Health & Medical Sciences Volume: 3, Number 2, 2026, *Page*: 1-12

Removable Partial Denture Treatment in A-32 Years Old Patient: Case Report

Aldita Nabila Indria*, Agung Priyambodo, Dharma Satya Aprianto

Universitas YARSI

DOI:
https://doi.org/10.47134/phms.v3i2.579
*Correspondence: Aldita Nabila Indria
Email: alditanbl.dentistry@gmail.com

Received: 22-12-2025
Accepted: 22-01-2026
Published: 22-02-2026

Abstract: This case report presents the prosthodontic management of a 32-year-old female patient who attended YARSI Dental Hospital, Jakarta, with complaints of discomfort and impaired chewing due to missing posterior mandibular teeth. Teeth 36, 46, and 47 had been extracted two years earlier as a result of extensive caries. The patient reported no systemic diseases, allergies, or parafunctional habits and demonstrated satisfactory oral hygiene. Clinical and radiographic examinations revealed favorable oral conditions, including healthy oral mucosa, adequate vestibular depth, and symmetrical facial features. Based on these findings, the patient was diagnosed with Kennedy Class III modification 1 partial edentulism. After receiving a detailed explanation of the treatment plan and providing informed consent, rehabilitation using a tooth- and mucosa-supported acrylic removable partial denture was selected to restore masticatory function and comfort. Anatomical impressions were taken using irreversible hydrocolloid to obtain study models. The denture was designed with appropriate clasp assemblies, rest seats, and an acrylic base extending to the retromolar pad. Surveying, blockout procedures, rest seat preparation, jaw relation recording, tooth arrangement, and wax try-in were performed sequentially before laboratory processing with heat-cured acrylic resin. Upon insertion, the denture exhibited satisfactory retention, stability, occlusion, and patient comfort without causing soft tissue irritation. Post-insertion instructions were provided, and follow-up visits were conducted to evaluate adaptation and function. Minor occlusal adjustments were required during the initial follow-up. Subsequent evaluations demonstrated improved masticatory comfort, good adaptation, and high patient satisfaction. This case highlights the effectiveness of systematic clinical and laboratory procedures in achieving successful outcomes with acrylic removable partial dentures.

Keywords: Occlusion, Fonetic, Mastication, Missing Teeth, Acrylic, Functional, Partially Edentulous

Introduction

Dental health issues in Indonesia remain a concern for all parties, one of which is tooth loss. Tooth loss is most common in the elderly, but it can also occur in adolescents and adults. According to the 2018 Basic Health Research (RISKESDAS), the rate of loss of natural teeth (less than 28 teeth) in individuals (dentulous) was 51.4%, and the rate of loss of natural teeth (more than 28 teeth) in individuals (edentulous) was 1.3%. The proportion of dentulous individuals aged 15 years was 4.1%, 55.6% for those aged 35-44 years, and 78.2%

for those aged 65 years and over. The proportion of edentulous individuals aged 15 years was 0.0%, 0.1% for those aged 35-44 years, and 9.0% for those aged 65 years and over (Ministry of Health of the Republic of Indonesia, 2018).

Tooth loss is a condition where teeth are not attached to their sockets, caused by caries, periodontal disease, and trauma (Chairunnisa & Julia, 2018). Other causes include impaction, orthodontic and prosthodontic indications, hypoplasia, supernumerary teeth, neoplasms, and cystic lesions. Both partial and complete tooth loss can impact several things, such as decreased chewing function, speech function, aesthetics, and quality of life (Lontaan et al, 2017).

The percentage of denture users in Indonesia is 5.5%. However, this figure does not fully reflect the true situation of tooth loss. Many people who have lost teeth and do not use dentures are still found. Various reasons can underlie this condition, and one frequently complained about is the discomfort of wearing dentures (Campbell et al, 2017).

Dentures are one way to address the impact of tooth loss, but they are not yet a priority for individuals experiencing tooth loss (Chairunnisa, 2018); (Ministry of Health of the Republic of Indonesia, 2018). According to RISKESDAS (2018), dentures were fitted in 1.4% of cases, with 19% of tooth loss cases. However, left untreated, tooth loss carries risks, such as speech limitations and impact on the temporomandibular joint, alveolar bone loss, and tooth migration (Ministry of Health of the Republic of Indonesia, 2018). Aesthetic changes occur without dentures. The patient's face will experience a decrease in height and a decrease in the vertical dimension of occlusion (Carr AB, 2016).

Growing evidence suggests an association between tooth loss and systemic health outcomes such as nutritional deficiencies, cognitive decline, and general health deterioration. Although denture rehabilitation may mitigate some of these effects, current evidence is largely observational and does not establish causality. Well-designed longitudinal and interventional studies are needed to clarify whether denture treatment can positively influence systemic health and aging-related outcomes (Emami et al, 2013).

Removable partial dentures (RPDs) are a type of prosthesis that may be indicated in cases of multiple tooth loss. This type of prosthesis offers the advantage of ease of insertion and/or removal by the patient. Furthermore, it is more cost-effective and conservative than other types of prosthesis (Malik MHA, 2022). A review on partial dentures highlights that almost 40% of patients stop using RPDs within 5 years, yet there is scarce research on why this happens or how to improve long-term use. It explicitly states that research on both disease-oriented and patient-centered outcomes for RPDs is lacking (Campbell et al, 2017).

There are three types of RPD materials and designs: acrylic (polymethyl methacrylate), metal framework (cobalt chrome), and thermoplastic/flexible dentures. Metal framework dentures are considered the gold standard RPD design due to their superior mechanical properties compared to other RPD materials. However, due to their metal components, this design is less aesthetically pleasing (Fueki et al, 2022).

Acrylic Removable Partial Dentures (RPDs) are dental prostheses that artificially provide teeth and related structures in a partially missing dental arch. They are made of

acrylic resin and can be inserted and removed by the patient themselves. Compared to metal dentures, acrylic dentures are more affordable and can be fabricated with relative ease in a lab environment. They are commonly used for short-term or transitional purposes, typically lasting between six and twelve months. When additional teeth need to be removed or when relining is necessary, acrylic can be easily bonded to existing acrylic material. Although bonding acrylic to cobalt-chromium alloys has improved through methods such as 4-META, using acrylic-to-acrylic adhesion remains simpler and more convenient. However, there are several drawbacks to acrylic dentures. The material is inherently flexible rather than rigid, and its durability can only be improved by increasing the thickness of the denture base. (Tribst et al, 2020). This case report is intended to demonstrate the successful enhancement of occlusal function and masticatory efficiency through the application of a removable partial denture in a young adult patient with posterior edentulism. Furthermore, the post-insertion clinical outcomes were systematically evaluated using established parameters, including denture retention, stabilization, occlusal relationships, prosthesis adaptation, aesthetic performance, and patient-reported comfort.

Methodology

This study employed a qualitative descriptive case report design focusing on a single patient presenting with posterior tooth loss in the lower jaws. The population targeted in this context is individuals experiencing partial edentulism in the posterior region with an urgent need for aesthetic and functional recovery. The sample consisted of a 32-year-old female patient with no-experience using denture. Given the clinical nature of the research, purposive sampling was applied to select a representative case that meets the criteria for partial denture placement.

The research instrument comprised clinical observation sheets, radiographic evaluation, and patient interview protocols. To ensure validity, diagnostic procedures such as intraoral examination, panoramic radiography, and dental mobility tests using standardized instruments were employed. The reliability of clinical findings was cross-verified by a supervising dentist. Data collection was performed through direct clinical examination, photographic documentation, impression taking, and observation of postoperative adaptation and patient response to the immediate denture.

The procedural steps included preliminary examination, treatment planning, impression with alginate material, fabrication of the study and working models, preparation of rest on the abutment tooth, determination of vertical dimension, try-in denture, insertion, and control of an acrylic denture in the lower jaws. Postoperative evaluations and control appointments were scheduled to monitor healing and denture fit. No specialized statistical software was utilized, as this is a descriptive case report. The data analysis was performed qualitatively by comparing clinical outcomes with prosthodontic principles of retention, stability, and patient satisfaction documented throughout the treatment process.

Result and Discussion

Case Report

A 32-year-old female patient presented to the YARSI Dental Hospital in Jakarta complaining of discomfort and difficulty chewing due to missing teeth on the lower left and right sides. The missing teeth were due to large cavities and had been extracted two years ago. The patient desired removable dentures to allow her to chew properly and comfortably. She brushed her teeth twice daily: in the morning after breakfast and at night before sleep. Her last visit to the dentist was approximately two years ago for a dental checkup. She had no history of systemic diseases, allergies, or bad habits. A clinical examination revealed missing teeth 36, 46, and 47. After discussing and explaining the treatment plan, the patient agreed to have a removable acrylic partial denture made for her lower jaw.

Case Management

During the first visit, a complete prosthodontic examination was performed, including extraoral and intraoral examinations. The extraoral examination revealed a symmetrical face, a convex facial profile, symmetrical pupils, a symmetrical tragus, a symmetrical nose, thick and symmetrical upper and lower lips, and no abnormalities in the lymph nodes or jaw joints. Furthermore, the intraoral examination revealed good oral hygiene, a small amount of saliva with a watery consistency, a large tongue, a low gag reflex, no abnormalities in the oral mucosa, a prognathic jaw relationship, no open bite, no cross bite, and no fractured teeth (Figure 1). Other findings included moderate maxillary and mandibular vestibules (left post, anterior post, right post), rectangular mandibular alveolar processes (left and right post), oval anterior, moderate, low tissue resistance, and a flat surface. The examination then revealed low superior labial frenulum, moderate inferior labial frenulum, low left and right maxillary buccal frenulum, moderate left and right mandibular buccal frenulum, and moderate lingual frenulum. The patient's palate was oval, with no palatine torus present, and a Class 1 molle palate classification. The left and right alveolar tuberosities were small, the left and right retromylohyoid spaces were deep, the maxillary and mandibular arches were oval, and the floor of the mouth was attached normally. The patient's mental attitude was philosophical.

This was followed by initial clinical photographs, interpretation of the patient's panoramic radiographs (Figure 2), determination of the patient's diagnosis of partial edentulousness (Kennedy Class III Modified 1), and determination of the treatment plan. The patient was asked to sign an informed consent after being informed of the treatment plan by the clinician.

Next, anatomical impressions of the maxilla and mandible were taken using irreversible hydrocolloid (alginate) impression material to obtain study models (Figure 3). The clinician then determined the preliminary treatment according to the previously determined design. The design used in this case is an acrylic resin removable partial denture supported by a combination of teeth and mucosa. It uses a 3-finger clasp on teeth 35 and 37, a 2-finger modified mesial rest clasp on teeth 45, an acrylic base plate, elements on teeth 36, 46, and 47, and an extension of the saddle outline to the retromolar pad.

Then, a survey and blockout were performed to locate and determine the greatest circumference of the teeth and identify undercut areas (Figure 4). Because the patient's removable partial denture design uses a modified rest, rest preparations were performed on the abutment teeth (Figure 5).

Afterward, the clinician created a plate, a bite plate, and a bite fixation using a layer of heated red wax on the teeth model. Then, the patient's vertical dimensions were adjusted. The lower jaw bite plate was then tried on in the patient's mouth, and the patient closed their mouth until they achieved complete occlusion. The bite plate was then crushed using a lecron until it softened. The patient was then asked to occlude their teeth again, creating a tooth impression on the bite plate, and then fixed.

The model was then placed in the articulator. The teeth were then aligned in the articulator (Figure 6A). With a shade guide that has been previously adjusted to the patient's natural teeth, the shade is A3. The clinician then tried on the wax denture in the patient's mouth (Figure 6B). Since it fit well and wasn't loose, clasps were immediately made on the wax denture, contouring, and lab processing for the heat-cured acrylic denture (Figure 7).

The patient returned for the next visit for the denture insertion. After the operator retrieves the acrylic dentures from the lab, they first check that the dentures conform to the planned design (Figure 8). There are no sharp acrylic parts, no plaster residue attached to the acrylic base, the clasp tips are not sharp, the tooth color is appropriate, and the surface of the acrylic base is shiny, smooth, and aesthetic. Then, the denture are fitted to the patient's mouth, achieving good retention, stabilization, and occlusion. Furthermore, patient comfort is ensured, and the denture isn't injure the patient's oral tissues (Figure 9). Next, instructions for use and care of the dentures are given: instructions for inserting and removing the dentures should be provided, starting from the back; maintaining the hygiene of the dentures and the oral cavity; cleaning the dentures before and after use by brushing them under running water; removing them during sleep and strenuous exercise; storing the dentures in their containers when not in use; and if pain occurs after insertion, the patient should seek immediate medical attention.

The day after the dentures were fitted, the patient returned for a follow-up visit (Figure 10). The subjective examination revealed no pain in the dentures, but a feeling of discomfort. Then, the operator immediately performed an occlusion check with articulating paper, and there were uneven scars. Then, the operator reduced the scars with a round bur. In addition, the results of the retention, stabilization, and adaptation examinations were good (no part of the denture pressed against the soft tissue, the gingiva wasn't pale). The second follow-up was scheduled 3 days after the first follow-up, and the results of the subjective examination showed that the patient had begun to get used to her dentures when used for chewing food, and the objective examination was all good in the patient. Furthermore, the third follow-up, which was 5 days after the second follow-up, was known that the patient's subjective examination no longer felt any bite that was stuck in her dentures, objective examinations such as retention, stabilization, occlusion, and adaptation were good, and the patient was satisfied with her dentures.

Figure 1. Patient's intraoral

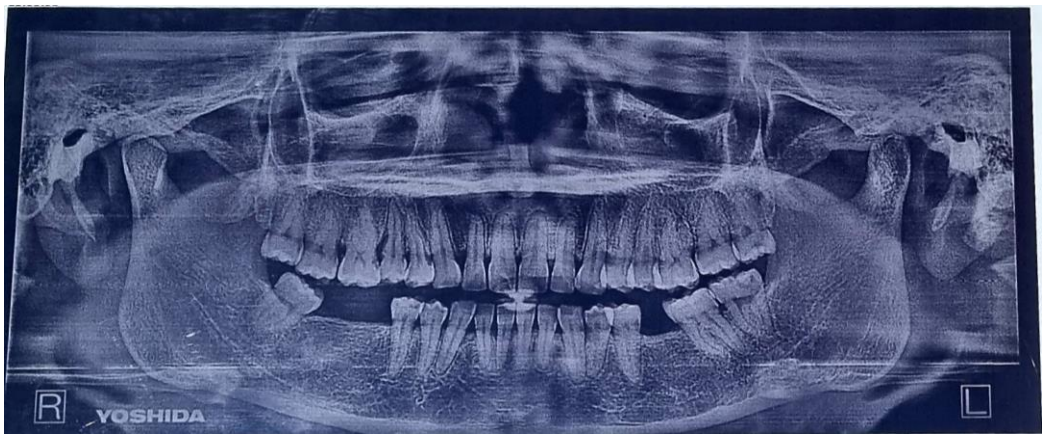
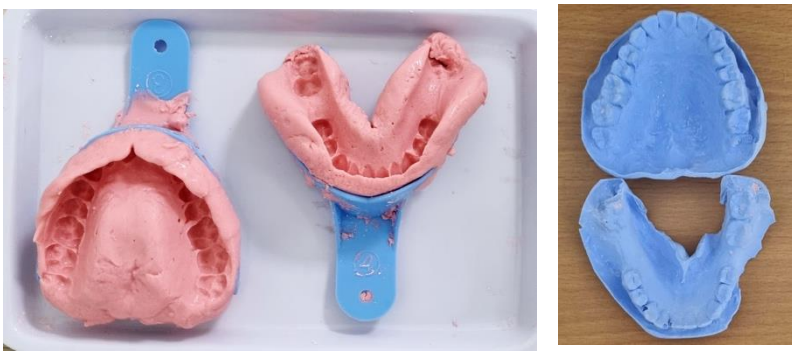


Figure 2. The panoramic radiograph



(A)

(B)

Figure 3. A) Results of anatomical impressions of the upper and lower jaws using alginate (B) Upper and lower jaw casts

Figure 4. Surveying and blocking out the study model

Figure 5. Preparation of the abutment rests

(A) (B)

Figure 6. (A) Tooth alignment in the articulator

(B) Try-in of the denture in the patient's mouth

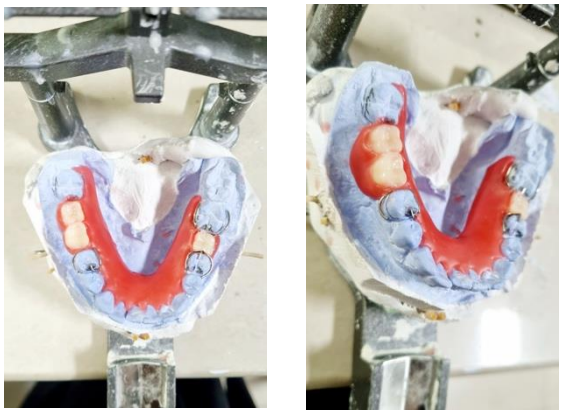


Figure 7. Fabrication of the RPD clasps

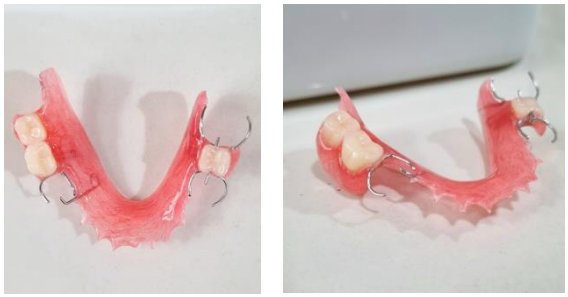


Figure 8. Heat-cured acrylic RPD

Figure 9. Try-in and insertion of the acrylic RPD in the patient

Figure 10. Follow-up the RPD acrylic

Discussion

Dentures, which are supposed to be rehabilitative treatments, can cause other oral problems if not planned ideally. The planning and design of a Removable Partial Denture (RPD) must balance the risks and benefits for the patient. The material chosen for the removable partial denture in this case is acrylic. Acrylic RPDs generally use two types of polymethylmethacrylate: heat-cured and self-cured acrylic. Heat-cured acrylic meets the criteria for an ideal base material because it is non-irritating, insoluble in oral fluids, offers good aesthetics, easy to manipulate, easy to repair, and has minimal dimensional changes. Its drawback is that it absorbs saliva, making it prone to abrasion during use (Akinyamoju et al, 2019). Self-cured acrylic is often used to repair broken dentures because it requires a short time and requires a single visit. Its advantages include good dimensional accuracy and stable shape. Disadvantages include color instability, incomplete polymerization, porosity, and a large amount of residual monomer, which reduces the strength of the acrylic, making it prone to fracture (McGivney & Carr, 2000). Indications for acrylic removable partial dentures include correcting masticatory problems, achieving good aesthetics, lower cost, and patients with good oral hygiene. Contraindications include patients allergic to acrylic materials and those with poor oral hygiene (Beaumont, 2002).

The previous research suggests that there have been more alterations and replacements in mandibular Removable Partial Dentures (RPDs) than in maxillary Removable Partial Dentures (RPDs) and more failures occur after 8 years for mandibular Removable Partial Dentures (RPDs) (Moreno A, 2016). Patient demographics, such as age and socioeconomic status, can also significantly influence the outcomes of Removable Partial Dentures (RPD). Older patients often have more complex dental needs due to wear and years of existing teeth, increased periodontal disease and higher bone loss in edentulous areas tend to be faster in younger patients and slow down as they get older. It has been suggested that pressure from a large denture base might lead to more bone loss (Koyama et al, 2010). A key difference between all those studies and our patient's is that the patient's

young age makes it easier to adapt to removable partial dentures, as her gums and jawbone are still healthy and her remaining teeth are intact. Furthermore, this patient is better able to maintain proper denture hygiene, reducing the risk of denture damage.

Creating a useful and comfortable removable partial denture (RPD) requires careful diagnosis, planning, and treatment (Kokich et al, 1999). Earlier reports on removable partial denture (RPD) failures prompted the belief that RPDs negatively affect periodontal health and may promote the development of dental caries. In contrast, recent research suggests that while the likelihood of root caries and gingival inflammation may rise, periodontal disease typically manifests only in individuals with inadequate oral hygiene or RPDs that are improperly designed (Dula et al, 2015). Removable partial dentures that are inadequately designed can increase difficulties in controlling plaque, so clinicians should prioritize a design that safeguards both the supporting teeth and surrounding gum tissue (Mazurat & Mazurat, 2003).

McCracken's biomechanical guidelines for designing removable partial dentures emphasize how forces are spread across the supporting tissues, ensuring that the denture maintains both retention and stability (Owen, 2000). The alveolar bone provides support for the RPD (Removable Partial Denture) through the periodontal ligament and the residual alveolar bone through the overlying gingival tissue. Potentially damaging forces must be minimized so that the physiological tolerance of the supporting tissues is not exceeded, to prevent pathological changes in the area (Donovan et al, 2001). Dula et al (2015) suggested that the ideal RPD design should aim to minimize pressure on the abutment teeth and the alveolar ridge.

Clasps are used as direct retainers for RPDs. The flexible clasp tips attach to the underside of the abutment teeth to provide retention (Budtz-Jørgensen et al, 2000). Each clasp component is required to satisfy six key biomechanical criteria: providing retention, maintaining stability, offering support, ensuring reciprocity, achieving encirclement, and allowing passivity (Davenport et al, 2000). Furthermore, the clasp design should ideally not negatively impact aesthetics. The selection of the clasp position on the individual teeth, the type of clasp, the clasp material, the location of the clasp in the dentition, and the number of clasps are crucial (Sato & Hosokawa, 2000).

Regular brushing and cleaning of dentures is crucial for maintaining periodontal health. Current approaches to denture hygiene involve mechanical or chemical methods. Mechanical techniques involve the use of manual brushes and/or ultrasonic scaling. Furthermore, it is recommended to remove dentures overnight to ensure adequate rest for the supporting tissues (Rahmayani et al, 2020).

Conclusion

Prosthodontic rehabilitation with an acrylic removable partial denture in the present case yielded clinically favorable outcomes across functional and aesthetic domains. Post-insertion clinical evaluation demonstrated a substantial improvement in oral performance, including facial aesthetics, phonetic function, and masticatory efficiency. The prosthesis

facilitated the re-establishment of smile harmony and contributed to improved facial proportionality. Phonetic assessment revealed adequate patient adaptation, with no evidence of speech articulation impairment following denture placement. Moreover, masticatory comfort and functional efficiency were significantly enhanced relative to the pre-treatment condition. Collectively, these findings support the use of acrylic removable partial dentures as a viable and well-accepted prosthodontic treatment modality capable of restoring oral function and contributing positively to patient-reported quality of life outcomes. Future investigations are recommended to incorporate larger sample sizes, longer follow-up periods, and standardized outcome measures, such as oral health–related quality of life indices and masticatory performance assessments, to further validate the long-term effectiveness of acrylic removable partial dentures. In clinical practice, careful patient selection, meticulous prosthesis design, and structured post-insertion follow-up are essential to optimize treatment outcomes and patient satisfaction.

References

Akinyamoju, C. A., Dosumu, O. O., Taiwo, J. O., Ogunrinde, T. J., & Akinyamoju, A. O. (2019). Oral health-related quality of life: acrylic versus flexible partial dentures. *Ghana Medical Journal*.

Beaumont, A. J. (2002). An Overview of Esthetics with RPDs. *Quintessence Int*, *33*, 747–755.

Budtz-Jørgensen, E., Bochet, G., Grundman, M., & Borgis, S. (2000). Aesthetic Considerations for the Treatment of Partially Edentulous Patients with Removable Dentures. *Pract Periodont Aesthet Dent*, *12*, 765.

Campbell, S. D., Cooper, L., Craddock, H., Hyde, T. P., Nattress, B., & Pavitt, S. H. (2017). Removable partial dentures: The clinical need for innovation. *J Prosthetic Dentistry*, *118*, 273–280.

Carr AB, Brown DT. (2016). McCracken's removable partial prosthodontics. Thirteenth ed. St. Louis, Missouri: Elsevier St. Louis, Missouri.

Chairunnisa, R., & Julia, R. (2018). *The Association between Number of Tooth Loss, Tooth Loss Quadrants, and Occlusal Support with Temporomandibular Disorders in Partially Edentulous Patient*. *8*.

Cowan, R. D., Gilbert, J. A., Elledge, D. A., & McGlynn, F. D. (1991). Patient Use of Removable Partial Dentures: two- and four-year Telephone Interviews. *J Prosthet Dent*, *65*, 668–670.

Davenport, J. C., Basker, R. M., Heath, J. R., Ralph, J. P., & Glantz, P. O. (2000). Retention. *Br Dent J*, *189*, 646–657.

Donovan, T. E., Derbabian, K., Kaneko, L., & Wright, R. (2001). Esthetic Considerations in Removable Prosthodontics. *J Esthet Restor Dent*, *13*, 241–253.

Dula, L. J., Ahmedi, E. F., Lila-Krasniqi, Z. D., & Shala, K. S. (2015). Clinical Evaluation of Removable Partial Dentures on the Periodontal Health of Abutment Teeth: A Retrospective Study. *TODENTJ*, *31*(9(1)), 132–139.

Emami, E., de Souza, R. F., Kabawat, M., & Feine, J. S. (2013). The impact of edentulism on oral and general health. *Int J Dent*.

Fueki, K., Inamochi, Y., Yoshida-Kohno, E., & Wakabayashi, N. (2022). Short-term effect of thermoplastic resin removable partial dentures on periodontal health: A randomized cross-over trial. *J Prosthodont Res*, *66*(1), 167–175.

Kementerian Kesehatan Republik Indonesia. (2018). Riset Kesehatan Dasar (Riskesdas) 2018. Jakarta: Badan Penelitian dan Pengembangan Kesehatan.

Kokich, V. O., Kiyak, H. A., & Shapiro, P. A. (1999). Comparing the Perception of Dentists and Lay People to Altered Dental Esthetics. *J Esthet Dent*, *11*, 311–324.

Koyama, S., Sasaki, K., Yokoyama, M., Sasaki, T., & Hanawa, S. (2010). Evaluation of factors affecting the continuing use and patient satisfaction with removable partial dentures over 5 years. *J Prosthodontic Res*, *54*(2), 97–101.

Lontaan, J., Siagian, K. V, & Pangemanan, D. H. C. (2017). Pola Kehilangan Gigi Pada Pasien Gigi Tiruan Sebagian Lepasan di Rumah Sakit Gigi dan Mulut Program Studi Pendidikan Dokter Gigi Fakultas Kedokteran Universitas Sam Ratulangi. *Jurnal Kedokteran Klinik*, *1*(3), 1–8.

Mazurat, N. M., & Mazurat, R. D. (2003). Discuss Before Fabricating: Communicating the Realities of Partial Denture Therapy. Part I: Patient Expectations. *J Can Dent Assoc*, *69*, 90.

McGivney, G. P., & Carr, A. B. (2000). *McCracken's Removable Partial Prosthodontics 10th ed*. Mosby Year-Book.

Mylonas, P., Milward, P., & McAndrew, R. (2022). Denture cleanliness and hygiene: an overview. *Br Dent J*, *233*(1), 20–26.

Owen, C. P. (2000). *Fundamentals of Removable Partial Denture 2nd ed*. UCT Press.

Rahmayani, L., Sofya, P., Andriany, P., & Jingga, C. (2020). Oral hygiene behavior of acrylic removable partial denture usage in Seuneubok District, West Aceh: A cross-sectional study. *J Int Oral Health*, *12*(2), 163.

Sato, Y., & Hosokawa, R. (2000). Proximal Plate in Conventional Circumferential Cast Clasp Retention. *J Prosthet Dent*, *83*(3), 319–322.

Tribst, J. P. M., Dal Piva, A., Borges, A. L. S., Araújo, R. M., Da Silva, J. M. F., & Bottino, M. A. (2020). Effect of different materials and undercut on the removal force and stress distribution in circumferential clasps during direct retainer action in removable partial dentures. *Dental Materials*, *36*(2), 179–186.