

Esthetic improvement using maxillary immediate denture and mandibular overdenture

¹Finka Nur Ikhwani, ¹Vera Aryanti, ²Setyawan Bonifacius, ²Rasmi Rikmasari

¹Resident of Prosthodontics Programme

²Department of Prosthodontics

Faculty of Dentistry University of Padjadjaran

Bandung, Indonesia

Corresponding author: Finka Nur Ikhwani, e-mail: finkanurikhwani@gmail.com

ABSTRACT

Loss of teeth in adult needs to be replaced with dentures to restore masticatory and esthetic functions. Dentures are made immediately before extraction and used immediately after extraction, so that they do not change in appearance or function. If patient has restorable teeth, the teeth can be used as denture support. Overdentures supported by one or more restored teeth or implants as periodontal and mucosal support to improve durability of the denture. This article discusses maxillary immediate denture and mandibular overdenture on a woman who felt uncomfortable with the denture that has been used for 4 years. Patient wants a new denture without changing appearance. Intraoral examination found tooth 17, 16, 26 GIC fillings, 13 dowel crown, 31, 32 PFM crowns, 42 composite filling with mobility grade I, and 44 caries. This case was managed with extraction teeth 16, RCT 26, and extraction 13 before insertion the maxillary immediate denture with cusil #17 and overdenture 26, and also RCT was performed on 44, 42, 32, 31 followed by insertion the magnetic overdenture 44, 42 and metal coping overdenture 31, 32. It is concluded that immediate denture and overdenture provide optimal results for esthetic improvement and patient satisfaction.

Keyword: immediate denture, overdenture, magnetic overdenture, metal coping overdenture

INTRODUCTION

Tooth loss in adulthood needs to be replaced by dentures to restore esthetics, masticatory, and phonetics function. Immediate dentures are made before tooth extraction which are used immediately after tooth extraction so that the patient does not experience changes in appearance and function. Advantages of immediate denture, that is maintain the appearance, minimize changes in speech and mastication function, facilitate adaptation of prostheses, reduce alveolar bone resorption, protect post-surgical area, and facilitate transfer of patient's natural jaw relationship, shape, and arrangement of teeth to be reproduced. The disadvantages are cannot replace natural tooth and require longer treatment after extraction (i.e relining, occlusal adjustments, and addition of labial flange).^{1,2}

If a patient has teeth that have been endodontically treated with good supporting tissue, these teeth can be used as denture supports. Tooth extraction may cause loss of periodontal tissue as part of the sensory mechanism, which alter the acceptance of strain and pressure loads on alveolar bone becomes greater. This condition leads alveolar bone resorption process, which will affect the area of the denture support. Preventive prosthodontic treatment emphasizes the importance of delaying or eliminating problems that may interfere prosthodontic treatment. Overdenture treatment is a preventive prosthodontics which preserves one or more natural teeth to prevent resorption of the alveolar ridge. An overdenture is a removable denture that co-

vers and rests on one or more natural teeth, natural tooth roots, or implants. The advantage of overdenture treatment is to maintain the condition of the alveolar ridge, both in height and volume. Presence of natural teeth affect a significant difference between overdenture and conventional dentures, sensory function of periodontal ligament provides psychological benefits. Proprioceptive sensors provide information about direction and magnitude of the loads/forces. This improves patient's coordination and ability when using denture.^{3,4} This case report discussed treatment of maxillary immediate denture and mandibular overdenture complete denture.^{3,4}

CASE

A 64-year-old female came to the Dental Hospital of Universitas Padjadjaran to get a new denture because the patient felt uncomfortable with the denture that had been worn for 4 years and some teeth were extracted due to fractures. Patient has been using valplast dentures on maxilla and mandible. The last history of tooth extraction was in January 2020 on right mandible tooth due to fract-



Figure 1 Intial extraoral condition



Figure 2 Initial intraoral condition

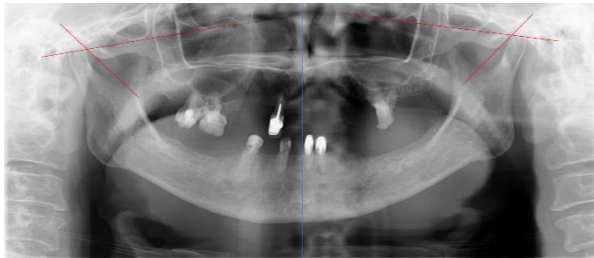


Figure 3 Panoramic radiograph

ure. Intraoral examination, teeth 17, 16, 26 were filled with GIC, 13 post crown, 31 and 32 PFM crown, 42 composite filling with mobility grade I, and 44 secondary caries (Fig.1,2,3).

MANAGEMENT

The patient was managed with maxillary immediate complete denture with cusil 17 and attachment supported overdenture teeth 26 and mandibular complete denture with attachment supported overdenture on teeth 44, 42 and tooth supported overdenture on teeth 31, 32.

At the first meeting, make impression of maxilla and mandibula to fabricate bite rims and measure vertical dimensions (occlusion was 57 mm and rest position was 59 mm), and determine centric relations. Bite rim was transferred to adjustable articulator to make a mock up (Fig.4).

Mock-up was made and tried in on the patient by



Figure 4 Measurement of vertical dimensions and centric relations.



Figure 5 Mock up try in

changing class III relation to class I relation (Fig.5). Patient agreed with this new condition. Next step was mouth preparation started from the maxilla, tooth 17 was repaired with composite fillings, tooth 16 was extracted, tooth 13 was also extracted because the crown and post could not be removed and there were complaints of pain, tooth 26 was treated endodontically (Fig.6) and restored with magnetic posts. In the mandible, teeth 32 and 42 treated endodontically and restored with metal coping posts, tooth 31 treated endodontically and restored with magnetic posts (Magfit 400) and also tooth 44 restored with magnetic posts (Magfit 800) (Fig.7).

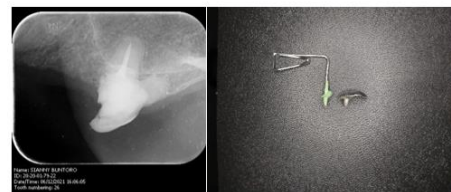


Figure 6 Treatment of tooth 26

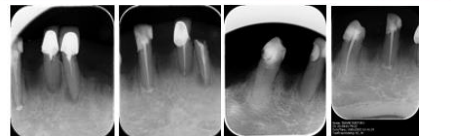


Figure 7A Treatment of teeth 32, 31, 42, 44, B teeth 31, 32; C teeth 42, 44

After mouth preparation was done, muscle trimming and physiological impressions were performed. Furthermore, re-checking the vertical dimensions and centric relations using previous bite rim. After that, facebow transfer was done, right horizontal condylar angle (H) was 54° and left was 55°, and the Bennet angle (L) was calculated by Hanau formula resulting in a right angle of 18.75° and left



Figure 8 Try in denture



Figure 9 Insertion



Figure 10 Final result of maxilla and mandibula denture

18.87°. After that, trial of dentures until patient comfortable. Denture wax pattern was packaged using acrylic. Prior to insertion, tooth 13 was extracted (Fig.8,9,10,11)).

DISCUSSION

Procedure of making dentures is generally carried out within 8-12 weeks after tooth extraction, be-

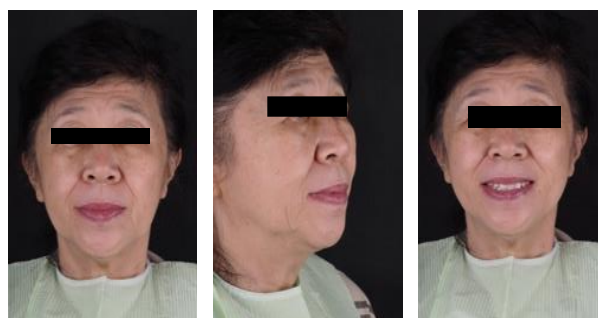


Figure 11 Final extraoral condition

cause alveolar bone resorption generally occurs. Therefore, periodic control is needed on the installation of immediate dentures, considering changes in alveolar bone which may cause the denture unstable. Relining procedure is generally performed 3-6 months after placement of immediate denture to fill the gap formed by alveolar bone resorption.^{5,6}

The success of immediate dentures supported by several factors, such as case selection, diagnosis, planning, careful surgical protocol, modification of impression, manufacture of dentures, and patient expectations. Selection of the right case plays an important role in success because not all cases can be made an immediate denture.⁷

Retention and stabilization problems often occur in mandibular dentures due to smaller supporting tissue area than maxilla. Making overdenture in mandible will reduce this problem by maintaining height and shape of alveolar bone. Conventional overdenture has advantages over implant support due to the presence of tooth roots and periodontal tissue that produce proprioceptive sensors that provide sense of comfort, mastication, and better psychological function.⁸

It is concluded that treatment of immediate dentures and overdenture can be combined to produce esthetic improvements in edentulous patients.

REFERENCES

1. Yeung C, Leung KCM, Yu OY, Lam WYH, Wong AWY, Chu CH. Prosthodontic rehabilitation and follow-up using maxillary complete conventional immediate denture. *Clin Cosmet Investig Dent* 2020; 23(12):437-45. doi:10.2147/CCIDE.S271304. PMID: 33122954; PMCID: PMC7591000.
2. Caputi S, Murmura G, Ricci L, Varvara G, Sinjari B. Immediate denture fabrication: a clinical report. *Ann Stomatol* 2014; 4(3-4):273-7. PMID: 24611094; PMCID: PMC3935354.
3. Kraljevic I, Glenz F, Jordi C, Zimmermann SD, Joda T, Zitzmann NU. Long-term observation of post copings retaining overdenture prostheses. *Int J Prosthodont* 2020;33(2):169-75. doi: 10.11607/ijp.6629. PMID: 32069341.
4. Chhabra A, Chhabra N, Jain A, Kabi D. Overdenture prostheses with metal copings: a retrospective analysis of survival and prosthodontic complications. *J Prosthodont* 2019;28(8):876-82. doi:10.1111/jopr.12756. Epub 2018. PMID: 29430787.
5. Nayak D, Singhal R, Agarwal S, Hussain S, Javed B, Gupta S. Immediate denture: a review. *Int J Sci Res* 2020; 9(2). Doi:10.36106/ijsr
6. Lavere AM, Krol AJ. Immediate denture service. *J Prosthet Dent* 1973;29(1):10-2.
7. Sharma K, Khurana P, Bhatia V, Priyanka. Fabrication of an immediate denture: a casereport. *Int J Sci Healthcare Res* 2020;5(1):247.
8. Arafa O. Effect of the vitality of the overdenture abutment tooth on stability. *Saudi J Oral Sci* 2016; 3(1).