

CASE REPORT

Management of single complete dentures in parkinson's patients

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ABSTRACT

Keywords: Motor Impairment, Parkinson's disease, Single complete denture

Background: Parkinson's disease is a progressive neurodegenerative disorder that disrupts control of body movement, which directly affects oral function, including adaptation to dentures. Motor symptoms such as tremors, bradykinesia, and rigidity, as well as non-motor manifestations such as cognitive impairment and depression, pose challenges in prosthodontic rehabilitation. **Purpose:** Prosthodontic management of single complete denture for an elderly patient with advanced stage Parkinson's disease, highlighting clinical challenges, care strategies, and the role of caregivers. **Case:** A 75-year-old female with diagnosis of Braak stage 6 Parkinson's disease have difficulty chewing due to complete tooth loss in the upper jaw and nearly total tooth loss in the lower jaw. The patient experienced motor limitations, medication-induced xerostomia, and difficulty understanding instructions. **Management:** Prosthodontic treatment consisted of fabricating conventional single complete dentures made of acrylic on the upper and lower jaws. Management of these limitations involved an individualized approach, simple denture design, modification of the tooth arrangement, and comprehensive education involving caregivers, this includes training in denture wearing and salivary gland massage to address lacks of saliva. **Conclusion:** Prosthodontic management in Parkinson's patients requires simple denture design, empathetic, as well as effective communication and education with both the patient and caregiver to achieve optimal oral rehabilitation. This can improve chewing function, comfort, and quality of life for patients. (IJP 2025;6(2):110-115)

Introduction

Parkinson's disease is a progressive neurological condition that affects the nervous system, particularly the areas of the brain that produce dopamine. Dopamine is a chemical that is important for controlling movement. When these dopamine-producing nerve cells are damaged, dopamine levels decrease, leading to characteristic motor symptoms such as tremor (shaking), bradykinesia (slowed movement), rigidity (stiffness), and balance problems. The cause of nerve cell loss is still unknown, but it is likely a combination of genetic and environmental factors. Dr. James Parkinson described this disease as shaking palsy.^{1,3}

As the second most common neurodegenerative disease in the world after Alzheimer's, Parkinson's is generally diagnosed in older adults, i.e., those over 60 years of age, with prevalence increasing with age. The average age of Parkinson's patients is 65 years, with prevalence increasing by 0.6% in the 65–69 age group and 2.6–3.5% in the 85–89 age group. Medications for the symptoms caused by this disease vary and there is no single primary choice, but commonly used drugs include levodopa, dopamine agonists, cholinesterase inhibitors, antimuscarinic drugs, monoamine oxidase-B inhibitors, and amantadine. In addition to medication, surgery or a combination of both can also be performed to reduce the symptoms of Parkinson's disease.⁴

The manifestations of Parkinson's disease can extend to the oral cavity. Motor disorders can make it difficult to maintain oral hygiene, and the

side effects of medications taken by patients can trigger other problems, such as dry mouth (xerostomia), reduced masticatory function, caries, periodontal disease, hypersalivation and drooling, orofacial pain, burning mouth syndrome, bruxism, and taste disorders.⁵ These symptoms can also cause various orofacial manifestations, such as reduced facial expression with a mask-like appearance, reduced blinking frequency, tremors in the forehead, eyelids, lips, and tongue muscles, and involuntary mandibular movements.¹ Previous studies have shown that this disease does not only affect one type of jaw movement, but impacts several involuntary and automatic movements. Therefore, difficulty swallowing (dysphagia) is common in Parkinson's patients due to weakness of the pharyngeal motor muscles.⁶

Non-motor symptoms also pose a negative impact on Parkinson's patients, such as sleep disorders, cognitive issues, and depression.³ Depression is the most common mental illness associated with Parkinson's disease, with a prevalence ranging from 4% to 70%.⁷ The presence of oral manifestations, motor disorders, and psychological disturbances in Parkinson's patients complicates the fabrication of dentures.

This case report discusses the management of complete single denture fabrication, including denture design, difficulties in impression taking and recording jaw movements, education and

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Figure 1. Extraoral photograph



Figure 2. Intraoral photo of the patient in the occlusal position. Teeth 43 and 38 remain



Figure 3. Panoramic radiographic photo. There is no thinning or discontinuity of the mandibular cortex, and no lesions are visible on the patient's jawbone



Figure 4. Periapical radiograph of teeth 38 and 43. The crown-to-root ratio is still good at 2:1, with no widening of the periodontal ligament or periapical lesions

instructions on denture use, and the role of caregivers in this care. Care strategies for Parkinson's patients must consider the physical and psychological challenges

associated with the disease, in addition to empathy and concern from the operator, as well as effective time management.

Case Report

A 75-year-old female patient came to the Specialized Dental and Oral Hospital of the Faculty of Dentistry, University of Indonesia, with the main complaint of wanting dentures made so that she could chew food comfortably because she was currently experiencing difficulties due to tooth loss. The patient has a history of using a partial removable denture on the upper jaw, which is no longer secure due to the extraction of the teeth that supported the denture. Currently, the denture is no longer in use.

The patient suffers from Parkinson's disease and is under the supervision of an internal medicine specialist. Extraoral examination: square face with asymmetry, straight profile, unequal height of the pupils and tragus indicating poor vertical balance. Symmetrical nose with normal respiratory function. Symmetrical lips, closing perfectly, and physiological oral aperture. Lymph nodes are not palpable and are not painful.

No clicking, crepitus, or pain was found in the left and right temporomandibular joints when opening or closing the mouth. Palpation of the masticatory muscles, including the masseter, temporalis, and pterygoid muscles, also did not cause pain. The patient's orofacial muscles were rigid, making it difficult to move laterally and impossible to move according to the operator's instructions.

Intraoral examination: the left posterior upper vestibule is shallow, the right posterior upper and anterior vestibules are moderate, the left and right posterior lower vestibules are shallow, and the anterior lower vestibules are moderate. The residual ridge shape of the patient's upper jaw is oval in the left posterior, right posterior, and anterior regions; with low height in the left posterior, moderate height in the right posterior and anterior regions; low tissue resistance in the left posterior, right posterior, and anterior regions; the surface shape of the left posterior and anterior regions is uneven, while the right posterior region is smooth. The shape of the residual ridge of the patient's lower jaw is triangular on the left posterior, oval on the right posterior and anterior; with low height on the left posterior, right posterior, and anterior; low tissue resistance on the left posterior and right posterior, moderate on the anterior; the surface shape of the left posterior, right posterior, and anterior is uneven.

The condition of the patient's oral cavity shows moderate oral hygiene with visible plaque and calculus accumulation on the remaining teeth, namely teeth 38 and 43. The patient's salivary glands produce secretions in less than normal volume with normal consistency. The size of the patient's tongue appears normal with normal mobility, but it is in Wright Class 3 position where the tongue is retracted and falls to the

PD is hypothesised to progress in six neuropathological stages (Braak stages)

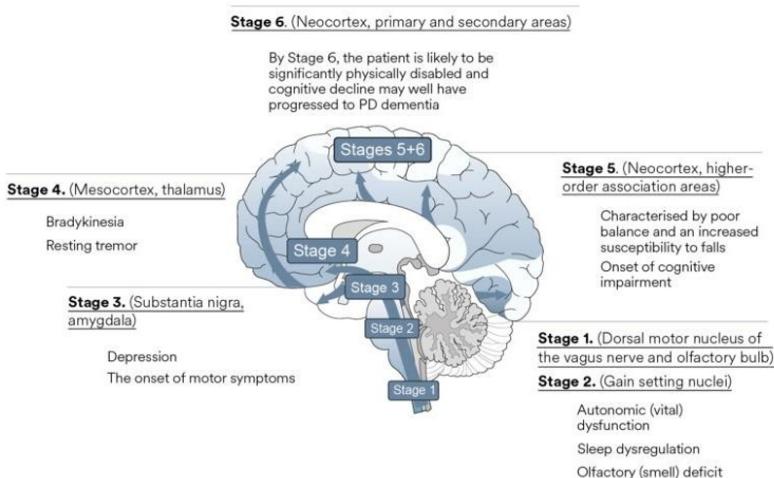


Figure 5. Stages of parkinson's disease according to braak stages

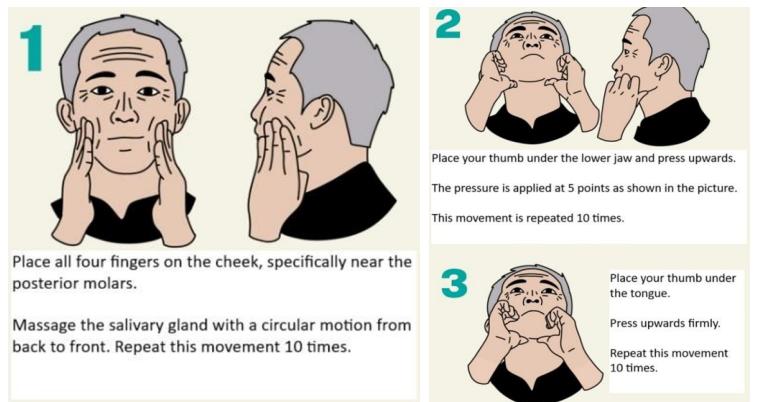


Figure 6. Illustration of salivary gland massage



Figure 7. Definitive vertical dimension

bottom of the mouth, with the tip of the tongue curling upward. The patient's gag reflex is low, and the oral mucosa appears healthy without any lesions or pathological abnormalities. The jaw relationship shows a prognathic pattern. The patient's chewing ability is still

good.

In this case, the patient refused to undergo dental implant placement and extraction of the remaining teeth. The patient was provided with an explanation and the potential risks. Clinical and radiological examinations of teeth 38 and 43 resulted in a diagnosis that these teeth are vital with a good crown-to-root ratio and no mobility, making them suitable as abutment teeth. There is no lack of prosthetic space. The diagnosis for this patient was complete tooth loss in the upper jaw and teeth 37, 36, 35, 34, 33, 32, 31, 41, 42, 44, 45, 46, 47, and 48, requiring rehabilitation with the fabrication and placement of a complete single denture; a complete upper denture and a conventional acrylic partial removable lower denture.

This patient has Parkinson's disease in Braak Stage 6, with clinical characteristics of difficulty walking and mobility using a wheelchair. Braak et al define stages 1-3 as the presymptomatic phase and stages 4-6 as the symptomatic phase. In the presymptomatic phase, Lewy bodies are already visible in the brain. In stage 2, patients experience difficulty sleeping and loss of smell. In stage 3, patients begin to experience depression and motor limitations, while in stage 4, the characteristic signs of Parkinson's disease occur, such as slow movement and tremors when the patient is at rest. In stages 5 and 6, patients have difficulty standing due to impaired balance and decreased cognitive function.⁸ The muscles of the extremities and oral cavity are stiff, there is difficulty moving the mandible, and there is difficulty with understanding and remembering instructions. Oral manifestations include xerostomia due to the antidepressant and antipsychotic medications routinely consumed by the patient. Because the treatment plan for this patient involved complete upper dentures, cohesive adhesion was required for retention, and the operator asked the caregiver to consult with an internist about administering artificial saliva. However, this was not medically approved. Therefore, the operator could only provide education and instructions for performing salivary gland massage (Figure 2.6) and consuming plenty of water to increase saliva production in the patient.

In this case, conventional denture fabrication was chosen due to functional movement limitations caused by neurological impairment. Acrylic material was the primary choice due to its ease of repair. For Parkinson's patients, the use of denture adhesive can enhance confidence in wearing dentures.⁹ Treatment began with anatomical impressions to create a tentative vertical dimension bite block and individual impression trays for the upper and lower jaws. The upper jaw impression tray was made without spacers for zinc oxide eugenol impression material, and the lower jaw was made using two wax spacers and stoppers for alginate impression material. On the next visit, the



Figure 8. Denture base elevation modification. Teeth 27 and 47 were replaced with base elevation to reduce the patient's chewing load



Figure 9. Occlusion and Articulation. In the upper jaw, red indicates occlusal contact and blue indicates articulation contact. In the lower jaw, black indicates occlusal contact and red indicates articulation contact



Figure 10. Intraoral view of the patient's complete denture

operator measures the tentative vertical dimension using a bite splint because the patient's old dentures are no longer secure and have an incorrect vertical dimension of occlusion. On the same day, functional impressions are taken using green stick compound and

physiological impressions are taken.

The next visit involved definitive vertical dimension measurements. The definitive vertical dimension was recorded in the centric relation position. The centric relation was obtained using the swallowing method, bilateral manual guidance, and the creation of a Walkhoff nucleus on the upper jaw bite block. The vertical dimension, bite block alignment, profile, and phonetic closest speaking space were well confirmed. After that, a facebow transfer was performed for mounting on a semi-adjustable articulator.

Teeth arrangement was performed using the concept of bilaterally balanced occlusion with modification of the antagonistic contact of teeth 38 and 17, which were replaced with an elevated denture base without tooth elements. This was done to reduce masticatory load. On the incisal of tooth 43, model reduction was performed because the tooth passed the curve of Wilson and interfered with the occlusion concept arrangement. During the next visit, a night trial and occlusal adjustment of tooth 43 were performed. This was followed by a laboratory process of making clasps, where a 2-finger clasp was used on tooth 38 as a combination support and a gilet clasp was used on tooth 43. After that, a post dam, gum cuffing, and packing were made.

During the next visit, a single complete denture was inserted. The expansion of the wings and base of the denture was confirmed to be correct before observing the intaglio surface pressure on the mucosa using pressure indication paste (a mixture of fletcher powder and olive oil). After that, occlusion and articulation were examined to confirm the concept of a bilaterally balanced occlusion.

The first challenge during insertion was the lack of retention of the complete upper jaw denture due to xerostomia, prompting the operator to remind the patient to massage the salivary glands and instruct them to massage before wearing the denture. The patient was instructed to use denture adhesive if the xerostomia condition was not resolved by massage. The second obstacle was the patient's difficulty in inserting and removing the dentures due to severely limited motor skills. For this, the operator educated and trained the caregiver to assist the patient. The final obstacle was the patient's difficulty in understanding the instructions, so the operator prepared notes to be given to the patient and caregiver.

At the last control visit, the patient still routinely massaged the salivary glands and subjectively had no complaints regarding comfort. The dentures were retentive and the patient rarely used denture adhesive until the end of the control treatment. Objectively, the mucosa was healthy with good occlusion and articulation. Therefore, it can be concluded that restorations in Parkinson's patients require an effective and concise treatment plan with the simplest possible treatment

design, good communication between the operator and the patient, as well as between the operator and the caregiver.

Discussion

Oral rehabilitation in patients with Parkinson's disease presents unique challenges that require a comprehensive approach. This case discusses prosthodontic management in a Parkinson's patient with maxillary edentulism and partial mandibular edentulism, with restoration using a single acrylic complete denture. Parkinson's disease is a degenerative brain condition associated with various motor and non-motor symptoms, such as slow movement, tremors, stiffness, imbalance, and cognitive decline and mental disorders. This condition significantly affects the patient's ability to maintain oral health and adapt to dentures.^{3,5}

Xerostomia, or dry mouth, is a common complaint among Parkinson's patients and is the root cause of caries and periodontal disease. This occurs due to a reduction in both stimulated and unstimulated saliva secretion, which is caused by the consumption of medications that treat Parkinson's symptoms, such as tricyclic antidepressants, antipsychotics (e.g., clozapine), anticholinergics, beta-blockers, and antihistamines. These medications are categorized as xerogenic drugs.¹⁰ Efforts to overcome xerostomia include: increasing hydration by drinking enough water, massaging the salivary glands to increase saliva quantity, using special dry mouth lozenges to increase saliva quantity and consuming xylitol, avoiding mouthwashes containing alcohol and cigarettes as they can worsen dry mouth. Patients can also be taught facial muscle exercises and tongue exercises aimed at improving the function of the orofacial muscles and facilitating saliva production and distribution.^{3,5,9}

Parkinson's patients often need help maintaining their oral hygiene. Therefore, caregiver education is very important. Caregivers need to be taught how to maintain the oral hygiene of patients and their dentures. In terms of denture care, caregivers must ensure that dentures are cleaned daily by soaking and brushing them with a non-abrasive cleaner. Dentures should be rinsed thoroughly after contact with the cleaner before being reinserted. It is also important to remember not to soak dentures in boiling water. Dentures should be stored submerged in water when not in use.^{3,6}

The implementation of a coordinated treatment plan, including the fabrication of appropriate dentures and comprehensive education, can significantly improve the oral function of patients with Parkinson's disease. Improved chewing rates and bite force after the use of stable upper jaw complete dentures contribute to improved masticatory ability in patients. This is directly related to improved quality of life in

patients related to oral health.¹¹ A compassionate and attentive approach to PD patients is essential to address anxiety and improve patient compliance with treatment. Cognitive impairment, dementia, and difficulties in verbal communication must be handled sympathetically. Therefore, it is recommended that dentists introduce themselves at each appointment. Stress is known to exacerbate tremors and uncontrolled movements during treatment. Smiling, direct eye contact, and gentle touch are known to reduce anxiety.

The presence of a caregiver beside the patient also helps to increase the patient's confidence and to interpret the patient's speech. Short appointments in the morning are ideal for patients. Tremors are less frequent in the morning. Communication with patients can be improved by using closed questions and allowing sufficient time for patients to respond. Effective communication is essential to motivate patients to undergo treatment and to use dentures successfully in the future. The dental chair backrest should be raised and lowered slowly. The dental chair should be in an upright position to prevent orthostatic hypotension.¹²

During the impression procedure, a 45-degree reclining position during impression taking is beneficial to avoid excessive saliva accumulation and reduce the risk of aspiration. Since patients cannot perform functional movements well, the Gothic arch tracing method cannot usually be used in Parkinson's patients to record the centric relation. Instead, bilateral manipulation techniques are used to guide the mandible into centric relation. Tooth arrangement in the neutral zone also improves the stability and retention of dentures. In the study by Viktor et al, tooth arrangement in the neutral zone did not interfere with involuntary muscle movements in Parkinson's patients.¹² Mono-plane tooth elements are recommended for patients with poor muscle control to assist with irregular mandibular movements. A lingual occlusion scheme can also be used in Parkinson's patients due to better masticatory efficiency and more limited lateral movement of dentures. Flat or monoplane lower denture elements are expected to enhance feedback from the masseter muscle and mucosa, thereby helping patients improve proprioception and mandibular movement. Water-based denture adhesive and denture cleaners will also help boost confidence in denture use and maintain denture hygiene.^{3,9}

Given the progressive nature of Parkinson's disease and possible changes in the hard and soft tissues of the oral cavity (such as ridge resorption), regular check-ups are essential. Patients should continue to visit the dentist every 6 months to ensure optimal denture adaptation, evaluate the condition of the supporting tissues, and manage any complications that may arise.

Conclusion

Parkinson's disease is a neurodegenerative disorder that causes motor and non-motor symptoms, which directly or indirectly affect the condition of the oral cavity and the patient's adaptation to dentures. Oral manifestations commonly found in Parkinson's patients, such as xerostomia, decreased orofacial motor skills, and cognitive impairment, pose challenges in all stages of denture fabrication and placement.

The role of caregivers is crucial as companions throughout the process of care, use, and daily maintenance of dentures, especially for patients with physical and cognitive limitations in the advanced stages of the disease. Management of xerostomia involves education on salivary gland massage and increased water intake, as the use of artificial saliva requires medical clearance that is not always obtainable for certain patients. Effective communication and written instructions are vital to overcome cognitive barriers and ensure the success of ongoing oral rehabilitation.

Post-insertion evaluations show that with an individualized approach, multidisciplinary collaboration, regular monitoring, and modifications to denture fabrication and fitting techniques, patients can still achieve optimal chewing function, comfort, and quality of life. Therefore, prosthodontic care management for Parkinson's patients requires an effective, simple, patient-centered treatment plan supported by proper education for patients and caregivers to achieve successful oral rehabilitation outcomes.

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