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Obstructive Sleep Apnea in Completely Edentulous Patient Wearing Complete Dentures: A Case Report

Bhupender Kumar Yadav[1*], Taniya Malhotra[2], Mona Juneja[3],Prerna Yadav[4]and Jaiveer Yadav[5]
[1,2,3,5]Department of Prosthodontics, Faculty of Dental Sciences, SGT University, Gurugram
[4] Department of Pedodontics, Faculty of Dental Sciences, SGT University, Gurugram
*Correspondence: Email id: drbhupinderyadav@gmail.com

ABSTRACT
For some individuals with OSA and those who can't wear CPAP, oral appliances are increasingly advised. The most popular oral appliance, also known as a MAD, moves the lower jaw forward as you sleep. Patients come to clinic because of their bothersome snoring, laziness, night-time apnea, and potential cardiovascular concerns in the long run. The degree to which MADs reduce the AH index varies among people. The majority of people with sleep apnoea have one or more comorbid conditions, such as depression, type 2 diabetes, or cardiovascular disorders. This study's objective was to assess how well the Mandibular Advancement Appliance treated daytime sleepiness and a variety of other symptoms associated with obstructive sleep apnoea.
Keywords: Apnoea, Comorbidities, Disturbed sleep, Mandibular Advancement Device.

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INTRODUCTION

Multiple bouts of the upper airway collapsing while you sleep are a symptom of the chronic illness known as obstructive sleep apnoea (OSA)[1-2]. This has an impact on the quality of nocturnal sleep, and it is well known that this causes daytime weariness and sleepiness. Obstructive sleep apnea is increasingly becoming acknowledged as a separate risk factor for a number of clinical outcomes, including stroke, altered glucose metabolism, systemic hypertension, and cardiovascular disease [3-4].Medical morbidity and mortality from obstructive sleep apnoea are becoming more recognized as key contributing factors. Recurrent bouts of a partial or total collapse of the upper airway during sleep characterize this reasonably frequent sleep condition. More likely, the ensuing decrease in airflow results in acute gas exchange disturbances and frequent awakenings from sleep. Obstructive sleep apnea poses a number of health risks [5-6]. In addition, it causes excessive daytime sleepiness, cognitive impairment, poor work performance, and a decline in health-related quality of life if left untreated[7]

CASE REPORT

This Case report highlights the evaluation and comparison of airway space, tongue position in OSA pts before and after mandibular advancement appliance therapy at baseline and 6 months for 20 patients.This study was conducted mainly to highlight the increase of oropharyngeal space and normalize the position of the tongue by providing a Mandibular Advancement Appliance for improved results and to enhance the quality of life.A 50-year-old edentulous patient wanted to get a complete denture fabricated. On examination, it was observed that the patient had retruded tongue position (i.e., Class III Tongue position, Wright's Classification) (Fig 1&2) and Mallampatti Score [8]: III.

Figure 1: Intraoral tongue position Figure 2: Tongue position with dentures

The patient was asked to fill out the Berlin Questionnaire, through which Obstructive Sleep apnoea in this patient was suspected. So, to confirm the same, the patient was made to undergo diagnostic tests for Obstructive Sleep Apnoea.

Oropharyngeal airway space was evaluated using a lateral cephalogram. The cephalometric landmarks were marked and measured. The patient was told to maintain tongue in a relaxed state and maintain anNH position to ensure consistency of hyoid location[9]. The lateral head position was carefully aligned. The cephalometric variables were evaluated (Fig 3). These landmarks were plotted after manual tracing of the lateral cephalogram. Radiographs were traced and orientated with the maxillary plane horizontal. The position of the hyoid was also recorded in relation to both the mandible and the maxilla. The readings will be recorded at baseline i.e., at the time of insertion of the appliance and 6 months after wearing of the appliance.

Figure 3: Cephalometric analysis

Spirometric analysis was done to evaluate the Pulmonary Function Tests (Fig 4). During spirometric analysis, the patient was seated in a chair in an examination room. Nose clip was used for closing the nostrils. A cup-like mask is an alternate option that can be placed around the patient's mouth. Next, the patient was told to take a deep inspiration, and was asked to hold the inspired air for few seconds and expire with as much force as possible. The maximum reading from the mean test values was recorded and used as the final result[10]. Through this, we determined FVC, FEV, Peak Inspiratory flow rate, oxygen saturation, and AHI (Apnea-Hypopnea Index). Patients with Mild-Moderate Restrictive Airway were included in the study and examined.

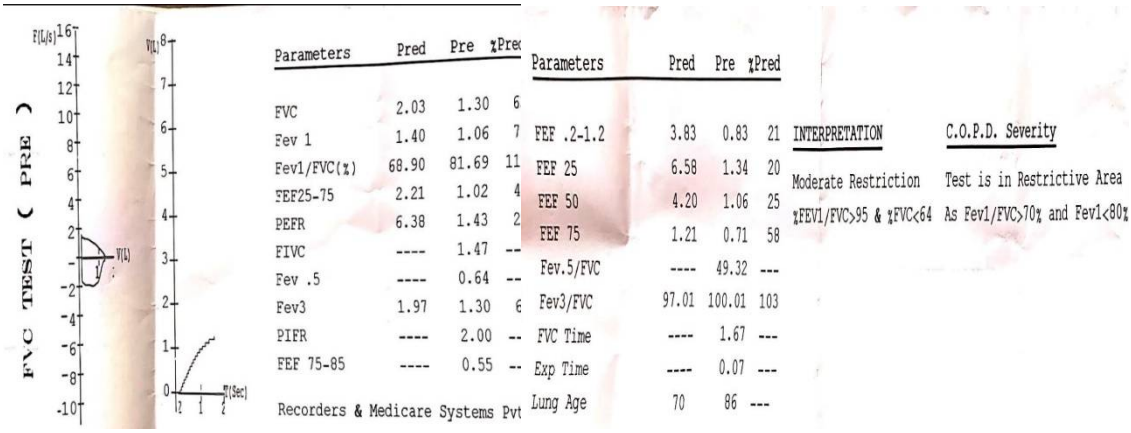

Figure 4: Spirometric analysis

Episodes of apnea were further evaluated by the Polysomnography test (Fig 5,6). In this test, the patient was connected to apparatus that keeps track of breathing patterns, blood oxygen levels, arm and leg movements, and heart, lung, and brain activity while the patient is asleep. Episodes of apnoea and hypopnea were evaluated.

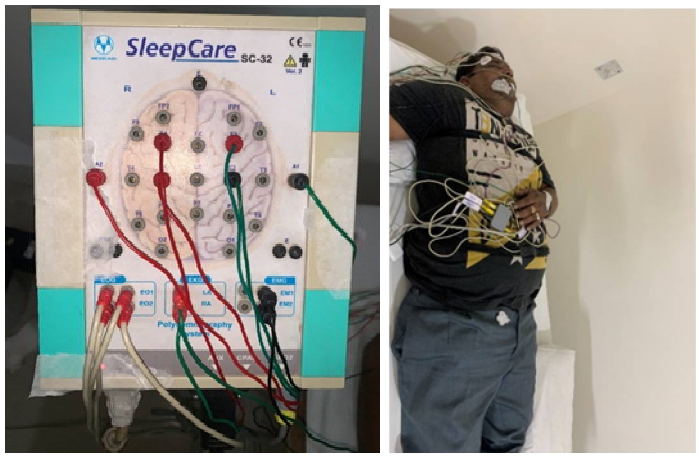

Figure 5: Polysomnographic analysis

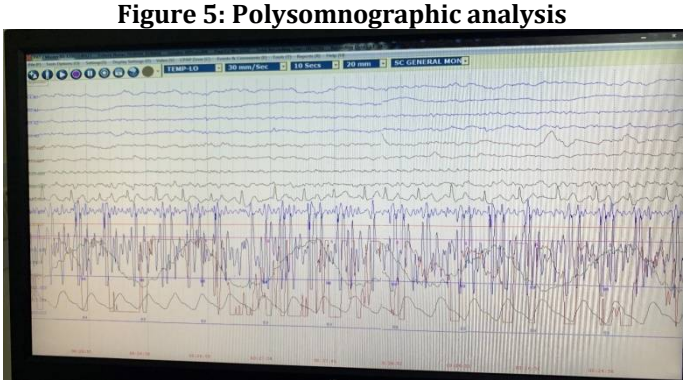

Figure 6: Result of polysomnographic test

Once the diagnosis of OSA was established, mild to moderate OSA was observed in the patient& a mandibular advancement device (Fig 7) was placed to enlarge the oropharyngeal space.

Figure 7: Mandibular advancement appliance

RESULTS AND DISCUSSION

The current case report reported the effect of mandibular advancement appliance in an edentulous patient wearing complete dentures. After 6 months, the patient was reviewed. The lateral cephalogram revealed an increased linear width of the upper airway space. The space had been increased by 2-3mm and the hyoid bone and tongue position had shifted superiorly. This further led to a positive correlation between the position of hyoid bone and tongue with the oropharyngeal space in completely edentulous patients (Fig 8).

Figure 8: Lateral cephalogram

OSA in geriatric patients is a topic which has been not explored in the scientific literature, and often it goes undiagnosed in elderly patients which affects their quality of life in long term. Wearing of complete dentures improve the tongue position and position of soft palate and improves the symptoms of OSA in edentulous patients, however the night time wearing of the dentures is still controversial and may affect the general oral health of the patients[11]. Night time wearing can cause denture stomatitis and oral ulceration, so prosthodontists usually advise to remove the prosthesis during night time, however individual suffering from OSA are advised to wear the dentures during night as it improves the pharyngeal patency and increase the tonicity of the muscle affecting the pharynx[12].

There are various treatment strategies which have been proposed by researchers for management of OSA in edentulous geriatric patients which ranges from giving appliance to surgical intervention of the soft palate[13]. The most common problem which the clinicians face during treatment of such patients is lack of retention in the prosthesis as the dentures are supported only by the mucosa and they can't resist the forces exerted by the advancement appliances on the dentures. This problem can be solved by employing dental implant to provide retention and stability to the prosthesis and also resists the forces of advancement appliances to treat OSA[14].

Elderly patients usually suffer from various medical complications and OSA act as an extra burden on the body complicating the prognosis of the already existing diseases in an individual, so extra attention is required in geriatric patients suffering from OSA to improve the quality of life[15]. However long-term prognosis of treatment of OSA in completely edentulous patients is missing in scientific literature and it is

the need of the hour to conduct randomized clinical trials to establish clinical evidence for treatment of such patients.

CONCLUSION

Retruded tongue position was associated with OSA. MAD can be an effective treatment option for the treatment of OSA in complete denture-wearing edentulous geriatric patients. Further research through long-term prospective studies is required to confirm the findings of the case report.

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