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CASE REPORT

Prosthetic Rehabilitation of Conventional Complete Denture in Parkinsonism Patient: A Case Report

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ABSTRACT

Parkinson's disease is a progressive, idiopathic neurological disorder characterized by tremors, rigidity, bradykinesia, and postural instability. The resulting decline in motor function and cognitive abilities significantly affects a patient's ability to maintain adequate nutrition and oral hygiene. Consequently, individuals with Parkinson's often face increased risks of dental caries and edentulism. In many cases, non-motor symptoms such as ap depression, constipation, sleep disturbances, anosmia, and cognitive decline can have a greater impact on the patient's quality of life than motor symptoms. Prosthodontic management of these patients requires special consideration and a sensitive approach, particularly when socioeconomic constraints limit access to multiple clinical appointments. This clinical report presents the complete oral rehabilitation of a patient with Parkinson's disease using conventional denture fabrication techniques tailored to minimize visits and accommodate the patient's unique needs.

KEYWORDS

• Parkinson's disease • Admix • Occlusal rims • Monoplane teeth • Lingualized occlusion

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INTRODUCTION

Parkinson's disease (PD) is a progressive neurological disorder resulting from the degeneration of dopamine-producing neurons, primarily located in the substantia nigra and the locus coeruleus regions of the brain.[1] The exact cause of Parkinson's disease remains unknown. Onset before the age of 40 is uncommon. While the condition affects men and women equally up to the age of 60, its prevalence becomes higher in men beyond that age.[2] The 3 cardinal signs of PD are dyskinesia (involuntary movement), bradykinesia (slow movement), and akinesia (muscular rigidity).[3] Individuals with Parkinson's disease (PD) often face various oral health issues, including xerostomia or sialorrhea, dry mouth and/ or burning mouth syndrome, inadequate oral hygiene, and difficulties related to denture use. In addition, impaired control of both voluntary and involuntary orofacial-pharyngeal muscles can result in challenges with chewing (mastication), swallowing (dysphagia), and tremors affecting the mouth and chin.[4] Parkinson's disease typically has a gradual onset and initially affects only one side of the body. Early symptoms include mild muscle stiffness and resting tremors. A characteristic sign is the 'pill-rolling' motion observed between the thumb and fingers. As the condition progresses, tremors may extend to the legs, face, tongue, and jaw. Patients often experience difficulty initiating both voluntary and involuntary movements (akinesia) and commonly develop a flexed posture as a result of muscle rigidity.[5] These challenges pose significant obstacles for clinicians when planning oral rehabilitation for patients with Parkinson's disease. Effective rehabilitation necessitates a multidisciplinary approach and careful consideration, as increased tremors, excessive salivation, reduced adaptability, and impaired muscle control can complicate prosthodontic procedures and negatively impact denture retention.[6] Appointments for patients with Parkinson's disease should ideally be scheduled early in the morning and kept short-preferably under 45 minutes-since symptoms tend to be least pronounced 60 to 90 minutes after medication intake. When adjusting the dental chair, it should be raised slowly to help the patient transition gradually to an upright position, minimizing the risk of orthostatic hypotension. To avoid triggering anxiety or frustration, the prosthodontist may need to reintroduce themselves at each visit, use simple language and short sentences, and minimize the use of face masks. A warm approach such as smiling, maintaining eye contact, and using gentle touch can be reassuring. Allowing the caregiver to sit beside the patient may also help reduce anxiety. Additionally, relaxation and distraction techniques can be employed to ease stress during treatment.[7]

Case Report

A 72 year old male reported to the Department of Prosthodontics, Crown & Bridge, Oral Implantology, Bhojia dental collage and hospital, Bhud, Baddi, Himachal Pradeshe with a chief complaint of broken prosthesis and wanted replacement.

The patient had a 7-year medical history of Parkinson's disease and was under medication. Patient was taking Tab. Pardopa twice daily for the past 7 years. Past dental history included fillings, extraction of teeth, and a removable partial prosthesis. He was able to communicate even though with some difficulty. He was well oriented, did not show signs of depression, and was highly motivated to replace his missing teeth. The intraoral examination revealed completely edentulous upper and lower arch (*Figure* 1). His physical and financial condition led to planning a denture.

On examination, the patient presented with the festinated gait/ Parkinson gait and forward flexion of the body. There was a low level of muscular coordination. The speech of the patient was soft, hurried and monotonous. There was a lack of facial expression and reduced blinking of the eye. The mandibular movement showed trembling and limited movement of lips during conversation. The patient was not able to stay still as he had no control over the muscles of his body. The patient was advised to take medication before coming to the Department and a special emphasis was made to treat the patient in compassionate, caring environment to reduce anxiety. Early morning appointments were given to the patient.

PROCEDURE

The dental chair should be adjusted and raised slowly, and the patient should be seated in a semi-reclined or upright position rather than fully supine. A semi-reclined dental

chair position in Parkinson's patients enhances comfort, safety, communication, and control, while reducing aspiration risk, anxiety, and orthostatic hypotension, ensuring more effective and compassionate dental care.

On the first day, both the Maxillary and Mandibular ridges of the patient were examined (*Figure 1*). Primary Impressions were made with impression compound in a conventional manner (*Figure 2*). Aliginate corrective impression was made on the mandibular impreesion due to the rigorous mandibular movements. To record the maxillary PPS area green stick material was used and the flow of green stick is more as compared to the impression compound.

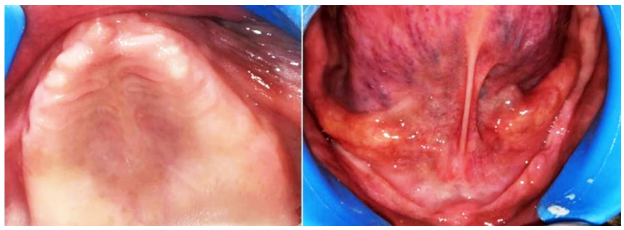

Figure 1: Edentulous Maxillary and Mandibular Arch

Figure 2: Primary Maxillary and Mandibular Impressions

Casts were poured and primary cast were obtained (*Figure 3*) and acrylic resin special trays were fabricated. Border Moulding with Green Stick Compound for maxilla (*Figure 4*) and for mandible admix was used for making the impression (*Figure 5*). Admix is a dental impression material composed of 3 parts impression compound and 7 parts green stick compound by weight. It combines the flow properties of both materials, making it ideal for border molding in complete denture fabrication. Admix offers improved adaptability, stability, and detail reproduction in edentulous impression techniques and Secondary Impressions were made with Zinc Oxide Eugenol Impression Paste (*Figure 6*). Then the final casts were obtained (*Figure 7*). After the final cast was obtain acrylic base plate and occlusal rims were prepared. In the next appointment conventional Jaw Relation was done. The vertical height of occlusion was set below than normal. The patient was requested to practice the movements at home prior to the appointment. Centric relation was recorded by hand guidance of the mandible as the patient was not able to hold the mandible jaw stable even for few seconds, the mid line and canine line was marked for the reference for centric (*Figure* 8). Articulation and Mounting of the Jaw Relation was done. Teeth arrangement were done anterior teeth were placed along with monoplane posterior teeth and lingualized occlusion was provided. (*Figure 9*). The esthetic trial and Jaw Relation verification was done in the Try-In (*Figure 10*). Dentures were cured and polished and delivered to the patient (*Figure 11*). The pre and post changes were verified (*Figure 12*).

Figure 3: Primary Cast

Figure 4: Border Moulding with Green Stick

Figure 5: Admix Impression

Figure 6: Secondary Impressions made with Zinc Oxide Eugenol Impression Paste

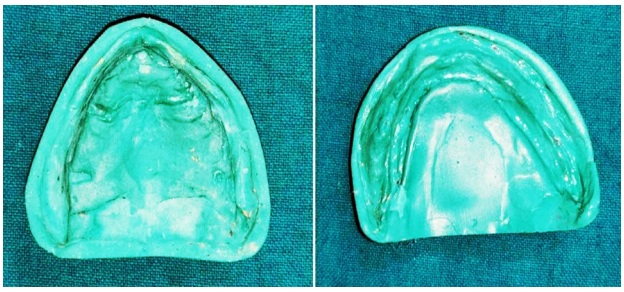

Figure 7: Final Cast

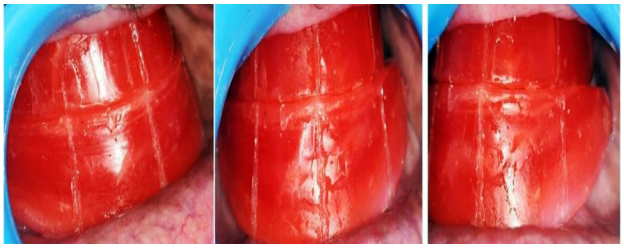

Figure 8: Jaw Relation

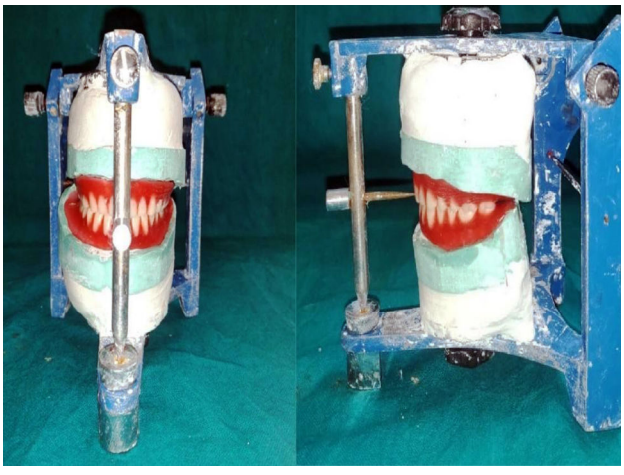

Figure 9: Teeth Arangement

Figure 10: Try- In

Figure 11: Denture Insertion

Figure 12: Pre and Post Denture Insertion

DISCUSSION

Parkinson's disease is a chronic, progressive neurodegenerative disorder marked by resting tremors (affecting the hands, arms, legs, jaw, and face), muscle rigidity and stiffness (particularly in the limbs and trunk), and postural instability with impaired balance and coordination. Distinct clinical features include resting tremors, muscular rigidity, hypokinesia, a mask-like facial expression, and cogwheel-type rigidity.[8] This is due to insufficient formation and action of dopamine produced in dopaminergic neurons of mid brain.[9] These symptoms present significant challenges in planning, executing, and achieving optimal outcomes in dental treatment. It is essential to consider these limitations to ensure a favorable prognosis. A compassionate and empathetic approach is crucial when managing patients

with Parkinson's disease to reduce anxiety and improve treatment cooperation. Cognitive decline, dementia, and speech difficulties should be addressed with sensitivity. Therefore, it is recommended that the dentist reintroduce themselves at each visit. Since stress can worsen tremors and involuntary movements during treatment, maintaining a calm environment- through smiling, direct eye contact, and gentle touch-can help ease patient anxiety.[10] Dentists encounter several challenges when fabricating complete dentures for patients with Parkinson's disease. Increased tremors, excessive salivation, reduced adaptive ability, and poor muscle control complicate procedures such as impression making and recording jaw relations, often resulting in compromised denture retention. Displacement of the center of gravity can lead to a tendency to fall forward or backward. Additionally, the tongue may dislodge the mandibular denture, while rigid or uncontrollable facial muscles can hinder the retention of the maxillary denture by disrupting the seal. Furthermore, patients often struggle with proper care and maintenance of their dentures.[11] In such cases, face bow transfer and Gothic arch tracings cannot be recorded due to the medical and physical condition of the patient. This eliminated the use of a semi or fully adjustable articulator. Monoplane teeth can be used to compensate for the variable centric relation.The lingualized occlusion scheme was utilized in the patient due to its combined advantage of better masticatory efficiency 12 less distortion, and limited lateral movement of denture.[13] The researchers have also reported that lingualized occlusion is suitable for the patient with involuntary teeth grinding.[14] Post-treatment follow-up is essential for the successful rehabilitation of patients with Parkinson's disease. Regular follow-ups allow for ongoing monitoring, assessment, and necessary adjustments to the dentures. Effective complete denture rehabilitation can significantly improve both the psychological well- being and physical functioning of individuals with Parkinson's disease.[15]

CONCLUSION

A considerable number of individuals with Parkinson's disease in the community require complete dentures for functional, aesthetic, and psychological rehabilitation. Treatment should be guided by a compassionate and empathetic approach, with a well-planned strategy to address the patient's physical limitations. Efforts must also be made to minimize patient anxiety throughout the treatment process. Maintaining oral health in patients with Parkinson's disease should be a priority in delivering comprehensive healthcare to this rapidly growing segment of the population. Dentists who are knowledgeable about the clinical manifestations of Parkinson's and its direct and indirect impact on oral health are better equipped to provide effective and holistic dental care for these patients.

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