10.5368/aedj.2017.9.2.2.3

PROSTHODONTIC CARE FOR EDENTULOUS PATIENTS WITH PARKINSON DISEASE

[1] Ahmed Asif — [1] Postgraduate
[2] Khandelwal Meenakshi — [2] Professor
[3] Punia Vikas — [3] Reader
[4] Malot Saransh — [4] Assistant Professor

[1-4] *Department of Prosthodontics and Crown and Bridge, Darshan Dental College and Hospital,Udaipur, Rajasthan, India.*

ABSTRACT: Parkinson's disease is seen in adults in their late middle or old age. It has four cardinal signs - resting tremor, bradykinesia, akinesia, and postural instability. Patient's gait is often slow, shuffling with a stooped posture and they tend to walk faster with shorter steps. The affected patients have uncontrolled movements of the body along with stiffness of muscles. Tremors in orofacial musculature caused by Parkinson's disease can make dental treatments, a challenge. The psychological component like depression, cognitive problems, and apathy further jeopardise the successful fabrication and utilisation of complete denture. This case series presents completely edentulous patients with Parkinson's disease successfully treated with complete dentures in a sympathetic and caring approach. Some modification of techniques and materials were adopted to suit the special situations.

KEY WORDS: Parkinsonism, Parkinson's disease, Neurodegenerative diseases, Monoplane, Neutral Zone

INTRODUCTION

Parkinson's disease (PD) is one of a group of motor system disorders and is an irreversible, slowly progressive, neurodegenerative movement disorder.[1] This is due to the progressive degeneration of nerve cells in the brain resulting in a decrease in dopamine levels. Dopamine is a chemical that helps in transmitting messages between cells.[2] The PD is second most common after Alzheimer disease. It is genetically linked disease, with the mean age of onset around 57 years.[3]

Parkinson's disease is divided into mild/early, moderate, advanced and severe stages according to Hoehn and Yahr.[4] In stage 1 only one side of the body is affected, usually with minimal or no functional impairment; and in stage 2 both sides of the body are affected, but posture and balance remain normal; in stage 3 both sides of the body are affected and there is mild imbalance when standing or walking; in stage 4 both sides of the body are affected and there is disabling instability while standing or walking, i.e. the person requires substantial help and cannot live alone; and in stage 5 fully developed disease is present, i.e. the person is often cachectic and restricted to bed or a wheelchair unless aided.

Degenerative disease in the central nervous system may have profound effect on mastication and mandibular function.[5] The neuromuscular and cognitive deficits associated with PD enhance the progression of dental disease, impair home care regimens, and encumber in-office dental treatment. In PD, 30–80% of patients have drooling of saliva from the corners of the mouth which is typically caused by a combination of pooling of saliva in the mouth as a result of dysphagia, decreased swallowing frequency, diminished closure of the lips, and antecollis. The jaw mobility and the speed of the jaw movements are reduced which further complicates the formation and the placement of the food bolus, and the chewing process. The other orofacial findings of these patients include mask-like face due to akinesia, impaired speech, xerostomia. Bruxism, attrition and some cracked teeth are due to the orofacial musculature tremors and levodopa medications.[6]

The successful complete denture rehabilitation largely depends on the ability of the patient to control the denture with oral musculature. The denture retention and control in PD patients is further compromised due to thick ropy saliva, xerostomia, and rigid muscles.[3]

Case report 1

A 77 -year-old completely edentulous male patient with Parkinson's disease was referred to Prosthodontic clinic for replacement of completely missing maxillary and mandibular ridges He was diagnosed with PD since last 15 years and was under Levodopa medication. The patient presented with festinated gait and forward flexion of the body. He required the assistance to walk and get in/out of the dental chair indicating a lower level of muscle coordination. The speech of the patient was soft, hurried, and monotonous. Extraoral examination revealed lack of facial expression and reduced blinking of eyes**.** The mandibular movements exhibited marked trembling. Intraoral examination revealed reduced salivary flow, both maxillary and mandibular residual ridges were high and well-rounded and Type I soft palate. Temporomandibular joint examination showed no significant pathological deviation.

Fig.1.Neutral zone with plaster index

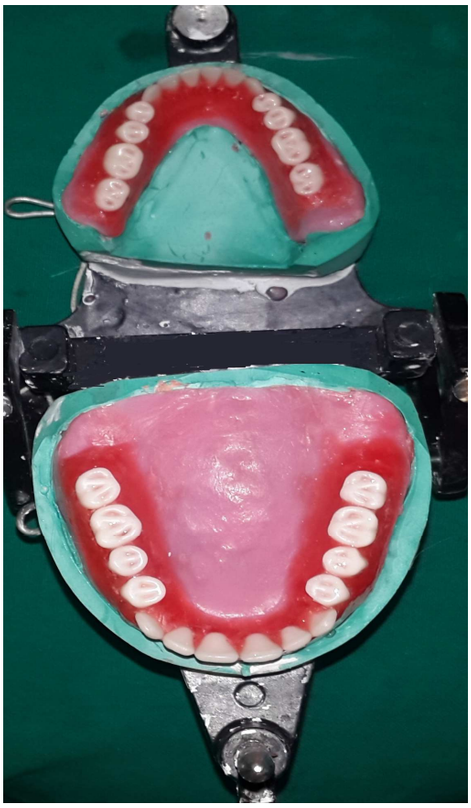

Fig.2. Monoplane teeth arrangement

Fig.3.Final denture with monoplane plane teeth and mesh

Case report 2

An 87-year-old completely edentulous female patient with Parkinson's disease was referred to Prosthodontic clinic for replacement of completely denture rehabilitation. She was diagnosed with PD since last 28 years and was under unknown medication. Speech of the patient was soft and slurry. Mandibular movement showed the marked trembling. No presence of any soft and hard tissue pathology.

Management

Patients consulting neurophysician opinion was sought regarding the fitness and required precaution during dental treatment. The treatment objective was the complete denture rehabilitation of the patients to improve their nutrition status through improved masticatory efficiency. Objective also included the improvement in speech and enhancing their psychological status. Treatment options were discussed with the patients and their attendants. Advantages and disadvantages of implant retained prosthesis were considered in both the cases. Dental implant failures were more common in neuropsychiatric disorder patient due to poor oral hygiene and tremors. Therefore conventional complete denture with modifications in techniques and materials were finalized. Patients were advised to take PD medicine (Levodopa) one hour prior to treatment. Appointments were fixed in the morning hour for short duration. Primary impressions were made with impression compound. Border mouldings were done by single step method using green stick impression compound. Final impressions were made with zinc oxide eugenol paste. Jaw relation was recorded with modeling wax and was then articulated. Another set of record bases and rims were fabricated using impression compound to record neutral zone. The softened compound was placed inside the patient's mouth, and they were requested to perform physiological muscle functions like sucking, swallowing, and phonetics. The plaster pumice indexes were made from the contoured impression compound to guide the technician in arranging the teeth in the neutral zone **(Fig. 1).** Monoplane denture teeth were used and arranged in occlusion **(Fig. 2).** The aesthetic try-in verifications were done on a trial denture and approval was taken from both patients. During packing thin mesh were incorporated in both maxillary and mandibular denture to prevent fracture of denture due to fall. Occlusal corrections were performed by selective grinding and dentures were inserted **(Fig. 3).** Patients were educated regarding the post insertion care of the denture and denture hygiene **(Fig. 4 and Fig. 5).** The follow-up recall visits were programmed for continuous evaluation and required correction of denture.

Discussion

The term "Parkinson's disease" is equated to "paralysis agitans" and has been reserved for what, at present, is considered the primary or "idiopathic" form of the disease.[4] It is found that patient with PD had more complaints about their oral health and more problems in oral health behavior than general population.[7] The successful provision and

use of removable dentures, particularly complete dentures, is a demanding and skilled undertaking for the clinician and patient, respectively.[8] Tremors caused by Parkinson's disease can make dental appointments a challenge. Anxiety increases the Parkinson's symptoms. It is important that patient should remain calm during dental treatment. The muscles of a patient with Parkinson's disease are not paralyzed, although they fatigue rapidly. Weakness affects whole movement patterns and not individual muscles.[9]

.

In these cases both patients were very co-operative and inclined to have the treatment. Their attendant's motivation was an added advantage to complete the treatment successfully. The advantages and disadvantages of an implant retained prosthesis were considered in both the cases; due to poor oral hygiene, tremors and many reports of dental implant failures in neuropsychiatric disorder patient conventional complete denture with modifications in techniques and materials were finalized.[10] The involuntary muscle movement, xerostomia, and rigid musculature in PD patients compromise the denture retention and control. The low fusing impression compound was used as it provides a chance for subsequent correction. Semireclined 45-degree position during impression procedure is advantageous for avoiding excessive saliva pooling and avoiding the risk of choking. Since the patient was unable to perform the functional mandibular movement, bilateral manipulation technique was utilized to guide the mandible to centric relation. Centric relation was recorded in wax to hasten the procedure and monoplane occlusion was developed in neutral zone to enhance the denture stability, retention and provide freedom in centric. It was observed by various researchers that dentures at neutral zone do not interfere with involuntary muscular movement in PD patient. Reinforcing the denture with metal mesh significantly increased impact strength, tensile strength and fracture resistance of the denture. Denture cleansers helps in improving the denture wearing confidence and denture hygiene

Post treatment follow-up is critical for successful rehabilitation. It is helpful for continuous monitoring, evaluation, and correction of denture. The effective complete denture rehabilitation will help PD patient in alleviating both psychological and physical debilities to significant extent.[3]

CONCLUSION

Significant number of PD patients in society require complete dentures for the functional, aesthetic, and psychological rehabilitation. The success of the prosthesis

PREOPERATIVE POSTOPERATIVE

Fig.4.Pre and Postoperative photographs (Case 1)

Fig.5. Pre and Postoperative photographs (Case 2)

will depend on the careful approach with diligent handling of the patient during the entire therapy. Conventional denture with modifications in materials and method along with proper education of the patient and the family regarding the post insertion care of the prosthesis is essential for the long term success of the treatment

References

1. Bakke M, Larsen SL, Lautrup C, Karlsborg M. Orofacial function and oral health in patients with Parkinson's disease. Eur J Oral Sci 2011; 119: 27–32.
2. Fouad AO, Mohammed M.A, Sulaiman SA, Abdullah SA, Syed S, Master L.Oral Rehabilitation of Parkinson's Disease Patient: A Review and Case Report. Case Rep Dent 2014;2014:1-4.
3. Haralur SB. Clinical strategies for complete denture rehabilitation in a patient with Parkinson disease and reduced neuromuscular control. Case Rep Dent 2015;2015:1-5.
4. Hoehn MM, Yahr MD. Parkinsonism: onset, progression, and mortality. Neurology 1967;17:427-42.
5. Bakke M, Moller E, Thomsen CE, Dalager T, Werdelin LM. Chewing in patients with severe neurological impairment. Arch Oral Biol 2007; 52: 399–403.
6. Rajeswari CL. Prosthodontic considerations in Parkinson's disease. PJSR 2010; 3: 45-47
7. Nakayama Y, Washio M, Mori M. Oral health conditions in patients with Parkinson_s disease. J Epidemiol 2004; 14: 143–150.
8. Packer M, Nikitin V, Coward T, Davis DM, Fiske J. The potential benefits of dental implants on the oral health qualityof life of people with Parkinson's disease. Gerontology 2009; 26: 11–18.
9. Bottenberg DE. The patient with parkinson's disease. Seminars in speech, language and hearing 1981; 2(3):167-70
10. Kiani S, Razavi SM, Movahedian B, Khalesi S. The Effect of Common Local and Systemic Conditions on Dental Implant Osseointegration: A Review of Literature. Avicenna J Dent Res.2015;7(2):1-12

Corresponding Author

Dr.**Asif Ahmed,**
Department of Prosthodontics,
Darshan Dental College and Hospital,
Udaipur, Rajasthan
email : drasifahmed85@gmail.com