

Prosthodontic rehabilitation of a complete edentulous patient with mandibular prognathism: A case report

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ABSTRACT

Background: Rehabilitation of completely edentulous patients with mandibular prognathism remains a clinical challenge because abnormal maxillomandibular relationships compromise denture retention, stability, occlusion, and function. Evidence describing prosthodontic management of this condition is still limited. **Objective:** To describe the prosthodontic rehabilitation of a completely edentulous patient with mandibular prognathism using complete dentures with an edge-to-edge tooth arrangement. **Case Presentation:** A 57-year-old male presented with complete edentulism for approximately ten years and complained of impaired mastication and speech. Clinical examination revealed a prognathic mandibular relationship with a 2-mm mandibular deviation to the right and severe alveolar ridge resorption. **Treatment:** The patient underwent conventional complete denture fabrication including preliminary and final impressions, jaw relation recording, semi-adjustable articulator mounting, and edge-to-edge anterior tooth arrangement to accommodate the skeletal discrepancy. **Results:** One month after denture insertion, clinical evaluation demonstrated satisfactory denture retention and stability without mucosal ulceration or occlusal interference. The patient reported improved chewing ability, speech, aesthetics, and overall satisfaction with the prosthesis. **Clinical Significance:** Edge-to-edge tooth arrangement can be considered a practical treatment option for complete denture rehabilitation in selected patients with mandibular prognathism, providing acceptable retention, stability, and functional outcomes despite unfavorable jaw relationships.

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INTRODUCTION

Complete edentulous is a condition defined as the loss of all teeth, a worldwide phenomenon (Lee & Saponaro, 2019). Complete edentulous occurs due to biological disease processes, such as dental

caries, periodontal disease, trauma, or cancer in the oral cavity. Patients with complete edentulous may be accompanied by several systemic diseases that can significantly affect a person. The prevalence of complete edentulous patients in Indonesia continues to increase due to the increasing elderly population (Al-Rafee, 2020), (Utami, 2025).

Prognathism according to The Glossary of Prosthodontics Terms is a condition in which the mandible protrudes in relation to the maxilla. Management of patients with complete edentulousness to obtain stable dentures is a challenge for dentists, especially in patients with prognathic mandibular jaw relationships (Rangarajan & Padmanabhan, 2024), (Uma, 2025). The criteria established for normal or retrognathic maxillary occlusion do not apply to interocclusal distance, mandibular movement, tooth-to-tooth relationships, or occlusion as in prognathic mandibular conditions, which makes the treatment of patients with prognathic mandibular jaw relationships more challenging to achieve excellent clinical results. One of the main problems that dentists will face is the arrangement of the dentures. Good occlusion is one of the criteria for obtaining stable dentures. In cases of prognathic mandible, the arrangement of teeth in an edge-to-edge relationship can be performed (Alhazmi & Abdurahiman, 2023), (Ismiyati, Maharani, & Nuryanti, 2025). Despite the availability of several occlusal approaches for Class III jaw relationships, there remains limited clinical evidence describing the rehabilitation of completely edentulous patients with mandibular prognathism using conventional complete dentures. Most published reports focus on general denture fabrication or skeletal Class III malocclusion rather than the specific prosthodontic management of edentulous prognathic patients. Consequently, clinicians often encounter uncertainty in selecting an appropriate tooth arrangement capable of providing adequate retention, stability, and functional occlusion in these challenging cases. Therefore, this case report presents the prosthodontic rehabilitation of a completely edentulous patient with mandibular prognathism using an edge-to-edge tooth arrangement. This report contributes clinical evidence regarding treatment planning, tooth arrangement, and short-term functional outcomes that may assist clinicians in managing similar cases.

This case report will describe a patient with mandibular prognathic condition who underwent complete denture prosthodontic rehabilitation at RSGM Maranatha. Complete dentures are dentures made to replace all missing natural teeth (Susanti, 2024), (Djafri, 2023). The purpose of making complete dentures is to replace all missing teeth and their tissues so that it can improve or restore masticatory, phonetic, and aesthetic functions, as well as correct abnormalities, disorders, and diseases caused by edentulous conditions (Rahajoe, 2021), (Furqan, Santoso, Fatmasari, & Bakhtiar, 2024).

RESEARCH METHOD

A 57-year-old male patient came to RSGM Maranatha with complaints of losing all RA and RB teeth in the last 10 years, causing difficulty in speaking and chewing. The patient admitted to having lost all his teeth in the past 3 months ago since the root remnants were removed. The patient had never worn dentures before and wanted to have complete dentures made (Furqan et al., 2024), (YUNITA, 2024).

Extraoral examination (Figure 1) showed a pointed face, concave facial profile, symmetrical lips, abnormal mouth opening (43 mm), mandibular opening deviated to the right by 2 mm. Intraoral examination showed that the patient had poor oral hygiene, moderate RA arch size and small RB, with ovoid maxillae and mandibular arch shapes. The patient appeared to have lost all teeth (Figure 2). Afterwards, the patient was given informed consent to undergo a complete denture treatment procedure starting with panoramic radiography first. The results of the supporting examination of panoramic radiography can be seen in Figure 3. This examination was carried out to see if there was any abnormality in the shape of the temporomandibular joint, and it can be seen that the condition of the temporomandibular joint had shrunk and changed shape, so the patient was suspected of having a temporomandibular disorder. The treatment plan

implemented for the patient consists of three main components. First, the patient received Oral Hygiene Instruction (OHI) and Dental Health Education (DHE) to improve understanding and practice of appropriate oral care. Second, a removable full denture (GTL) was fabricated to restore function and aesthetics. Finally, the patient was advised to attend recall appointments every six months to monitor oral health status and ensure the long-term success of the treatment..



Figure 1. Initial extraoral documentation



Figure 2. Intraoral intraoral documentation

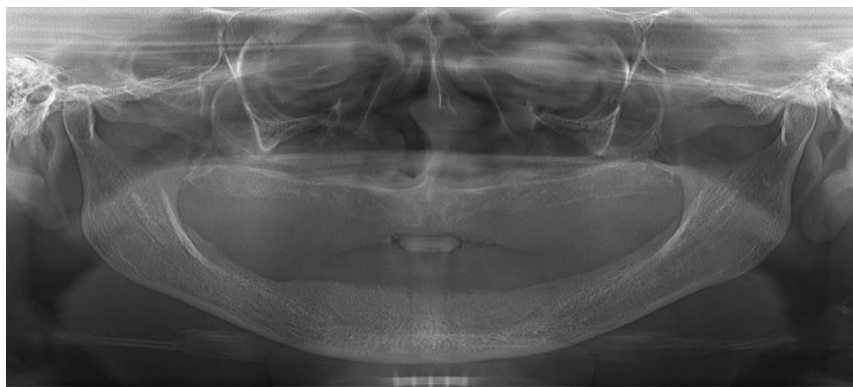


Figure 3. Panoramic radiography examination

The procedure of making complete dentures on patients begins with initial impressions with alginate material and making diagnostic models. Diagnostic models are also used to determine the design of complete dentures. The design of complete dentures must be based on primary retention, secondary retention, tissue support, stabilization, phonetics, and aesthetics. From the diagnostic model, an individual custom tray made of acrylic resin is then made. This minimizes tissue displacement and changes in the dimensions of the impression material and produces an impression with the right extension. The individual impression tray is then used for

the muscle trimming procedure on the upper and lower jaws using xantigen. Muscle trimming is done to print the supporting tissue structure. (Figure 4).



Figure 4. Muscle trimming with the use of individual custom tray

After the maxillary and mandibular muscle trimming procedures, final impressions were made. Final impressions were made using zinc oxide eugenol paste impression material (Figure 5). The final impressions were then beaded and boxed to obtain a working model. The maxillary and mandibular occlusal rims were made on the working model using a wax base plate. After the occlusal rim was completed, the occlusal rim was tried-in on the patient and vertical dimensions and centric relation determination were performed (Figure 6). After completion, the working model was mounted on a semi-adjustable articulator.



Figure 5. Final impression with ZOE impression material



Figure 6. Vertical dimension and centric relation recording

The arrangement of teeth begins with the anterior teeth arranged in an edge-to-edge relationship. Next, a trial of the dentures is carried out on the patient for aesthetics, after being approved by the patient. After an evaluation is carried out that the dentures have been able to adapt well, are stable in the oral cavity and are not easily removed, the dentures are continued to be processed. After processing, finishing, and polishing are completed, the patient is called for insertion. Before inserting the denture, it is necessary to evaluate the denture for porous or sharp parts. If the denture has been polished and smooth (Figure 7), it can be inserted into the patient's mouth (Figure 8) by paying attention to the adaptation of the base, retention, stabilization, occlusion, aesthetics, and phonetics of the patient.



Figure 7. Final polished and finished removable complete denture



Figure 8. Insertion of the removable complete denture

Patients are also given post-insertion instructions, namely how to remove and install dentures and that dentures are not as efficient as natural teeth, so they need to learn to adapt to wearing new dentures and the adaptation time can take up to 3 weeks or longer. Speech will feel stiff, so you should practice often. If there are complaints or pain, consult a dentist. Dentures and mucosa should be cleaned after eating using a soft brush and toothpaste. If not used, dentures should be soaked or kept wet to prevent shrinkage. Dentures should also be removed 8 hours a day (at night) to rest the supporting tissue and soak in denture cleaner or water or mouthwash. If loose, dentures must be refitted or replaced. Check with a dentist every 3-6 months

RESULTS AND DISCUSSIONS

Patients with complete edentulousness require complete dentures because they encompass various purposes of improving the patient's function, one example of which is mastication function.⁵ Complete dentures can also restore the vertical dimension height that has decreased due to the long-term loss of all teeth without replacement. Residual resorption changes in the maxillary and mandibular ridges can also occur when teeth are lost one by one (Putri, 2023), (Fadila, 2024). In the present case, the fabricated complete dentures demonstrated satisfactory adaptation during insertion and follow-up. Clinical examination after one month showed acceptable denture retention and stability during functional movements without evidence of mucosal ulceration or occlusal interference. The patient also reported improvement in chewing ability, speech, facial appearance, and overall comfort.

Aesthetic changes in the face associated with a completely edentulous state include a deeper nasolabial groove, loss of labiodental shape, more pointed lips, and a prognathic mandible (Rahim, 2024), (Everhard, 2019). This proves that tooth loss can affect a person's appearance. Dentists who have successfully treated or restored the patient's oral cavity can restore function and improve the aesthetic appearance of completely edentulous patients (Daryono, 2024), (Lubis, 2024). Similar functional improvements have been reported in previous case reports involving complete dentures for patients with unfavorable jaw relationships. Alhazmi and Abdurahiman (2023) reported that individualized tooth arrangement significantly improves denture stability in Class III jaw relationships. Likewise, Rangarajan and Padmanabhan (2024) emphasized that successful rehabilitation depends on appropriate occlusal modification according to skeletal morphology. The present case supports these findings because satisfactory denture stability was achieved despite the prognathic mandibular relationship.

The maxillae and mandibular relationship involves a deviation from the normal physiological relationship that happened because of the chronic complete edentulous state.⁷ Mandibular prognathic conditions are often associated with challenging complete denture treatment.⁹ In this case, the patient presented with alveolar bone resorption. The same fundamental considerations of anatomy, physiology, and masticatory function must be made before further treatment is initiated (Furqan et al., 2024), (Amalia & Putri, 2026).

The placement and arrangement of teeth in prognathic patients is the key to successful treatment of prognathic mandibular patients. There are many ways to address the situation of prognathic mandibular jaw relationships. Some of these include cross-bite or edge-to-edge bite adjustments (Mufeed, Adel, & Wadallah, n.d.). In this case, the prognathic mandibular jaw relationship is addressed by edge-to-edge tooth arrangement. The maxillary and mandibular teeth are arranged as close as possible to the labial plate of the alveolar bone with the inclination of the maxillary anterior teeth labially and the mandibular anterior teeth lingually. This is done so that stability can be achieved (Triana, 2024). Edge-to-edge tooth arrangement offers several clinical advantages, including reduced horizontal occlusal forces, improved denture stability, and easier achievement of balanced occlusion in patients with mild to moderate mandibular prognathism. However, the technique also has limitations. In severe skeletal discrepancies, esthetics may be compromised, posterior occlusal contacts may become difficult to establish, and denture instability may still occur. Alternative treatment options include crossbite tooth arrangement, implant-supported overdentures, or orthognathic surgery depending on patient conditions and available resources.

Although there are no reference teeth in completely edentulous treatment, the maxillomandibular relationship must be recorded by precisely creating and contouring the occlusal rim so that when the teeth are arranged, the jaw relationship can be transferred to an articulator that can replicate the movement and arrangement of the artificial teeth (Azer, 2023).

Mandibular prognathic conditions treated with edge-to-edge tooth arrangement may be indicated to obtain a stable occlusion. Artificial tooth arrangement is considered an art based on

biomechanical factors. The occlusion must be able to function efficiently with minimum trauma to the supporting tissues, whether in normal or abnormal jaw relations (Furqan et al., 2024), (Suwandi, 2020).⁷ It is therefore very important for dentists to know and understand the patient's situation or condition which requires special adjustments to the standard principles of tooth arrangement. Objective clinical evaluation demonstrated satisfactory denture retention against vertical dislodgement and acceptable stability during mastication and lateral mandibular movement. No pressure spots, mucosal ulceration, or occlusal discrepancies requiring major adjustment were observed during the one-month follow-up.

At the one-month follow-up, the patient reported satisfaction with denture retention, stability, chewing ability, speech, and facial appearance. Although standardized patient-reported outcome measures, such as the OHIP-EDENT questionnaire or a visual analogue scale (VAS), were not administered, subjective patient feedback and clinical examination indicated successful short-term rehabilitation. Future studies should incorporate validated clinical outcome measures to strengthen the evidence supporting this treatment approach. (PANORAMIK, PESYARATAN, SARJANA, & FAUZIAH, n.d.).

CONCLUSION

This case report demonstrates that conventional complete denture rehabilitation using an edge-to-edge tooth arrangement can provide satisfactory short-term functional and prosthetic outcomes in a completely edentulous patient with mandibular prognathism. Careful assessment of the maxillomandibular relationship, accurate jaw relation recording, and individualized tooth arrangement were essential to achieving acceptable denture retention, stability, and patient adaptation. Scientifically, this report contributes additional clinical evidence regarding prosthodontic management of completely edentulous patients with mandibular prognathism, a condition that remains relatively underreported in the literature. The findings support the use of individualized occlusal modification as an important consideration when managing patients with unfavorable jaw relationships. From a clinical perspective, this case provides practical guidance for prosthodontists and general dentists in selecting an appropriate tooth arrangement to improve denture stability and function while minimizing occlusal complications. The described approach may serve as an alternative treatment option for patients who are not candidates for implant-supported prostheses or orthognathic surgery. In healthcare practice, careful diagnosis, individualized treatment planning, and regular post-insertion follow-up are recommended to optimize long-term treatment success and patient satisfaction. Future studies with longer follow-up periods and standardized clinical outcome measurements are needed to strengthen the evidence for this treatment approach.

References

- Al-Rafee, M. A. (2020). The epidemiology of edentulism and the associated factors: A literature Review. *Journal of Family Medicine and Primary Care*, 9(4), 1841-1843.
- Alhazmi, S. T. F., & Abdurahiman, V. T. (2023). Managing class III jaw relations. *Clinical Case Reports*, 11(5), e07335.
- Amalia, A., & Putri, S. A. (2026). *Bedah Mulut: Panduan Lengkap Bedah Maksilofasial bagi Praktisi Gigi*. Afdan Rojabi Publisher.
- Azer, S. S. (2023). Simulating mandibular movements and articulator design. *The Journal of Prosthetic Dentistry*, 129(3), 377-379.
- Daryono, D. (2024). *Kunci Sukses Klinik Gigi: Kepuasan Pasien sebagai Prioritas*. MEGA PRESS NUSANTARA.
- Djafri, R. (2023). EVALUASI TINGKAT KEPUASAN PASIEN PENGGUNA GIGI TIRUAN LENGKAP PADA KASUS FLAT RIDGE RSGM UNHAS TAHUN 2019-2021. Universitas Hasanuddin.
- Everhard, N. C. (2019). Penurunan Dimensi Vertikal Wajah Pada Lansia Akibat Kehilangan Gigi Posterior Di Tegalsari Kota Semarang. Universitas Muhammadiyah Semarang.

- Fadila, A. (2024). PEMBUATAN GIGI TIRUAN SEBAGIAN LEPASAN AKRILIK RAHANG ATAS FREE END UNILATERAL DAN RAHANG BAWAH BILATERAL DENGAN KASUS ROTASI GIGI 44 DISERTAI RESORBSI TULANG ALVEOLAR. Poltekkes Kemenkes Tanjungkarang.
- Furqan, M., Santoso, B., Fatmasari, D., & Bakhtiar, D. A. (2024). Asuhan Kesehatan Gigi Dan Mulut Pada Pasien Kontak Prematur. Yayasan Pendidikan Cendekia Muslim.
- Ismiyati, T., Maharani, A. S., & Nuryanti, A. (2025). *Rehabilitasi Kehilangan Gigi dengan Gigi Tiruan Sebagian Lepasan*. UGM PRESS.
- Lee, D. J., & Saponaro, P. C. (2019). Management of edentulous patients. *Dental Clinics*, 63(2), 249–261.
- Lubis, F. L. C. (2024). KOMUNIKASI KESEHATAN DOKTER GIGI DALAM MENINGKATKAN KESEHATAN GIGI PASIEN DI KLINIK AHMAD AFFANDI DENTAL CARE JALAN GAPERTA NO. 28 MEDAN. Fakultas Ilmu Sosial & Ilmu Politik, Universitas Islam Sumatera Utara.
- Mufeed, A., Adel, W., & Wadallah, N. (n.d.). Biomechanical Factors Affect Tooth Arrangement for Different Arch Relationship.
- PANORAMIK, W. D. M. R., PESYARATAN, U. M., SARJANA, M. G., & FAUZIAH, L. (n.d.). PERBEDAAN BESAR SUDUT GONIAL MANDIBULA PADA PRIA DAN.
- Putri, N. S. (2023). PEMBUATAN GIGI TIRUAN SEBAGIAN LEPASAN AKRILIK RAHANG ATAS DAN RAHANG BAWAH FREE END DENGAN KASUS RESORBSI TULANG ALVEOLAR. Poltekkes KemenkesTanjungkarang.
- Rahajoe, S. O. (2021). Gigi tiruan lengkap resin akrilik pada kasus full edentulous. *JIKG (Jurnal Ilmu Kedokteran Gigi)*, 4(2), 53–57.
- Rahim, J. (2024). ANALISIS ANTROPOMETRI PERUBAHAN PROFIL WAJAH PADA PASIEN YANG MENGGUNAKAN PIRANTI MYOFUNCTIONAL PREFABRICATED MYOBRACE BERDASARKAN GOLDEN RASIO WAJAH DALAM BIDANG FRONTAL DAN LATERAL. Universitas Hasanuddin.
- Rangarajan, V., & Padmanabhan, T. V. (2024). *Textbook of Prosthodontics-E-Book*. Elsevier Health Sciences.
- Susanti, H. (2024). GAMBARANTINGKATKEPUASANMASYARAKATPEMAKAIGIGI TIRUAN LEPASAN DI DESA BANDING AGUNG KECAMATAN TALANG PADANG KABUPATEN TANGGAMUS. Poltekkes Kemenkes Tanjungkarang.
- Suwandi, T. (2020). Keterkaitan antara bidang orthodonti dan periodonti dalam perawatan estetika rongga mulut. *Jurnal Kedokteran Gigi Terpadu*, 2(1).
- Triana, A. (2024). PEMBUATAN GIGI TIRUAN SEBAGIAN LEPASAN AKRILIK RAHANG BAWAH KLASIFIKASI KENNEDY KELAS III MODIFIKASI 1 DENGAN KASUS MIGRASI GIGI DISERTAI RESORBSI TULANG ALVEOLAR. POLTEKKES KEMENKES TANJUNGGARANG.
- Uma, U. (2025). Occlusal analysis using a novel classification of static and dynamic articulations in TMD and non-TMD patients.
- Utami, S. (2025). *Gigi Sehat Lansia: Pentingnya Merawat Mulut Di Usia Lanjut*. Deepublish.
- YUNITA, D. E. A. (2024). GAMBARAN PENGETAHUAN IBU TERKAIT PENCABUTAN GIGI PERSISTENSI DI PUSKESMAS KEBUN TEBU LAMPUNG BARAT TAHUN 2024. POLTEKKES KEMENKES TANJUNGGARANG.