

Case Report

## Immediate overdenture for improving aesthetic of anterior teeth with periodontal problem

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### ABSTRACT

**Background:** The construction of overdenture is often applied because endodontic treatment usually give very promising results and patient has high motivation to maintain their natural teeth. Overdenture is a removable partial or complete denture that covers and rests on one or more remaining natural teeth, roots and/or dental implants. The presence of retained teeth can maximize retention, stabilization and prevent trauma to the oral mucosa. Meanwhile, the presence of root in the bone can delay resorption of the alveolar process. The role of proprioceptor in the periodontal ligament abutment teeth remains effective. Thus, it can be said the overdenture treatment is a preventive prosthodontic treatment. **Purpose:** The purpose of this case report was to present a case of maxillary and mandibullary anterior teeth with periodontal disease, through endodontic and prosthodontic treatments for recovering its function of phonetic and aesthetic. **Case:** The 25 years old female with periodontal problems (protrusive, wiggly  $^{\circ}1-^{\circ}2$  and along with gingival retraction) on 12, 11, 21, 22 and 32, 31, 41, 42. The patient felt bad about his performance and affect his self confidence. The patient visited tthe dental hospital to restore her teeth and recovering aesthetic and phonetic functions. **Case management:** The overdenture inserted immediately after one visit endodontic treatment and cutting off the clinical crown of the teeth. The adaptation of the denture is needed by relining using self cured acrylic resin. The patient was quite satisfied with the treatment. **Conclusion:** In conclusion, the maxillary and mandibullary anterior teeth with periodontal problem could be managed through conservative and prosthotontic approach of treatment to recover of its performance and function.

**Key words:** Immediate overdenture, endodontic, relining

### ABSTRAK

**Latar belakang:** Konstruksi overdenture sering diaplikasikan pada pasien, karena perawatan endodontik memberikan hasil perawatan yang sangat menjanjikan dan pasien memiliki motivasi tinggi untuk mempertahankan gigi asli mereka. Overdenture adalah gigi tiruan lepasan sebagian atau lengkap yang bertumpu pada satu atau lebih gigi asli yang tersisa, akar dan/atau implan gigi. Gigi asli yang tersisa di dalam mulut dapat memaksimalkan retensi, stabilisasi dan mencegah trauma pada mukosa oral. Selain itu, dipertahankannya sisa akar gigi dapat menghambat resorpsi tulang alveolar serta peran proprioceptor ligamen periodontal tetap efektif. Dengan demikian, dapat dikatakan bahwa perawatan overdenture adalah perawatan prostodontik pencegahan. **Tujuan:** Tujuan dari laporan kasus ini adalah untuk mempresentasikan kasus gigi-gigi anterior rahang atas dan rahang bawah dengan penyakit periodontal melalui perawatan endodontik dan prostodontik untuk memulihkan fungsi fonetik dan estetik. **Kasus:** Wanita usia 22 tahun dengan masalah periodontal (protrusi, goyang  $^{\circ}1-^{\circ}2$  dan disertai dengan retraksi gingival) pada 12, 11, 21, 22 dan 32, 31, 41, 42. Pasien datang ke rumah sakit gigi dan mulut ingin memperbaiki giginya untuk mengembalikan fungsi estetik dan fonetik. Pasien merasa kurang percaya diri terhadap penampilannya. **Tatalaksana kasus:** Overdenture dipasang segera setelah perawatan one visit endodontik yang diikuti dengan pematangan mahkota klinis. Relineing dengan resin akrilik diperlukan untuk menyesuaikan gigi tiruan terhadap jaringan pendukungnya. Pasien cukup puas dengan perawatan ini. **Kesimpulan:** Disimpulkan bahwa, gigi-gigi anterior rahang atas dan rahang bawah dengan masalah periodontal dapat diperbaiki melalui pendekatan perawatan konservasi dan prostodonsi untuk memperbaiki penampilan dan fungsi.

**Kata kunci:** Imidiat overdenture, endodontik, relining

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## INTRODUCTION

A patient who still has complete natural teeth, but having problems with anterior teeth such as wiggling; protrusion; extrusion are cases frequently found in dental practice. These problems are usually resolved with extraction or replacing them with conventional denture. However, in a certain time, the user of this denture may perceive either reduction of its retention and stability, or looseness which generally relates to resorption in the alveolar bone occurred physiologically or pathologically. Tooth extraction, subsequently replaced by removable denture, has some impacts. The patient needs to adjust himself to the new situation such as speaking, masticating, and swallowing. Besides, the patient may get psychological and social problems. Physically, there may be an occlusion change, vertical dimension, and alveolar bone reduction.<sup>1,2</sup>

It is common when a patient who has anterior teeth with poor condition, for instance, uneven structure affecting its aesthetic; or having periodontal problems, needs help from a dentist to get restoration or treatment. In this globalization era, many people ask for immediate, accurate, and qualified treatment, consequently the improvement of the dental health service related to prosthodontic treatment is necessarily conducted. One of services that can be provided in relation to the globalization demands is a treatment using overdenture (OD).

OD may be a partial denture or full removable denture, which covers up and rests on one or more remaining natural teeth, tooth root, or dental implant. In general, retained teeth have an endodontic treatment. They enable to inhibit the resorption process, which desirably can obtain a maximum retention and stability. Thus, overdenture treatment is a preventive prosthodontic treatment. Retained teeth, which lay under the overdenture basis, may preserve the height of alveolar ridge that make overdenture remain stable. This stability is possibly preserved any longer, because the masticating weight is more easily controlled and accepted evenly by the retained teeth and their adjacent tissue.<sup>3,4</sup>

Periodontal retained teeth (the retained teeth under overdenture) are essential to consider since only the potential teeth that may be employed as props of overdenture. Those teeth should have minimum mobility and depth of sulcus that can be treated on which the gingival attaches well.<sup>4,5</sup> Crown/root ratio if tooth crown cutting reaches the border of gingival margin, it may increase the crown/root ratio and tooth looseness may be reduced up to 40% allowing the functional stimulation accepted by those teeth possibly tolerate.<sup>6,7</sup>

Likewise the conventional denture construction, OD can be constructed immediately, therefore it is named immediate overdenture (IOD), on which has previously been conducted endodontic and periodontal treatments.

Further, IOD needs to be well-adjusted to its supporting/ adjacent tissue by grinding and relining before insertion, that is why it is also called temporary denture. It is also said that in the adjustment stage, it is advisably conducted relining by using tissue conditioner material. After the patient has adapted to the denture, furthermore, definitive denture can be made or replace the relining material on his denture with acrylic resin material.<sup>3,8</sup> The purpose of this case report was to present a case of maxillary and mandibullary anterior teeth with periodontal disease, through endodontic and prosthodontic treatments for recovering its function of phonetic and aesthetic.

## CASE

A 25 years old female student felt some distance among her front teeth since 7 months ago. There was much plaque on the upper and lower anterior teeth. The patient went to a dentist in order to have the plaque cleaned. The therapy conducted was a flap operation, foremost, on 12, 11, 21, 22, 32, 31, 41, 42. The result of the treatment showed there was no progress, precisely, it seemed to be severer.

Examination indicated that those teeth were wiggly between  $^{\circ}1-^{\circ}2$ . There were also gingival retraction (the severest were 11, 12, 21), and defect on the regio between 11 and 21. Four upper inciseve were found with multiple diastema, of which position was protrusion that made the patient feel less confident toward its aesthetic appearance because of having problem to close her upper lip (Figure 1). Therefore, the patient really needed restoration using denture to recover its aesthetic and phonetic functions. Patient with fully devolved to the operator about the kinds of dentures. At the same time, X-ray photos were also conducted at 12, 11, 21, 22, 32, 31, 41, 42 for making the diagnosis and treatment plan. Radiographic Interpretation shows the ratio of crown/root 1:1, and no periapical abnormalities found. The treatment plan will do is make the IOD for 12, 11, 21, 22, 32, 31, 41, 42.



Figure 1. Early condition of the patient's teeth.

## CASE MANAGEMENT

When the patient came at the first time, the intra oral and extra-oral examinations were directly conducted. The anatomical impression of the maxillary and mandibular teeth were made in order not only to get study models and dental records, to know the occlusion and relation, but also to determine the denture design and to prepare individual design tray.

The next visit, the physiological impression of the maxillary and mandibular teeth were made with elastomeric impression materials, and then reproduces with dental stone into the master model, where on the master model is constructed IOD. The first stage, 11, 21, 22, 31, 32, 41, 42 on the master model were cut up to a 1 mm above the marginal gingiva. The selection of artificial teeth was adapted to the size and color of the retained teeth using shade guide. Arrangement of artificial teeth with respect to the teeth next to them, overjet (3 mm) and overbite (2 mm), antero-posterior and lateral movement. The denture was made from acrylic resin with half Jackson on 16, 26, 35, 45 as retention clasps (Figure 2).

On the last visit, endodontic treatment was done step by step, where it required local anaesthetic. Endodontic methods used the traitement SPAD (Laboratoire SPAD-B.P. N°7-21801 Quetigny France). The first step was done on the 32, 31, 41, 42. This step was followed by cutting off their clinical crowns (Figure 3). After denture insertion, path of insertion was checked (Figure 4). The last step was done on the 12, 11, 21, 22. The procedure was similar with the first step. Inter roots distance was checked in order to make the arrangement of the artificial the artificial teeth, and at the same time the root surface of the teeth were protected with fluoride (Figure 5). The occlusion and articulation were



**Figure 2.** Removable partial denture upper and lower jaws element and basis from acrylic. Mandibular and maxillary removable partial denture with half Jackson on 16, 26, 35, 45 as retention clasps.



**Figure 3.** The cutting of clinical crowns after endodontic treatment on 32, 31, 41, 42.

grinding checked with articulating paper (occlusal grinding was done) and relining (using a tissue conditioner) was done on the denture base. Removal of the denture to be cleaned of soft liner scraps, and then polishing and finishing. On the final insertion (Figure 6), the occlusion, articulation and appearance of the patient were carefully observed (Figure 7). In addition, patient education was important in order that she understand to maintain the denture. Besides that, periodically control is needed, i.e. on 1 day, 3 days, 1 week and 1 month after the treatment.



**Figure 4.** Trial of lower overdenture.



**Figure 5.** Clinical crown cutting after endodontic treatment on 12, 11, 21, 22, 32, 31, 41, 42 and continued with fluoride protector application.





**Figure 6.** Post insertion of upper and lower OD.



**Figure 7.** The patient's performance with upper and lower IOD.

## DISCUSSION

Some factors affecting the success of treatment using IOD are the accuracy of diagnose, conscientious treatment plan, good co-operation between the dentist and the patient. In this case, some advantages obtained that there is no edentulous phase allowing to fit the denture immediately after conducting endodontic treatment and crown teeth cutting; improving the patient's aesthetic, of which early condition is poor and disturbs the lips closing.<sup>4,6</sup>

A patient suffering from edentulous, mainly on the anterior, is risky to the resorption of alveolar bone. Therefore, it is very beneficial to preserve the anterior teeth as the props of overdenture. Besides, the anterior teeth have significant position to support and stabilize OD.<sup>9</sup>

If the crown teeth is cut above the gingival margin, the wiggling teeth will 40% reduced due to the absence of pressure from the antagonistic teeth. Besides, the presence of the retained roots may preserve the alveolar bone and neuromuscular function. The patient with OD has masticating ability 1/3 bigger compared to those with conventional denture. However, the patient with OD needs longer time to accomplish number of masticating movement.<sup>6,10,11</sup>

In this case, if the financial standing becomes the main problem in relation to the patient's inadequacy, the other alternative treatment may be provided with immediate denture (ID). However, the use of IOD obviously seems to be much more prominent compared to ID. ID is a temporary denture, because in the restoration process, alveolar ridge reduction leading to the denture instability or looseness. ID requires continuous relining.<sup>12</sup> It is different from IOD, the presence of teeth or remained roots from the original teeth may provide proprioceptive stimulation from receptor appropriately, it makes the occlusal excess capable to send a signal to muscles in order to reduce their contractions.<sup>4,6,13</sup>

Other alternative treatment possibly conducted is by making pin crown on the lower jaw, but the crown may be only constructed after endodontic treatment and teeth cutting, and waiting the reduction of teeth looseness that, of course, make the patient suffer from edentulous phase. However, this method is impossibility applied on the upper jaw because of poor aesthetic condition, foremost on the 11 and 21.

In the case of denture fitting is done immediately, adjustment between denture base and adjacent tissue is achieved by relining. The first stage of relining is advisable to use tissue conditioner intended to adjust the adjacent tissue (especially tooth roots) in order to accept masticating force. After the adjacent tissue has been adjusted, the definitive relining material may be applied using self-cured acrylic. Besides, to preserve the health of tooth roots, it needs to protect from either abrasion or caries, which may be conducted by applying protector fluoride, coping (extended casting metal), or filling (ionomer glass and composite).<sup>8,11,14</sup>

In this case, insertion is conducted through relining by using tissue conditioner (soft tissue treatment), on the last control (1 month), soft liner is disposed and replaced by self-cured acrylic. All steps of relining work are undergone directly (direct technique).

In the first day of control, seemingly, there was a pressure spot presence and no significant complaint. IOD basis was still contacted well to its adjacent tissue. Further, in the following two weeks, it seemed a little distance between IOD basis and its adjacent tissue, the patient also complained about the food remain attached in it. To resolve this problem, the first procedure conducted was relining by using soft liner. After 1 month it indicated that the patient felt satisfied with her denture, there was no complain and it seemed there was no distance between the denture base and its adjacent tissue. In the same time, the soft liner was subsequently replaced by self cured acrylic (Figure 8).

Instruction and promotion about the importance of preserving oral hygiene are expected to grow the patient's awareness of the importance of oral hygiene that leads her to change her habits. Periodical examination within an interval of 6 months will serve appropriate maintenance to the patients' prosthetic, restoration and periodontal condition.

IOD is a treatment using conservative and preventive approaches. If the teeth under the IOD are retained, they can



**Figure 8.** The patient's condition after wearing OD for one month.

protect and assist to preserve the height of alveolar bone. The patient does not necessarily get edentulous phase, and he or she may like this denture type more easily. In this case, the preparation time in needed relatively short due to one visit endodontic treatment. Meanwhile, protecting the opened teetn roots surface are carried out by applying fluoride protector. The success of IOD treatment highly depends on the patient's ability to maintain his or her oral hygiene and denture as well as his or her discipline to visit a dentist.

In conclusion, the maxillary and mandibullary anterior teeth with periodontal problem could be managed through conservative and prosthodontic approach of treatment to recover of its performance and aesthetic function. The patient was quite satisfied with the treatment.

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