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Prosthodontic Management of Anterior Hyperfunction Syndrome Using Immediate Lower Complete Denture: A Case Report

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Abstract: Anterior hyperfunction syndrome (AHS) is a condition due to the absence of support from the posterior teeth occlusion and only remaining lower anterior teeth. An immediate complete denture is a full denture for either the upper or lower jaw that is placed right after extraction of remaining teeth. The immediate lower complete denture is chosen to ensure the patient does not experience being toothless following tooth extractions, while also preserving chewing capability and speech functions. This case report described the management of a 76-year-old male patient with chief complaint of loose maxillary complete denture and difficulty in chewing. Intra oral examination revealed full edentulous maxilla and partially edentulous mandible. There was supraeruption and mobility of lower anterior teeth, resorption posterior mandibular ridges, and loss of vertical dimension of occlusion. Patient was rehabilitated using a new conventional maxillary complete denture and an immediate lower complete denture which be placed immediately after the multiple extraction of anterior lower teeth. Case management involved monitoring at 24 hours, three days, two weeks, eight weeks,12 weeks, and 24 weeks post insertion to observe the resorption process after tooth extraction, which might necessitate relining and rebasing of the artificial teeth. In conclusion, the immediate lower complete denture can restore chewing, speech and aesthetic functions, as well as stable and retentive dentures but still need relining and rebasing to improve its function in this patient.
Keywords: anterior hyperfunction syndrome; immediate complete denture; supraeruption

INTRODUCTION

Anterior hyperfunction syndrome (AHS), also known as Combined Kelly syndrome, is a complex disorder affecting the stomatognathic system.[1,2] It was initially defined by five traits, that are loss of bone from the anterior portion of the maxillary ridge, hyperplasia of the tuberosities, papillary hyperplasia of the hard palate's mucosa, supraeruption of the mandibular anterior teeth, loss of alveolar bone and ridge height beneath the mandibular removable partial denture bases. The AHS mainly caused by edentulism, particularly the loss of upper and posterior mandibular teeth.[1] The prosthodontic rehabilitation of a patient with a complete edentulous maxilla and a partial edentulous mandible presents many difficulties for the clinician.[3]

An immediate complete denture is a prothesis that is made to be inserted immediately after tooth extraction, so, that the patient does not have to experience a period of being toothless.[4] Immediate dentures can be divided into two types, namely interim immediate dentures and conventional immediate dentures. Interim immediate dentures are temporary dentures for reasons of aesthetics, mastication, occlusal support. Conventional immediate dentures are immediate dentures, which are modified into permanent dentures.[5] Indications for immediate dentures it can be used for anterior teeth with large caries, teeth with periodontal disorders, abnormalities in the position of the arrangement of anterior teeth, patient with good general health dan oral hygiene.[5,6] Patient with systemic disorders, mental stability, cannot cooperate, emotionally disturbed, acute pathological disorders, excessive bone loss are contraindications for immediate denture.[5]

CASE REPORT

We reported a 76-year-male patient who came to a private clinic, primarily reporting issues of loose maxillary complete denture and challenges in mastication. The patient had controlled diabetes mellitus. At the first visit, the assessment showed that there were all missing teeth in the maxilla with loss of bone, and missing of teeth 35 33 32 31 41 42 43 on the mandibula. Teeth mobility grade 3 from 33-43 and mobility grade 1 on 35 were also found (Figure 1). The patient was given preprosthetic treatment (scaling) on the anterior lower teeth and also treatment options. The patient also declined implant-based treatment due to financial and surgical constraints. The patient preferred to avoid having his teeth removed until the new dentures were ready. The treatment plan involved new complete dentures for maxilla and immediate complete denture for mandible (extraction from 33-43 were planned and maintained 35 because it is expected to last longer). Upper preliminary impressions were made with Alginate (Aroma Fast, GC) poured with dental stone (Pro model super, Pro Dental) to make model cast for diagnosis and treatment planning also individual impression tray for patient. A referral letter was forwarded to his internist for a medical consultation regarding the medication he was using before the extraction.

At the second visit, after the individual custom tray fit the upper and lower jaws, border molding was recorded using heated greenstick compound (Peri compound border molding impression material, GC Corporation, Japan), followed by the upper final impression using medium body (Masterdent, Dentonics) and lower one using alginate (Aroma Fast, GC) (Figure 2).

Figure 1. Initial condition of patient with loose upper complete denture and supraeruption teeth in anterior mandibula

Figure 2. Final impression of upper and lower jaws

At the third visit, vertical dimension determination was carried out (Figure 3). Determination of vertical dimensions in edentulous patients began with determining the resting vertical dimension without using the upper and lower bite rims. The patient was asked to pronounce the letter "M" and in a resting position the vertical dimension was measured. The vertical dimension of occlusion was obtained from the vertical dimension at rest, minus the free-way space of 2-4 mm to obtain the vertical dimension of occlusion then continued mounting on an articulator. Then, tooth selection was carried out. Teeth were selected with a smaller-occlusal plane, and the number of teeth was reduced. Teeth were positioned in a bilateral balanced occlusion, with color and size coordinated to the patient's skin tone and facial structure (Figure 4).

At the fourth visit, denture try-in was checked for colour and vertical dimension. Patient was satisfied with the colour and shape of the teeth. In the lab, the remaining anterior lower teeth in the master cast were ground down 1-2 mm apically, simulating a post-extraction socket. Acrylic teeth were promptly positioned on the cast, the gingival region was shaped, and the immediate complete denture was fabricated using heat-cured resin acrylic.

Figure 3. Vertical dimension determination

Figure 4. Tooth arrangement was performed

At the fifth visit, extraction of all anterior teeth 33, 32, 31, 41, 42, 43 with grade 3 mobility was performed (Figure 5), then dentures were inserted immediately after tooth extraction (Figure 6).

Figure 5. Post extraction anterior lower teeth

Figure 6. The upper jaw used conventional full denture meanwhile the lower jaw used immediate denture

The patient was instructed to have a liquid diet and not to remove the dentures for 24 hours after the installation of the denture. At the first control (24 hours post insertion), patient

complained of pain in the area of the extraction site. The denture was removed by the operator and a traumatic ulcer was seen on the buccal surface of the residual ridge in the area of the extraction site. Examination with PIP (pressure indicating paste) was carried out to determine whether there were any parts that pressed excessively on the mucosa, and relief was performed on the denture in the area of post-extraction trauma until no part of the denture pressed on the area when the denture was installed. Addition of a soft liner to the denture in the area of the extraction site and examination of occlusion and articulation with articulating paper were performed.

At the second control (72 hours post insertion), during anamnesis, the patient complained of uncomfortable feeling while eating using the denture. In clinical examination, the traumatic ulcer on the buccal surface of the residual ridge in the area of the extraction site had improved. Examination with PIP was done to determine whether there were any parts that pressed excessively on the mucosa and examination of occlusion and articulation with articulating paper.

At the third control (two weeks post insertion), the patient felt comfortable with his new denture, but felt more mobility on tooth 35 from grade 1 to grade 2. The dentist and patient agreed that the tooth could not be saved and the patient was willing to have it extracted. Therefore, extraction of 35 was performed at the same day and denture was repaired with adding the tooth element 35. The denture was reinserted one week after extraction of 35, which already had been added the tooth element on 35.

At the fourth control (eight weeks post insertion), the patient still had complaint. Reline was performed with autopolymerising acrylic resin (Tokuyama Rebase II), so, that the denture could adapt well to the surface of the residual ridge after extraction which was already stable. At the fifth control (12 weeks post insertion), the patient had no longer any complaints. At the sixth control (24 weeks post insertion), the patient did not complain of pain either during installation, biting, or chewing (Figure 7).

Figure 7. Condition after 24 weeks post insertion

DISCUSSION

Anterior hyperfunction syndrome (AHS) usually characterizes with anterior bone loss in the maxilla and supraeruption of the lower anterior teeth.[2] In this case based on examination tooth 33,32,31,41,42,43 extruded with mobility grade 3 and mobility grade 1 on 35. Tooth with mobility grade 3 were indicated to be extracted, the patient refused to experience the edentulous phase especially the upper front teeth because it could interfere with his appearance, therefore immediate denture treatment was chosen. The patient also declined implant-based treatment due to financial and surgical constraints. in the third control as the time heals the wound there is increasing mobility in tooth 35. The dentist and patient agree to do extraction on 35 and do denture repair with adding the teeth element 35. The denture reinserted one week after 35 was extracted. This patient had been followed up to 24 weeks from the initial extraction.

Immediate denture minimizes the number of visits required, as tooth extractions are performed right before the denture placement, eliminating the need to wait for healing. Tooth extraction leads to the resorption of alveolar bone.[7] Recovery following tooth extraction typically lasts 4-6 weeks; as a result, numerous patients delay the extraction procedure due to their unwillingness to go through the period of tooth loss, particularly for front teeth. Immediate dentures are very applicable in many cases that are often found in clinics, because patients will

not experience the phase of being toothless. The facial muscles remain supported, and the new dentures can maintain the position of the patient's teeth as before they were extracted.

To achieve a successful immediate complete denture, mucostatic impression to record maximum denture-bearing area and better stress distribution occlusal scheme was modified for balanced occlusion in various mandibular movements.[3] Utari also success in fabricating immediate complete denture with flat ridge use closed mouth impression method.[8] Once the healing of the extraction site is complete, the denture can be either relined or substituted with a new prosthesis. Prior to the process of creating immediate dentures, the patient receives multiple explanations, such as the potential discomfort and pain at the extraction site; challenges with eating and speaking; the need to wear immediate dentures for the initial 24 hours without removal, followed by an evaluation after 24 hours to assess retention, stability, and support of the denture; a tendency for increased saliva production; and the necessity for relining immediate dentures due to changes in the supporting tissue.[9]

Besides aesthetic factors in this situation, immediate dentures offer several benefits, including support around the mouth, retention of muscle function, jaw alignment, and facial height; reduced post-surgery discomfort since the extraction site is shielded from food and the tongue; straightforward replication of the original teeth's position and shape; gradual adaptation for the patient to the denture during healing; and positive reinforcement for the patient's mental well-being.[9] A continuous follow-up of 8 to 12 months is essential to guarantee a successful outcome of immediate denture.[4]

Fabrication of immediate denture might be more difficult because we cannot predict the arrangement of the tooth and treatment outcome, especially in the anterior part where the extractions were carried out. Try-in cannot be done in all the anterior arrangement; the final arrangement will be visible when the denture are inserted.[10,11] Correct indication, as well as precise extraction of clinical and laboratory fabrication procedure also play an important role in the success of immediate denture.[10,12] The dentist must be prepared for any possibility that might be happen like bleeding form extraction, pain control, and prolonged dental visit.[11]

CONCLUSION

In this case, the immediate complete dentures for lower jaw plays a very important role in the patient's aesthetic and psychological aspects because the patient does not go through the phase being toothless. Patient was also satisfied with the denture even though it needed relining to achieve better retention and stabilization. Good cooperation is needed between the dentist and patient to achieve comfortable denture.

Conflict of Interest

The authors declare that there is no conflict of interest in this case report.

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