tongue to exit at the frenulum to connect to an adjustable anchor. The device works passively and continuously, requiring no input from the patient.

**Methods:** The goal was to demonstrate safety and efficacy of the LTR at 180 days. Sixteen subjects were evaluated with in-lab PSG, endoscopy, questionnaires and x-ray at baseline and at 1, 2, 3 and 6-months (m) after implantation. Three subjects were withdrawn from the study: 2 were referred for tonsillectomy, and 1 for non-compliance. One subject missed the 6-m follow-up. Twelve subjects returning at 6-m had the following mean and ranges: age 39 (29–64), BMI 33 (23–59), AHI 26.5 (11.6–54.4), ESS 13.9 (6–21) and O2 <90% of 16.8 min (1.3–55).

**Results:** The LTR was inserted under propofol in an average of 4.7 (3–18) minutes. Subject pain was rated as 1.7 out of 10 the day following the procedure and decreased to .1 at day 30. Twelve mild AEs were reported. At 180 days the AHI improved 58% (p <.006) with 7 of 12 having 50% improvement and an AHI <20. Time of O2 <90% improved 48% (p<0.2). ESS improved 46% (p<0.001); 8 of 9 subjects with ESS scores >10 were reduced to ≤10. Subjects had no impairment of speech or swallowing and little sensation of the device. Snoring was rated as having decreased by 10 of 12 subjects. All subjects chose to retain the LTR.

**Conclusion:** The feasibility study was considered a success as safety, efficacy and patient acceptance of the LTR were high. Efficacy seems unrelated to OSA severity or BMI; however, decreased efficacy was seen with tonsillar hypertrophy and nasal congestion. Further study is needed to demonstrate persistent efficacy and safety over time.

**Support (If Any):** Linquaflex Inc.

**0511**

UPPER AIRWAY STIMULATION FOR OBSTRUCTIVE SLEEP APNEA: A SINGLE CENTER CLINICAL EXPERIENCE WITH 100 PATIENTS

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**Introduction:** Upper airway stimulation (UAS) is a novel therapy for patients with obstructive sleep apnea (OSA). The aim of this study was to analyze the application and outcome of UAS in patients with moderate to severe OSA in the clinical routine of a tertiary referral center.

**Methods:** One hundred patients who received a UAS device (Inspire Medical Systems) were included. Treatment outcome was evaluated at 2, 3, 6, 12, 24 and 36 months after surgery. Data collection included demographics, body mass index (BMI), apnea hypopnea index (AHI), oxygen saturation and desaturation index (ODI), Epworth Sleepiness Score (ESS) and adherence to therapy.

**Results:** The mean age was 58.7 years with 94 patients being male and 6 female. Mean BMI was 29.4kg/m². The mean pre-implantation AHI of 36.7/h could be reduced to 6.9/h (12 months), to 6.8/h (24 months) and to 6.7/h (36 months) (p<0.001). The mean pre-implantation ODI of 34.4/h could be reduced to 8.0/h (12 months), to 12.0/h (24 months) and to 8.2/h (36 months) (p=0.004). The mean pre-implantation ESS of 11.0 could be reduced to 6.0 after 12, 24 and 36 months (p=0.006). Therapy adherence was a usage of 6.6 hours/night after 24 months and 6.3 hours/night after 36 months.

**Conclusion:** OSA can be successfully treated with upper airway stimulation on a long-term outcome. Patients maintained high adherence to therapy use after 36 months. Upper airway stimulation has been successfully implemented in the routine clinical management of OSA outside of a clinical trial setting and should be offered to incompilant patients to CPAP, who met the inclusion criteria for implantation.

**Support (If Any):** None.

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**0512**

VELOPHARYNX AND OROPHARYNX DIMENSION CHANGES WITH STIMULATION AND POSITIVE PRESSURE

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**Introduction:** The velopharynx is most common collapsible region of the upper airway. Various OSA therapies therapeutically open the upper airway at least in part by improving velopharynx patency. The hypothesis is that therapy like unilateral nerve stimulation is less likely to increase the dimensions of the lateral wall of the velopharynx than pressure forcing because of its actions on tongue protrusion do not affect velum structures.

**Methods:** Seven adult patients (4M, 3F: age range 39 to 68 year) with moderate or severe OSA who had UNS (Inspire Medical Systems, Maple Grove, MN) had cone beam CT collected in the seated position during a) regular breathing, b) with UNS therapy, c) CPAP pressures of +10 cmH2O applied by a full facemask and d) mask pressure of -2cm H2O. Lateral walls of the velopharynx and oropharynx were measured on axial slices reconstructed from the CBCT.

**Results:** Nerve stimulation significantly increases the lateral walls of the velopharynx and the oropharynx (from 21.9 ± 5.4 to 27.0 ± 5.1 mm, p<0.02 and from 28.0 ± 7.8 to 36.0 ± 6.5, p<0.03 respectively). The surface area of the velopharynx increased from (124 ± 46.5 to 186 ± 57.9 mm²,p<0.02) with an increase of the oropharynx surface area from (203.4 ± 89.07 to 367 ± 90 mm², p<0.01). In contrast, pressure of +10cmH2O, showed an increase in the lateral dimension of the velopharynx and the oropharynx (from 21.9 ± 5.4 to 26.1 ± 5.1 mm, p<0.02 and from 28.0 ± 7.8 to 33.7 ± 7 mm,p=0.01 respectively). The surface area of the velopharynx increased from (124 ± 46.5 to 166 ± 40 mm²,p<0.02) with an increase of the oropharynx surface area from (203.4 ± 89.07 to 292 ± 74 mm², p<0.01).

**Conclusion:** Nerve stimulation has a greater effect on the velopharynx and oropharynx than positive pressure.

**Support (If Any):**