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IMPACT OF TREATMENT WITH MANDIBULAR ADVANCEMENT ORAL APPLIANCE ON RESPIRATORY PARAMETERS, SLEEP AND CARDIOMETABOLIC RISK FACTORS OF CPAP NON-ADHERENT PATIENTS WITH SEVERE OBSTRUCTIVE SLEEP APNEA

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Introduction: Obstructive sleep apnea (OSA) may trigger systemic changes linked to important cardiometabolic risk factors such as hypertension, stroke and diabetes II. As a life-threatening, multifactorial disorder, OSA demands a multiprofessional approach. The most common worldwide treatments are Continuous Positive Airway Pressure (CPAP) and Mandibular Advancement Oral Appliance (OAm). The aim of this study was to evaluate the impact of OAm treatment on CPAP non-adherent patients with severe OSA, comparing objective and subjective data between baseline and follow up.

Methods: A prospective study was carried out including non-adherent severe OSA patients, which were referred to OAm therapy evaluation. Patients presenting with snoring, gasping/choking during sleep, fatigue and daily sleepiness were evaluated by a sleep medicine specialist and the diagnosis of severe OSA with a basal polysomnography (PSG). All the patients were treated with a standard OAm (PMPositioner®). Baseline and Follow up (6 months) sleep parameters (PSG and Epworth Sleepiness Scale - ESS) were compared to assess treatment efficacy.

Results: Seventeen patients (9 with hypertension and 8 with hypertension + diabetes) met the inclusion criteria and 13 finished the protocol. After treatment with OAm the following parameters improved significantly: OSA severity (44.5±13.5 to 9.0±4.3, p≤0.001), ODI (46.8±11.6 to 12.1±9.1(p<0.05)), REM (18.4± 4.8 to 21.5± 2.9 (p<0.05)) and SaO2nadir (75.7± 9.4 to 87.0±3.6, p<0.001), ESS (p<0.005). Ten patients (58%) reported a reduction either in systolic and diastolic blood pressure with 3 of them (30%) reduced the hypertensive drug dose.

Conclusion: Our findings show that OAm is a safe and effective treatment option to CPAP non-adherent severe OSA patients. Furthermore OAm therapy had also a positive impact on cardiometabolic risk factors which are particularly relevant outcomes in OSA patients.

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THE EFFECT OF TEXT MESSAGE REMINDERS ON POSITIVE AIRWAY PRESSURE ADHERENCE IN VETERANS WITH OBSTRUCTIVE SLEEP APNEA

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Introduction: Adherence to positive airway pressure (PAP) therapy continues to be a challenge. The main objective of this study was to determine whether mobile text-message reminders increased PAP adherence in veterans with obstructive sleep apnea.

Methods: This is a retrospective study of 25 patients with poor adherence to PAP therapy who used the Veterans Affairs ANNIE app to receive nightly mobile text message reminders. PAP adherence was measured at baseline, 1,and 3 months. A one-way repeated measures ANOVA was used to compare the effect of time on PAP adherence, specifically the percentage of overall days used and percentage use >4 hours. A two-way repeated measures ANOVA without replication was used to determine the effects of AHI severity and time on PAP adherence.

Results: Our sample demographics included a mean age of 59 ±12 years, mean BMI of 33.5% ±5.4, and mean AHI of 26.3 ±25.4. The mean PAP overall percentage use and mean use >4 hours respectively were 32% ± 27 and 18% ± 19 at baseline, 66% ± 27 and 45% ± 30 at 1 month, and 54% ±32 and 37% ± 30 at 3 months. After three months of receiving nightly text-message reminders, there was a statistically significant effect of time on percentage overall PAP use, F (2, 48)=21.54, p=2.10E-07, as well as in the percentage PAP use >4 hours, F (2, 48)=22.05, p=1.61E-07. A two-way repeated measures ANOVA without replication yielded a main effect of the interaction of time with PAP adherence, F (2, 48)=22, p=<0.0001. AHI severity was not a significant factor.

Conclusion: Nightly text message reminders significantly improved PAP adherence from baseline to 3 months. Though PAP adherence was not optimal, it doubled initially in our sample. Further studies are warranted to determine how text-messages can be used long term to improve adherence.

Support: Nil

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A SAFE AND PRECISE TONGUE BASE SURGERY FOR OBSTRUCTIVE SLEEP APNEA: REAL-TIME INTRAOPERATIVE ULTRASOUND-ASSISTED TRANSORAL ROBOTIC SURGERY

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Introduction: Lingual artery (LA) injury is a devastating complication of tongue base surgery. Compared with the anatomic findings of computed tomography angiography (CTA), intraoperative blade of mouth gag might change the thickness of base of tongue (BOT) and anatomy of LA. We aimed to investigate the position of LA in the BOT with intraoperative ultrasound (IOU) imaging during transoral robotic surgery (TORS), and evaluate the bleeding complications when assisted with / without IOU.

Methods: Adult obstructive sleep apnea (OSA) patients who received TORS in BOT resection were recruited since 2016. Assessment tools were pre-op over-night hospital polysomnography (PSG) and anatomy-based Friedman Staging System. Ultrasound imaging was utilized to identify anatomic parameters of LA in BOT, including distance to midline, arterial depth and diameter.

Results: Ninety-three OSA patients (82 male, 88.2%) were analyzed. The mean age was 42.2±10.0 years old and body mass index was 29.2±4.5 kg/m^2. The average apnea hypopnea index (AHI) was 58.1±21.4 events/hour. There were 66 (71.0%), 24 (25.8%) and 3 (3.2%) patients in Friedman stages II, III and IV, respectively. Seventy patients underwent TORS with IOU had shorter operation time (191.7±3.8 minutes) than 23 patients without IOU (220.1±6.6

minutes), less total blood loss (11.3±10.8 versus 19.6±26.7 ml), and more BOT tissue reduction volume (7.1±2.5 versus 3.9±1.6 ml). Significant predictors of arterial depth were higher AHI level during rapid-eye-movement (REM) sleep stage (p=0.038), bigger tonsil size (p=0.034) and more elevated Friedman tongue position (p=0.012). Postoperative complication associated with LA injury was not found in the patients with use of IOU.

Conclusion: When tongue retracted with blade, the distance to midline and depth of LA were altered in BOT. With IOU assisted, surgeon could identify LA position confidently. It is expectable to maximize efficiency and minimize catastrophic bleeding complications when OSA patients received TORS in BOT resection.

Support: nil

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THE ASSOCIATION BETWEEN SLEEP-RELATED BREATHING DISORDERS AND FREE FLAP RECONSTRUCTION SURGERY IN PATIENTS WITH ORAL AND OROPHARYNGEAL CANCERS DURING 6-MONTH FOLLOW-UP

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Introduction: Little was known about the association between sleep-related breathing disorders (SRBDs) and oral and oropharynx cancers (OOCs). To clarify the impact of free flap reconstruction on SRBDs, we performed a pilot study to investigate the change of SRBDs severity in patients with OOC before and after flap reconstruction surgery.

Methods: This study recruited 15 patients who were newly diagnosed with OOCs and expected to receive free flap reconstruction surgery. For each participant, polysomnography tests were performed repeatedly at the time of pre-operative, post-operative 1-week, and post-operative 6-month periods.

Results: All the subjects were male. Median age was 56 years (range 37-68). Mean of body mass index (BMI) was 24.5 (SD 5.8). Pre-operative apnea-hypopnea index (AHI) was 21.1/hour (SD 20.1). During post-operative 1-week period, BMI was 24.1(SD 5.8) and AHI was 40.2/hour (SD 27.9). During post-operative 6-month period, BMI was 23.4 (SD 3.3) and AHI was 33.3/hour (SD 21.6). Comparison between pre-operative and post-operative 6-month periods, there was no significant difference in BMI, but AHI increased significantly (21.1/hour v.s. 33.3/hour, $P = 0.01$).

Conclusion: Our study showed that OOCs patients with free flap reconstruction surgery had significantly increased AHI level during post-operative 1-week period. The SRBDs severity became partial remission after 6 months. We recommend that the head and neck cancer team should pay attention to the SRBDs issues in OOCs patients with free flap reconstruction surgery.

Support:

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COMPARISON BETWEEN VENTILATOR DETECTED APNEA HYPOPNEA INDEX AND MANUAL SCORED RESULTS

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Introduction: The apnea hypopnea index and percentage of periodic breathing detected by the ventilator machine are often used by sleep doctors to evaluate whether sleep apnea has been adequately treated or need further interventions. There are concerns about the accuracy of this autodetection.

Methods: Patients with sleep apnea who were treated with positive airway pressure at the Beth Israel Deaconess Medical Center (Boston) and tracked by the EncoreAnywhere system were included. The machine detected AHI(AHIm) and PB(PBm) were extracted from the first week data in every month from the start of use. The manual scored AHI(AHIs) and PB(PBs) were calculated from the last waveform graph during every month. The apnea hypopnea index as well as periodic breathing in 1st, 2nd, 3rd,6th month AHIm, AHIs, PBm and PBs were compared respectively.

Results: A total of 128 patients were included. The mean age was 56.5 and 66% of them were male. In the first month, the mean AHIs was significantly higher than AHIm, 16.27 vs. 5.36, p<0.001. There was also a large difference between percentage of PBs and PBm, 15.55% vs. 1.96, p<0.001. 78% patients whose AHIm <5 were actually has AHIs >5. The Kappa value for the AHIm and AHIs were 0.074, p=0.069; the value of PBm and PBs was 0.216, p=0.015. In the 2nd, 3rd and 6th months, the mean difference between AHIs and AHIm was 10.58, 10.68, 10.12, respectively. The mean difference between PBs and PBm was 12.32%,11.53%,and 9.18%.

Conclusion: Autodetection of respiratory events consistently under-estimates the severity of residual events. Mean differences remained stable over 6 months. Caution is recommended when attributing non-apnea reasons for residual symptoms in patients with apparently low machine estimated AHI and PB.

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HYBRID THERAPIES TO IMPROVE SLEEP APNEA MANAGEMENT

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Introduction: A one-size fits all approach to sleep apnea management, as is promoted by insurance requirements, pervades the field of sleep medicine but does not address individual differences in disease phenotype or treatment tolerance or attempt to achieve meaningful targets for adherence or disease optimization. Continuous positive airway pressure (CPAP) is considered to be the gold standard treatment for sleep apnea, yet CPAP nonadherence rates remain high (estimates at > 30%) while usage goals (at least 4 hours/night) and therapeutic success targets (machine detected AHI < 5) allow for substantial residual disease to persist. Hybrid therapy, combining mandibular advancement device (MAD) and positive airway pressure (PAP), has demonstrated additive effects on lowering the AHI, ODI, and therapeutic PAP pressure in severe OSA patients with pressure intolerance. This analysis explores the impact of hybrid therapy on treatment adherence and optimization, and identifies patient and data characteristics suggestive of benefit from combined therapies.

Methods: In a retrospective analysis, we reviewed the demographic data, medical histories, home sleep test, diagnostic and therapeutic attended polysomnography results, and PAP device settings and data (including usage, leak, residual event index, and waveforms) pre-and post-hybrid approach, in patients treated with hybrid