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## UPPER AIRWAYS 3D VOLUMETRIC ANALYSIS BEFORE AND AFTER ORAL APPLIANCE THERAPY IN OBSTRUCTIVE SLEEP APNOEA

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**Aims:** Obstructive Sleep Apnoea Syndrome (OSAS) shows apnoea or hypopnea due to upper airways stenosis during sleep with its typical symptoms including snoring during sleep and excessive daytime sleepiness. Cone Beam Computed Tomography (CBCT) is useful to reach an accurate 3D volumetric analysis of upper airways. The Oral Appliances (OA) are considered to be an effective treatment for OSAS. The aim is to detect morphological changes in upper airways using CBCT before and after oral appliance therapy.

**Material and Methods:** The study included 50 patients (26 males and 24 females). They were diagnosed with OSAS using polysomnography (PSG). Some criteria has been applied to diagnose OSAS: an apnoea-hypopnoea index (AHI) of >5 per hour during sleep and pathological daytime sleepiness. The therapeutic effect of oral appliance was evaluated by using PSG and when it showed an AHI of <10 or a decrease of >50%. Two types of OA were applied: the Mandibular Advancement Device and Twin Block Appliance. These enlarged the upper airways by holding the mandible forward, at the 60-70% of the maximum mandible advancement and at the minimum vertical position. A CBCT was performed in all the patients.

**Results and Conclusion:** The mean upper airways' 3D volumetric reconstructions increased significantly during the presence of OA versus the absence of OA ( $p<0.01$ ). AHI diminished significantly during the presence of OA ( $p<0.01$ ). Oral therapy is effective for treating mild and moderate OSA. The advantage of a 3D evaluation of the upper airway during OA therapy is the accurate visual confirmation of morphological changes in each region of the upper airway and it could increase the compliance and motivation of the patients for the treatment. OSAS treatment methods included surgery, nasal continuous positive airway pressure (NCPAP), weight reduction, drug therapy and, in the mild and moderate OSA, the use of oral appliances. CBCT is useful to detect morphological changes of upper airways, by a 3D evaluation analysis during oral devices' use. The management of the obstructive sleep apnoea syndrome could be challenging. The treatment recommendations should be proposed by a multidisciplinary approach, that involves different specialists: otorhinolaryngologists surgeons, neurologists, sleep doctors and dentists.

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