraction of retromolar pad when the mouth closed can break the denture border [5].

5. Conclusion

In conclusion, the closed mouth impression method was proven to be a solution for flat ridge case. The success of the complete denture treatment could enhance the quality of life on geriatric patient with medically compromised condition.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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